



Cisco Nexus 7718 Switch Site Preparation and Hardware Installation Guide

First Published: 2013-08-31

Last Modified: 2014-06-10

Americas Headquarters

Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
<http://www.cisco.com>
Tel: 408 526-4000
800 553-NETS (6387)
Fax: 408 527-0883

Text Part Number: OL-30453-01

THE SPECIFICATIONS AND INFORMATION REGARDING THE PRODUCTS IN THIS MANUAL ARE SUBJECT TO CHANGE WITHOUT NOTICE. ALL STATEMENTS, INFORMATION, AND RECOMMENDATIONS IN THIS MANUAL ARE BELIEVED TO BE ACCURATE BUT ARE PRESENTED WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED. USERS MUST TAKE FULL RESPONSIBILITY FOR THEIR APPLICATION OF ANY PRODUCTS.

THE SOFTWARE LICENSE AND LIMITED WARRANTY FOR THE ACCOMPANYING PRODUCT ARE SET FORTH IN THE INFORMATION PACKET THAT SHIPPED WITH THE PRODUCT AND ARE INCORPORATED HEREIN BY THIS REFERENCE. IF YOU ARE UNABLE TO LOCATE THE SOFTWARE LICENSE OR LIMITED WARRANTY, CONTACT YOUR CISCO REPRESENTATIVE FOR A COPY.

The following information is for FCC compliance of Class A devices: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio-frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case users will be required to correct the interference at their own expense.

The following information is for FCC compliance of Class B devices: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If the equipment causes interference to radio or television reception, which can be determined by turning the equipment off and on, users are encouraged to try to correct the interference by using one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Modifications to this product not authorized by Cisco could void the FCC approval and negate your authority to operate the product.

The Cisco implementation of TCP header compression is an adaptation of a program developed by the University of California, Berkeley (UCB) as part of UCB's public domain version of the UNIX operating system. All rights reserved. Copyright © 1981, Regents of the University of California.

NOTWITHSTANDING ANY OTHER WARRANTY HEREIN, ALL DOCUMENT FILES AND SOFTWARE OF THESE SUPPLIERS ARE PROVIDED "AS IS" WITH ALL FAULTS. CISCO AND THE ABOVE-NAMED SUPPLIERS DISCLAIM ALL WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING, WITHOUT LIMITATION, THOSE OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT OR ARISING FROM A COURSE OF DEALING, USAGE, OR TRADE PRACTICE.

IN NO EVENT SHALL CISCO OR ITS SUPPLIERS BE LIABLE FOR ANY INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES, INCLUDING, WITHOUT LIMITATION, LOST PROFITS OR LOSS OR DAMAGE TO DATA ARISING OUT OF THE USE OR INABILITY TO USE THIS MANUAL, EVEN IF CISCO OR ITS SUPPLIERS HAVE BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

Any Internet Protocol (IP) addresses and phone numbers used in this document are not intended to be actual addresses and phone numbers. Any examples, command display output, network topology diagrams, and other figures included in the document are shown for illustrative purposes only. Any use of actual IP addresses or phone numbers in illustrative content is unintentional and coincidental.

All printed copies and duplicate soft copies of this document are considered uncontrolled. See the current online version for the latest version.

Cisco has more than 200 offices worldwide. Addresses and phone numbers are listed on the Cisco website at www.cisco.com/go/offices.

Cisco and the Cisco logo are trademarks or registered trademarks of Cisco and/or its affiliates in the U.S. and other countries. To view a list of Cisco trademarks, go to this URL: www.cisco.com/go/trademarks. Third-party trademarks mentioned are the property of their respective owners. The use of the word partner does not imply a partnership relationship between Cisco and any other company. (1721R)

© 2019 Cisco Systems, Inc. All rights reserved.



CONTENTS

PREFACE

Preface ix

Audience **ix**

Document Conventions **ix**

Documentation Feedback **x**

Communications, Services, and Additional Information **xi**

CHAPTER 1

Overview 1

Overview of the Cisco Nexus 7718 Switch Installation Features **1**

CHAPTER 2

Preparing the Site 7

Humidity Requirements **7**

Altitude Requirements **7**

Dust and Particulate Requirements **8**

Minimizing Electromagnetic and Radio Frequency Interference **8**

Shock and Vibration Requirements **9**

Grounding Requirements **9**

Planning for Power Requirements **9**

Rack and Cabinet Requirements **12**

Clearance Requirements **14**

CHAPTER 3

Installing the Chassis 17

Installing a Rack or Cabinet **17**

Unpacking and Inspecting a New Switch **18**

Installing the Bottom-Support Rails **19**

Installing a Chassis in a Rack or Cabinet **21**

Grounding a Switch Chassis **27**

Installing Cable Management Frames 33

Installing the Front Doors 38

Installing the Air Filters 41

CHAPTER 4**Connecting to the Network 45**

Guidelines for Connecting Ports 45

Connecting a Console to the Switch 46

Connecting the Management Interface 47

Creating the Initial Switch Configuration 48

Connecting Interface Ports to the Network 49

Connecting a Fiber-Optic Cable to a Transceiver 49

Disconnecting Optical Ports from the Network 50

Maintaining Transceivers and Optical Cables 50

CHAPTER 5**Managing the Switch 53**

Displaying Information About Installed Hardware Modules 53

Displaying the Hardware Inventory for a Switch 56

Displaying the Backplane and Serial Number Information 58

Displaying Environmental Information for a Switch 59

Displaying Temperatures for Modules 63

Connecting to a Module 64

Saving the Module Configuration 65

Displaying Power Usage Information 66

Reloading a Module 66

Rebooting the Switch 67

Overview of Supervisor Modules 67

Shutting Down a Supervisor Module 68

Overview of I/O Module Support 69

Accessing an I/O Module through a Console 70

Displaying Information for the Installed Modules 71

Purging the Module Configuration 73

Shut Down or Power Up an I/O Module 74

Overview of Fabric Module Support 74

Change the Amount of Power Reserved for Fabric Modules 75

Shutting Down or Powering Up a Fabric Module	75
Power Modes Overview	76
Guidelines for Configuring Power Redundancy Modes	77
Configuring the Power Mode	82
Maximum Power Available for 3-kW Power Supplies	83
Maximum Power Available for 3-kW DC Power Supplies	84
Maximum Power Available for 3.5-kW Inputs (AC)	85
Maximum Power Available for 3.5-kW Inputs (DC)	89
Overview of Fan Trays	92
Displaying the Status for the Fan Trays	95
CHAPTER 6	
Installing or Replacing Modules, Fan Trays, and Power Supplies	97
Using an ESD Wrist Strap to Prevent ESD Damage	97
Installing or Replacing a Supervisor Module	98
Migrating from Supervisor 2E Modules (N77-SUP2E) to Supervisor 3E Modules (N77-SUP3E)	102
Nondisruptive Migration from Supervisor 2E Modules (N77-SUP2E) to Supervisor 3E Modules (N77-SUP3E)	105
Prerequisites for Nondisruptive Migration from Supervisor 2E Modules (N77-SUP2E) to Supervisor 3E Modules (N77-SUP3E)	106
Case 1: Dual Supervisor Migration	107
Case 2: Single Supervisor Migration	111
Viewing Migration Status	114
Troubleshooting	117
Migration Clean Up	125
Installing or Replacing an I/O Module	126
Replacing a Fan Tray	128
Migrating from Gen 1 Fan Trays (N77-C7718-FAN) to Gen 2 Fan Trays (N77-C7718-FAN-2)	133
Installing or Replacing a Fabric Module	134
Installing or Replacing a Power Supply in a Switch Chassis	140
Connecting a 3-kW AC Power Supply to AC Power Sources	142
Connecting a 3.5-kW HVAC/HVDC Power Supply to AC Power Sources	143
Connecting DC Power Supplies with Power Sources	145
Connecting a 3.5-kW HVAC/HVDC Power Supply to DC Power Sources	147

APPENDIX A	Switch Specifications	149
	Environmental Specifications	149
	Switch Dimensions	150
	Power Requirements	150
	Maximum Power Available for 3-kW Power Supplies	151
	Maximum Power Available for 3-kW DC Power Supplies	152
	Maximum Power Available for 3.5-kW Inputs (AC)	153
	Maximum Power Available for 3.5-kW Inputs (DC)	157
	Weights and Quantities for the Chassis, Modules, Fan Trays, and Power Supplies	160
	Transceivers, Connectors, and Cables Used with Each I/O Module	162
	100-Gb CPAK Transceiver Specifications	171
	100-Gb QSFP+ Transceiver Specifications	172
	40-Gb QSFP+ Transceiver Specifications	174
	10-Gb SFP+ Optical Transceivers and Fabric Extender Transceivers	176
	10BASE-DWDM SFP+ Transceiver Specifications	180
	1-Gb SFP Transceivers	184
	1000BASE-CWDM SFP Transceiver Cables	184
	1000BASE-DWDM SFP Transceiver Specifications	186
	1000BASE-T and 1000BASE-X SFP Transceiver Specifications	188
	RJ-45 Module Connectors	190
	Power Supply Cable Specifications	190
	3-kW AC Power Cord Specifications	191
	3.5-kW HVAC/HVDC Power Supply AC Power Cord Specifications	192
	3-kW DC Power Cord Specifications	202
	3.5-kW HVAC/HVDC Power Supply DC Power Cord Specifications	202

APPENDIX B	LEDs	205
	Chassis LEDs	205
	Supervisor Module LEDs	206
	I/O Module LEDs	208
	Fan Tray LEDs	210
	Power Supply LEDs	210

APPENDIX C**Accessory Kits 213**

Accessory Kit Contents 213

APPENDIX D**Site Preparation and Maintenance Records 217**

Site Preparation Checklist 217

Contact and Site Information 218

Chassis and Module Information 219



Preface

This preface describes the audience, organization and conventions of the *Cisco Nexus 7706 Hardware Installation Guide*. It also provides information on how to obtain related documentation.

- [Audience, on page ix](#)
- [Document Conventions, on page ix](#)
- [Documentation Feedback, on page x](#)
- [Communications, Services, and Additional Information, on page xi](#)

Audience

This publication is for network administrators who configure and maintain Cisco Nexus devices.

Document Conventions



Note

As part of our constant endeavor to remodel our documents to meet our customers' requirements, we have modified the manner in which we document configuration tasks. As a result of this, you may find a deviation in the style used to describe these tasks, with the newly included sections of the document following the new format.

Command descriptions use the following conventions:

Convention	Description
bold	Bold text indicates the commands and keywords that you enter literally as shown.
<i>Italic</i>	Italic text indicates arguments for which the user supplies the values.
[x]	Square brackets enclose an optional element (keyword or argument).
[x y]	Square brackets enclosing keywords or arguments separated by a vertical bar indicate an optional choice.

Convention	Description
{x y}	Braces enclosing keywords or arguments separated by a vertical bar indicate a required choice.
[x {y z}]	Nested set of square brackets or braces indicate optional or required choices within optional or required elements. Braces and a vertical bar within square brackets indicate a required choice within an optional element.
<i>variable</i>	Indicates a variable for which you supply values, in context where italics cannot be used.
string	A nonquoted set of characters. Do not use quotation marks around the string or the string will include the quotation marks.

Examples use the following conventions:

Convention	Description
<code>screen font</code>	Terminal sessions and information the switch displays are in screen font.
boldface screen font	Information you must enter is in boldface screen font.
<i>italic screen font</i>	Arguments for which you supply values are in italic screen font.
<>	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.

This document uses the following conventions:



Note

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



Caution

Means *reader be careful*. In this situation, you might do something that could result in equipment damage or loss of data.

Documentation Feedback

To provide technical feedback on this document, or to report an error or omission, please send your comments to: .

We appreciate your feedback.

Communications, Services, and Additional Information

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

Cisco Bug Search Tool

[Cisco Bug Search Tool](#) (BST) is a web-based tool that acts as a gateway to the Cisco bug tracking system that maintains a comprehensive list of defects and vulnerabilities in Cisco products and software. BST provides you with detailed defect information about your products and software.



CHAPTER 1

Overview

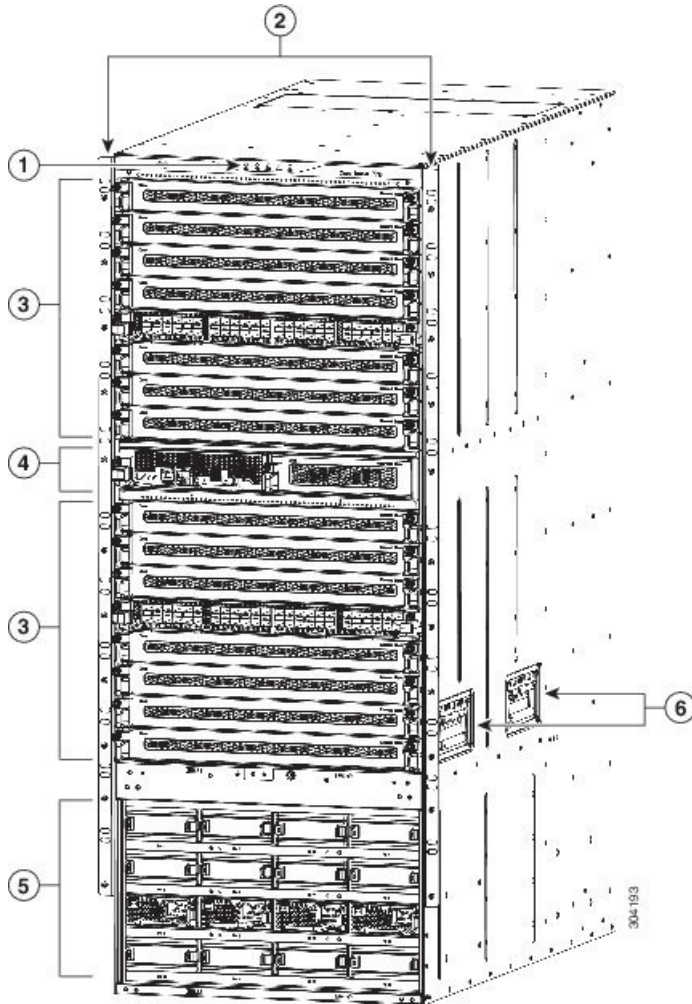
This chapter includes the following sections:

- [Overview of the Cisco Nexus 7718 Switch Installation Features, on page 1](#)

Overview of the Cisco Nexus 7718 Switch Installation Features

The Cisco Nexus 7718 chassis has 18 slots for one or two supervisor modules and up to 16 I/O modules. The chassis also holds up to six fabric modules, up to 16 AC or DC 3-kW and 3.5-kW HVAC/HVDC power supplies, and three fan trays. To group the many networking cables for each I/O module on this chassis, you can install cable management frames on the chassis. You can install optional locking front doors and you can install an optional set of air filters on the front door and cable management frames. The following figure shows the standard hardware features seen from the front of the chassis.

Figure 1: Standard Hardware Features on the Front of the Cisco Nexus 7718 Chassis

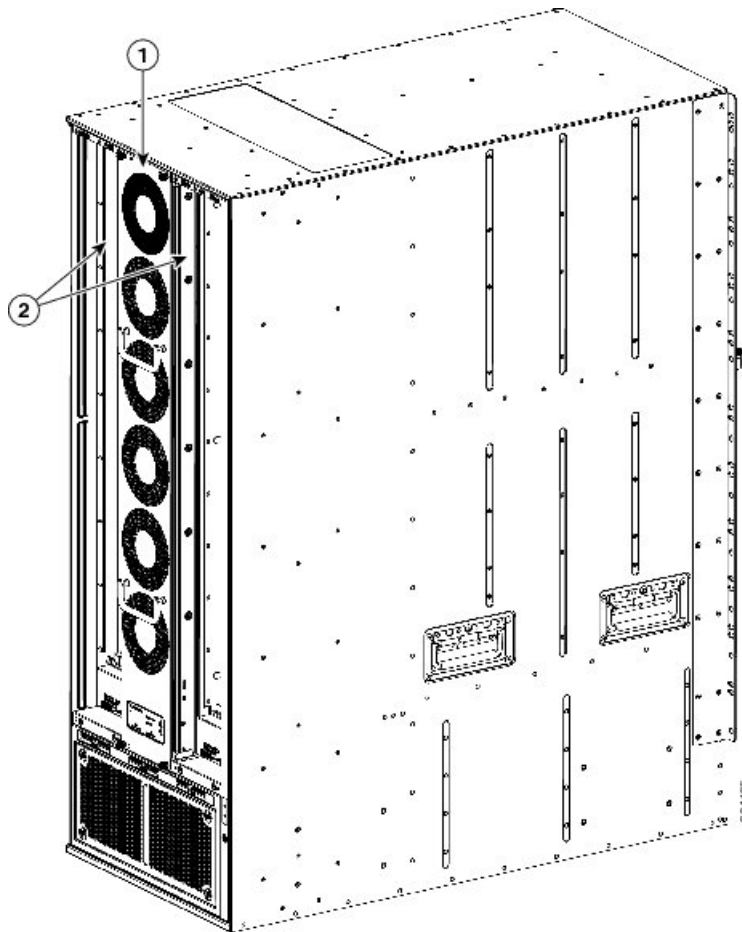


1	Chassis LEDs	4	Supervisor modules (one or two) (N77-SUP2E and N77-SUP3E) in Slots 9,10
2	Chassis mounting brackets (one on each side of the chassis)	5	Power supplies (up to 16) <ul style="list-style-type: none"> • 3-kW AC power supply (N77-AC-3KW) • 3-kW DC power supply (N77-DC-3KW) • 3.5-kW HVAC/HVDC power supply (N77-HV-3.5KW)

3	<p>I/O modules (1–16) in Slots 1-8, 11-18</p> <ul style="list-style-type: none"> • 48-port 1- and 10-Gigabit Ethernet I/O module (N77-F248XP-23E) • 12-port 100-Gigabit Ethernet I/O module (N77-F312CK-26) • 24-port 40-Gigabit Ethernet I/O module (N77-F324FQ-25) • 48-port 1- and 10-Gigabit Ethernet I/O module (N77-F348XP-23) • 30-port 100-Gigabit Ethernet I/O module (N77-F430CQ-36) • 12-port 100-Gigabit Ethernet I/O module (N77-M312CQ-26L) • 24-port 40-Gigabit Ethernet I/O module (N77-M324FQ-25L) • 48-port 1- and 10-Gigabit Ethernet I/O module (N77-M348XP-23L) 	6	Chassis handles (used only for small movements on the rack)
---	--	---	---

The following figure shows the standard hardware features seen from the rear of the chassis.

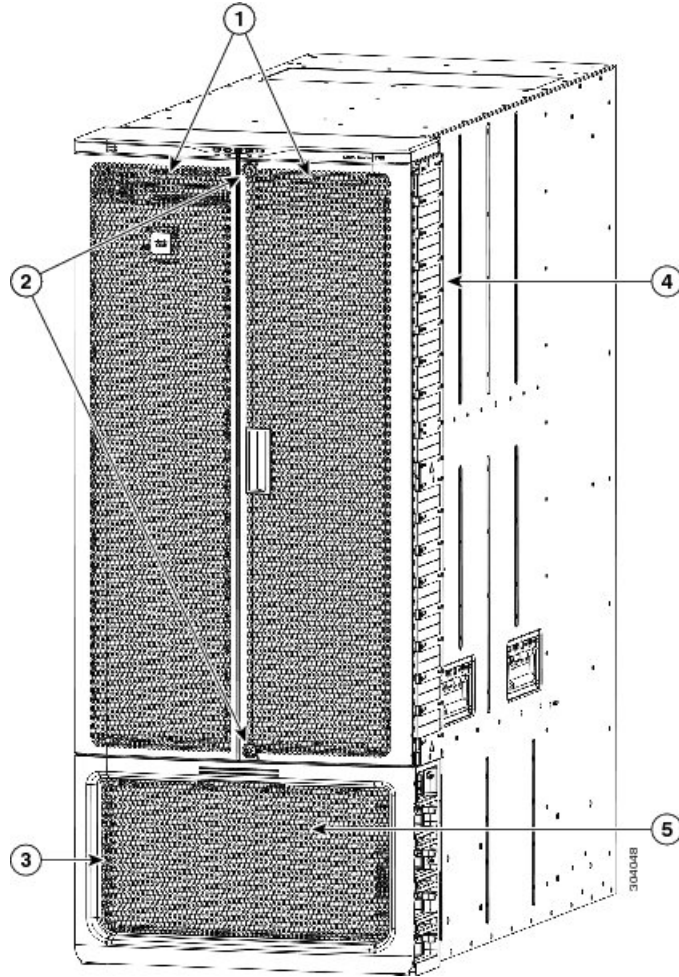
Figure 2: Standard Hardware Features on the Rear of the Cisco Nexus 7718 Chassis



1	Three fan trays — only 1 fan tray, N77-C7718-FAN, is shown in this figure to show fabric modules in back. There are 2 types of fan trays: 38 mm Gen 1 fan trays (N77-C7718-FAN) and 76 mm Gen 2 fan trays (N77-C7718-FAN-2). Use the Gen 2 fan trays for Network Equipment Building System (NEBS) compliance when the Cisco Nexus 7700 M3-Series 12-port 100-Gigabit Ethernet I/O module (N77-M312CQ-26L) or the Cisco Nexus 7700 F4-Series 30-port 100-Gigabit Ethernet I/O module (N77-F430CQ-36) is installed on the switch.	3	Blank module in place of missing fabric module
2	Fabric modules (up to six with two behind each fan tray) (N77-C7718-FAB-2)	4	Fabric and fan tray LEDs

The following figure shows the optional features seen on the front of the Cisco Nexus 7718 chassis.

Figure 3: Optional Hardware Features on the Front of the Cisco Nexus 7718 Chassis



1	Front doors with locks (N77-C7718-FDK)	4	Air filter (N77-C7718-AFLT) inside each of the top two front doors (filters not shown), between each door and the cable management frame (not shown), and over the cable management frames (shown).
2	Locks to prevent access to the cable management area	5	Power supply cable management frames (not seen behind the power supply door).
3	Power supply door (N77-C7718-FDK)		



CHAPTER 2

Preparing the Site

This chapter includes the following sections:

- [Humidity Requirements, on page 7](#)
- [Altitude Requirements, on page 7](#)
- [Dust and Particulate Requirements, on page 8](#)
- [Minimizing Electromagnetic and Radio Frequency Interference, on page 8](#)
- [Shock and Vibration Requirements, on page 9](#)
- [Grounding Requirements, on page 9](#)
- [Planning for Power Requirements, on page 9](#)
- [Rack and Cabinet Requirements, on page 12](#)
- [Clearance Requirements, on page 14](#)

Humidity Requirements

High humidity can cause moisture to seep into the switch. Moisture can cause corrosion of internal components and degradation of properties such as electrical resistance, thermal conductivity, physical strength, and size. The switch is rated to operate at 8 to 80 percent relative humidity, with a humidity gradation of 10 percent per hour.

The switch can withstand from 5 to 90 percent relative humidity. Buildings in which the climate is controlled by air-conditioning in the warmer months and by heat during the colder months usually maintain an acceptable level of humidity for the switch equipment. However, if the switch is located in an unusually humid location, you should use a dehumidifier to maintain the humidity within an acceptable range.

Altitude Requirements

If you operate a switch at a high altitude (low pressure), the efficiency of forced and convection cooling is reduced and can result in electrical problems that are related to arcing and corona effects. This condition can also cause sealed components with internal pressure, such as electrolytic capacitors, to fail or to perform at a reduced efficiency. This switch is rated to operate at altitudes from –500 to 13,123 feet (–152 to 4,000 meters). You can store the switch at altitudes of –1,000 to 30,000 feet (–305 to 9,144 meters).

Dust and Particulate Requirements

Exhaust fans cool power supplies and system fan trays cool switches by drawing in air and exhausting air out through various openings in the chassis. However, fans also ingest dust and other particles, causing contaminant buildup in the switch and increased internal chassis temperature. A clean operating environment can greatly reduce the negative effects of dust and other particles, which act as insulators and interfere with the mechanical components in the switch.



Note If you are using this switch in a nonclean environment, you can order and install optional air filters. These air filters require that you also order the optional front door for the chassis.

In addition to regular cleaning, follow these precautions to avoid contamination of your switch:

- Do not permit smoking near the switch.
- Do not permit food or drink near the switch.

Minimizing Electromagnetic and Radio Frequency Interference

Electromagnetic interference (EMI) and radio frequency interference (RFI) from the switch can adversely affect other devices such as radio and television (TV) receivers operating near the switch. Radio frequencies that emanate from the switch can also interfere with cordless and low-power telephones. Conversely, RFI from high-power telephones can cause spurious characters to appear on the switch monitor.

RFI is defined as any EMI with a frequency above 10 kHz. This type of interference can travel from the switch to other devices through the power cable and power source or through the air like transmitted radio waves. The Federal Communications Commission (FCC) publishes specific regulations to limit the amount of EMI and RFI that can be emitted by computing equipment. Each switch meets these FCC regulations.

To reduce the possibility of EMI and RFI, follow these guidelines:

- Cover all open expansion slots with a metal filler.
- Always use shielded cables with metal connector shells for attaching peripherals to the switch.

When wires are run for any significant distance in an electromagnetic field, interference can occur between the field and the signals on the wires and cause the following implications:

- Bad wiring can result in radio interference emanating from the plant wiring.
- Strong EMI, especially when it is caused by lightning or radio transmitters, can destroy the signal drivers and receivers in the chassis and even create an electrical hazard by conducting power surges through lines into equipment.



Note To predict and prevent strong EMI, you might need to consult experts in radio frequency interference (RFI).

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

If the wires exceed the 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 switches. You may want to consult experts in electrical surge suppression and shielding if you had similar problems in the past.

Shock and Vibration Requirements

The switch is being shock- and vibration-tested for operating ranges, handling, and earthquake standards to Network Equipment Building Standards (NEBS) Zone 4 per GR-63-Core.

Grounding Requirements

The switch is sensitive to variations in voltage supplied by the power sources. Overvoltage, undervoltage, and transients (or spikes) can erase data from the memory or cause components to fail. To protect against these types of problems, ensure that there is an earth-ground connection for the switch. You can connect the grounding pad on the switch either directly to the earth-ground connection or to a fully bonded and grounded rack.

You must provide the grounding cable to make this connection but you can connect the grounding wire to the switch using a grounding lug that ships with the switch. Size the grounding wire to meet local and national installation requirements. Depending on the power supply and system, a 12 AWG to 6 AWG copper conductor is required for U.S. installations (for those installations, we recommend that you use commercially available 6 AWG wire). The length of the grounding wire depends on the proximity of the switch to proper grounding facilities.



Note You automatically ground the AC power supplies when you connect them to a power source, but you cannot ground a 3-kW DC power supply. You must connect the chassis to the facility earth ground.

Planning for Power Requirements

To plan for the power requirements of a switch, you must determine each of the following:

- Power requirements of the switch
- Minimum number of power supplies required to power the switch and its components
- Power mode to use and the number of additional power supplies required for that mode

You must also ensure that the circuit used for the switch is dedicated to the switch to minimize the possibility of circuit failure.

When you know the amount of power that is required for operations (available power) and redundancy (reserve power), you can plan for the required number of input power receptacles with reach of the switch location.

Step 1 Determine the power requirement for the switch by summing the maximum wattage for each installed module (see the following table).

Table 1: Power Requirements for the Cisco Nexus 7718 Switch Modules

Component	Quantity	Maximum	Typical	
Supervisor Modules	1 or 2	—	—	
Supervisor 2 Enhanced (N77-SUP2E)	(same type if using 2)	265 W	137 W	
Supervisor 3 Enhanced (N77-SUP3E)		150 W	110 W	
F2 I/O Modules	1 to 16 (can mix types)	—	—	
48-port 1- and 10-Gigabit Ethernet I/O module (N77-F248XP-23E)		500 W	451 W	
F3 I/O Modules		—	—	
48-port 1- and 10-Gigabit Ethernet I/O module (N77-F348XP-23)		480 W	450 W	
24-port 40-Gigabit Ethernet I/O module (N77-F324FQ-25)		740 W	650 W	
12-port 100-Gigabit Ethernet I/O module (N77-F312CK-26)		730 W	640 W	
F4 I/O Module		—	—	
30-port 100-Gigabit Ethernet I/O module (N77-F430CQ-36)		1000 W	730 W	
M3 I/O Modules		—	—	
48-port 1- and 10-Gigabit Ethernet I/O module (N77-M348XP-23L)		560 W	500 W	
24-port 40-Gigabit Ethernet I/O module (N77-M324FQ-25L)		750 W	700 W	
12-port 100-Gigabit Ethernet I/O module (N77-M312CQ-26L)		1095 W	800 W	
Fabric Module		3 to 6	—	—
Fabric Module (N77-C7718-FAB-2)			300 W	102 W
Fan Trays	—	—	—	
38 mm Gen 1 Fan Tray (N77-C7718-FAN)	3	900 W	51 W	
76 mm Gen 2 Fan Tray (N77-C7718-FAN-2)	3	900 W	51 W	

For example, if you are installing a switch with two Supervisor 2 modules (2 x 265 W), 16 48-port 10-Gigabit Ethernet I/O modules (PID: N77-F248XP-23E) (16 x 500 W), six fabric modules (6 x 300 W) and three fan trays (3 x 900 W), the power requirements for this switch would be 13,030 W.

Note Maximum power values are used for calculating the power requirements.

Step 2 Determine the number of power supplies needed for the available power requirement by dividing the power requirement amount (see Step 1) by the output wattage of the power supplies installed in the switch.

For 3-kW power supplies, round up a fractional result to the nearest ones digit to determine the number of power supplies needed.

For example, if you are installing a switch with 3-kW power supplies and have a consumption of 13,030 W, you need five power supplies ($13,030 \text{ W} / 3000 \text{ W} = 4.34$ or 5 power supplies) to operate the switch and all of its modules.

Step 3 Select one of the following power modes to determine the number of additional power supplies required for reserve power:

- **Combined power**—Do not add any power supplies to the number of power supplies calculated for the available power in Step 2. This power mode does not provide power redundancy, so no extra power supplies are needed.
- **Power supply redundancy ($n+1$ redundancy)**—Add one power supply (reserve power supply). This form of power redundancy provides a reserve power supply that can replace any active power supply that goes offline.
- **Input source redundancy (grid redundancy)**—Add enough power supplies (reserve power supplies) to at least equal the total output of the active power supplies (number of power supplies calculated in Step 2). Typically, you would double the number of power supplies. You must plan for a second power source for the reserve power supplies. For example, if you calculate that you need two 3-kW power supplies for 6 kW of available power, you need another two 3-kW power supplies for 6 kW of reserve power (for a total of four 3-kW power supplies used for available and reserve power).
- **Full redundancy ($n+1$ and grid redundancy)**—Add enough power supplies (reserve power supplies) to at least equal the output of the active power supplies (number of power supplies calculated in Step 2). For power supply ($n+1$) redundancy, ensure that you have at least one extra power supply. For input-source (grid) redundancy, you will probably double the number of power supplies. You must plan for a second power source with at least the same amount of input power for the reserve power supplies. For example, if you calculate that you need two 3-kW power supplies for 6 kW of active power, then you need another two 3-kW power supplies for 6 kW of reserve power (for a total of four 3-kW power supplies used for active and reserve power). Either one of the reserve power supplies can replace any of the active power supplies.

Step 4 Be sure that the power source circuits are dedicated to the switch and not to other electrical equipment.

For combined power mode (no power redundancy) or power supply ($n+1$) redundancy, you need only one dedicated circuit. For input-source (grid) or full redundancy, you must have two dedicated power circuits, each circuit powering half of the 3-kW or 3.5-kW power supplies. The requirements for each circuit are listed in the following table.

Table 2: Circuit Requirements for 3-kW Power Supplies

Power Supply		Number of Circuits	Requirement for Each Circuit
AC Power Supplies			
3-kW power supply	(N77-AC-3.0KW)	1	20 A at 110 VAC or 220 VAC
DC Power Supplies			
3-kW power supply	(N77-DC-3.0KW)	1	20A

Table 3: Circuit Requirements for 3.5-kW HVAC/HVDC Power Supplies

Power Supply		Number of Circuits	Requirement for Each Circuit
3.5-kW HVAC/HVDC power supply	(N77-HV-3.5KW)	1	20 A at 110 VAC, 210 VAC, 220/230 VAC and 277 VAC or 20 A at 210 VDC, 220/240 VDC and 380 VDC

Step 5 Plan the placement of the input power receptacles within reach of the power cables used for each power supply (see the following table for the maximum distances).

Typically, power receptacles are placed on the rack with the switch. If the DC power source is further than allowed by the DC power cables, you can install a power interface unit (PIU) in the rack with the switch and connect that to the power source with other cabling.

Power Supply	Maximum Distance Between Receptacle and Power Supply
All AC power supplies	12 feet (3.6 m)
HVAC/HVDC 3.5-kW power supplies	14 feet (4.26 m)
DC 3-kW power supplies	Determined by the length of the power cord that you supply.

Rack and Cabinet Requirements

You can install the following types of racks or cabinets for your switch:

- Standard perforated cabinets
- Solid-walled cabinets with a roof fan tray (bottom to top cooling)



Note Installation clearance requirements for solid-wall cabinets are not in the scope of this guide. Such installations have to be custom-engineered by a cooling professional. The customised configuration should satisfy the requirements mentioned in the [Preparing the Site](#) and the [Switch Specifications](#) sections.

- Standard open four-post Telco racks

To correctly install the switch in a cabinet that is located in a hot-aisle/cold-aisle environment, you should fit the cabinet with baffles to prevent exhaust air from recirculating into the chassis air intake.

Work with your cabinet vendors to determine which of their cabinets meet the following requirements or see the Cisco Technical Assistance Center (TAC) for recommendations:

- Use a standard 19-inch, four-post Electronic Industries Alliance (EIA) cabinet or rack with mounting rails that conform to English universal hole spacing per section 1 of the ANSI/EIA-310-D-1992 standard.

- The height of the rack or cabinet must accommodate the 26-RU (45.25 inches or 114.9 cm) height of the switch and its bottom support bracket.
- The depth of a four-post rack must be 24 to 32 inches (61.0 to 81.3 cm) between the front and rear mounting brackets.
- Required clearances between the chassis and the edges of its rack or the interior of its cabinet are as follows:
 - 7.5 inches (19.1 cm) is required between the chassis and the front of the rack or interior of the cabinet (required for cabling).
 - 3.0 inches (7.6 cm) is required between the rear of the chassis and the perforated rear door of the cabinet (required for airflow inside the cabinet if used).



Note This requirement does not apply to enclosures which have a solid rear door or wall with other exhaust configurations.

- No clearance is required between the chassis and the sides of the rack or cabinet (no side airflow).

Additionally, you must consider the following site requirements for the rack:

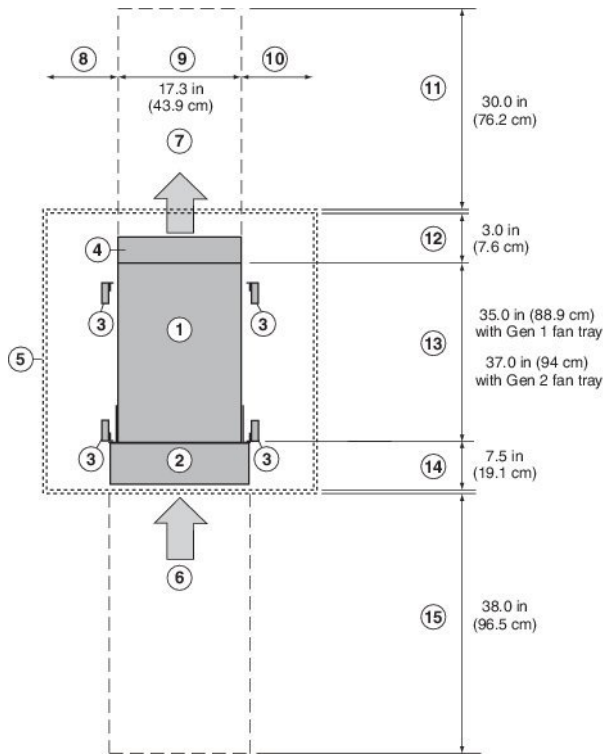
- Power receptacles must be located within reach of the power cords used with the switch.
 - AC power supplies
 - Power cords for 3-kW AC power supplies are 8 to 12 feet (2.5 to 3.6 m) long.
 - DC power supplies
 - Power cords for 3.0-kW DC power supplies are supplied and dimensioned by the customer.
 - HVAC/HVDC power supplies
 - Power cords for 3.5-kW HVAC/HVDC power supplies are 14 feet (4.26 m) long.
- Clearance required for cables that connect to as many as 1600 ports (in addition to the cabling required for other devices in the same rack). These cables must not block access to any removable chassis modules or block airflow into or out of the chassis. Route the cables through the cable management frames on the left and right sides of the chassis.
- Where necessary, have a seismic rating of Network Equipment Building Standards (NEBS) Zone 3 or Zone 4, per GR-63-CORE if required.¹
- Minimum gross load rating of 2000 lb (907.2 kg) (static load rating) if supporting two switches.

¹ Currently undergoing NEBS testing.

Clearance Requirements

You must provide the chassis with adequate clearance between the chassis and any other rack, device, or structure so that you can properly install the chassis, route cables, provide airflow, and maintain the switch. For the clearances required for an installation of this chassis, see the following figure.

Figure 4: Clearances Required for the Chassis



1	Chassis	9	Chassis width
2	Cable management frames	10	No right side clearance required (no airflow on right side)
3	Vertical rack-mount posts and rails	11	Rear service clearance required to replace fan trays and fabric modules
4	Area required for fan tray handles (allow 2 inches [5 cm])	12	Airflow clearance required between the chassis and inside of cabinet (if used)
5	Nearest object or inside of cabinet (no side clearance required)	13	Chassis depth Note The chassis depth will increase by 2 inches when the 76mm Gen 2 fan tray (N77-C7718-FAN-2) is used.

6	Air intake from cold aisle for all modules and power supplies	14	Clearance required between the front of the chassis and the inside of the cabinet (if used) or edge of cold aisle (if no cabinet) for the cable management frames and the optional front doors
7	Air exhaust to hot aisle for all modules and power supplies	15	Front service clearance required for installing the chassis and replacing the modules
8	No left side clearance required (no airflow on left side)		



Note [Figure 4: Clearances Required for the Chassis](#), on page 14 shows the clearance requirements for conventional cold-aisle to hot-aisle systems which include rack enclosures with perforated front and rear doors. The information given above does not apply to enclosures which have a solid rear or front door or wall with other inlet or exhaust configurations. We recommend consulting a cooling professional if a solid rear or front door is used.



CHAPTER 3

Installing the Chassis

This chapter includes the following topics:

- [Installing a Rack or Cabinet, on page 17](#)
- [Unpacking and Inspecting a New Switch, on page 18](#)
- [Installing the Bottom-Support Rails , on page 19](#)
- [Installing a Chassis in a Rack or Cabinet, on page 21](#)
- [Grounding a Switch Chassis, on page 27](#)
- [Installing Cable Management Frames, on page 33](#)
- [Installing the Front Doors, on page 38](#)
- [Installing the Air Filters, on page 41](#)

Installing a Rack or Cabinet

Before you install the switch, you must install a standard four-post, 19-inch EIA data center rack (or a cabinet that contains such a rack) that meets the requirements listed in [Rack and Cabinet Requirements](#).

Step 1 Bolt the rack to the concrete subfloor before moving the chassis onto it.

Note Stability hazard. The rack stabilizing mechanism must be in place, or the rack must be bolted to the floor before you slide the unit out for servicing. Failure to stabilize the rack can cause the rack to tip over.

Statement 1048

Step 2 If the rack has bonded construction, connect it to the earth ground. This action enables you to easily ground the switch and its components and to ground your electrostatic discharge (ESD) wrist strap to prevent damaging discharges when you handle ungrounded components before installing them.

Step 3 If you need access to the source power at the rack, include either AC power receptacles or a DC power interface unit (PIU) with the amperage required by the switch that you are installing. .

If you are using DC power, be sure that the DC power supply is grounded and that there is direct access to the facility DC power or indirect access through a power interface unit (PIU). You must connect the DC power supply to the earth ground before you connect it to the facility DC power.

Note Take care when connecting units to the supply circuit so that wiring is not overloaded.

Statement 1018

Note If you are using the combined power mode or power-supply redundancy, you need only one power source. If you are using input-source redundancy or full redundancy, you need two power sources.

Unpacking and Inspecting a New Switch

Before you install a new chassis, you need to unpack and inspect it to be sure that you have all the items that you ordered and verify that the switch was not damaged during shipment. If anything is damaged or missing, contact your customer representative immediately.



Caution When you handle the chassis or its components, you must follow ESD protocol at all times to prevent ESD damage. This protocol includes but is not limited to wearing an ESD wrist strap that you connect to the earth ground.



Tip Do not discard the shipping container when you unpack the switch. Flatten the shipping cartons and store them with the pallet used for the system. If you need to move or ship the system in the future, you will need these containers.

Step 1 Compare the shipment to the equipment list that is provided by your customer service representative and verify that you have received all of the ordered items.

The shipment should include boxes for the following:

- System chassis, which includes the following installed components:
 - 1 or 2 supervisor modules
 - 1 to 16 I/O modules
 - Up to 6 fabric modules
 - 3 fan trays
 - 1 to 16 power supply units
- Switch accessory kit
 - To see a list of what is included in this kit, see [Accessory Kit Contents, on page 213](#).
- Cable management frames
 - Left and right side frames
 - Top frame
 - M4 x 12 mm flat-head Phillips screws (12)
- Front door kit — Optional (N77-C7718-FDK)

- Front door (1) (69-2532-01)
- M3 x 8 mm pan-head screws (2) (48-0393-01)
- Air filter kit — Optional (N77-C7718-AFLT)
 - Air filter (1) for the front door
 - Door-side brush filters (2)
 - Cable-management frame brush filters (2)
 - M4 x 12 mm flat-head Phillips screws (12)

Step 2 Check the contents of each box for damage.

Step 3 If you notice any discrepancies or damage, send the following information to your customer service representative by email:

- Invoice number of the shipper (see the packing slip)
- Model and serial number of the missing or damaged unit
- Description of the problem and how it affects the installation

Installing the Bottom-Support Rails

The bottom-support rails support the chassis in the rack or cabinet. To maximize the stability of the rack, you must attach these rails at the lowest possible rack unit (RU). If anything lighter than the switch is already installed in the rack, you should make sure that it is positioned above where you will be installing the switch.



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

To attach the bottom-support rails to a four-post EIA rack, follow these steps:

Before you begin

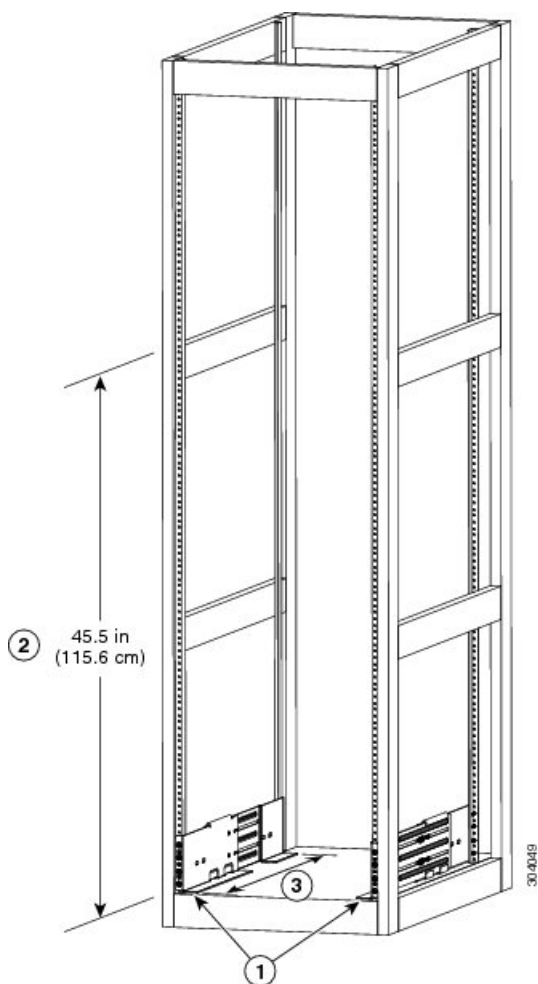
Before you can install the bottom support rails, make sure that you have done each of the following:

- Installed a four-post rack or cabinet (see [Installing a Rack or Cabinet](#)).

- Unpacked and inspected the chassis shipment.

Step 1 Position one of the two adjustable bottom-support rails at the lowest possible RU in the rack or cabinet. Adjust the length of the rail so that it stretches from the outer edges of the front and rear vertical mounting rails. You can expand the rail so that its mounting brackets are spaced between 24 to 32 inches (61.0 to 81.3 cm). See the following figure.

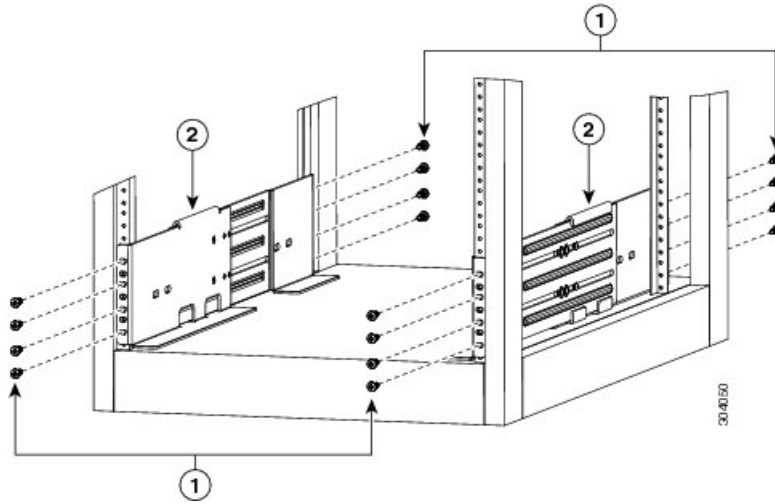
Figure 5: Positioning Bottom-Support Rails for a Cisco Nexus 7718 Chassis



1	Position two bottom-support rails at the lowest RU on the rack.	2	Allow at least 45.5 inches (115.6 cm) (26 RU) for each Cisco Nexus 7718 chassis.
---	---	---	--

Step 2 Attach the bottom-support rail to the rack or cabinet. Use a Phillips screwdriver to screw in four M6 x 19 mm or 12-24 x 3/4 inch Phillips screws on each end of the rail (using a total of 8 screws for the rail) as shown in the following figure. Tighten each screw to 40 in. lbs (4.5 N.m) of torque.

Figure 6: Attaching Bottom-Support Rails to a Rack



1	M6 x 19 mm (or 12-24 x 3/4 in.) Phillips screws (8 per rail)	2	Adjustable bottom-support rails (2)
---	--	---	-------------------------------------

Step 3 Repeat the first two steps to attach the other bottom-support rail to the other side of the rack.

Note Make sure that the two bottom-support rails are level with one another. If they are not level, adjust the higher rail down to the level of the lower rail.

What to do next

When the bottom-support rails are installed at the lowest possible RU and are level, you are ready to install the chassis in the rack or cabinet.

Installing a Chassis in a Rack or Cabinet

To move a chassis to a rack, it is necessary to slide the chassis onto a mechanical lift, use that mechanical lift to position the chassis in front of its place on the rack, slide the chassis from the lift to the rack, and then bolt the chassis to the rack. You can make the chassis easier to move if you remove the power supplies, fan trays, and fabric modules. These modules are sealed to minimize the chance of being damaged by electrostatic discharge (ESD), so you can remove them from the chassis to make the chassis easier to move.

Before you begin

- You have fully installed a rack or cabinet (see [Installing a Rack or Cabinet](#)).



Note Stability hazard. The rack stabilizing mechanism must be in place, or the rack must be bolted to the floor before you slide the unit out for servicing. Failure to stabilize the rack can cause the rack to tip over. Statement 1048

- You have installed the bottom-support rails to the lowest possible RU in the rack and there is at least 25 RU (43.75 inches [111 cm]) of space above the rails to install the chassis.
- Data center ground is accessible where you are installing the chassis.
- If there are other devices in the rack, you have arranged the heavier devices below lighter devices, and all devices are installed as low as possible with spacing left for the switch chassis.
- You have unpacked and inspected the chassis shipment for completeness and damage.
- You have the following tools and equipment:
 - Mechanical lift capable of lifting the weight of the chassis and the modules, fan trays, and power supplies installed in it. Fully loaded, the switch weighs up to 923 lb (419 kg). If you remove the units protected from ESD damage (power supplies, fan trays, and fabric modules), the maximum weight of the chassis is 586 lb (266 kg). To determine the full weight of your chassis with its modules installed (or the weight if you remove the protected modules), see [Weights and Quantities for the Chassis, Modules, Fan Trays, and Power Supplies, on page 160](#).



Caution You must use a mechanical lift to lift anything weighing over 120 pounds (55 kg).

- Number 1 Phillips-head torque screwdriver
- 18 12-24 x 3/4-inch or M6 x 19 mm Phillips screws from the bottom-support rails kit



Note You should also have at least three persons to move the chassis, which can weigh up to 923 pounds (449 kg), onto and off the mechanical lift and rack.



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

Step 1

If you need to make the chassis as light as possible for moving, remove the following modules and place them where their connectors will not be damaged:

- Power supplies—For each power supply, press and hold the eject lever, and use the handle on the front of the power supply to pull the power supply out of the chassis.
- Fan trays—Unscrew the four captive screws, and use the two handles on the fan tray to pull the fan tray out of the chassis.
- Fabric modules—For each fabric module, keep your face at least 12 inches (30 cm) away from the modules, press both eject buttons on the front, rotate both levers away from the front of the module, use the levers to pull the module out of the chassis.

Step 2

Load the chassis onto a mechanical lift as follows:

- a) Position the mechanical lift next to the shipping pallet that holds the chassis.
- b) Elevate the lift platform to the level of the bottom of the chassis (or no more than 1/4 inch [0.635 cm] below the bottom of the chassis).
- c) Use at least four persons to slide the chassis fully onto the lift so that the side of the chassis touches or is close to the vertical rails on the lift. Make sure that the front and rear of the chassis are unobstructed so you can easily push the chassis into the rack.

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

Caution To lift the chassis, use a mechanical lift, not the handles on the side of the chassis (the handles are not rated for lifting over 200 pounds [91 kg]). Use the side handles for only repositioning the chassis after it is already on the mechanical lift or in the rack or cabinet.

Step 3

Use the mechanical lift to position the chassis in front of the four-post rack or cabinet and elevate the chassis to the level of the bottom-support rails or no more than 1/4 inch (0.6 cm) above the bracket.

Step 4

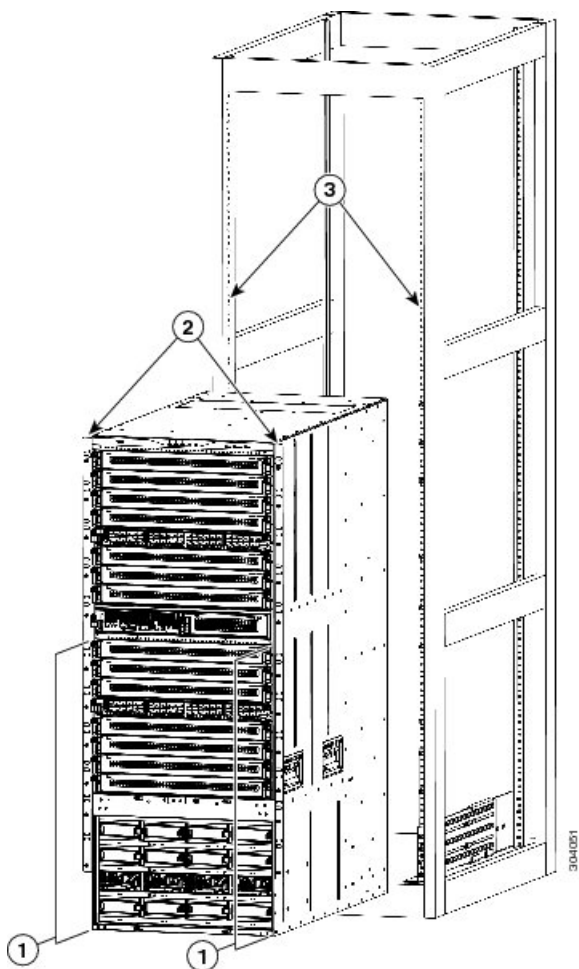
Make sure that the chassis is positioned with the rear (the side with the open power supply slots) ready to go into the rack or cabinet first. If necessary, you can use the two handles on either side of the chassis to move the chassis on the lift.

Step 5

Use two persons to push the chassis halfway onto the rack or cabinet and use one person to guide the chassis down the bottom-support brackets while making sure that the chassis does not get caught on any edges of the bottom support brackets.

Push only the lower front sides of the chassis—do not push on any modules and do not use any module handles to move the chassis.

Figure 7: Moving the Chassis onto a Rack or Cabinet



1	Push the sides of the lower half of the front side of the chassis (do not push on any of the modules or module handles).	3	Rack vertical mounting rails.
2	Chassis mounting brackets.		

Step 6 If the mechanical lift is raised above the bottom-support brackets, gently lower the lift to the level of the brackets or no more than 1/4 inch (0.6 cm) below the brackets.

This keeps the chassis level on the brackets and helps prevent the chassis from getting caught on the inside edges of the bottom-support brackets.

Step 7 Use two persons to fully push the chassis all the way onto the rack or cabinet.

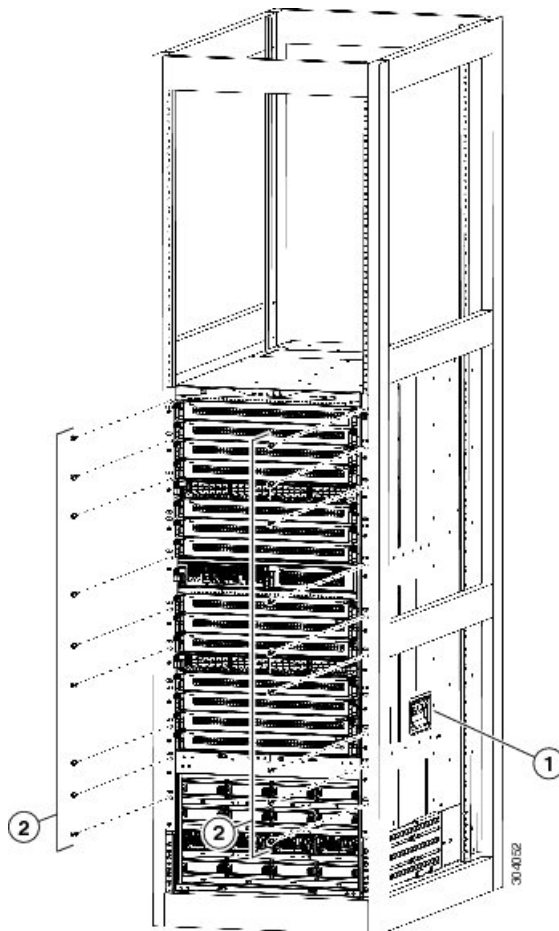
You have pushed the chassis all the way when its two vertical mounting brackets come in contact with the vertical rails on the rack or cabinet.

Step 8 Align the mounting bracket on the chassis to the vertical mounting rails on the rack, and attach the chassis to the rack.

Align the screw holes in the chassis mounting brackets to the screw holes in the vertical mounting rails on the rack or cabinet. Use a Phillips screwdriver to screw in nine M6 x 19-mm or 12-24 x 3/4-inch screws in each of the two chassis mounting brackets (use a total of 18 screws for two mounting brackets). See the following figure.

Tip To adjust the placement of the chassis on the bottom-support rails, use the chassis handles shown in the following figure.

Figure 8: Attaching the Chassis to the Rack



1	Handles used to adjust the chassis placement	2	Nine M6 x 19 mm or 10-24 x 3/4 in. Phillips screws used to attach each side bracket to a front mounting rail (use a total of 18 screws)
---	--	---	---

Step 9

If you removed any fabric modules before moving the chassis, replace each one in the chassis as follows:

- a) Holding the front of the fabric module (the side with the LEDs), turn the module so that the front side is vertical.

Note The top of the module has an alignment bracket running from the rear to the front. The electrical connectors will be at the bottom.

- b) Align the rear of the fabric module to an open fabric slot and insert the bracket on top of the module in the track at the top of the slot.

Note If there are only three fabric modules to install, install them in fabric slots 1, 3, and 5.

- c) Slide the module part way into the slot.
- d) Unscrew the captive screw on each of two ejector levers on the front of the module and rotate the two levers away from the module.
- e) Holding the levers, slide the module all the way into the slot until it stops.
- f) Simultaneously rotate both levers to the front of the module and secure them to the module by screwing their captive screws to the module. Tighten each screw to 8 in-lb (0.9 N·m).

Step 10

If you removed any fan trays before moving the chassis, reinstall each one in the chassis as follows:

- a) Holding each of the two handles on the fan tray with your two hands, align the fan tray to an open fan tray slot.

Note The two alignment brackets on top of the fan tray should align to two tracks at the top of the slot.

- b) Slide the fan tray into the slot until the front of the fan tray comes in contact with the rear of the chassis.

Note The two alignment pins on the fan tray (on the top and one on the bottom) should go into holes in the chassis and the four captive screws on the fan tray should align to screw holes in the chassis.

- c) Screw in the four captive screws to the chassis and tighten each screw to 8 in-lb (0.9 N·m).

Step 11

If you removed any power supplies before moving the chassis, reinstall each one as follows:

- a) Determine which power supply slots to fill and ensure that each of those slots is open.

If you are using the combined or power supply redundancy mode, you can use any slot for the power supply that you are installing. If you are using input-source or full redundancy mode, you must group the power supplies that are to be connected to the same grid on either the left or right power supply slots in the chassis (that is, place the power supplies for grid A in slots 1, 2, 5, or 6 and place the power supplies for grid B in slots 3, 4, 7, or 8).

- b) Place one hand on the front of the power supply and place your other hand under it to support its weight.
- c) Align the power supply to an open power supply slot.

Note The alignment bracket on top of the power supply should align to a track at the top of the slot and a bar at the bottom of the power supply should be guided by a track at the bottom of the slot.

- d) Slide the power supply all the way into the slot until it stops.
- e) Slide the handle in the middle of the ejector lever toward the end of the lever and rotate the lever to the front of the power supply. Release the middle handle.

Note The lever should grab the inside of the slot and push the power supply onto its mid plane connectors.

- f) Screw in the two captive screws on the front of the power supply to the chassis. Tighten each screw to 8 in-lb (0.9 N·m).

Step 12

Connect each installed power supply with an AC power circuit as follows:

Note If you are using combined power mode (no power redundancy) or power supply ($n+1$) power mode, connect all of the power supplies to the same power circuit (grid). If you are using input source ($n+n$) or full power mode, connect half of the power supplies (located in slots 1, 2, 5, 6, 9, 10, 13, and 14) to one AC power circuit and the other half of the power supplies (located in slots 3, 4, 7, 8, 11, 12, 15, and 16) to another AC power circuit. When you connect each power supply to an AC power circuit, the LEDs on the power supply turn on. The switch can operate when each of the required power supplies have a green OUTPUT LED lit.

- a) Ensure that the power supply is turned off by making sure that the power switch is set to 0.

- b) Connect the power cable that shipped with the power supply to the AC power source.
- c) Connect the other end of the power cable to the power supply outlet.

What to do next

After the chassis is secured to the rack, you can ground the switch.

Grounding a Switch Chassis

The switch is fully grounded as soon as you connect the chassis and the power supplies to the earth ground in the following ways:

- You connect the chassis to either a fully-bonded, grounded rack or to the data center ground.



Note The system ground, also referred to as the network equipment building system (NEBS) ground, provides additional grounding for EMI shielding requirements and for the low-voltage supplies (DC-DC converters) on the modules. This grounding system is active even when the AC and HVAC/HVDC power cables are not connected to the system.

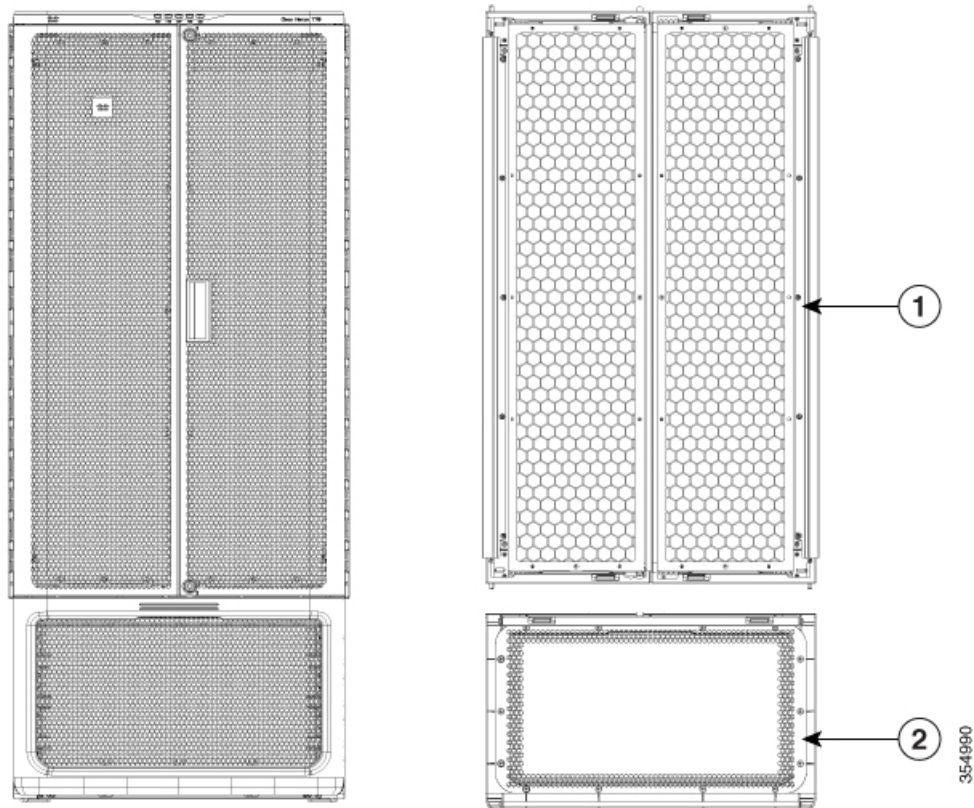
- You connect the AC and HVAC/HVDC power supplies to the earth ground automatically when you connect an AC or HVAC/HVDC power supply to an AC or HVAC/HVDC power source.
- You connect the 6-kW DC power supplies to the earth ground before connecting the power supplies to the DC power source.



Note To comply with GR-1089, you have to bond the front industrial design (ID) doors to the ground port on the chassis using the ground braid.

The following figure shows the two sections of the Cisco Nexus 7718 front ID doors. The upper two doors are used for the I/O modules and the bottom door is used for the power supplies.

Figure 9: Front ID Door Sections



1	Doors for I/O modules	2	Door for power supplies
---	-----------------------	---	-------------------------

Before you begin

Before you can ground the chassis, you must have a connection to the earth ground for the data center building. If you installed the switch chassis into a bonded rack (see the rack manufacturer's instructions for more information) that now has a connection to the data center earth ground, you can ground the chassis by connecting its grounding pad to the rack. Otherwise, you must connect the chassis grounding pad directly to the data center ground.

To connect the switch chassis to the data center ground, you need the following tools and materials:

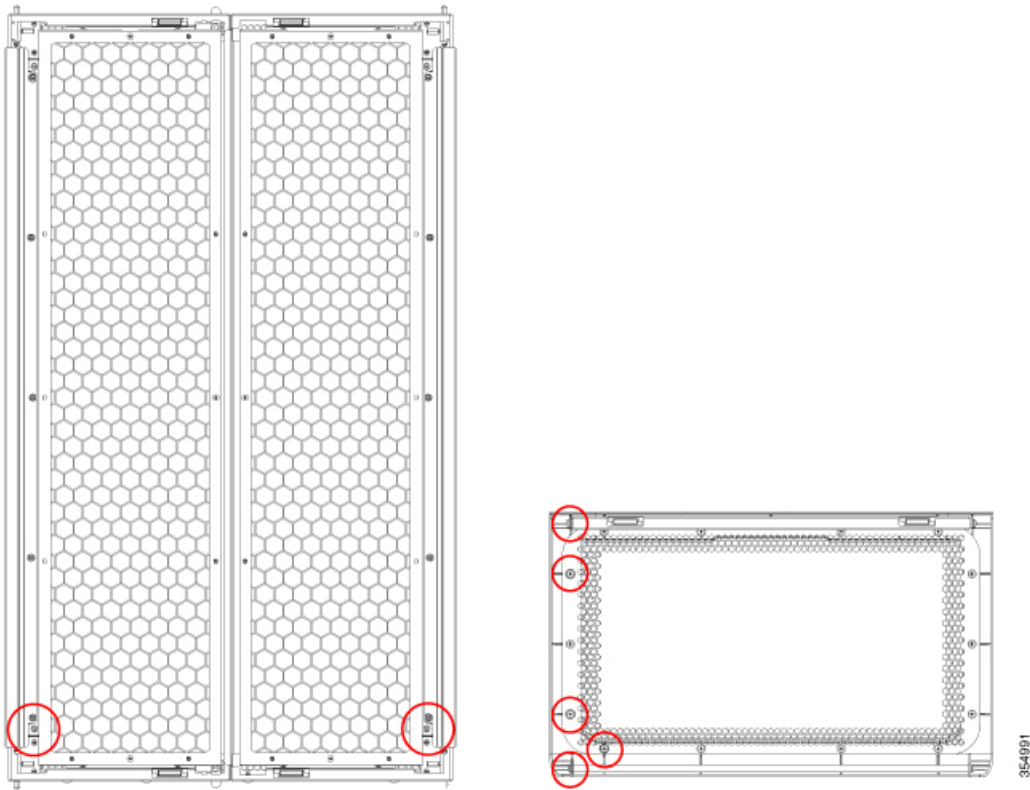
- Grounding lug—A two-holed standard barrel lug that supports up to 6 AWG wire. This lug is supplied with the accessory kit.
- Grounding screws—Two M4 x 8 mm (metric) pan-head screws. These screws are shipped with the accessory kit.
- Grounding wire—Not supplied with the accessory kit. This wire should be sized to meet local and national installation requirements. Depending on the power supply and system, a 12 AWG to 6 AWG copper conductor is required for U.S. installations. We recommend that you use commercially available 6 AWG wire. The length of the grounding wire depends on the proximity of the switch to proper grounding facilities.

- Number 1 manual Phillips-head torque screwdriver.
- Crimping tool to crimp the grounding wire to the grounding lug.
- Wire-stripping tool to remove the insulation from the grounding wire.

Step 1 Remove 7 screws from the front industrial design (ID) doors.

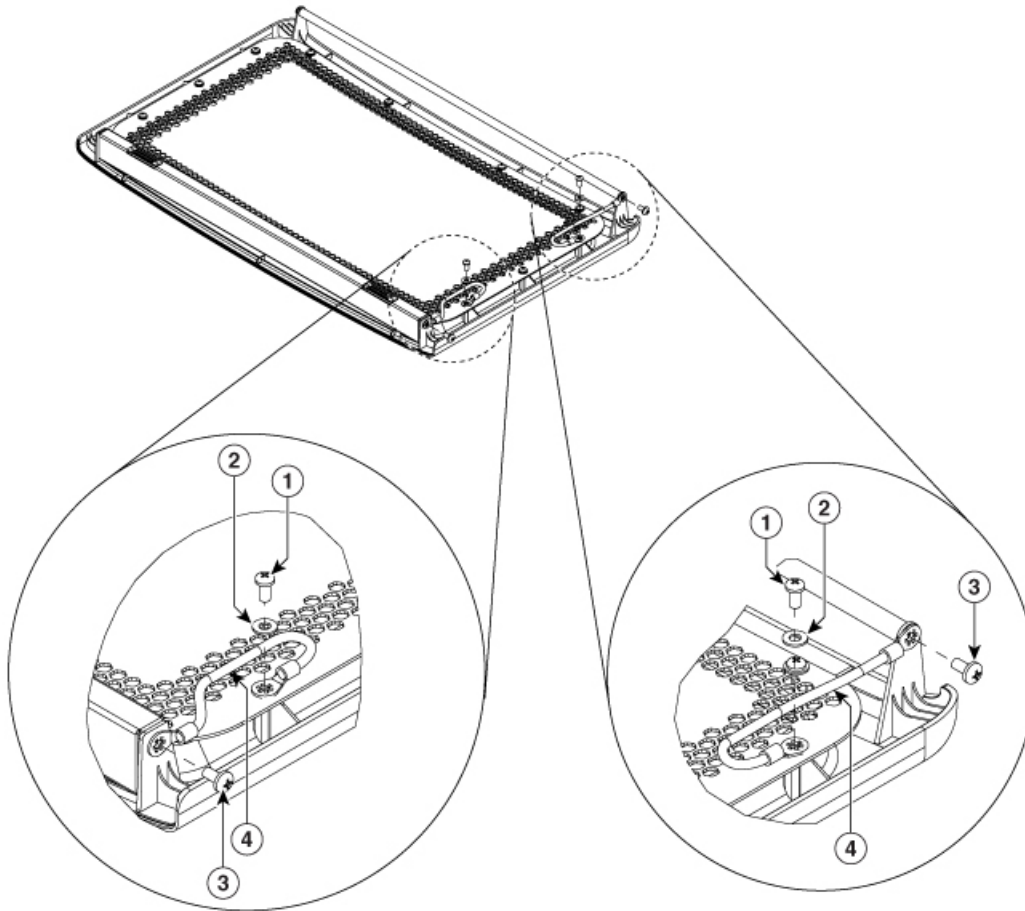
The following figure shows the 7 screws (circled) that have to be removed.

Figure 10: Front ID Door



Step 2 Install grounding cables to the left side of the power supply door, as shown in the figure below, to connect the middle plate with the top and bottom hinges.

Figure 11: Grounding Cable Locations on the Door for the Power Supplies

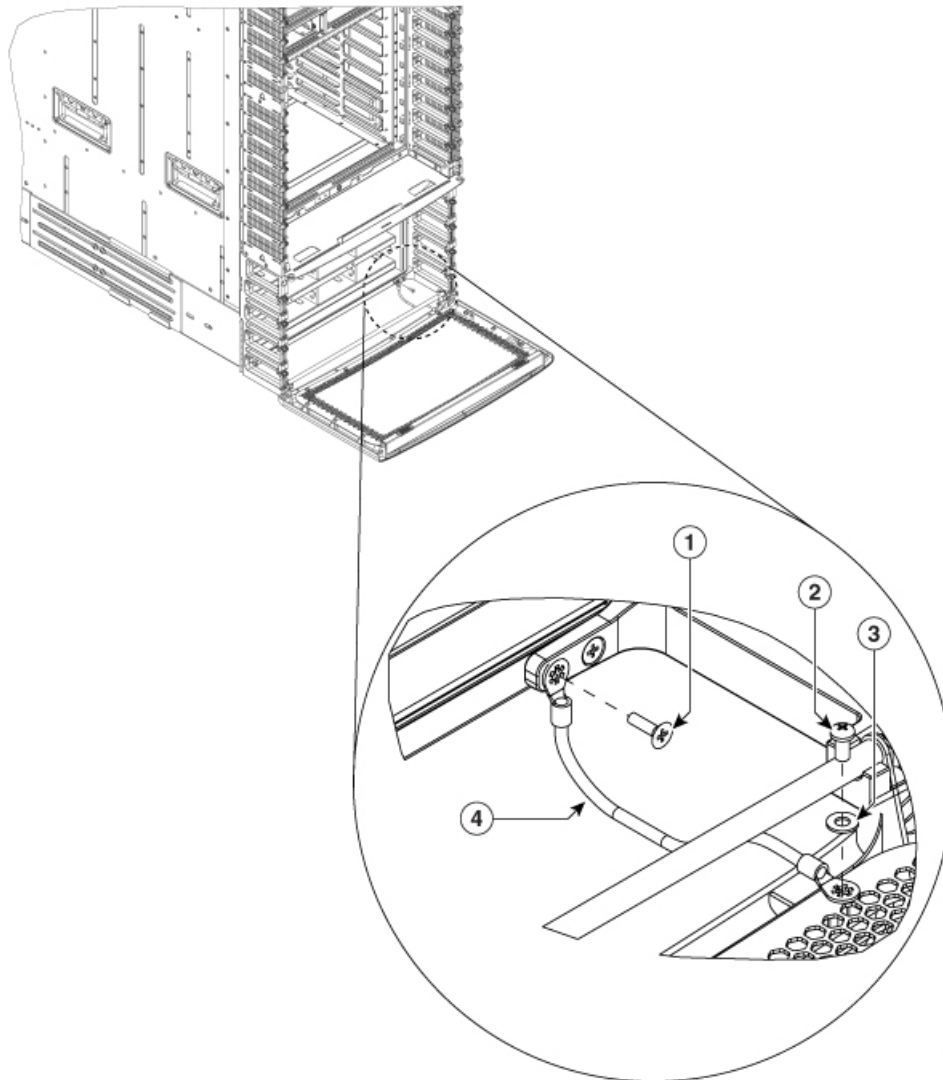


1	M4 screw	2	Flat washer
3	M4 screw	4	Grounding cable

Step 3 Tighten the screw to 7 in-lb (0.79 N-m) of torque to provide proper bonding.

Step 4 Connect the grounding cable from the door for the power supplies to the switch chassis, as shown in the figure below.

Figure 12: Grounding Cable Location between the door for the Power Supplies and the Cisco Nexus 7718 switch chassis



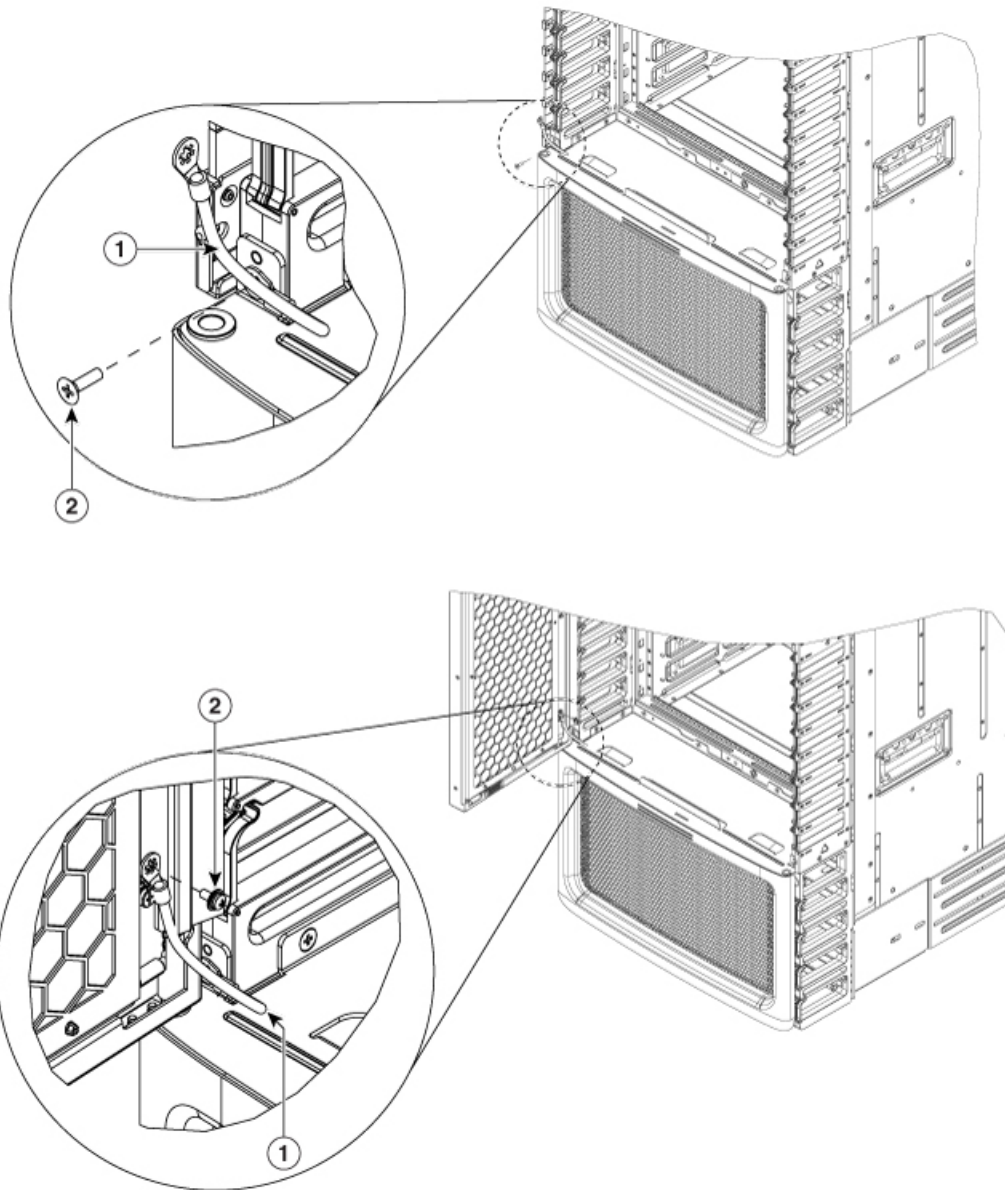
1	M4 screw	2	M4 screw
3	Flat washer	4	Grounding cable

Step 5

Install a grounding cable between the left hand side door for the I/O modules and the switch chassis, as shown in the figure below. Repeat the procedure for installing a grounding cable between the right hand side door for the I/O modules and the switch chassis.

Figure 13: Grounding Cable Location between the Left Hand Side Door for the I/O Modules and the Cisco Nexus 7718 Switch Chassis

Note The grounding cable location for installing the grounding cable between the right hand side door for the I/O modules and the Cisco Nexus 7718 switch chassis will be mirrored on the right hand side of the switch.



1	Grounding cable	2	M4 screw
---	-----------------	---	----------

Step 6 Apply the star ring terminal end of the grounding cables to the front ID doors.

Step 7 Connect the other round terminal of the grounding cable to the ground port on the chassis, as shown in [Figure 13: Grounding Cable Location between the Left Hand Side Door for the I/O Modules and the Cisco Nexus 7718 Switch Chassis, on page 31](#). Tighten the M4 screw to 9 to 12 in-lb (1.01 to 1.35 N-m) of torque.

Installing Cable Management Frames

You install the middle cable management frame and then install the lower and upper frames on the middle frame. After installing the cable management frames on the left and right sides of the front of the chassis, you install the top hood, and then tighten the screws holding all the frames to the chassis.

If you are installing the optional front doors on the chassis, you must have the cable management frames already installed because they hold the front doors to the chassis.

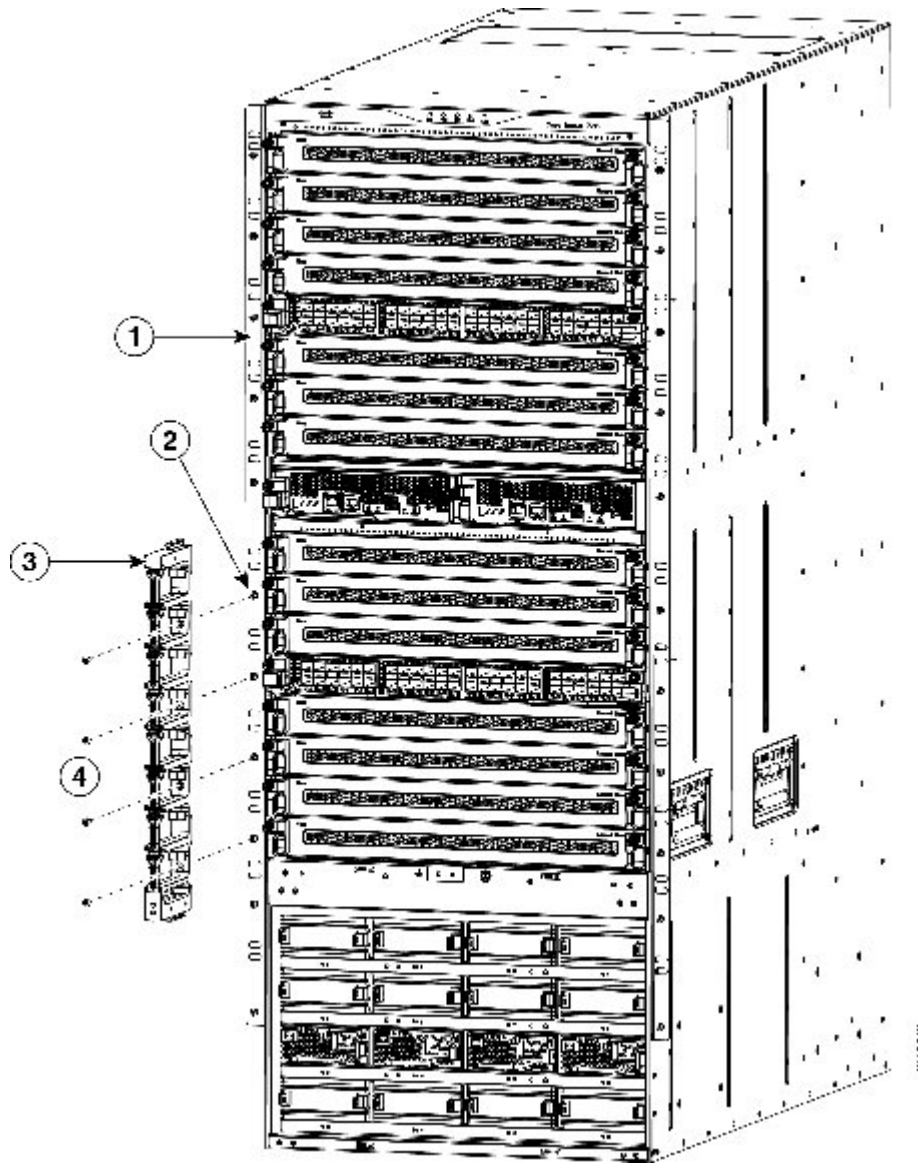
Before you begin

- The chassis is installed and secured to the rack or cabinet.
- You have the following tools and equipment:
 - Phillips torque screwdriver (customer supplied).
 - Following frames and screws (shipped with the switch):
 - Two cable management upper side frames
 - Two cable management middle side frames
 - Two cable management lower side frames
 - One cable management top hood frame
 - 36 M4 x 13-mm, flat-head, Phillips screws

Step 1 Attach the middle cable management frames as follows:

- a) Align the four screw holes in a middle cable management frame to four screw hole standoffs on one of two brackets attached to the front of the chassis (see the following figure).

Figure 14: Attaching the Middle Cable Management Frame to the Chassis



1	Chassis mounting bracket	3	Middle cable management frame with four screw holes
2	Four screw-hole standoffs on the chassis mounting bracket	4	Four M4 x 13 mm screws that secure the middle cable management frame to the chassis mounting bracket

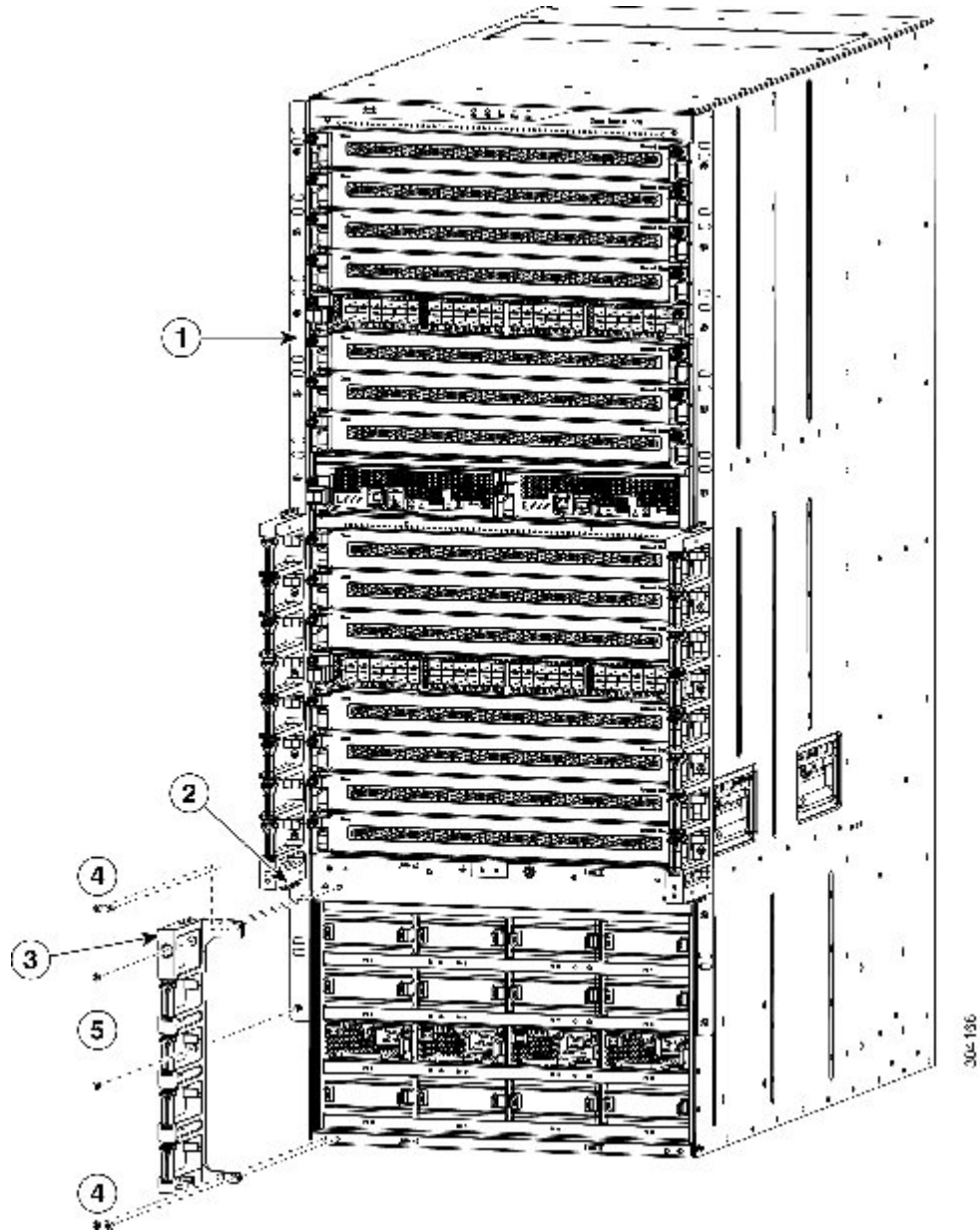
- b) Use four M4 x 13 mm screws to attach the frame to the bracket. Do not tighten the screws.
- c) Repeat steps 1a and 1b to attach the other middle cable management frame to the other side of the chassis.

Step 2 Attach the lower cable management frames as follows:

- a) Position a lower cable management frame below the installed middle cable management frame and slide the lower frame onto the flange at the bottom of the middle frame.

Verify that the two angle brackets on the frame are touching the front of the chassis and that the screw holes in the brackets align with screw holes in the chassis. If not, remove this frame and replace it with the other lower frame.

Figure 15: Attaching a Lower Cable Management Frame to the Chassis



1	Chassis mounting bracket	4	Two M4 x 13 mm screws to secure an angle bracket to the chassis
2	Alignment flange on the middle cable management frame	5	Two M4 x 13 mm screws to secure the frame to the chassis mounting bracket

3	Middle cable management frame with alignment groove on top, two screw holes, and two angle brackets with two screw holes each		
---	---	--	--

- b) Use two M4 x 13 mm screws to attach the frame to the vertical chassis mounting bracket. Do not tighten the screws.
- c) Use two M4 x 13 mm screws to attach each of the two angle brackets to the chassis (total of four screws). Do not tighten the screws.
- d) Repeat steps 2a, 2b, and 2c to attach the other lower cable management frame to the other side of the chassis.

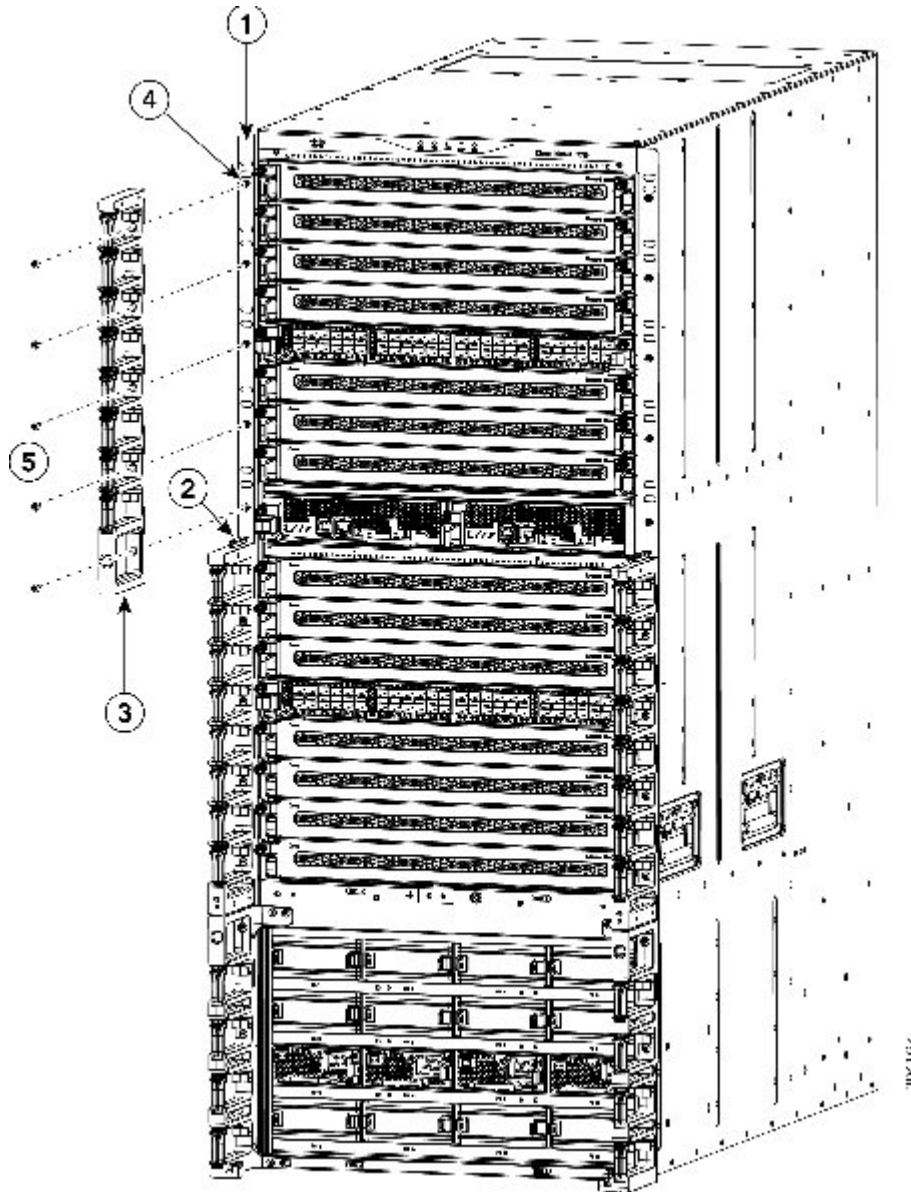
Step 3

Attach the upper cable management frames as follows:

- a) Position the upper cable management frame above the installed middle cable management frame and slide the upper frame onto the flange on the top of the middle frame (see the following figure).

Verify that the five screw holes on the frame align with five screw-hole standoffs on the chassis mounting bracket.

Figure 16: Attaching an Upper Cable Management Frame to the Chassis



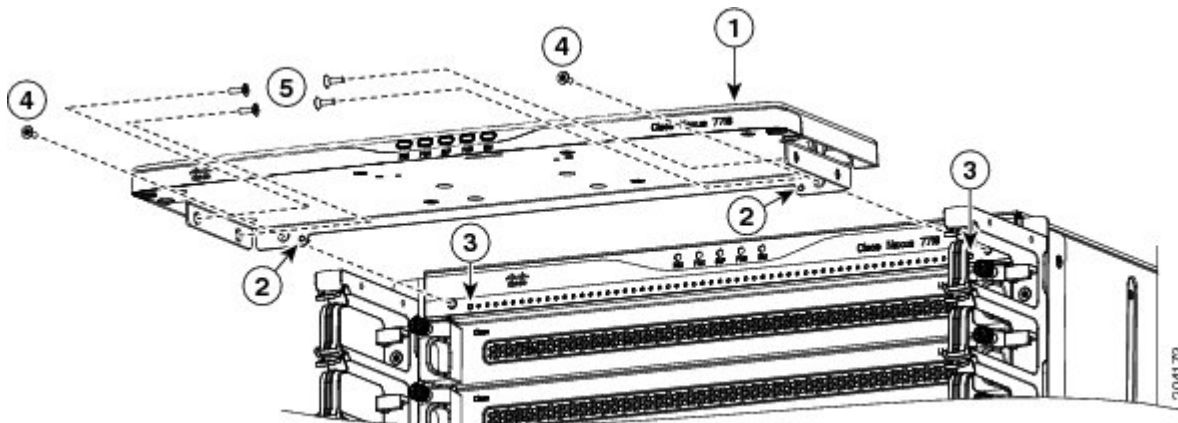
1	Chassis mounting bracket	4	Screw hole standoff (5)
2	Alignment flange on the middle cable management frame	5	Five M4 x 13 mm screws to secure the frame to the chassis mounting bracket
3	Upper cable management frame with five screw holes and an alignment groove on the bottom		

- b) Use five M4 x 13 mm screws to attach the frame to the bracket. Do not tighten the screws.
- c) Repeat steps 3a and 3b to attach the other upper cable management frame to the other side of the chassis.

Step 4 Attach the top hood to the cable management frames and chassis as follows:

- a) Set the top hood, with its angle brackets pointing downward, on top of the two upper cable management frames. Verify that the two alignment pins on the back side of the hood are aligned with two holes on the top of the chassis (see Callouts 2 and 3 in the following figure).

Figure 17: Attaching the Top Hood Cable Management Frame to the Chassis



1	Top hood cable management frame	4	M4 x 13 mm screw (2) to secure the top hood to the chassis
2	Alignment pins on the back side of the top hood frame	5	Four M4 x 13 mm screws (two per side) to secure top hood to each upper cable management frame
3	Align holes in the chassis		

- b) Slide the hood toward the chassis so that the alignment pins enter the two holes. Verify that two holes on each side of the angle bracket align to two screw holes on the cable management frames and a screw hole on each side of the back angle bracket aligns with a screw hole on the chassis.
- c) Use two M4 x 13 mm screws to attach the top hood to the chassis (see Callout 4 in the previous figure).
- d) Use two M4 x 13 mm screws to attach each side of the top hood to the two side cable management frames (4 screws total—see Callout 5 in the previous figure). Do not tighten the screws.
- e) Tighten each of the six top-hood screws to 11 to 15 in-lb (1.2 to 1.7 N·m) of torque.

Step 5 Tighten each of the 30 cable-management side-frame screws to 11 to 15 in-lb (1.2 to 1.7 N·m) of torque.

What to do next

You are ready to attach the optional front doors to the cable management frames.

Installing the Front Doors

You can optionally install the following doors on the chassis:

- Two locking doors to cover the supervisor and I/O modules
- One door to cover the power supplies

To install the doors, you must first install a divider bracket that holds the bottoms of the two front doors and provides the door stop for the power supply door. If you also install air filters, this bracket also prevents air particulates from entering the air intakes of the supervisors and I/O modules from the power supply area.

You must also install a metal door stop on the bottom of the top hood of the cable management frames. This door stop provides a metallic surface for magnets in the front doors to hold onto when closed.

If you ordered the air filter kit, you can also install air filters on the two front doors and on the cable management frames while installing the front doors on the chassis.



Note To route cables through the cable management frames to the I/O modules, it is easiest to either do that before you add the front doors or to remove the front doors temporarily.

Before you begin

Verify the following before installing the front doors:

- Cable management frames are installed on the chassis
- You have the following tools and equipment:
 - Front door kit (N77-C7718-FDK=) with the following undamaged components:
 - Left door (1 piece, part number 800-39049-01)
 - Right door (1 piece, part number 800-39048-01)
 - Power supply door (1 piece, part number 800-39049-01)
 - Divider bracket (1 piece, part number 800-39233-01)
 - Door stop bracket (1 piece, part number 700-39993-01)
 - M4 x 13 mm pan-head Phillips screws (10 pieces, part number 48-3151-01)
 - If you are also installing air filters, you must have the air filter kit available.
 - Phillips screwdriver with torque capability



Caution Use only torque-capable, manually-operated screwdrivers. Do not use powered drivers, which can over tighten and damage screws, nor use magnetic drivers, which can damage nearby electronics.

Step 1

Install the divider bracket between the left and right cable management frames as follows:

- a) Position the divider bracket at the bottom of the left and right middle cable management frames (at the bottom of the supervisor and I/O module area of the chassis) so that the two screw holes in each side of the bracket align to two screw holes at the bottom of the left and right middle cable management frames (see the following figure).

Four screw holes on the upper back of the bracket should also align to four screw holes in the chassis.

Figure 18: Installing the Divider Bracket

1	Position the divider bracket at the bottom of the middle cable management frame and align eight screw holes in the bracket to eight screw holes in the cable management frames (two holes in each frame) and chassis (4 holes in the chassis).	2	Fasten the bracket to the cable management frames and chassis with eight M4 x 13 mm screws. Tighten each screw to 11.5 to 15 in-lbs (1.3 to 1.7 N·m).
---	--	---	---

- b) Screw in eight M4 x 13 mm screws to hold this bracket to the bottom of the left middle cable management bracket (two screws), the bottom of the right middle cable management bracket (two screws), and the chassis (four screws). Tighten each screw to 11.5 to 15 in-lbs (1.3 to 1.7 N·m).

Step 2 If you also have an air filter kit, install six air filters on the front doors and cable management frames as explained in [Installing the Air Filters, on page 41](#)

Step 3 Install the door-stop bracket on the top hood of the cable management frames as follows:

- a) Position the door-stop bracket under the top hood frame so that its two screw holes align to two screw holes in the top hood (see the following figure).

Be sure that there is a perpendicular edge facing the front. This edge stops the front doors and provides a metallic surface for the magnets in the door to hold onto when closed.

Figure 19: Installing the Door-Stop Bracket

1	Top hood frame with two screw holes on its bottom side	3	Align the two screw holes in the bracket with two screw holes in the top hood. Fasten with two M4 x 13 mm screws.
2	Door-stop bracket with two screw holes.		

- b) Screw in two M4 x 13 mm screws to hold this bracket to the top hood. Tighten each screw to 11.5 to 15 in-lbs (1.3 to 1.7 N·m).

Step 4 Install the two front doors to the supervisor and I/O module area as follows:

- a) On the back side (open side) of one door, pull in on two protruding spring pins so that the pins are held inside the door frame (see the following figure). Hold these two pins in through the next step.

Figure 20: Installing a Front Door Over the Supervisor and I/O Module Area

1	Front door with its open side facing the front of the chassis (optionally, you can install an air filter in the open cavity in the door).	4	Pull the handles for each of two spring pins toward the center of the door and hold the pins in place.
2	Pin hole in the top hood	5	Align the spring pins to holes in the top hood and divider bracket.
3	Pin hole in the divider bracket	6	Release the pins so that they spring into the holes in the top hood and divider bracket.

- b) Position the door with the back (open) side facing the front of the chassis and the two held spring pins aligned to two holes in the top hood and divider bracket as shown in the previous figure.
- c) Release the two spring pins so that they insert into the holes in the top hood and divider brackets.

The door should freely swing on the spring pins.

- d) Close the door to cover half of the supervisor and I/O module area.
Magnets in the door will hold the door shut to the door-stop bracket on the top hood and to the divider bracket.

- e) Repeat Steps 4a through 4d to install the other front door.

Step 5

Install the door in front of the power supply area as follows:

- a) Position the door to the power supply area so that its two bars on the backside are resting on two holders protruding from the left and right power supply cable management frames as shown in the following figure.

Figure 21: Positioning the Power Supply Door on the Chassis

1	Rest the two bars on the door door holder brackets (on the bottoms of the left and right cable management frames).	2	Rotate the top of the door to the metallic door stop on the divider bracket.
---	--	---	--

- b) Rotate the top of the door to the divider bracket installed on the cable management frames.
The magnets on the door hold the door to the divider bracket.

Installing the Air Filters

You can optionally install six air filters on the two front doors and the left and right cable management frames. These air filters significantly reduce the air particulates that can enter into the air intakes for the supervisor and I/O modules.

If you have not already installed the front doors, see [Installing the Front Doors, on page 38](#) for instructions on how to install the air filters on the front doors before installing the doors. Otherwise, use these instructions to install the air filters on the already installed front doors.

Before you begin

- Cable management frames are fully installed on the chassis
- Front doors are either installed on the chassis (if the front doors are ready to be installed on the chassis, see [Installing the Front Doors, on page 38](#)).

Step 1

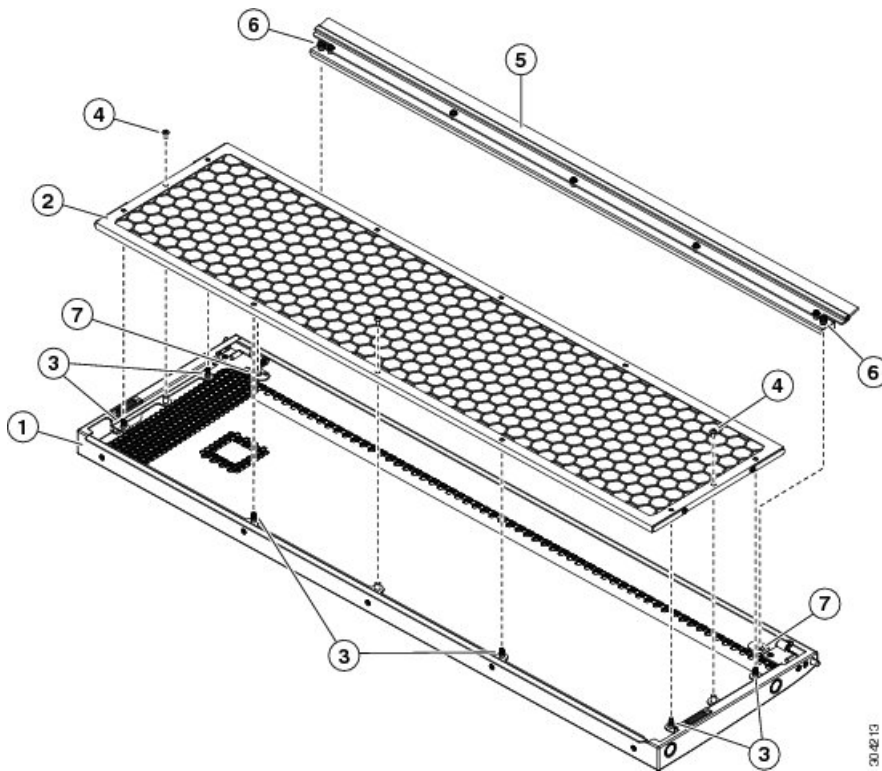
Install two door filters and two door-side filters on the two front doors as follows:

- a) Remove one of the two front doors by pulling in on both of the two spring pins holding the door to the top hood and divider frames, and set the door down on its front side.

The hollowed side of the door faces up.

- b) Align the six alignment holes on the largest filter to six alignment studs on the open side of the door as shown in the following figure.

Figure 22: Aligning a Door Filter to a Door



1	Front door, back side facing up	5	Air filter for the side of the door
2	Air filter for inside of door	6	Captive screws (one on each end)
3	Alignment pins (two on the top, side, and bottom of the door)	7	Screw hole for captive screw on filter
4	Screws (3) used to secure filter to the door		

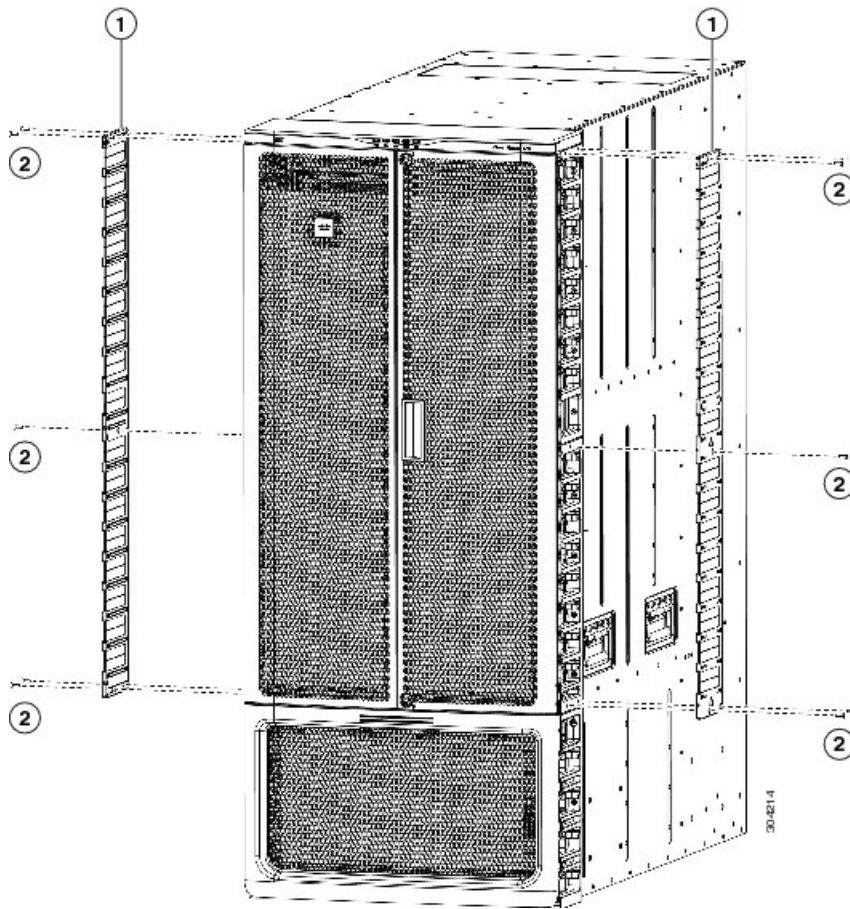
- c) Press the filter onto the alignment studs and use two __ x __ mm screws to secure the filter to the door.
- d) Reattach the door to the chassis by pulling in its two spring pins, inserting the door edge between the top hood and the divider bracket on the cable management frames. When each spring pin is aligned to a hole in the front corner of the top hood, release that spring pin so that it goes into that hole. When both spring pins are released and the door can swing open and closed, the door is remounted.
- e) Repeat Steps 1a through 1d once for the other side door.

Step 2

Install the two cable-management filters on the left and right cable management frames as follows:

- a) Align the five screw holes in one of the two cable management air filters to five screw holes in one of the upper cable management frames as shown in the following figure.

Figure 23: Attaching a Cable-Management Frame Air Filter



1	Air filter for cable management frame	2	Five M3 x 13 mm screws for each air filter
---	---------------------------------------	---	--

- b) Secure the air filter to the cable management frame using five M3 x 13 mm screws and tighten to 5 to 7 in-lb (0.56 to 0.79 N·m) of torque.
- c) Repeat Steps 2a and 2b to attach the remaining cable-management air filter.



CHAPTER 4

Connecting to the Network

This chapter contains the following sections:

- [Guidelines for Connecting Ports, on page 45](#)
- [Connecting a Console to the Switch, on page 46](#)
- [Connecting the Management Interface, on page 47](#)
- [Creating the Initial Switch Configuration, on page 48](#)
- [Connecting Interface Ports to the Network, on page 49](#)

Guidelines for Connecting Ports

You can use CPAK, Quad Small Form-Factor Pluggable Plus (QSFP+), Small Form-Factor Pluggable Plus (SFP+), and Small Form-Factor Pluggable (SFP) transceivers to connect the ports on the I/O modules to other network devices, which can include other switches or Fabric Extenders (FEXs). The SFP+ transceivers include Fabric Extender Transceivers (FETs) for connecting I/O modules with FEXs.

The transceivers used with copper cables come already assembled with their cables. The transceivers used with fiber-optic cables come separated from their cables. To prevent damage to the fiber-optic cables and their transceivers, we recommend that you keep the transceivers disconnected from their fiber-optic cables when installing the transceiver in the I/O module. Before removing a transceiver for a fiber-optic cable, remove the cable from the transceiver.

To maximize the effectiveness and life of your transceivers and optical cables, do the following:

- Wear an ESD-preventative wrist strap that is connected to an earth ground whenever handling transceivers. The switch is typically grounded during installation and provides an ESD port to which you can connect your wrist strap.
- Do not remove and insert a transceiver more often than is necessary. Repeated removals and insertions can shorten its useful life.
- Keep the transceivers and fiber-optic cables clean and dust free to maintain high signal accuracy and to prevent damage to the connectors. Attenuation (loss of light) is increased by contamination and should be kept below 0.35 dB.
 - Clean these parts before installation to prevent dust from scratching the fiber-optic cable ends.
 - Clean the connectors regularly; the required frequency of cleaning depends upon the environment. In addition, clean connectors if they are exposed to dust or accidentally touched. Both wet and dry cleaning techniques can be effective; refer to your site's fiber-optic connection cleaning procedures.

- Do not touch the ends of connectors. Touching the ends can leave fingerprints and cause other contamination.
- Inspect routinely for dust and damage. If you suspect damage, clean and then inspect fiber ends under a microscope to determine if damage has occurred.

Connecting a Console to the Switch

Before you create a network management connection for the switch or connect the switch to the network, you must create a local management connection through a console terminal and configure an IP address for the switch. You can also use the console to perform the following functions, each of which can be performed through the management interface after you make that connection later on:

- Configure the switch using the command-line interface (CLI).
- Monitor network statistics and errors.
- Configure Simple Network Management Protocol (SNMP) agent parameters.
- Download software updates.

You make this local management connection between the asynchronous serial port on a supervisor module and a console device capable of asynchronous transmission. Typically, you can use a computer terminal as the console device. On the supervisor modules, you use one of the following asynchronous serial ports:

- CONSOLE SERIAL PORT

This port is used for direct connections to the console.



Note Before you can connect the console port to a computer terminal, make sure that the computer terminal supports VT100 terminal emulation. The terminal emulation software makes communication between the switch and computer possible during setup and configuration.

Before you begin

- The switch must be fully installed in its rack, connected to a power source, and grounded.
- The necessary cabling for the console, management, and network connections must be available.
 - An RJ-45 rollover cable and DB9F/RJ-45 adapter are provided in the switch accessory kit.
 - Network cabling should already be routed to the location of the installed switch.

Step 1 Configure the console device to match the following default port characteristics:

- 9600 baud
- 8 data bits
- 1 stop bit

- No parity

Step 2 Connect an RJ-45 rollover cable to the CONSOLE SERIAL PORT.

You can find this cable in the accessory kit.

Step 3 Route the RJ-45 rollover cable through the center slot in the cable management system and then to the console or modem.

Step 4 Connect the other end of the RJ-45 rollover cable to the console or to a modem.

If the console or modem cannot use an RJ-45 connection, use the DB-9F/RJ-45F PC terminal adapter found in the accessory kit for the switch. Alternatively, you can use an RJ-45/DSUB F/F or RJ-45/DSUB R/P adapter, but you must provide those adapters.

What to do next

You are ready to create the initial switch configuration (see [Creating the Initial Switch Configuration, on page 48](#)).

Connecting the Management Interface

The supervisor management port (MGMT ETH) provides out-of-band management, which enables you to use the command-line interface (CLI) or the Cisco Data Center Network Manager (DCNM) interface to manage the switch by its IP address. This port uses a 10/100/1000 Ethernet connection with an RJ-45 interface.



Note In a dual supervisor switch, you can ensure that the active supervisor module is always connected to the network by connecting the management interface on both supervisor modules to the network (that is, you can perform this task for each supervisor module). That way, no matter which supervisor module is active, the switch automatically has a management interface that is running and accessible from the network.



Caution To prevent an IP address conflict, do not connect the MGMT 10/100/1000 Ethernet port until the initial configuration is complete. For more information, see [Creating the Initial Switch Configuration, on page 48](#).

Before you begin

You must have completed the initial switch configuration (see [Creating the Initial Switch Configuration, on page 48](#)).

Step 1 Connect a modular, RJ-45, UTP cable to the MGMT ETH port on the supervisor module.

Step 2 Route the cable through the central slot in the cable management system.

Step 3 Connect the other end of the cable to a 10/100/1000 Ethernet port on a network device.

What to do next

You are ready to connect the interface ports on each of the I/O modules to the network.

Creating the Initial Switch Configuration

You must assign an IP address to the switch management interface so that you can then connect the switch to the network.

When you initially power up the switch, it boots up and asks you a series of questions to configure the switch. To enable you to connect the switch to the network, you can use the default choices for each configuration except the IP address, which you must provide. You can perform the other configurations at a later time as described in the *Cisco Nexus 7000 Series NX-OS Fundamentals Configuration Guide*.



Note You should also know the unique name needed to identify the switch among the devices in the network.

Before you begin

- A console device must be connected with the switch.
- The switch must be connected to a power source.
- Determine the IP address and netmask needed for the following interfaces:
 - Management (Mgmt0) interface

Step 1 Power up the switch by turning the power switch from standby (0) to on (1) with each power supply installed in the switch chassis.

The Input and Output LEDs on each power supply light up (green) when the power supply units are sending power to the switch, and the software asks you to specify a password to use with the switch.

Step 2 Enter a new password to use for this switch.

The software checks the security strength of your password and rejects your password if it is not considered to be a strong password. To increase the security strength of your password, make sure that it adheres to the following guidelines:

- At least eight characters
- Minimizes or avoids the use of consecutive characters (such as "abcd")
- Minimizes or avoids repeating characters (such as "aaabbb")
- Does not contain recognizable words from the dictionary
- Does not contain proper names
- Contains both uppercase and lowercase characters
- Contains numbers as well as letters

Examples of strong passwords include the following:

- If2CoM18
- 2004AsdfLkj30
- Cb1955S21

Note Clear text passwords cannot include the dollar sign (\$) special character.

Tip If a password is trivial (such as a short, easy-to-decipher password), the software will reject your password configuration. Be sure to configure a strong password as explained in this step. Passwords are case sensitive.

If you enter a strong password, the software asks you to confirm the password.

Step 3 Enter the same password again.

If you enter the same password, the software accepts the password and begins asking a series of configuration questions.

Step 4 Until you are asked for an IP address, you can enter the default configuration for each question.

Repeat this step for each question until you are asked for the Mgmt0 IPv4 address.

Step 5 Enter the IP address for the management interface.

The software asks for the Mgmt0 IPv4 netmask.

Step 6 Enter a network mask for the management interface.

The software asks if you need to edit the configuration.

Step 7 Enter **no** to not edit the configuration.

The software asks if you need to save the configuration.

Step 8 Enter **yes** to save the configuration.

What to do next

You can now set up the management interface for each supervisor module on the switch.

Connecting Interface Ports to the Network

You can connect optical interface ports on I/O modules with other devices for network connectivity.

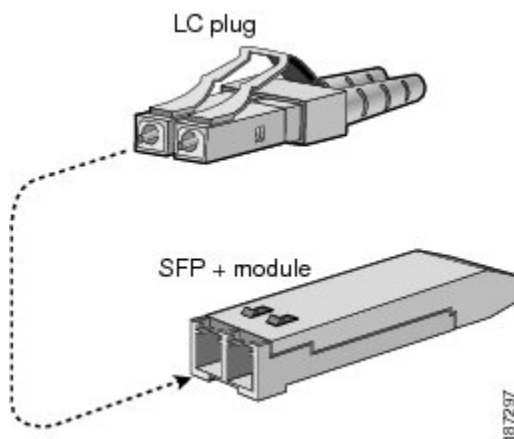
Connecting a Fiber-Optic Cable to a Transceiver

To prevent damage to the fiber-optic cables, do not place more tension on them than the rated limit and do not bend them to a radius less than 1 inch (2.54 cm) if there is no tension in the cable or 2 inches (5.08 cm) if there is tension in the cable.

To prevent possible damage to the cable or transceiver, install the transceiver in the port before installing the cable in the transceiver.

- Step 1** Attach an ESD-preventative wrist strap and follow its instructions for use.
- Step 2** Remove the dust cover from the port connector on the cable.
- Step 3** Remove the dust cover from the cable end of the transceiver.
- Step 4** Align the cable connector with the transceiver and insert the connector into the transceiver until it clicks into place (see the following figure for SFP or SFP+ transceivers).

Figure 24: Connecting an LC Optical Cable Plug to a Transceiver



If the cable does not install easily, ensure that it is correctly oriented before continuing.

Disconnecting Optical Ports from the Network

When removing fiber-optic transceivers, you must remove the fiber-optic cables from a transceiver before removing the transceiver from the port.

Maintaining Transceivers and Optical Cables

Transceivers and fiber-optic cables must be kept clean and dust free to maintain high signal accuracy and prevent damage to the connectors. Attenuation (loss of light) is increased by contamination and should be below 0.35 dB.

Consider the following maintenance guidelines:

- Transceivers are static sensitive. To prevent ESD damage, wear an ESD-preventative wrist strap that is connected to the grounded chassis.
- Do not remove and insert a transceiver more often than is necessary. Repeated removals and insertions can shorten its useful life.
- Keep all optical connections covered when not in use. Clean them before using to prevent dust from scratching the fiber-optic cable ends.
- Do not touch the ends of connectors. Touching the ends can leave fingerprints and cause other contamination.

- Clean the connectors regularly; the required frequency of cleaning depends upon the environment. In addition, clean connectors if they are exposed to dust or accidentally touched. Both wet and dry cleaning techniques can be effective; refer to your site's fiber-optic connection cleaning procedures.
- Inspect routinely for dust and damage. If you suspect damage, clean and then inspect fiber ends under a microscope to determine if damage has occurred.



CHAPTER 5

Managing the Switch

- [Displaying Information About Installed Hardware Modules, on page 53](#)
- [Displaying the Hardware Inventory for a Switch, on page 56](#)
- [Displaying the Backplane and Serial Number Information, on page 58](#)
- [Displaying Environmental Information for a Switch, on page 59](#)
- [Displaying Temperatures for Modules, on page 63](#)
- [Connecting to a Module, on page 64](#)
- [Saving the Module Configuration, on page 65](#)
- [Displaying Power Usage Information, on page 66](#)
- [Reloading a Module, on page 66](#)
- [Rebooting the Switch, on page 67](#)
- [Overview of Supervisor Modules, on page 67](#)
- [Overview of I/O Module Support, on page 69](#)
- [Overview of Fabric Module Support, on page 74](#)
- [Power Modes Overview, on page 76](#)
- [Overview of Fan Trays, on page 92](#)

Displaying Information About Installed Hardware Modules

To display information about the switch hardware and the hardware modules installed in the switch chassis, use the **show hardware** command.

Enter the **show hardware** command.

Example:

```
switch# show hardware
Cisco Nexus Operating System (NX-OS) Software
TAC support: http://www.cisco.com/tac
Documents: http://www.cisco.com/en/US/products/ps9372/tsd_products_support_series_home.html
Copyright (c) 2002-2013, Cisco Systems, Inc. All rights reserved.
The copyrights to certain works contained in this software are
owned by other third parties and used and distributed under
license. Certain components of this software are licensed under
the GNU General Public License (GPL) version 2.0 or the GNU
Lesser General Public License (LGPL) Version 2.1. A copy of each
such license is available at
```

<http://www.opensource.org/licenses/gpl-2.0.php> and
<http://www.opensource.org/licenses/lgpl-2.1.php>

Software

```

BIOS:          version 1.7.0
kickstart:    8.3(0)SK(1) [build 8.3(0)SK(0.47)] [gdb]
system:       8.3(0)SK(1) [build 8.3(0)SK(0.47)] [gdb]
BIOS compile time:    10/10/2017
kickstart image file is: bootflash:///n7700-s3-kickstart.8.3.0.SK.0.47.gbin
kickstart compile time: 5/31/2018 23:00:00 [03/02/2018 06:26:13]
system image file is:   bootflash:///n7700-s3-dk9.8.3.0.SK.0.47.gbi
system compile time:   5/31/2018 23:00:00 [03/02/2018 08:23:10]

```

Hardware

```

cisco Nexus7000 C... (... Slot) Chassis ("Supervisor module-3")
Intel(R) Xeon(R) CPU D-1548 with 65617088 kB of memory.
Processor Board ID JAE2150086E

```

```

Device name: N7...
bootflash:    3932160 kB
slot0:        0 kB (expansion flash)

```

Kernel uptime is 2 day(s), 7 hour(s), 31 minute(s), 20 second(s)

```

Last reset at 419340 usecs after Mon Mar  6 08:38:30 2017
Reason: Reset Requested by CLI command reload
System version: 8.3(0)SK(0.47)
Service:

```

plugin

```

Core Plugin, Ethernet Plugin
-----

```

Switch hardware ID information

```

-----
Switch is booted up
Switch type is : Nexus7700 C... (... Slot) Chassis
Model number is N77-C7...
H/W version is 0.2
Part Number is 73-15311-01
Part Revision is 04
Manufacture Date is Year 17 Week 21
Serial number is JAF1721ADPE
CLEI code is

```

```

-----
Chassis has ... Module slots and ... Fabric slots
-----

```

```

Module1 empty

```

```

Module2 ok
Module type is : 100 Gbps Ethernet Module
0 submodules are present
Model number is N77-F430CQ-36
H/W version is 0.203
Part Number is 73-101350-02
Part Revision is 05
Manufacture Date is Year 21 Week 43
Serial number is JAE214303LY
CLEI code is

```

```

Module3 ok

```

```
Module type is : Supervisor module-3
0 submodules are present
Model number is N77-SUP3E
H/W version is 0.909
Part Number is 73-16310-09
Part Revision is 09
Manufacture Date is Year 21 Week 50
Serial number is JAE2150086E
CLEI code is

Module4 ok
Module type is : 10/40 Gbps Ethernet Module
0 submodules are present
Model number is N77-M324FQ-25L
H/W version is 0.4
Part Number is 73-17257-05
Part Revision is 08
Manufacture Date is Year 19 Week 48
Serial number is JAE194804JX
CLEI code is
.
.
.
-----
Chassis has ... PowerSupply Slots
-----

PS1 ok
Power supply type is: 3000.00W 220v AC
Model number is N77-AC-3KW
H/W version is 1.0
Part Number is 341-0600-01
Part Revision is B0
Manufacture Date is Year 17 Week 17
Serial number is DTM171700CR
CLEI code is CMUPABRCAA

PS2 absent

PS3 absent

PS4 absent

-----
Chassis has ... Fan slots
-----

Fan1(sys_fan1) ok
Model number is N77-C7...-FAN-2
H/W version is 0.100
Part Number is 73-101408-01
Part Revision is 01
Manufacture Date is Year 20 Week 51
Serial number is NCV2051T036
CLEI code is
```

Displaying the Hardware Inventory for a Switch

To display information about the field replaceable units (FRUs), including product IDs, serial numbers, and version IDs, use the **show inventory** command.

Enter the **show inventory** command.

Example:

```
switch# show inventory
NAME: "Chassis",  DESCR: "Nexus7700 C7718 (18 Slot) Chassis "
PID: N77-C7718      ,  VID: V01 ,  SN: JAF1650ABCA

NAME: "Slot 1",  DESCR: "100 Gbps Ethernet Module"
PID: N77-F430CQ-36  ,  VID: V00 ,  SN: JAE214303LW

NAME: "Slot 2",  DESCR: "10/40 Gbps Ethernet Module "
PID: N77-M324FQ-25L  ,  VID: V00 ,  SN: JAE194507M4

NAME: "Slot 3",  DESCR: "1/10 Gbps Ethernet Module"
PID: N77-F348XP-23   ,  VID: V00 ,  SN: JAE17360CYQ

NAME: "Slot 4",  DESCR: "1/10 Gbps Ethernet Module"
PID: N77-F348XP-23   ,  VID: V00 ,  SN: JAE17360CZ6

NAME: "Slot 5",  DESCR: "1/10 Gbps Ethernet Module"
PID: N77-F348XP-23   ,  VID: V00 ,  SN: JAE17360CXX

NAME: "Slot 6",  DESCR: "1/10 Gbps Ethernet Module"
PID: N77-F348XP-23   ,  VID: V00 ,  SN: JAE17360CYP

NAME: "Slot 7",  DESCR: "1/10 Gbps Ethernet Module"
PID: N77-F348XP-23   ,  VID: V00 ,  SN: JAE17360CZE

NAME: "Slot 8",  DESCR: "1/10 Gbps Ethernet Module"
PID: N77-F348XP-23   ,  VID: V00 ,  SN: JAE17360CYZ

NAME: "Slot 9",  DESCR: "Supervisor Module-3"
PID: N77-SUP3E       ,  VID: V01 ,  SN: JAE2150086E

NAME: "Slot 10", DESCR: "Supervisor Module-3"
PID: N77-SUP3E       ,  VID: V01 ,  SN: JAE17280TRD

NAME: "Slot 11", DESCR: "1/10 Gbps Ethernet Module"
PID: N77-F348XP-23   ,  VID: V00 ,  SN: JAE17360CYU

NAME: "Slot 12", DESCR: "1/10 Gbps Ethernet Module"
PID: N77-F348XP-23   ,  VID: V00 ,  SN: JAE17280JCV

NAME: "Slot 13", DESCR: "1/10 Gbps Ethernet Module"
PID: N77-F348XP-23   ,  VID: V00 ,  SN: JAE17310985

NAME: "Slot 14", DESCR: "1/10 Gbps Ethernet Module"
PID: N77-F348XP-23   ,  VID: V00 ,  SN: JAE17360CZH

NAME: "Slot 15", DESCR: "1/10 Gbps Ethernet Module"
PID: N77-F348XP-23   ,  VID: V00 ,  SN: JAE17310979

NAME: "Slot 16", DESCR: "1/10 Gbps Ethernet Module"
PID: N77-F348XP-23   ,  VID: V00 ,  SN: JAE1731097C
```

```
NAME: "Slot 17", DESCR: "1/10 Gbps Ethernet Module"
PID: N77-F348XP-23      , VID: V00 , SN: JAE1731096S

NAME: "Slot 18", DESCR: "1/10 Gbps Ethernet Module"
PID: N77-F348XP-23      , VID: V00 , SN: JAE17360CYL

NAME: "Slot 19", DESCR: "Fabric card module"
PID: N77-C7718-FAB-2    , VID: V00 , SN: JAE213604M9

NAME: "Slot 20", DESCR: "Fabric card module"
PID: N77-C7718-FAB-2    , VID: V00 , SN: JAE212106WA

NAME: "Slot 21", DESCR: "Fabric card module"
PID: N77-C7718-FAB-2    , VID: V00 , SN: JAE212106VM

NAME: "Slot 22", DESCR: "Fabric card module"
PID: N77-C7718-FAB-2    , VID: V00 , SN: JAE212106W6

NAME: "Slot 23", DESCR: "Fabric card module"
PID: N77-C7718-FAB-2    , VID: V00 , SN: JAE212106WX

NAME: "Slot 24", DESCR: "Fabric card module"
PID: N77-C7718-FAB-2    , VID: V00 , SN: JAE212106X3

NAME: "Slot 33", DESCR: "Nexus7700 C7718 (18 Slot) Chassis Power Supply"
PID: N77-AC-3KW        , VID: V01 , SN: DTM164800EL

NAME: "Slot 34", DESCR: "Nexus7700 C7718 (18 Slot) Chassis Power Supply"
PID: N77-AC-3KW        , VID: V01 , SN: DTM164800AL

NAME: "Slot 37", DESCR: "Nexus7700 C7718 (18 Slot) Chassis Power Supply"
PID: N77-AC-3KW        , VID: V01 , SN: DTM164902EV

NAME: "Slot 39", DESCR: "Nexus7700 C7718 (18 Slot) Chassis Power Supply"
PID: N77-AC-3KW        , VID: V01 , SN: DTM1651006Y

NAME: "Slot 41", DESCR: "Nexus7700 C7718 (18 Slot) Chassis Power Supply"
PID: N77-AC-3KW        , VID: V01 , SN: DTM164902G3

NAME: "Slot 42", DESCR: "Nexus7700 C7718 (18 Slot) Chassis Power Supply"
PID: N77-AC-3KW        , VID: V01 , SN: DTM164901XC

NAME: "Slot 44", DESCR: "Nexus7700 C7718 (18 Slot) Chassis Power Supply"
PID: N77-AC-3KW        , VID: V01 , SN: DTM164902F9

NAME: "Slot 45", DESCR: "Nexus7700 C7718 (18 Slot) Chassis Power Supply"
PID: N77-AC-3KW        , VID: V01 , SN: DTM164800HG

NAME: "Slot 47", DESCR: "Nexus7700 C7718 (18 Slot) Chassis Power Supply"
PID: N77-AC-3KW        , VID: V01 , SN: DTM165200XU

NAME: "Slot 49", DESCR: "Nexus7700 C7718 (18 Slot) Chassis Fan Module"
PID: N77-C7718-FAN     , VID: V01 , SN: JAF1633BDKR

NAME: "Slot 50", DESCR: "Nexus7700 C7718 (18 Slot) Chassis Fan Module"
PID: N77-C7718-FAN     , VID: V01 , SN: JAF1633BDDB

NAME: "Slot 51", DESCR: "Nexus7700 C7718 (18 Slot) Chassis Fan Module"
PID: N77-C7718-FAN     , VID: V01 , SN: JAF1633BDEC
switch#
```

Displaying the Backplane and Serial Number Information

You can display the backplane information, including the serial number for the switch, by using the **show sprom backplane** command.

Enter the **show sprom backplane** command.

Example:

```
switch# show sprom backplane 1
DISPLAY backplane sprom contents:
Common block:
Block Signature : 0xabab
Block Version   : 3
Block Length    : 160
Block Checksum  : 0x165c
EEPROM Size     : 65535
Block Count     : 5
FRU Major Type  : 0x6001
FRU Minor Type  : 0x0
OEM String      : Cisco Systems, Inc.
Product Number  : N77-C7718
Serial Number   : JAF1650ABCA
Part Number     : 73-14605-03
Part Revision   : 02
Mfg Deviation   : 0
H/W Version     : 0.100
Mfg Bits        : 0
Engineer Use    : 0
snmpOID        : 9.12.3.1.4.62.0.0
Power Consump   : 0
RMA Code        : 0-0-0-0
CLEI Code       : CMB1B0FAKE
VID            : V01
Chassis specific block:
Block Signature : 0x6001
Block Version   : 3
Block Length    : 39
Block Checksum  : 0x316
Feature Bits    : 0x0
HW Changes Bits : 0x0
Stackmib OID    : 0
MAC Addresses   : 84-78-ac-0b-4a-00
Number of MACs  : 128
OEM Enterprise  : 9
OEM MIB Offset  : 5
MAX Connector Power: 0
Wwn software-module specific block:
Block Signature : 0x6005
Block Version   : 1
Block Length    : 0
Block Checksum  : 0x66
wnn usage bits:
00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00
```

```

00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00
00 00
License software-module specific block:
Block Signature : 0x6006
Block Version   : 1
Block Length    : 16
Block Checksum  : 0x157
lic usage bits:
c0 20 00 00 00 00 00 00
Second Serial number specific block:
Block Signature : 0x6007
Block Version   : 1
Block Length    : 28
Block Checksum  : 0x344
Serial Number   : JAF1650BBQN
switch#

```

Displaying Environmental Information for a Switch

You can display all of the environment-related switch information by using the **show environment** command.

Enter the **show environment** command.

Example:

```

switch# show environment
Power Supply:
Voltage: 50 Volts
Power
Supply      Model                Actual      Total
              Output          Capacity    Status
              (Watts )          (Watts )
-----
1           -----                0 W         0 W      Absent
2           -----                0 W         0 W      Absent

```

Displaying Environmental Information for a Switch

3	-----	0 W	0 W	Absent
4	-----	0 W	0 W	Absent
5	N7K-AC-3KW	0 W	0 W	Shutdown
6	N77-AC-3KW	0 W	0 W	Shutdown
7	N77-AC-3KW	0 W	0 W	Shutdown
8	-----	0 W	0 W	Absent
9	N7K-AC-3KW	943 W	3000 W	Ok
10	-----	0 W	0 W	Absent
11	-----	0 W	0 W	Absent
12	-----	0 W	0 W	Absent
13	N77-AC-3KW	979 W	3000 W	Ok
14	N7K-AC-3KW	935 W	3000 W	Ok
15	-----	0 W	0 W	Absent
16	-----	0 W	0 W	Absent

Module	Model	Actual Draw (Watts)	Power Allocated (Watts)	Status
7	N77-F430CQ-36	N/A	0 W	Powered-Dn
8	N77-F430CQ-36	577 W	1000 W	Powered-Up
9	supervisor	N/A	0 W	Absent
10	N77-SUP3E	96 W	150 W	Powered-Up
12	N77-F430CQ-36	N/A	0 W	Pwr-Denied
16	N77-M348XP-23L	330 W	560 W	Powered-Up
17	N77-F430CQ-36	604 W	1000 W	Powered-Up
18	N77-F430CQ-36	603 W	1000 W	Powered-Up
Xb1	N7F-C7018-FAB-2	N/A	300 W	Powered-Dn
Xb2	N7F-C7018-FAB-2	N/A	300 W	Powered-Dn
Xb3	xbar	N/A	300 W	Absent
Xb4	N77-C7718-FAB-2	143 W	300 W	Powered-Up
Xb5	N77-C7718-FAB-2	150 W	300 W	Powered-Up
Xb6	N77-C7718-FAB-2	152 W	300 W	Powered-Up
fan1	N77-C7718-FAN-2	82 W	900 W	Powered-Up
fan2	N77-C7718-FAN-2	82 W	900 W	Powered-Up
fan3	N77-C7718-FAN-2	82 W	900 W	Powered-Up

N/A - Per module power not available

Power Usage Summary:

Power Supply redundancy mode (configured) Non-Redundant (combined)
 Power Supply redundancy mode (operational) Non-Redundant (combined)

Total Power Capacity (based on configured mode) 9000 W
 Total Power of all Inputs (cumulative) 9000 W
 Total Power Output (actual draw) 2857 W
 Total Power Allocated (budget) 8360 W
 Total Power Available for additional modules 640 W

Clock:

Clock	Model	Hw	Status
A	Clock Module	--	NotSupported/None
B	Clock Module	--	NotSupported/None

Fan:

Fan	Model	Hw	Status
-----	-------	----	--------


```

Fan1(sys_fan1) N77-C7718-FAN-2 0.100 Ok
Fan2(sys_fan2) N77-C7718-FAN-2 0.100 Ok
Fan3(sys_fan3) N77-C7718-FAN-2 0.100 Ok
Fan_in_PS1 -- -- Absent
Fan_in_PS2 -- -- Absent
Fan_in_PS3 -- -- Absent
Fan_in_PS4 -- -- Absent
Fan_in_PS5 -- -- Shutdown
Fan_in_PS6 -- -- Shutdown
Fan_in_PS7 -- -- Shutdown
Fan_in_PS8 -- -- Absent
Fan_in_PS9 -- -- Ok
Fan_in_PS10 -- -- Absent
Fan_in_PS11 -- -- Absent
Fan_in_PS12 -- -- Absent
Fan_in_PS13 -- -- Ok
Fan_in_PS14 -- -- Ok
Fan_in_PS15 -- -- Absent
Fan_in_PS16 -- -- Absent
Fan Zone Speed %(Hex): Zone 1: 40.78(0x68)

```

Temperature:

```

-----
Module   Sensor                MajorThresh  MinorThres  CurTemp    Status
          (Celsius)             (Celsius)   (Celsius)
-----
8        Crossbar1(s1)          125          115         55         Ok
8        Crossbar2(s2)          125          115         52         Ok
8        Arb-muxSn0(s3)         125          115         54         Ok
8        Arb-muxSn1(s4)         125          115         58         Ok
8        CPU(s5)                125          115         59         Ok
8        CPU(s6)                125          115         48         Ok
8        L2L3Dev1(s7)           125          115         51         Ok
8        L2L3Dev2(s8)           125          115         48         Ok
8        L2L3Dev3(s9)           125          115         52         Ok
8        L2L3Dev4(s10)          125          115         48         Ok
8        L2L3Dev5(s11)          125          115         40         Ok
8        L2L3Dev6(s12)          125          115         40         Ok
8        L2L3Dev7(s13)          125          115         48         Ok
8        L2L3Dev8(s14)          125          115         51         Ok
8        L2L3Dev9(s15)          125          115         49         Ok
8        L2L3Dev10(s16)        125          115         51         Ok
10       Inlet(s1)              60           42          23         Ok
10       CPU1CORE1(s2)          85           75          36         Ok
10       CPU1CORE2(s3)          85           75          36         Ok
10       CPU1CORE3(s4)          85           75          36         Ok
10       CPU1CORE4(s5)          85           75          36         Ok
10       CPU1CORE5(s6)          85           75          36         Ok
10       CPU1CORE6(s7)          85           75          36         Ok
10       CPU1CORE7(s8)          85           75          36         Ok
10       CPU1CORE8(s9)          85           75          36         Ok
10       DDR4DIMM1(s10)         95           85          28         Ok
10       DDR4DIMM2(s11)         95           85          28         Ok
10       DDR4DIMM3(s12)         95           85          28         Ok
10       DDR4DIMM4(s13)         95           85          28         Ok
10       L2L3Dev1(s14)          125          115         40         Ok
10       L2L3Dev1(s15)          125          115         43         Ok
10       L2L3Dev1(s16)          125          115         44         Ok
16       Crossbar1(s1)          125          115         44         Ok
16       Crossbar2(s2)          125          115         54         Ok
16       Arb-muxSn0(s3)         125          105         53         Ok
16       Arb-muxSn1(s4)         125          105         55         Ok
16       CPU(s5)                125          105         51         Ok

```

Displaying Environmental Information for a Switch

16	CPU	(s6)	125	105	51	Ok
16	PCISW	(s7)	110	100	49	Ok
16	L2L3Dev1Sn1	(s8)	125	115	55	Ok
16	L2L3Dev1Sn2	(s9)	125	115	57	Ok
16	L3Lkup1Sn1	(s10)	125	105	55	Ok
16	L3Lkup1Sn2	(s11)	125	105	55	Ok
16	L2L3Dev2Sn1	(s12)	125	115	52	Ok
16	L2L3Dev2Sn2	(s13)	125	115	54	Ok
16	L3Lkup2Sn1	(s14)	125	105	55	Ok
16	L3Lkup2Sn2	(s15)	125	105	56	Ok
17	Crossbar1	(s1)	125	115	66	Ok
17	Crossbar2	(s2)	125	115	65	Ok
17	Arb-muxSn0	(s3)	125	115	62	Ok
17	Arb-muxSn1	(s4)	125	115	66	Ok
17	CPU	(s5)	125	115	59	Ok
17	CPU	(s6)	125	115	52	Ok
17	L2L3Dev1	(s7)	125	115	64	Ok
17	L2L3Dev2	(s8)	125	115	59	Ok
17	L2L3Dev3	(s9)	125	115	64	Ok
17	L2L3Dev4	(s10)	125	115	60	Ok
17	L2L3Dev5	(s11)	125	115	47	Ok
17	L2L3Dev6	(s12)	125	115	47	Ok
17	L2L3Dev7	(s13)	125	115	60	Ok
17	L2L3Dev8	(s14)	125	115	65	Ok
17	L2L3Dev9	(s15)	125	115	62	Ok
17	L2L3Dev10	(s16)	125	115	65	Ok
18	Crossbar1	(s1)	125	115	67	Ok
18	Crossbar2	(s2)	125	115	66	Ok
18	Arb-muxSn0	(s3)	125	115	68	Ok
18	Arb-muxSn1	(s4)	125	115	72	Ok
18	CPU	(s5)	125	115	71	Ok
18	CPU	(s6)	125	115	61	Ok
18	L2L3Dev1	(s7)	125	115	64	Ok
18	L2L3Dev2	(s8)	125	115	59	Ok
18	L2L3Dev3	(s9)	125	115	65	Ok
18	L2L3Dev4	(s10)	125	115	59	Ok
18	L2L3Dev5	(s11)	125	115	47	Ok
18	L2L3Dev6	(s12)	125	115	47	Ok
18	L2L3Dev7	(s13)	125	115	61	Ok
18	L2L3Dev8	(s14)	125	115	66	Ok
18	L2L3Dev9	(s15)	125	115	64	Ok
18	L2L3Dev10	(s16)	125	115	66	Ok
xbar-4	Crossbar1	(s1)	125	115	48	Ok
xbar-4	Crossbar2	(s2)	125	115	42	Ok
xbar-4	Crossbar3	(s3)	125	115	39	Ok
xbar-4	Crossbar4	(s4)	125	115	42	Ok
xbar-5	Crossbar1	(s1)	125	115	50	Ok
xbar-5	Crossbar2	(s2)	125	115	43	Ok
xbar-5	Crossbar3	(s3)	125	115	39	Ok
xbar-5	Crossbar4	(s4)	125	115	39	Ok
xbar-6	Crossbar1	(s1)	125	115	48	Ok
xbar-6	Crossbar2	(s2)	125	115	43	Ok
xbar-6	Crossbar3	(s3)	125	115	42	Ok
xbar-6	Crossbar4	(s4)	125	115	40	Ok

switch#

Displaying Temperatures for Modules

Each supervisor, I/O, and fabric module has temperature sensors with two thresholds:

- Minor temperature threshold—When a minor threshold is exceeded, a minor alarm occurs and the following actions occur for all four sensors:
 - Displays system messages
 - Sends Call Home alerts (if configured)
 - Sends SNMP notifications (if configured)
- Major temperature threshold—When a major threshold is exceeded, a major alarm occurs and the following actions occur:
 - For sensors 1, 3, and 4 (outlet and onboard sensors), the following actions occur:
 - Displays system messages.
 - Sends Call Home alerts (if configured). For more information, refer [Associating an Alert Group with a Destination Profile](#).
 - Sends SNMP notifications (if configured). For more information, refer [Enabling SNMP Notifications](#).
 - For sensor 2 (intake sensor), the following actions occur:
 - If the threshold is exceeded in a switching module, only that module is shut down.
 - If the threshold is exceeded in an active supervisor module with HA-standby or standby present, only that supervisor module is shut down and the standby supervisor module takes over.
 - If you do not have a standby supervisor module in your switch, you have up to 2 minutes to decrease the temperature. During this interval, the software monitors the temperature every 5 seconds and continuously sends system messages as configured.



Tip We recommend that you install dual supervisor modules. If you are using a switch without dual supervisor modules, we recommend that you immediately replace the fan module if just one fan is not working.



Note A threshold value of -127 indicates that no thresholds are configured or applicable.

You can display temperature readings for module temperature sensors by using the **show environment temperature** command.

Enter the **show environment temperature** command.

Example:

```
switch# show environment temperature
Temperature:
```

```
-----
Module      Sensor                MajorThresh  MinorThres  CurTemp      Status
           (Celsius)             (Celsius)    (Celsius)
-----
1           Crossbar (s5)         105          95          60           Ok
1           QEng1Sn1 (s12)       115          110         70           Ok
1           QEng1Sn2 (s13)       115          110         68           Ok
1           QEng1Sn3 (s14)       115          110         67           Ok
1           QEng1Sn4 (s15)       115          110         68           Ok
1           QEng2Sn1 (s16)       115          110         70           Ok
1           QEng2Sn2 (s17)       115          110         68           Ok
1           QEng2Sn3 (s18)       115          110         68           Ok
1           QEng2Sn4 (s19)       115          110         68           Ok
1           L2Lookup (s27)       115          105         57           Ok
1           L3Lookup (s28)       120          110         62           Ok
2           Crossbar (s5)         105          95          65           Ok
2           QEng1Sn1 (s12)       115          110         70           Ok
2           QEng1Sn2 (s13)       115          110         68           Ok
2           QEng1Sn3 (s14)       115          110         67           Ok
2           QEng1Sn4 (s15)       115          110         68           Ok
2           QEng2Sn1 (s16)       115          110         69           Ok
2           QEng2Sn2 (s17)       115          110         68           Ok
2           QEng2Sn3 (s18)       115          110         67           Ok
2           QEng2Sn4 (s19)       115          110         68           Ok
2           L2Lookup (s27)       115          105         56           Ok
2           L3Lookup (s28)       120          110         63           Ok
5           Outlet1 (s1)         125          125         49           Ok
5           Outlet2 (s2)         125          125         37           Ok
5           Intake (s3)          60           42          32           Ok
5           EOBC_MAC (s4)       105          95          43           Ok
5           CPU (s5)             105          95          40           Ok
5           Crossbar (s6)       105          95          61           Ok
5           Arbiter (s7)         110          100         67           Ok
5           CTSdev1 (s8)        115          105         43           Ok
5           InbFPGA (s9)        105          95          44           Ok
5           QEng1Sn1 (s10)      115          105         60           Ok
5           QEng1Sn2 (s11)      115          105         59           Ok
5           QEng1Sn3 (s12)      115          105         56           Ok
5           QEng1Sn4 (s13)      115          105         57           Ok
xbar-1     Outlet (s1)         125          125         38           Ok
xbar-1     Intake (s2)         60           42          32           Ok
xbar-1     Crossbar (s3)       105          95          56           Ok
xbar-2     Outlet (s1)         125          125         39           Ok
xbar-2     Intake (s2)         62           42          31           Ok
xbar-2     Crossbar (s3)       105          95          56           Ok
switch#
```

Connecting to a Module

At any time, you can connect to any module by using the **attach module** command. Once you are at the module prompt, you can obtain further details about the module by using module-specific commands in EXEC mode.

You can also use the `attach module` command to display the standby supervisor module information, although you cannot configure the standby supervisor module using this command.

Step 1 Enter the `attach module slot_number` command.

Example:

```
switch# attach module 4
switch(standby)#
```

Provides direct access to the specified module (in this example, the standby supervisor module is in slot 6).

Step 2 `dir bootflash`

Example:

```
switch(standby)# dir bootflash
Example:
switch# dir bootflash:
 80667580      Feb 21 22:04:59 2008  n7700-s2-kickstart.7.3.0.DX.1.bin
 22168064      Feb 21 22:04:19 2008  n7700-s2-dk9.7.3.0.DX.1.bin
 16384         Jan 03 19:56:00 2005  lost+found/
Usage for bootflash://sup-local
 234045440 bytes used
 1684602880 bytes free
 1918648320 bytes total
switch#
```

Provides the available space information for the standby supervisor module.

Note To exit the module-specific prompt, use the `exit` command.

Saving the Module Configuration

To save the new configuration along with the non-default VDC configuration to nonvolatile storage, use the `copy running-config startup-config vdc-all` command from EXEC mode. Once you enter these commands, the running and the startup copies of the configuration are identical.

The following table lists various scenarios when module configurations are preserved or lost.

Scenario	Consequence
A particular switching module is removed and you used the <code>copy running-config startup-config vdc-all</code> command again.	The configured module information is lost.
A particular switching module is removed and the same switching module is replaced before you enter the <code>copy running-config startup-config vdc-all</code> command again.	The configured module information is preserved.

Scenario	Consequence
A particular switching module is removed and replaced with the same type switching module, and you entered the reload module slot_number command.	The configured module information is preserved.
A particular switching module is reloaded when you enter the reload module slot_number command.	The configured module information is preserved.

Displaying Power Usage Information

To display the power usage information for the entire switch, use the **show environment power** command. This command shows the power usage for many of the modules installed in the switch. For the older modules that do not have the capability to output this information, the output is shown as N/A.



Note Power usage is reserved for both supervisor modules regardless of whether one or both supervisor modules are present.

Enter the **show environment power** command.

Reloading a Module

You can reset a module by using the **reload module** command and specifying the module by its slot number in the chassis.



Caution Reloading a module disrupts traffic through the module.

Step 1 Enter the **configure terminal** command to enter the configuration terminal mode.

Example:

```
switch# configure terminal
switch(config)#
```

Step 2 Specify the slot number for the module that you are resetting by entering the **reload module slot_number** command.

Example:

```
switch(config)# reload module 1
```

Rebooting the Switch

To reboot or reload the switch, use the **reload** command without any options. When you use this command, you reboot the switch.



Note If you need to use the **reload** command, be sure to save the running configuration by using the **copy running-config startup-config vdc-all** command beforehand.

Step 1 Start the configuration mode by entering the **configure terminal** command.

Example:

```
switch# configure terminal
switch(config)#
```

Step 2 Save the running configuration by entering the **copy running-config startup-config vdc-all** command.

Example:

```
switch(config)# copy running-config startup-config vdc-all
```

Step 3 Reload the switch by entering the **reload** command.

Example:

```
switch(config)# reload
```

Overview of Supervisor Modules

The switch has one or two supervisor modules of the following types:

- Supervisor 2 Enhanced (N77-SUP2E)
- Supervisor 3 Enhanced (N77-SUP3E)



Note You can use only one type of supervisor module in a switch.

When a switch has two supervisors, one supervisor is automatically active while the other is in standby mode. If the active supervisor goes down or is disconnected for replacement, the standby supervisor automatically becomes active. If you need to replace one of two installed supervisor modules with another module, you can do this without interrupting operations—the supervisor that you are not replacing becomes the active supervisor and retains the kickstart configuration while you replace the other supervisor.

If the switch has just one supervisor, you can install the new supervisor in the open supervisor slot during operations and make that supervisor active after the installation.

Supervisor modules are automatically powered up and started with the switch.

To understand the terms used for the supervisors, see the following table.

Module Terms	Usage	Description
module-9 and module-10	Fixed	<ul style="list-style-type: none"> Module-9 refers to the supervisor module in chassis slot 9. Module-10 refers to the supervisor module in chassis slot 10.
sup-1 and sup-2	Fixed	<ul style="list-style-type: none"> sup-1 refers to the supervisor module in slot 9. sup-2 refers to the supervisor module in slot 10.
sup-active and sup-standby	Relative	<ul style="list-style-type: none"> sup-active refers to the active supervisor module—relative to the slot that contains the active supervisor module. sup-standby refers to the standby supervisor module—relative to the slot that contains the standby supervisor module.
sup-local and sup-remote	Relative	<p>If you are logged into the active supervisor, the following applies:</p> <ul style="list-style-type: none"> sup-local refers to the active supervisor module. sup-remote refers to the standby supervisor module. <p>If you are logged into the standby supervisor, the following applies:</p> <ul style="list-style-type: none"> sup-local refers to the standby supervisor module (the one that you are logged into). There is no sup-remote available from the standby supervisor module (you cannot access a file system on the active supervisor).

Shutting Down a Supervisor Module

To shut down a supervisor module, use the **out-of-service module** command to specify the chassis slot with that module.

Step 1 Start the configuration mode by entering the **configure terminal** command.

Example:

```
switch# configure terminal
switch(config)#
```


Step 2 Take the supervisor module out of service by entering the **out-of-service module** *slot_number* command.

Example:

```
switch(config)# out-of-service module 9
switch(config)#
```

Overview of I/O Module Support

The following table lists the I/O modules supported by the switch.

I/O Module	Supported Cisco Nexus FEX Models						
	2224TP	2232PP	2232TM	2232TM-E	2248PQ	2248TP	2248TP-E
F2-Series Enhanced 48-port 1- and 10-GE with XL (N7F248XP2)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
F3-Series Enhanced 48-port 1-/10-GE with XL (N7F348XP2)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
F3-Series Enhanced 24-port 40-GE with XL (N7F324FQ2)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
F3-Series Enhanced 12-port 100-GE with XL (N7F312CK2)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
F4-Series 30-port 100-Gigabit Ethernet I/O module (N7F430CQ3)	Yes	Yes	Yes	Yes	Yes	Yes	Yes

I/O Module	Supported Cisco Nexus FEX Models						
	2224TP	2232PP	2232TM	2232TM-E	2248PQ	2248TP	2248TP-E
M3-Series 48-port 1-/10-GE (N77-M348XP-23L)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
M3-Series 24-port 40-GE (N77-M324FQ-25L)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
M3-Series 12-port 100-GE (N77-M312CQ-26L)	No	No	No	No	No	No	No

The following F3-Series modules are supported by the Cisco Nexus 7700 Series switches:

- F3-Series Enhanced 48-port 1-/10-G Ethernet with XL (N77-F348XP-23)
- F3-Series Enhanced 24-port 40-G Ethernet with XL (N77-F324FQ-25)
- F3-Series Enhanced 12-port 100-G Ethernet with XL (N77-F312CK-26)

The following F4-Series module is supported by the Cisco Nexus 7700 Series switches:

- F4-Series 30-port 100-G Ethernet (N77-F430CQ-36)

The following M3 Series modules are supported by the Cisco Nexus 7700 Series switches:

- M3-Series 48-port 1-/10-G Ethernet (N77-M348XP-23L)
- M3-Series 24-port 40-G Ethernet (N77-M324FQ-25L)
- M3-Series 12-port 100-G Ethernet (N77-M312CQ-26L)

Accessing an I/O Module through a Console

You can troubleshoot bootup problems for an I/O module by accessing the module through its console port. This action establishes a console mode that you must exit in order to use other Cisco NX-OS commands.

To attach to the console port for an I/O module, use the **attach console module** command to specify the module you need to work with. Specify a slot from 1 to 8 or from 11 to 18.



Note To exit the console mode, enter the ~, command.

Attach to the console port for the I/O module by entering the **attach console module slot_number** command.

Example:

```
switch# attach console module 1
connected
Escape character is '^,' (tilde comma)
```

Displaying Information for the Installed Modules

You can display information about the modules installed in the switch chassis by using the **show module** command. This information includes module type, bootup status, MAC addresses, serial numbers, software versions, and hardware versions. You can use this command in the following ways to display information about all of the installed module or specific modules:

- For information on all modules, use the **show module** command.
- For information on a specific supervisor or I/O module, use the **show module slot_number** command to specify a slot number.
- For information on a specific fabric module, use the **show module xbar slot_number** command to specify a slot number.

For a description of the module status indicated by one of the above **show module** commands, see the following table.

I/O Module State	Description
powered up	The hardware has electrical power. When the hardware is powered up, the software begins booting.
testing	The module has established connection with the supervisor and the module is performing bootup diagnostics.
initializing	The diagnostics have completed successfully and the configuration is being downloaded.
failure	The switch detects a module failure upon initialization and automatically attempts to power-cycle the module three times. After the third attempt, the module powers down.
ok	The switch is ready to be configured.
power-denied	The switch detects insufficient power for an I/O module to power up.
active	This module is the active supervisor module and the switch is ready to be configured.
HA-standby	The HA switchover mechanism is enabled on the standby supervisor module.

Use the **show module [slot_number] | [xbar slot_number]** command in one of the following ways:

Option	Description
show module	Displays information for all of the installed modules.
show module slot_number	Displays information for a supervisor or I/O module that you specify by its slot number.

Option	Description
<code>show module xbar slot_number</code>	Displays information for the fabric module that you specify by its slot number.

Display information for all or specific modules.

Displaying Information for All Installed Modules

Displaying Information for a Specific Supervisor or I/O Module

Displaying Information for a Specific Fabric Module

```

switch# show module
Mod  Ports  Module-Type                               Model                               Status
---  ---
4    48     1/10 Gbps Ethernet Module                N77-M348XP-23L                     ok
5    24     10/40 Gbps Ethernet Module               N77-M324FQ-25L                     ok
6    30     100 Gbps Ethernet Module                 N77-F430CQ-36                      ok
8    48     1/10 Gbps Ethernet Module                N77-F348XP-23                      ok
9    0      Supervisor Module-3                       N77-SUP3E                           active *

Mod  Sw                Hw
---  ---
4    8.3(0)SK(0.47)    0.203
5    8.3(0)SK(0.47)    0.203
6    8.3(0)SK(0.47)    0.909
8    8.3(0)SK(0.47)    0.203
9    8.3(0)SK(0.47)    0.203

Mod  MAC-Address(es)                               Serial-Num
---  ---
4    50-06-ab-91-05-a0 to 50-06-ab-91-05-d3    JAE194108S6
5    00-57-d2-0a-9c-c0 to 00-57-d2-0a-9d-23    JAE194507M4
6    00-27-90-a1-ab-50 to 00-27-90-a1-ab-b3    JAE214303LW
8    e8-ed-f3-e4-c8-e8 to e8-ed-f3-e4-c9-1f    JAE17360CZA
9    0c-68-03-28-d9-58 to 0c-68-03-28-d9-6a    JAE172704C3

Mod  Online Diag Status
---  ---
4    Pass
5    Pass
6    Pass
8    Pass
9    Pass

Xbar  Ports  Module-Type                               Model                               Status
---  ---
1    0      Fabric Module 3                           N77-C7718-FAB-2                     ok

Xbar  Sw                Hw
---  ---
1    NA                0.705

```

```

Xbar MAC-Address(es)                               Serial-Num
---
1      NA                                           JAE213604M9

* this terminal session
switch#

switch# show module 1
Mod  Ports  Module-Type                               Model                Status
---
1    30    100 Gbps Ethernet Module                 N77-F430CQ-36       ok

Mod  Sw                Hw
---
1    8.3(0)SK(0.47)    0.203

Mod  MAC-Address(es)                               Serial-Num
---
1    00-27-90-a1-ab-50 to 00-27-90-a1-ab-b3    JAE214303LW

Mod  Online Diag Status
---
1    Pass

Chassis Ejector Support: Enabled
Ejector Status:
Left ejector CLOSE, Right ejector CLOSE, Module HW does support
ejector based shutdown, Ejector policy enabled.
switch#

switch# show module xbar 1
Xbar Ports  Module-Type                               Model                Status
---
1    0        Fabric Module 2                          N77-C7718-FAB-2     ok

Xbar Sw                Hw
---
1    NA                0.101

Xbar MAC-Address(es)                               Serial-Num
---
1    NA                                           JAE17260CCT

Chassis Ejector Support: Enabled
Ejector Status:
Top ejector OPEN, Bottom ejector OPEN, Module HW does not support ejector
based shutdown, Ejector policy disabled.
switch#

```

Purging the Module Configuration

You can clear the running configuration for an I/O slot that is not functioning by using the **purge module** command in EXEC mode.



Note This command does not work on supervisor slots nor on any I/O slot that currently has a powered-up module.

Before you begin

Verify that either the I/O slot is empty or the I/O module installed in the slot is powered down.

Clear the running configuration by using the **purge module *slot_number* running-config** command.

Example:

```
switch# purge module 1 running-config
```

Example

For example, suppose you create an IP storage configuration with a 48-port 10/100/1000 Ethernet I/O module in slot 3 of Switch A. This module uses an IP address. You decide to remove this I/O module and move it to Switch B, and you no longer need the IP address. If you try to configure this unused IP address, you will receive an error message that prevents you from proceeding with the configuration. In this case, you need to enter the **purge module 3 running-config** command to clear the old configuration in Switch A before using the IP address.

Shut Down or Power Up an I/O Module

You can shutdown or power up an I/O module by using the **poweroff module** or **no poweroff module** command to specify the module by its slot number in the chassis.

Step 1 Start the configuration mode by entering the **configure terminal** command.

Example:

```
switch# configure terminal  
switch(config)#
```

Step 2 Shutdown the module by entering the **[no] shutdown module *slot_number*** command.

Example:

```
switch(config)# poweroff module 1  
switch(config)#
```

Example:

```
switch(config)# no poweroff module 1  
switch(config)#
```

Overview of Fabric Module Support

This switch supports the following fabric modules:

- Fabric 2 (N77-C7718-FAB-2)

Change the Amount of Power Reserved for Fabric Modules

By default, each switch reserves enough power for the maximum quantity of fabric modules that can be installed in its chassis. If you have installed fewer than the maximum number of fabric modules and need to free up unused reserve power for I/O modules, you can power down the unused slots and specify a smaller maximum number of modules.

To specify a different maximum number of fabric modules for your system, use the hardware fabrics max number command. To verify the status of the installed fabric modules, use the **show module xbar** command. To verify the amount of reserved power, use the **show environment power** command.

Before you begin

- Make sure that the fabric modules that you are using are installed in slots 1 through x where x is the new maximum number of fabric modules.

You do not have to fill all of the fabric slots, but the fabric modules that you install must be in slots 1 through x . For example, if you specify 4 as the new maximum number of fabric modules, you must make sure that the fabric modules that you are using are in slots 1 through 4.

- Make sure that each of the installed fabric modules is powered up by using the **no poweroff xbar slot_number** command (see [Shutting Down or Powering Up a Fabric Module, on page 75](#)).
- Power down the unused slots by using the **poweroff xbar slot_number** command (see [Shutting Down or Powering Up a Fabric Module, on page 75](#)).

Step 1 Start the configuration mode by entering the **configure terminal** command.

Example:

```
switch# configure terminal
switch(config)#
```

Step 2 Power off specific a specific fabric module by using the **hardware fabrics max quantity** command. Use a digit between 1 and 6, inclusive.

Example:

```
switch(config)# hardware fabrics max 4
switch(config)#
```

Shutting Down or Powering Up a Fabric Module

To shut down a fabric module, use either the **out-of-service xbar** command or the **poweroff xbar** command. If you use the **poweroff xbar** command, the slot remains in that state until you use the **no poweroff** command. If you use the **out-of-service xbar** command, the out-of-service state remains in effect until you do something like remove the module and replace it with another module.



Note If you are going to limit the maximum number of fabric modules, make sure that powered-on fabric modules are in the first n fabric module slots, where n is the new maximum number of fabric modules. For example, if you are limiting the maximum number of fabric modules to 4, you must make sure that the four powered-on fabric modules are in fabric slots 1 through 4.

If you are powering up more fabric modules than allowed by the current maximum number of fabric modules, then make sure that the fabric modules that you are powering up are installed in the first n fabric slots (slots 1 through n), power-on those modules with the **no poweroff xbar** command, and change the maximum number of fabric modules to n (see [Change the Amount of Power Reserved for Fabric Modules, on page 75](#)).

Step 1 Start the configuration mode by entering the **configure terminal** command.

Example:

```
switch# configure terminal
switch(config)#
```

Step 2 Shut down or power up the specified fabric module by entering the **[no] shutdown xbar slot_number** command.

Example:

```
switch(config)# poweroff xbar 1
switch(config)#
```

Example:

```
switch(config)# no poweroff xbar 1
switch(config)#
```

Power Modes Overview

You can configure one of the following power modes to either use the combined power provided by the installed power supply units (no power redundancy) or to provide power redundancy when there is a power loss:

Combined mode

This mode allocates the combined power of all power supplies to active power for switch operations. This mode does not allocate reserve power for power redundancy in case of power outages or power supply failures.

Power-supply ($n+1$) redundancy mode

This mode allocates one power supply as a reserve power supply in case an available power supply fails. The remaining power supplies are allocated for available power. The reserve power supply must be at least as powerful as each power supply used for the available power.

For example, if a switch requires 7.1 kW of available power and the switch has four power supplies that each output 3-kW, then three of the power supplies provide 9.0 kW of available power and one power supply provides 3.0 kW of reserve power in case another power supply fails.

Input-source (grid) redundancy mode

This mode allocates half of the power to available power and the other half to reserve power. You must use a different power source for the active and reserve power sources so that if the power source used for active power fails, the other power source used for the reserve power can provide power for the switch.

For example, if the switch requires 7.1 kW of power, the switch has six power supplies that each output 3 kW, and there are two 220-V power grids, then you use grid A to power three 3-kW power supplies that provide the available power to power the switch and you use grid B to power the other three 3-kW power supplies that provide the reserve power in case grid A fails.

Full redundancy mode

This mode provides both power-supply ($n+1$) and input-source (grid) redundancies. As happens with the input-source redundancy mode, this mode allocates half of the power supplies to provide available power and the other half of the power supplies to provide the reserve power. One of the reserve power supplies can alternatively be used to provide power if a power supply supplying the available power fails.

Guidelines for Configuring Power Redundancy Modes

The amounts of available and reserve power depend on the power redundancy mode that you specify and the number of power supplies installed in the switch. For each redundancy mode, consider the following:

Combined mode

The available power equals the combined output of all installed power supplies. There is no reserve power. You activate this mode by using the **power redundancy-mode combined** command.

For example, if the power requirement for a switch is 5.2 kW and the switch has one 3-kW power supply with 220 V input and 3.0-kW output, consider the following power planning scenarios:

- Scenario 1—no added power supplies

If you do not add a power supply unit, the available power (3.0 kW) is insufficient for the switch power requirement of 5.2 kW, so the switch powers the supervisor modules, fabric modules, and fan trays, before powering as many I/O modules as the remaining available power can support (one or more I/O modules will not be powered).

- Scenario 2—install an extra 3-kW power supply

If you install an additional 3-kW power supply unit that can output 3.0 kW, the available power becomes 6.0 kW. The increased amount of available power exceeds the switch power requirement of 5.2 kW, so all of the modules and fan trays in the switch can power up.

The following table shows the results for each scenario.

Scenario	Power Requirement	Power Supply 1 Output	Power Supply 2 Output	Available Power	Reserve Power	Result
1	5.2 kW	3.0 kW	—	3.0 kW	—	Available power is less than the power requirement for the switch, so you cannot power the entire switch (some of the I/O modules will not be able to power up).
2	5.2 kW	3.0 kW	3.0 kW	6.0 kW	—	Available power exceeds the power requirement for the switch, so the entire switch can power up.

Power supply ($n+1$) redundancy mode

The power supply that outputs the most power provides the reserve power so that it can take over for any other power supply that fails, and all of the other installed power supplies provide the available power. You activate this power mode by using the **power redundancy-mode ps-redundant** command.

For example, if the power requirement for a switch is 5.2 kW and the switch has two 3.0 kW power supplies outputting 3.0 kW each (220-V input from the grid), consider the following power planning scenarios:

- Scenario 1—no added power supplies

One 3-kW power supply, which outputs just 3.0 kW for 110-V of input power, provides the reserve power and the other 3-kW power supply, also outputting 3.0 kW, provides the available power. The available power (3.0 kW) does not meet the switch requirements of 5.2 kW, so the switch powers up except for some of its I/O modules.

- Scenario 2—adding one 3-kW power supply

One 3-kW power supply, which outputs 1.45 kW, provides the reserve power and the other two 3-kW power supplies, also outputting 3.0 kW each, provide a sufficient amount of power (6.0 kW) to meet the switch requirements (5.2 kW), so the entire switch powers up.

The following table shows the results for each scenario.

Scenario	Power Requirement	Output (kW) for Power Supplies			Available Power	Reserve Power	Result
		1	2	3			
1	5.2 kW	3.0 kW	3.0 kW	—	3.0 kW	3.0 kW	Available power is less than the power requirement for the switch, so you cannot power the entire switch (one or two of the I/O modules will not be able to power up).
2	5.2 kW	3.0 kW	3.0 kW	3.0 kW	6.0 kW	3.0 kW	Available power exceeds the power requirement for the switch, so the entire switch can power up.

Input-source (grid) redundancy mode

Half of the 3-kW power supplies are connected to one power source (grid) and the other half are connected to another power source. The available power is provided by one power source and the reserve power is provided by the other power source. If the power source providing the available power fails, the switch uses the reserve power source to provide its required power. You activate this power mode by using the **power redundancy-mode insrc_redundant** command.

For example, if the power requirement for a switch is 5.2 kW, the switch uses two 220-V power sources, and the switch has two 3-kW power supplies (each outputting 3.0 kW when using 220-V power sources), consider the following power planning scenarios:

- Scenario 1—no added power supplies

The available power is 3.0 kW (output from one 3-kW power supply) and the reserve power is 3.0 kW (output from the other power supply). The available power (3.0 kW) does not meet the switch requirements (5.2 kW), so most of the modules will power up but some of the I/O modules will not be able to power up.

- Scenario 2—adding two 3-kW power supplies

The available power is 2.9 kW (output from two 3-kW power supplies on grid A) and the reserve power is 2.9 kW (output from the other two power supplies on grid B). The available power (2.9 kW) exceeds the power requirement of the switch (2.8 kW), so the entire switch can power up.

The following table shows the results for each scenario.

Scenario	Power Requirement	Output for Power Supplies				Available Power	Reserve Power	Result
		1	2	3	4			
1	5.2 kW	3.0 kW	3.0 kW	—	—	3.0 kW	3.0 kW	Available power (3.0 kW) is less than the power requirement for the switch (5.2 kW), so most of the switch can power up but one or more I/O modules cannot power up.
2	5.2 kW	3.0 kW	3.0 kW	3.0 kW	3.0 kW	6.0 kW	6.0 kW	Available power (6.0 kW) exceeds the power requirement for the switch (5.2 kW), so the entire switch can power up.

Full redundancy mode

Full redundancy provides both power-supply redundancy and input-source redundancy. For power-supply redundancy, the power supply with the most output provides reserve power and the other power supplies provide the available power. For input-source redundancy, the available power is provided by one power source and the reserve power is provided by another power source, with half of the 3-kW power supplies powered by one source and the other half powered by the other source. You activate this power mode by using the **power redundancy-mode redundant** command.

For example, if the power requirement for a switch is 2.8 kW, the switch uses two 110-V power sources, and the switch has two 3-kW power supplies (each outputting 1.45 kW for 110-V power sources), consider the following power planning scenarios:

- Scenario 1—no added power supplies

The available power is 1.45 kW (output from one 3-kW power supply using a 110-V power source) and the reserve power is 1.45 kW (output from the other power supply). The available power does not meet the switch requirements of 2.8 kW, so most of the modules will power up but one or more I/O modules will not be able to power up.

- Scenario 2—adding two 3-kW power supplies

The available power is 2.9 kW (output from two 3-kW power supplies using a 110-V power source) and the reserve power is 2.9 kW (output from the other two power supplies). The available power (2.9 kW) exceeds the power requirement of the switch (2.8 kW), so the entire switch can power up.

The following table shows the results for each scenario.

Scenario	Power Rqmnt	Output for Power Supplies				Input Source Redundancy		Power Source Redundancy		Result
		1	2	3	4	Avail.	Res.	Avail.	Res.	
1	2.8 kW	1.45 kW	1.45 kW	—	—	1.45 kW	1.45 kW	1.45 kW	1.45 kW	Available power for both redndis does not meet the switch requirements so some of the I/O modules cannot power up.

Scenario	Power Rqmnt	Output for Power Supplies				Input Source Redundancy		Power Source Redundancy		Result
		1	2	3	4	Avail.	Res.	Avail.	Res.	
2	2.8 kW	1.45 kW	1.45 kW	1.45 kW	1.45 kW	2.9 kW	2.9 kW	4.35 kW	1.45 kW	Available power for both redund exceeds the switch equipment so the entire switch can power up.

Configuring the Power Mode

You can configure the power supply mode by using the **power redundancy-mode** command.



Note To display the current power supply configuration, use the **show environment power** command.

Step 1 Start the configuration mode by entering the **configure terminal** command.

Example:

```
switch# configure terminal
switch(config)#
```

Step 2 Specify one of the following power modes by entering the **power redundancy-mode mode** command:

- For combined mode, include the **combined** keyword.
- For power supply redundancy mode, include the **ps-redundant** keyword.
- For input source redundancy mode, include the **insrc_redundant** keyword.
- For full redundancy mode, include the **redundant** keyword.

Example:

```
switch(config)# power redundancy-mode redundant
switch(config)#
```

Maximum Power Available for 3-kW Power Supplies

The maximum power available for operations depends on the input power from your power source, the number and output capabilities of your power supplies, and the power redundancy mode that you use. The following table lists the amount of power available for 3-kW power supplies depending on power inputs, numbers of power supplies, and the mode used.

Power Inputs	Power Supplies	Combined Mode	Power Supply Redundancy Mode	Input Source Redundancy Mode	Full Redundancy Mode
1 input (220 V)	1	3000 W	—	—	—
	2	6000 W	3000 W	3000 W	3000 W
	3	9000 W	6000 W	3000 W	3000 W
	4	12000 W	9000 W	6000 W	6000 W
	5	15000 W	12000 W	6000 W	6000 W
	6	18000 W	15000 W	9000 W	9000 W
	7	21000 W	18000 W	9000 W	9000 W
	8	24000 W	21000 W	12000 W	12000 W
	9	27000 W	24000 W	12000 W	12000 W
	10	30000 W	27000 W	15000 W	15000 W
	11	33000 W	30000 W	15000 W	15000 W
	12	36000 W	33000 W	18000 W	18000 W
	13	39000 W	36000 W	18000 W	18000 W
	14	42000 W	39000 W	21000 W	21000 W
	15	45000 W	42000 W	21000 W	21000 W
	16	48000 W	45000 W	24000 W	24000 W

Power Inputs	Power Supplies	Combined Mode	Power Supply Redundancy Mode	Input Source Redundancy Mode	Full Redundancy Mode
1 input (110 V)	1	1450 W	—	—	—
	2	2900 W	1450 W	1450 W	1450 W
	3	4350 W	2900 W	1450 W	1450 W
	4	5800 W	4350 W	2900 W	2900 W
	5	7250 W	5800 W	2900 W	2900 W
	6	8700 W	7250 W	4350 W	4350 W
	7	10150 W	8700 W	4350 W	4350 W
	8	11600 W	10150 W	5800 W	5800 W
	9	13050 W	11600 W	5800 W	5800 W
	10	14500 W	13050 W	7250 W	7250 W
	11	15950 W	14500 W	7250 W	7250 W
	12	17400 W	15950 W	8700 W	8700 W
	13	18850 W	17400 W	8700 W	8700 W
	14	20300 W	18850 W	10150 W	10150 W
	15	21750 W	20300 W	10150 W	10150 W
	16	23200 W	21750 W	11600 W	11600 W

Maximum Power Available for 3-kW DC Power Supplies

The maximum power available for operations depends on the input power from your power source, the number and output capabilities of your power supplies, and the power redundancy mode that you use. The following table lists the amount of power available for 3-kW DC power supplies depending on power inputs, numbers of power supplies, and the mode used.

Power Inputs	Power Supplies	Combined Mode	Power Supply Redundancy Mode	Input Source Redundancy Mode	Full Redundancy Mode
1 input	1	3000 W	—	—	—
	2	6000 W	3000 W	3000 W	3000 W
	3	9000 W	6000 W	3000 W	3000 W
	4	12000 W	9000 W	6000 W	6000 W
	5	15000 W	12000 W	6000 W	6000 W
	6	18000 W	15000 W	9000 W	9000 W
	7	21000 W	18000 W	9000 W	9000 W
	8	24000 W	21000 W	12000 W	12000 W
	9	27000 W	24000 W	12000 W	12000 W
	10	30000 W	27000 W	15000 W	15000 W
	11	33000 W	30000 W	15000 W	15000 W
	12	36000 W	33000 W	18000 W	18000 W
	13	39000 W	36000 W	18000 W	18000 W
	14	42000 W	39000 W	21000 W	21000 W
	15	45000 W	42000 W	21000 W	21000 W
	16	48000 W	45000 W	24000 W	24000 W

Maximum Power Available for 3.5-kW Inputs (AC)

The maximum power available for operations depends on the input power from your power source, the number and output capabilities of your power supplies, and the power redundancy mode that you use. The following table lists the amount of power available for 3.5-kW HVAC/HVDC power supplies depending on AC power inputs, number of power supplies, and the mode used.

Power Inputs	Power Supplies	Combined Mode	Power Supply Redundancy Mode	Input Source Redundancy Mode	Full Redundancy Mode
1 input (277 V)	1	3500 W	—	—	—
	2	7000 W	3500 W	3500 W	3500 W
	3	10,500 W	7000 W	3500 W	3500 W
	4	14,000 W	10,500 W	7000 W	7000 W
	5	17,500 W	14,000 W	7000 W	7000 W
	6	21,000 W	17,500 W	10,500 W	10,500 W
	7	24,500 W	21,000 W	10,500 W	10,500 W
	8	28,000 W	24,500 W	14,000 W	14,000 W
	9	31,500 W	28,000 W	14,000 W	14,000 W
	10	35,000 W	31,500 W	17,500 W	17,500 W
	11	38,500 W	35,000 W	17,500 W	17,500 W
	12	42,000 W	38,500 W	21,000 W	21,000 W
	13	45,500 W	42,000 W	21,000 W	21,000 W
	14	49,000 W	45,500 W	24,500 W	24,500 W
	15	52,500 W	49,000 W	24,500 W	24,500 W
	16	56,000 W	52,500 W	28,000 W	28,000 W

Power Inputs	Power Supplies	Combined Mode	Power Supply Redundancy Mode	Input Source Redundancy Mode	Full Redundancy Mode
1 input (220/230 V)	1	3500 W	—	—	—
	2	7000 W	3500 W	3500 W	3500 W
	3	10,500 W	7000 W	3500 W	3500 W
	4	14,000 W	10,500 W	7000 W	7000 W
	5	17,500 W	14,000 W	7000 W	7000 W
	6	21,000 W	17,500 W	10,500 W	10,500 W
	7	24,500 W	21,000 W	10,500 W	10,500 W
	8	28,000 W	24,500 W	14,000 W	14,000 W
	9	31,500 W	28,000 W	14,000 W	14,000 W
	10	35,000 W	31,500 W	17,500 W	17,500 W
	11	38,500 W	35,000 W	17,500 W	17,500 W
	12	42,000 W	38,500 W	21,000 W	21,000 W
	13	45,500 W	42,000 W	21,000 W	21,000 W
	14	49,000 W	45,500 W	24,500 W	24,500 W
	15	52,500 W	49,000 W	24,500 W	24,500 W
	16	56,000 W	52,500 W	28,000 W	28,000 W

Power Inputs	Power Supplies	Combined Mode	Power Supply Redundancy Mode	Input Source Redundancy Mode	Full Redundancy Mode
1 input (210 V)	1	3100 W	—	—	—
	2	6200 W	3100 W	3100 W	3100 W
	3	9300 W	6200 W	3100 W	3100 W
	4	12,400 W	9300 W	6200 W	6200 W
	5	15,500 W	12,400 W	6200 W	6200 W
	6	18,600 W	15,500 W	9300 W	9300 W
	7	21,700 W	18,600 W	9300 W	9300 W
	8	24,800 W	21,700 W	12,400 W	12,400 W
	9	27,900 W	24,800 W	12,400 W	12,400 W
	10	31,000 W	27,900 W	15,500 W	15,500 W
	11	34,100 W	31,000 W	15,500 W	15,500 W
	12	37,200 W	34,100 W	18,600 W	18,600 W
	13	40,300 W	37,200 W	18,600 W	18,600 W
	14	43,400 W	40,300 W	21,700 W	21,700 W
	15	46,500 W	43,400 W	21,700 W	21,700 W
	16	49,600 W	46,500 W	24,800 W	24,800 W

Power Inputs	Power Supplies	Combined Mode	Power Supply Redundancy Mode	Input Source Redundancy Mode	Full Redundancy Mode
1 input (110 V)	1	1500 W	—	—	—
	2	3000 W	1500 W	1500 W	1500 W
	3	4500 W	3000 W	1500 W	1500 W
	4	6000 W	4500 W	3000 W	3000 W
	5	7500 W	6000 W	3000 W	3000 W
	6	9000 W	7500 W	4500 W	4500 W
	7	10,500 W	9000 W	4500 W	4500 W
	8	12,000 W	10,500 W	6000 W	6000 W
	9	13,500 W	12,000 W	6000 W	6000 W
	10	15,000 W	13,500 W	7500 W	7500 W
	11	16,500 W	15,000 W	7500 W	7500 W
	12	18,000 W	16,500 W	9000 W	9000 W
	13	19,500 W	18,000 W	9000 W	9000 W
	14	21,000 W	19,500 W	10,500 W	10,500 W
	15	22,500 W	21,000 W	10,500 W	10,500 W
	16	24,000 W	22,500 W	12,000 W	12,000 W



Note A combination of 3-kW AC and 3.5-kW HVAC/HVDC power supplies can be used.

Maximum Power Available for 3.5-kW Inputs (DC)

The maximum power available for operations depends on the input power from your power source, the number and output capabilities of your power supplies, and the power redundancy mode that you use. The following table lists the amount of power available for 3.5-kW HVAC/HVDC power supplies depending on DC power inputs, number of power supplies, and the mode used.

Power Inputs	Power Supplies	Combined Mode	Power Supply Redundancy Mode	Input Source Redundancy Mode	Full Redundancy Mode
1 input (380 V)	1	3500 W	—	—	—
	2	7000 W	3500 W	3500 W	3500 W
	3	10,500 W	7000 W	3500 W	3500 W
	4	14,000 W	10,500 W	7000 W	7000 W
	5	17,500 W	14,000 W	7000 W	7000 W
	6	21,000 W	17,500 W	10,500 W	10,500 W
	7	24,500 W	21,000 W	10,500 W	10,500 W
	8	28,000 W	24,500 W	14,000 W	14,000 W
	9	31,500 W	28,000 W	14,000 W	14,000 W
	10	35,000 W	31,500 W	17,500 W	17,500 W
	11	38,500 W	35,000 W	17,500 W	17,500 W
	12	42,000 W	38,500 W	21,000 W	21,000 W
	13	45,500 W	42,000 W	21,000 W	21,000 W
	14	49,000 W	45,500 W	24,500 W	24,500 W
	15	52,500 W	49,000 W	24,500 W	24,500 W
	16	56,000 W	52,500 W	28,000 W	28,000 W

Power Inputs	Power Supplies	Combined Mode	Power Supply Redundancy Mode	Input Source Redundancy Mode	Full Redundancy Mode
1 input (220/240 V)	1	3500 W	—	—	—
	2	7000 W	3500 W	3500 W	3500 W
	3	10,500 W	7000 W	3500 W	3500 W
	4	14,000 W	10,500 W	7000 W	7000 W
	5	17,500 W	14,000 W	7000 W	7000 W
	6	21,000 W	17,500 W	10,500 W	10,500 W
	7	24,500 W	21,000 W	10,500 W	10,500 W
	8	28,000 W	24,500 W	14,000 W	14,000 W
	9	31,500 W	28,000 W	14,000 W	14,000 W
	10	35,000 W	31,500 W	17,500 W	17,500 W
	11	38,500 W	35,000 W	17,500 W	17,500 W
	12	42,000 W	38,500 W	21,000 W	21,000 W
	13	45,500 W	42,000 W	21,000 W	21,000 W
	14	49,000 W	45,500 W	24,500 W	24,500 W
	15	52,500 W	49,000 W	24,500 W	24,500 W
	16	56,000 W	52,500 W	28,000 W	28,000 W

Power Inputs	Power Supplies	Combined Mode	Power Supply Redundancy Mode	Input Source Redundancy Mode	Full Redundancy Mode
1 input (210 V)	1	3100 W	—	—	—
	2	6200 W	3100 W	3100 W	3100 W
	3	9300 W	6200 W	3100 W	3100 W
	4	12,400 W	9300 W	6200 W	6200 W
	5	15,500 W	12,400 W	6200 W	6200 W
	6	18,600 W	15,500 W	9300 W	9300 W
	7	21,700 W	18,600 W	9300 W	9300 W
	8	24,800 W	21,700 W	12,400 W	12,400 W
	9	27,900 W	24,800 W	12,400 W	12,400 W
	10	31,000 W	27,900 W	15,500 W	15,500 W
	11	34,100 W	31,000 W	15,500 W	15,500 W
	12	37,200 W	34,100 W	18,600 W	18,600 W
	13	40,300 W	37,200 W	18,600 W	18,600 W
	14	43,400 W	40,300 W	21,700 W	21,700 W
	15	46,500 W	43,400 W	21,700 W	21,700 W
	16	49,600 W	46,500 W	24,800 W	24,800 W



Note A combination of 3-kW DC and 3.5-kW HVAC/HVDC power supplies can be used.

Overview of Fan Trays

The Cisco Nexus 7718 switch supports two types of fan trays:

- 38 mm Gen 1 Fan Tray (N77-C7718-FAN)
- 76 mm Gen 2 Fan Tray (N77-C7718-FAN-2)—Use this fan tray for Network Equipment Building System (NEBS) compliance when the Cisco Nexus 7700 M3-Series 12-port 100-Gigabit Ethernet I/O module (N77-M312CQ-26L) or the Cisco Nexus 7700 F4-Series 30-port 100-Gigabit Ethernet I/O module (N77-F430CQ-36) is installed on the switch.



Note During normal switch operations, all 3 fan trays in a switch should be of the same type.

Fan trays provide airflow through a switch for cooling. Each fan tray contains multiple fans to provide redundancy. The switch can continue functioning in the following situations:

- One or more fans fail within a fan tray—Even with multiple fan failures, the switch can continue functioning. When a fan fails within a tray, the functioning fans in the module increase their speed to compensate for the failed fans. If a fan fails, the failed fan has to be replaced.

The following is a sample output displaying a fan failure, along with the associated syslogs:

```
switch# show environment fan
Fan:
-----
Fan                Model                Hw                Status
-----
Fan1(sys_fan1)    N77-C7718-FAN-2      0.100            Failure(Failed Fanlets: 5 6 )
Fan2(sys_fan2)    N77-C7718-FAN-2      0.100            Ok
Fan3(sys_fan3)    N77-C7718-FAN-2      0.100            Ok
Fan_in_PS1        --                    --                Ok
Fan_in_PS2        --                    --                Ok
Fan_in_PS3        --                    --                Ok
Fan_in_PS4        --                    --                Ok
Fan_in_PS5        --                    --                Ok
Fan_in_PS6        --                    --                Ok
Fan_in_PS7        --                    --                Ok
Fan_in_PS8        --                    --                Ok
Fan_in_PS9        --                    --                Ok
Fan_in_PS10       --                    --                Ok
Fan_in_PS11       --                    --                Ok
Fan_in_PS12       --                    --                Ok
Fan_in_PS13       --                    --                Shutdown
Fan_in_PS14       --                    --                Shutdown
Fan_in_PS15       --                    --                Ok
Fan_in_PS16       --                    --                Ok
--More--2017 Mar 15 01:45:40 switch-m3100scale %$ VDC-1 %$ %PLATFORM-1-PFM_ALERT:
FAN_BAD: fan1
Fan Zone Speed %(Hex): Zone 1: 100.00(0xff)
switch#
```

- The fan tray is removed for replacement—The fan tray is designed to be removed and replaced while a switch is operating, without presenting an electrical hazard or damage to the switch. Starting from Cisco NX-OS Release 7.2(0)D1(1), use the **hardware fan-tray maintenance-mode [long | medium | short]** command to put the switch in fan tray maintenance mode to prepare for fan tray removal and replacement. For more information, see [Replacing a Fan Tray](#). You have up to 72 hours to replace a fan tray as long as the switch air-inlet temperature does not exceed 86° Fahrenheit (30° C). If the temperature exceeds 86° Fahrenheit (30° C), the switch will shut down in 3 minutes.



Note The switch will shut down if a mix of Gen 1 (N77-C7718-FAN) and Gen 2 (N77-C7718-FAN-2) fan trays are present in the same switch for more than 21600 seconds (6 hours). The syslog message "PLATFORM-0-FAN_MISMATCH_TIME: Mismatch of Fan modules. Both Gen1 and Gen2 fans are present in the fantray for <number> seconds" will be displayed at regular intervals when both Gen 1 and Gen 2 fan trays are present in the same switch.

- If you remove more than one fan tray at a time, the switch can operate up to three minutes before shutting down. To prevent a shutdown, remove only one fan tray at a time.



Note

- We recommend that you do not remove more than one fan tray at a time.
- When a fan fails or when you remove a fan tray, the remaining operating fans speed up to compensate for the loss of fans. This can increase the noise made by the fan trays until you replace the missing fan tray or replace the defective fan tray.
- When replacing a failed fan tray in a running system, be sure to promptly replace the fan tray.

**Caution**

If one or more fans fail within a fan tray, the Fan Status LED turns red. A fan failure could lead to temperature alarms if not corrected immediately.

The fan status is continuously monitored by the software. In case of a fan failure, the following actions occur:

- System messages are displayed.
- Call Home alerts are sent (if configured). For more information, refer [Associating an Alert Group with a Destination Profile](#).
- SNMP notifications are sent (if configured). For more information, refer [Enabling SNMP Notifications](#).

Each of the three fan trays cover two fabric modules as follows:

- Fan tray in slot 41 covers the fabric modules in slots 21 and 22.
- Fan tray in slot 42 covers the fabric modules in slots 23 and 24.
- Fan tray in slot 43 covers the fabric modules in slots 25 and 26.

If you need to replace a fabric module, you must remove the fan tray covering the fabric module before you replace the fabric module. You must replace the fabric module and its covering fan tray within three minutes or an overtemperature condition can occur.

Displaying the Status for the Fan Trays

Enter the **show environment fan** command.

Example:

```
switch# show environment fan
```

```
Fan:
```

```
-----  
Fan              Model              Hw              Status  
-----  
Fan1(sys_fan1)   N77-C7718-FAN-2    0.100          Ok  
Fan2(sys_fan2)   N77-C7718-FAN-2    0.100          Ok  
Fan3(sys_fan3)   N77-C7718-FAN-2    0.100          Ok  
Fan_in_PS1       --                 --             Ok  
Fan_in_PS2       --                 --             Ok  
Fan_in_PS3       --                 --             Ok  
Fan_in_PS4       --                 --             Ok  
Fan_in_PS5       --                 --             Ok  
Fan_in_PS6       --                 --             Ok  
Fan_in_PS7       --                 --             Ok  
Fan_in_PS8       --                 --             Ok  
Fan_in_PS9       --                 --             Ok  
Fan_in_PS10      --                 --             Ok  
Fan_in_PS11      --                 --             Ok  
Fan_in_PS12      --                 --             Ok  
Fan_in_PS13      --                 --             Shutdown  
Fan_in_PS14      --                 --             Shutdown  
Fan_in_PS15      --                 --             Ok  
Fan_in_PS16      --                 --             Ok  
Fan Zone Speed %(Hex): Zone 1: 37.25(0x5f)  
switch#
```




CHAPTER 6

Installing or Replacing Modules, Fan Trays, and Power Supplies

This chapter includes the following topics:

- [Using an ESD Wrist Strap to Prevent ESD Damage, on page 97](#)
- [Installing or Replacing a Supervisor Module, on page 98](#)
- [Migrating from Supervisor 2E Modules \(N77-SUP2E\) to Supervisor 3E Modules \(N77-SUP3E\), on page 102](#)
- [Nondisruptive Migration from Supervisor 2E Modules \(N77-SUP2E\) to Supervisor 3E Modules \(N77-SUP3E\), on page 105](#)
- [Installing or Replacing an I/O Module, on page 126](#)
- [Replacing a Fan Tray, on page 128](#)
- [Migrating from Gen 1 Fan Trays \(N77-C7718-FAN\) to Gen 2 Fan Trays \(N77-C7718-FAN-2\), on page 133](#)
- [Installing or Replacing a Fabric Module, on page 134](#)
- [Installing or Replacing a Power Supply in a Switch Chassis, on page 140](#)

Using an ESD Wrist Strap to Prevent ESD Damage

Before you touch any switch modules, you must ground yourself to protect the modules from electrostatic discharge (ESD). You can ground yourself by wearing an ESD wrist strap connected to a grounded chassis or a grounded rack.



Caution Always handle modules by their carrier edges (typically the covered bottom, sides, and front of the module) and never touch the circuitry on the module.

Before you begin

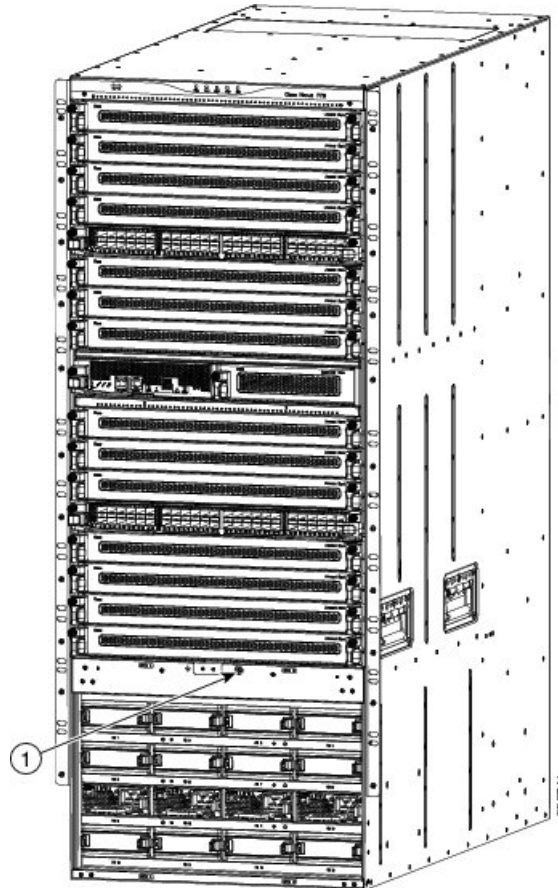
You must have a grounding connection close to where you are installing components in the chassis.

Step 1 Attach or wrap an ESD wrist strap to your arm.

Step 2 Attach the other end of the strap to the grounded chassis in one of the following ways:

- If the wrist strap has a banana plug on the other end, insert the plug into the ESD port on the chassis (see the following figure for the location of the port on the front of the chassis). The chassis has another ESD port on the rear of the chassis.

Figure 25: Location of the ESD Port on the Front of the Chassis



1	ESD port on the front of the chassis
---	--------------------------------------

- If the wrist strap has an alligator clip on the other end, clip that onto one of the two screws holding the grounding lug to the chassis.

What to do next

After you ground yourself, you can replace the modules on the chassis.

Installing or Replacing a Supervisor Module

You can install or replace a supervisor module during switch operations so long as there is another supervisor module installed and operating on the switch. If you eject the active supervisor from its slot in a chassis with

two supervisor modules, operations automatically switch over to the standby supervisor module. If you need to replace a supervisor in a chassis with just one supervisor, you can install the new supervisor in the open supervisor slot, make the new supervisor active, and remove the other supervisor module.



Note If you remove a supervisor module without replacing it, you must fill the slot with a blank filler plate to maintain the designed airflow for the chassis.

Before you begin



Caution The system will shut down when you remove the single supervisor module in the Cisco Nexus 7702 chassis.

- You must follow ESD protocols, including the following:
 - You must wear a grounded ESD wristband (or other personal grounding device) whenever you handle the electronic modules outside the grounded chassis.
 - You must carry electronic modules by only their covered edges or handles. Do not touch their electronic components.
 - Whenever a module is outside a grounded chassis, place it flat on an antistatic surface or in an antistatic bag. Never lean the module on anything nor place anything else on top of the module nor lean anything on the module.
- Verify that the chassis is grounded.
- Verify that you have the following tools and equipment:
 - ESD wrist strap (or other personal grounding device)
 - Number 1 Phillips torque screwdriver
Manual torque screwdrivers are recommended. Be sure to never exceed the recommended torque setting for the screw that you are working with.
 - Replacement supervisor module
 - Supervisor 2E (N77-SUP2E=)

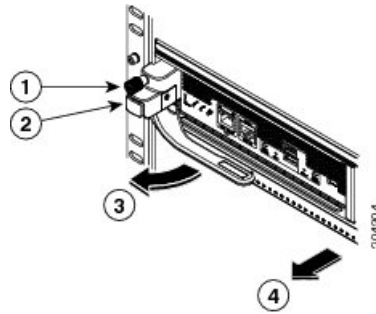
Step 1

If you need to remove a supervisor module to open the slot for a new module, follow these steps (if you already have an open slot, go to the next step):

Note If the slot that you need to open has a blank filler plate, remove the plate by unscrewing its captive screw and pulling on the handle attached to the plate to remove the plate, and go to Step 3).

- a) Disconnect all of the networking cables attached to the front of the module.
- b) Unscrew the captive screw on the left side of the module until the screw is no longer connected to the chassis (see Callout 1 in the following figure).

Figure 26: Removing a Half-Width Supervisor Module



1	Unscrew the captive screw until it is free of the chassis.	3	The handle springs open.
2	Press the ejector button.	4	Pull the handle to remove the module part way from the slot. Place your other hand under the module and fully remove it from the slot.

- c) Press the eject button on the left side of the module (see Step 2 in the previous figure).
The ejector springs out part way from the front of the module.
- d) Fully rotate the handle from the front of the module and pull the handle to move the module part way out of its slot.
- e) Place your other hand under the module to support its weight and pull the module fully out of its slot.
- f) Place the module on or in antistatic material.

Step 2 Install the new or replacement supervisor module as follows:

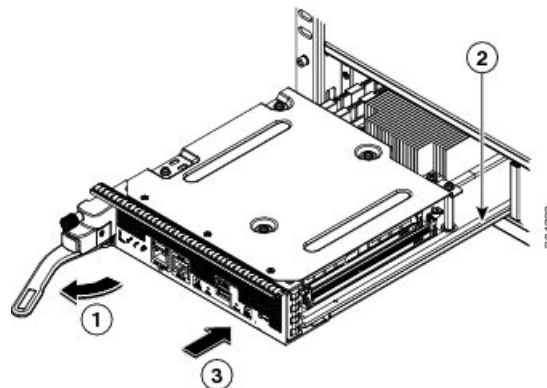
- a) Unpack the new supervisor module and inspect it for damage.

If anything is damaged or missing, contact your customer representative immediately.

Caution Do not touch the electrical components or connectors on the module. Always hold the module by only its covered front and bottom sides.

- b) Press the ejector button next to the handle to release the handle from the front of the module (see Callout 1 in the following figure).

Figure 27: Positioning a Half-Width Supervisor Module to its Slot



1	Rotate the handle fully away from the front of the module.	3	Push the module all the way into the slot (until it stops and the front is about 1/4 inch in front of the chassis).
2	Align the bottom of the module to the module guides in the slot.		

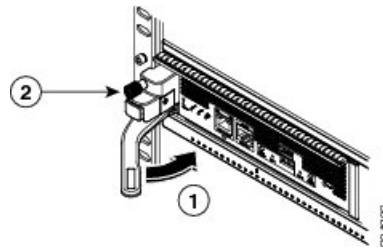
- c) Rotate the end of the handle away from the front of the module until it stops (see Callout 1 in the previous figure).
- d) With one hand under the supervisor module and the other hand holding the module by its front, align the rear of the module to the open supervisor slot.
- e) Slide the module onto the guides inside the slot and push the module fully into the slot until you cannot push the module further.

The front of the module should be about 1/4 inch (0.6 cm) in front of the chassis.

- f) Rotate the handle to the front of the module (see Callout 1 in the following figure) until it clicks when it reaches the front of the module.

The module should be fully inserted in the slot and the front of the module should be even with the fronts of all of the other installed modules. The captive screw by the ejector button on the module should be aligned to a screw hole on the chassis.

Figure 28: Securing a Supervisor Module to its Slot



1	Rotate the handle all the way to the front of the module.	2	Tighten the captive screw to 8 in-lb (0.9 N·m) of torque.
---	---	---	---

- g) Screw in the captive screw to secure the module to the chassis (see Callout 2 in the previous figure). Tighten the screw to 8 in-lb (0.9 N·m) of torque.
- h) Verify that the supervisor module LEDs turn on and appear as follows:
 - STATUS LED is green.
 - SYSTEM LED is green.
 - ACTIVE LED is amber or green.

For more information about the LED states for this module, see [Supervisor Module LEDs, on page 206](#).

- i) Attach the management cable to the MGMT ETH port.

The MGMT ETH LED should be green. If not, see [Supervisor Module LEDs, on page 206](#) for information about the LED states.

Migrating from Supervisor 2E Modules (N77-SUP2E) to Supervisor 3E Modules (N77-SUP3E)

To migrate from Supervisor 2E modules to Supervisor 3E modules, follow these steps:

Before you begin

- Before migrating from Supervisor 2E modules to Supervisor 3E modules, note the following guidelines:
 - This migration process is disruptive because the power must be turned off for the switch.
 - You cannot mix Supervisor 2E and Supervisor 3E modules in a production environment.

Step 1 Insert a USB drive in the usb1 or the slot0 USB port on the active supervisor 2E module. We will use the usb1 port for the steps given below.

Step 2 Format the drive by using the **format** command.

```
switch(config)# format usb1
```

Step 3 Copy all of the VDC configurations for the switch to the USB drive by using the **copy running-config** command.

```
switch(config)# copy running-config usb1:configuration_file_name vdc-all
```

Step 4 Backup the installed licenses for the switch to the USB drive by using the **copy licenses** command.

```
switch(config)# copy licenses usb1:licenses_archive_file_name.tar
```

Note You must use the **tar** extension for the archive file. This file will contain all of the license files that were installed on the Supervisor 2E module.

Step 5 Copy the Supervisor 3E version of the kickstart, system, and EPLD (optional) images to the USB drive by using the **copy** command.

```
switch(config)# copy scp://path/n7700-s3-kickstart.8.3.1.bin usb1:
```

```
switch(config)# copy scp://path/n7700-s3-dk9.8.3.1.bin usb1:
```

```
switch(config)# copy scp://path/n7700-s3-epld.8.3.1.img usb1:
```

Note This example specifies Cisco NX-OS Release 8.3(1) images. This is the minimum software release for the Cisco Nexus 7700 Series Supervisor 3E modules.

Caution Use -s3- images with Supervisor 3E modules. If you use an -s2- image with a Supervisor 3E module, the supervisor will not boot up. Some examples of an -s2- image are given below:

- n7700-s2-kickstart.8.0.1.bin
- n7700-s2-kickstart.8.1.1.bin
- n7700-s2-kickstart.8.2.1.bin

- Step 6** Turn off the power to the switch using the power switch on each power supply. The Output LED turns off on each power supply and the Status LEDs turn off on all of the supervisor and I/O modules.
- Caution** If any of the supervisor or I/O module Status LEDs is turned on (showing any color), stop at this step until you are able to turn off those modules.
- Step 7** For each Supervisor 2E module installed in the switch, remove the module and replace it with a Supervisor 3E module as explained in [Installing or Replacing a Supervisor Module, on page 98](#).
- Caution** If the switch has two supervisor modules, ensure that both supervisors are of the same type. Do not mix Supervisor 2E modules with Supervisor 3E modules.
- Step 8** Power up the switch by using the power switch on each of its power supplies. The Output LED on each power supply turns on and eventually turns green when the power supply is sending power to the switch. The Status LED on each installed supervisor module also turns on when the module begins to turn on. The supervisor that becomes active has a green ACTIVE LED (the standby supervisor module has an amber ACTIVE LED).
- Step 9** Remove the USB drive from the Supervisor 2E module (this drive has copies of the Supervisor 2E configuration, license, and software images) and insert it in the USB port on the active Supervisor 3E module (ACTIVE LED is green).
- Step 10** Connect a console to the active supervisor module as explained in [Connecting a Console to the Switch, on page 46](#).
- Step 11** If you are setting up the initial configuration for the supervisor module, the initial setup script will ask you if you want to enforce the secure password standard. Make your selection, enter your password, and then confirm the password by entering it again.

```

----- System Admin Account Setup -----
Do you want to enforce secure password standard (yes/no) [y]:
  Enter the password for "admin":
  Enter the password for "admin":

```

- Step 12** When you are asked to enable admin VDCs, enter **no**.

```
Do you want to enable admin vdc (yes/no) [no]: no
```

- Step 13** When you are asked to enter the basic configuration, enter **no**.

```

----- Basic System Configuration Dialog VDC: 1 -----
This setup utility will guide you through the basic configuration of
the system. Setup configures only enough connectivity for management
of the system.

```

```

Please register Cisco Nexus7000 Family devices promptly with your
supplier. Failure to register may affect response times for initial
service calls. Nexus7000 devices must be registered to receive
entitled support services.

```

```

Press Enter at anytime to skip a dialog. Use ctrl-c at anytime
to skip the remaining dialogs.

```

```
Would you like to enter the basic configuration dialog (yes/no): no
```

- Step 14** When asked to log in, enter the login and password that you specified in step 11.

```

User Access Verification
switch login:
Password:

```

Step 15 Verify that the switch is running the required version of the NX-OS software by using the show version command.

```
switch(config)# show version
```

Note If the version of NX-OS is not the same as you intended to use, copy the previously saved images from the USB drive in `usb1` to `bootflash:` and perform an upgrade to the appropriate version. For more information, see the [Cisco Nexus 7000 Series NX-OS Software Upgrade and Downgrade Guide](#).

Step 16 Copy the TAR archive containing the license files from the `usb1` drive to `bootflash:`, extract the archive, and install the licenses by using the `copy`, `tar extract`, and `install license` commands. Repeat the `install license` command for each extracted license file.

```
switch(config)# copy usb1:licenses_archive_file_name.tar bootflash:
```

```
switch(config)# tar extract bootflash:licenses_archive_file_name.tar to bootflash:
```

```
switch(config)# install license bootflash:licenses_archive_file_name.lic
```

Note The `tar extract` command requires that the TAR file be located in `bootflash:` or `volatile:`.

Step 17 Make sure that all I/O modules are online and that the standby supervisor is in ha-standby mode by using the `show module` command.

```
switch(config)# show module
```

```
switch(config)# show module
Mod Ports Module-Type                               Model                               Status
-----
 9    0    Supervisor module-3                               N77-SUP3E                          active *
10    0    Supervisor module-3                               N77-SUP3E                          ha-standby
12   30   100 Gbps Ethernet Module                         N77-F430CQ-36                       ok
...
```

Step 18 Restore the previously saved configurations by using the `copy` command to copy the configuration file in the USB drive to the running configuration.

```
switch(config)# copy usb1:configuration_file_name running-config
```

Note If the imported configuration file includes configurations for Fabric Extenders (FEXs) and those modules are not up yet, you will see error messages for that. If that happens, we recommend that you run the FEX configuration again after the FEX modules come online. You can verify the status of the FEX modules and for the associated server-facing interfaces by using the `show fex` and `show interface brief` commands.

Note If you have not inserted the standby supervisor module until now, do not insert it during this step. Instead, wait until you complete this procedure before installing the standby supervisor module.

Step 19 Save the configuration in the startup configuration by using the `copy running-config startup-config vdc-all` command.

```
switch(config)# copy running-config startup-config vdc-all
```

Nondisruptive Migration from Supervisor 2E Modules (N77-SUP2E) to Supervisor 3E Modules (N77-SUP3E)

Nondisruptive Migration from Supervisor 2E Modules (N77-SUP2E) to Supervisor 3E Modules (N77-SUP3E) has the following limitations:

- Do not change any configuration settings or network connections during the upgrade.
- Configuration mode is blocked during the migration procedure to prevent any changes.
- You cannot press Control+C to abort the migration procedure until 45 minutes have elapsed since the **migrate sup kickstart** *<sup3-kickstart-image>* **system** *<sup3-system-image>* command has been used.
- Before you initiate the migration procedure, you must first remove QoS policies and ACLs from interfaces that are in the down state. The clear inactive-config qos command, that clears inactive configuration, will delete the port channel policies even if one of the ports in a port channel has inactive policies.

Guidelines for manual policy removal:

- During manual removal, when the interface is part of a port channel, remove the policy map or access list from the port channel or remove the interface from the port channel before initiating the migration procedure.
- For all other interface types, please remove the policy map or access list from the interface.
- The **migrate sup kickstart** *<sup3-kickstart-image>* **system** *<sup3-system-image>* command that is used to initiate the non-disruptive migration process is only available in global config mode.
- Ensure that the Supervisor-3E module has not been inserted in the standby slot before using the **migrate sup kickstart** *<sup3-kickstart-image>* **system** *<sup3-system-image>* command. If the supervisor-3E module has already been inserted in the standby slot, the migration process will be aborted and the supervisor-3E module will be powered down.
- Do not reload or manually insert or remove any I/O or fabric module after using the **migrate sup kickstart** *<sup3-kickstart-image>* **system** *<sup3-system-image>* command. Any removal or insertion of I/O or fabric modules has to be done before initiating the migration process or after the migration is completed.
- Do not remove or insert any Fabric Extender (FEX) modules during migration.
- Insert the standby Supervisor-3E module into the chassis only when you are prompted to insert the Supervisor-3E module during migration by a message on the system console.
- After the Supervisor-3E module has been inserted during the migration process, do not remove or manually reload the standby Supervisor-3E module.
- Do not insert or remove any transceivers from any modules while the migration is in progress.
- Do not remove any power supply modules or fan modules during the migration process.
- Do not copy any configurations using the **copy running-config startup-config** command or the **copy running-config startup-config vdc-all** from any other management session while migration is in progress.
- Do not trigger any EPLD or BIOS upgrades during migration.
- Do not trigger any ISSU during migration.

- Do not perform migration from fabric module-2 to fabric module-3 during the supervisor-2E to supervisor-3E migration.
- Take a backup of the licenses and configuration before starting the migration procedure. In case of any failure or loss of licenses and configuration in Supervisor-2E, disruptive migration has to be done to upgrade to Supervisor- 3E. In such a scenario, all configurations and licenses have to be applied or installed again. Backup the installed licenses from the switch to a USB drive by using the **copy licenses** command. To view the current licenses installed on the switch, use the **show license** command.


```
switch# copy licenses usb1:<licenses_archive_file_name>.tar
```
- Ensure that there is sufficient power in the chassis before starting the migration process. In case of a power failure, redundant power supplies can then take over and migration will not be disrupted.
- Downgrade to supervisor-2E modules from supervisor-3E modules is a disruptive procedure.

Prerequisites for Nondisruptive Migration from Supervisor 2E Modules (N77-SUP2E) to Supervisor 3E Modules (N77-SUP3E)

- The minimum supported release for this procedure is Cisco NX-OS Release 8.4(1). If you are using an image older than Cisco NX-OS Release 8.4(1), upgrade to Cisco NX-OS Release 8.4(1), and then perform nondisruptive migration from Supervisor 2E modules to Supervisor 3E modules.
- We recommend that you use a console connection to perform the migration procedure. In case you do not have a console connection and are using an SSH/Telnet connection, use the **terminal monitor** command to display all the syslogs mentioned in the below procedures.
- Back up the running configuration from the current active supervisor module to the FTP/SFTP/TFTP server, or a USB flash drive.


```
switch# copy running-config ftp://[username[:password]@]server[/path]
or
switch# copy running-config usb1:<runningconfiguration>.txt
Copy complete, now saving to disk (please wait)...
```
- Before you initiate the migration procedure, you must first remove QoS policies and ACLs from interfaces that are in the down state. The `clear inactive-config qos` command, that clears inactive configuration, will delete the port channel policies even if one of the ports in a port channel has inactive policies.

Guidelines for manual policy removal:

- During manual removal, when the interface is part of a port channel, remove the policy map or access list from the port channel or remove the interface from the port channel before initiating the migration procedure.
- For all other interface types, please remove the policy map or access list from the interface.
- The **migrate sup kickstart <sup3-kickstart-image> system <sup3-system-image>** command that is used to initiate the non-disruptive migration process is only available in global config mode.
- Ensure that the Supervisor-3E module has not been inserted in the standby slot before using the **migrate sup kickstart <sup3-kickstart-image> system <sup3-system-image>** command. If the supervisor-3E module has already been inserted in the standby slot, the migration process will be aborted and the supervisor-3E module will be powered down.

- Do not reload or manually insert or remove any I/O or fabric module after using the **migrate sup kickstart** `<sup3-kickstart-image> system <sup3-system-image>` command. Any removal or insertion of I/O or fabric modules has to be done before initiating the migration process or after the migration is completed.
- Do not remove or insert any Fabric Extender (FEX) modules during migration.
- Insert the standby Supervisor-3E module into the chassis only when you are prompted to insert the Supervisor-3E module during migration by a message on the system console.
- After the Supervisor-3E module has been inserted during the migration process, do not remove or manually reload the standby Supervisor-3E module.
- Do not insert or remove any transceivers from any modules while the migration is in progress.
- Do not remove any power supply modules or fan modules during the migration process.
- Do not copy any configurations using the **copy running-config startup-config** command or the **copy running-config startup-config vdc-all** from any other management session while migration is in progress.
- Do not trigger any EPLD or BIOS upgrades during migration.
- Do not trigger any ISSU during migration.
- Do not perform migration from fabric module-2 to fabric module-3 during the supervisor-2E to supervisor-3E migration.
- Take a backup of the licenses and configuration before starting the migration procedure. In case of any failure or loss of licenses and configuration in Supervisor-2E, disruptive migration has to be done to upgrade to Supervisor- 3E. In such a scenario, all configurations and licenses have to be applied or installed again. Backup the installed licenses from the switch to a USB drive by using the **copy licenses** command. To view the current licenses installed on the switch, use the **show license** command.


```
switch# copy licenses usb1:<licenses_archive_file_name>.tar
```
- Ensure that there is sufficient power in the chassis before starting the migration process. In case of a power failure, redundant power supplies can then take over and migration will not be disrupted.
- Downgrade to supervisor-2E modules from supervisor-3E modules is a disruptive procedure.

Case 1: Dual Supervisor Migration

To perform non-disruptive migration from Supervisor 2E modules to Supervisor 3E modules in a switch that has both active and standby supervisor modules installed, follow these steps:

Before you begin

The minimum supported release for this procedure is Cisco NX-OS Release 8.4(1). If you are using an image older than Cisco NX-OS Release 8.4(1), upgrade to Cisco NX-OS Release 8.4(1), and then perform nondisruptive migration from Supervisor 2E modules to Supervisor 3E modules.

Step 1

Copy the Cisco NX-OS Release 8.4(1) kickstart and system images to the active supervisor module bootflash, using an FTP or TFTP server.

```
switch# copy tftp://tftpserver.cisco.com/n7700/n7700-s3-kickstart.8.4.1.bin bootflash:n7700-s3-kickstart.8.4.1.bin
```

```
switch# copy tftp://tftpserver.cisco.com/n7700/n7700-s3-dk9.8.4.1.bin bootflash:system n7700-s3-dk9.8.4.1.bin
```

Step 2 Use the **migrate sup kickstart** *<sup3-kickstart-image>* **system** *<sup3-system-image>* command in config mode to initiate the migration process. This command triggers image version compatibility checks before initiating the migration process to ensure that the image being used is compatible with the supervisor 3E module.

- A message then appears on the console asking for confirmation to continue the migration procedure. Type **Yes** on the console prompt to continue with the migration procedure.
- Configuration commands are now blocked. The **migrate sup kickstart** *<sup3-kickstart-image>* **system** *<sup3-system-image>* command will then check if it has to initiate a single supervisor or dual supervisor migration process by checking if there is a standby supervisor 2E module installed in the switch.
- The **migrate sup kickstart** *<sup3-kickstart-image>* **system** *<sup3-system-image>* command will power down the standby supervisor 2E module installed in the switch.
- You can use the **show module** command to display the modules installed in the switch.

Sup2E syslogs

```
switch# show module
```

Mod	Ports	Module-Type	Model	Status
1	48	1/10 Gbps Ethernet Module	N77-F348XP-23	ok
2	30	10/25/40/100 Gbps Ethernet Module	N77-F430CQ-36	ok
3	0	Supervisor Module-2	N77-SUP2E	ha-standby
4	0	Supervisor Module-2	N77-SUP2E	active*
5	30	10/25/40/100 Gbps Ethernet Module	N77-F430CQ-36	ok
6	30	10/25/40/100 Gbps Ethernet Module	N77-F430CQ-36	powered-dn

```
switch(config)# migrate sup kickstart n7700-s3-kickstart.8.4.1.bin system n7700-s3-dk9.8.4.1.bin
```

This will start the Supervisor-2 to Supervisor-3 migration. Configuration will be locked until migration is complete.

```
Do you wish to continue (y/n) [n] y
```

```
<Thu May 16 01:10:11 2019> Starting migration, Please do not remove any linecards or fabric cards until migration is complete
```

```
<Thu May 16 01:10:11 2019> Standby supervisor in slot 3 has been powered down
```

Step 3 After the standby supervisor 2E module is powered down, remove the standby supervisor 2E module from the slot and replace it with the supervisor 3E module, as explained in the [Installing or Replacing a Supervisor Module](#) section. When the supervisor 3E module is detected in the standby supervisor slot, a netboot is initiated with the image that is provided by using the **migrate sup kickstart** *<sup3-kickstart-image>* **system** *<sup3-system-image>* command.

- Note**
- After removing the supervisor 2E module from the switch, you have to insert the replacement supervisor 3E module into the switch within a period of 30 minutes after using the **migrate sup kickstart** *<sup3-kickstart-image>* **system** *<sup3-system-image>* command. In case you have not inserted the supervisor 3E module within 30 minutes after using this command, migration is aborted and you have to use the command again to reinitiate the migration process.
 - After the supervisor 3E module is inserted in the slot, a timeout of 45 minutes is triggered for the supervisor 3E module to power up and come online. If the supervisor 3E module fails to power up and come online at the first attempt, a retry is initiated every 15 minutes. In case the supervisor 3E module fails to come online after 3 retries or 45 minutes, you have to remove the supervisor 3E module and restart the migration process by using the **migrate sup kickstart** *<sup3-kickstart-image>* **system** *<sup3-system-image>* command.

Sup2E syslogs

```
2019 Apr 23 22:36:35 Switch %$ VDC-1 %$ %PLATFORM-2-MOD_PWRDN: Module 3 powered down
(Serial number JAE21360CHS)
<Thu May 16 01:10:11 2019> Manual-boot is enabled for Standby Supervisor
<Thu May 16 01:10:11 2019> Please remove Supervisor-2 (N77-SUP2E) module from slot 3
and insert Supervisor-3 (N77-SUP3E) module within 30 minutes
```

- Step 4** Wait for the supervisor 3E module to come up in HA-standby mode. After the new supervisor 3E module is detected by the switch, it may take up to 15 minutes for the supervisor 3E module to come online.

Sup2E syslogs

```
<Tue Apr 30 10:02:47 2019> Supervisor-3 is detected in slot 4
<Tue Apr 30 10:02:47 2019> Reloading standby. This might take upto 15 minutes.
Please wait ...
2019 May 16 01:10:19 Switch-m3 %$ VDC-3 %$ %PLATFORM-2-MOD_DETECT: Module 3 detected
(Serial number :unavailable) Module-Type Supervisor Module-3 Model :unavailable
<Thu May 16 01:10:21 2019> Supervisor-3 (N77-SUP3E) is detected in slot 3
<Thu May 16 01:10:21 2019> Reloading standby. This might take up to 15 minutes. Please wait
2019 May 16 01:10:21 Switch %$ VDC-1 %$ %PLATFORM-2-PFM_STANDBY_MODULE_RESET_MIGRATION:
Reloading Standby Supervisor as part of Supervisor migration
<Thu May 16 01:12:21 2019> Standby supervisor not yet online. This might take sometime,
Please wait ...
2019 May 16 01:36:18 Switch %$ VDC-1 %$ %CARDCLIENT-2-SSE: MOD:3 SUP ONLINE
```

Sup3E syslogs

```
System is coming up ... Please wait ... System is
coming up ... Please wait ...
Switch(standby) login: 2019May 16 01:32:56 Switch %$ VDC-1 %$ %USBHSD-2-MOUNT:
logflash: online
adminbackup
Switch(standby)# 2019May 16 01:35:37 Switch %$ VDC-1 %$ %CARDCLIENT-2-REG: Sent
2019May 16 01:35:54 Switch %$ VDC-1 %$ %CARDCLIENT-2-SSE: LC_READY sent
2019May 16 01:36:18 Switch %$ VDC-1 %$ %CARDCLIENT-2-SSE: MOD:3 SUP ONLINE
```

- Step 5** After the supervisor 3E module is online, the configurations are copied to the supervisor 3E module.

Sup2E syslogs

```
<Thu May 16 01:36:43 2019> Standby Supervisor-3 (N77-SUP3E) has come online, configs
will be copied
<Thu May 16 01:36:43 2019> Saving configuration now. Please wait ...
[#####] 100%
Copy complete.
/mnt/plog/migration_cli.log: 3.35 kB 85.81 kB/s
```

- Step 6** System switchover is then initiated. This process moves the supervisor 3E module from the HA-standby mode to Active mode. The SSH/telnet session is disconnected during the switchover. You have to then reconnect to the SSH/telnet session. Also, ensure that the console link and the management link is connected to the newly inserted supervisor-3E module.

Sup2E syslogs

```
<Thu May 16 01:37:26 2019> Supervisor-2 (N77-SUP2E) will switchover to
Supervisor-3 (N77-SUP3E) now
<Thu May 16 01:37:26 2019> Switchover is successful, Supervisor-3 (N77-SUP3E)
is now active
Switch(config)#
User Access Verification
Switch login:
```

Sup3E syslogs

```
Switch(standby)# 2019May 16 01:37:26 Switch %$ VDC-1 %$ %KERN-2-SYSTEM_MSG: [
553.259393] Switchover started by redundancy driver - kernel
```

Case 1: Dual Supervisor Migration

```
2019May 16 01:37:26 Switch %$ VDC-1 %$ %SYSMGR-2-HASWITCHOVER_PRE_START: This
supervisor is becoming active (pre-start phase).
2019May 16 01:37:27 Switch %$ VDC-1 %$ %SYSMGR-2-SWITCHOVER_OVER: Switchover
completed.
```

Step 7 After the switchover to the supervisor 3E module is completed, the boot parameters are set for the supervisor migration process. Do not set any configuration parameters until the boot parameters are set. After the boot parameters are set, the migration process is complete. Use the **show boot** command to display the current boot variables and the **show module** command to display the modules installed in the switch.

Sup3E syslogs

```
2019May 16 01:37:39 Switch %$ VDC-1 %$ %BOOTVAR-2-SUP3_MIGRATION_CONFIG_STARTED:
Setting boot parameters for supervisor migration process, it might take some
time. Please do not replace Supervisor-2 (N77-SUP2E) in standby slot with
Supervisor-3 (N77-SUP3E) and set any config parameters until migration is
complete.
Switch# 2019Apr 23 00:18:53 Switch %$ VDC-1 %$ %BOOTVAR-2-SUP3_MIGRATION_
COMPLETE: Migration process is complete now. Supervisor-2 (N77-SUP2E) in standby
slot can now be replaced with Supervisor-3 (N77-SUP3E).
Switch# show boot
Current Boot Variables:
sup-1
kickstart variable = bootflash:/n7700-s3-kickstart.8.4.1.bin
system variable = bootflash:/n7700-s3-dk9.8.4.1.bin
Boot POAP Disabled
sup-2
kickstart variable = bootflash:/n7700-s3-kickstart.8.4.1.bin
system variable = bootflash:/n7700-s3-dk9.8.4.1.bin
Boot POAP Disabled
Boot Variables on next reload:
sup-1
kickstart variable = bootflash:/n7700-s3-kickstart.8.4.1.bin
system variable = bootflash:/n7700-s3-dk9.8.4.1.bin
Boot POAP Disabled
sup-2
kickstart variable = bootflash:/n7700-s3-kickstart.8.4.1.bin
system variable = bootflash:/n7700-s3-dk9.8.4.1.bin
Boot POAP Disabled
Cisco Nexus Operating System (NX-OS) Software
TAC support: http://www.cisco.com/tac
Copyright (c) 2002-2019, Cisco Systems, Inc. All rights reserved.
The copyrights to certain works contained in this software are
owned by other third parties and used and distributed under
license. Certain components of this software are licensed under
the GNU General Public License (GPL) version 2.0 or the GNU
Lesser General Public License (LGPL) Version 2.1. A copy of each
such license is available at
http://www.opensource.org/licenses/gpl-2.0.php and
http://www.opensource.org/licenses/lgpl-2.1.php
Switch# show module
Mod Ports Module-Type Model Status
-----
1 48 1/10 Gbps Ethernet Module N77-F348XP-23 ok
2 30 10/25/40/100 Gbps Ethernet Module N77-F430CQ-36 ok
3 0 Supervisor Module-3 N77-SUP3E active*
4 0 Supervisor Module-2 N77-SUP2E powered-dn
5 30 10/25/40/100 Gbps Ethernet Module N77-F430CQ-36 ok
6 30 10/25/40/100 Gbps Ethernet Module N77-F430CQ-36 ok
Mod Power-Status Reason
---
3 powered-dn Reset (powered-down) because of incompatible configuration
```

After the supervisor 3E module has been moved to Active mode, non-disruptive migration from supervisor 2E modules to supervisor 3E modules is completed. A console message, SUP3_MIGRATION_COMPLETE, is then displayed.

- Step 8** You can now power down and remove the other supervisor 2E module, and replace it with a Supervisor 3E module. This supervisor 3E module will come up in HA-standby mode.

Case 2: Single Supervisor Migration

To perform non-disruptive migration from Supervisor 2E modules to Supervisor 3E modules in a switch that has only the active supervisor module installed and there is no standby supervisor module, follow these steps:

- Step 1** Copy the Cisco NX-OS Release 8.4(1) kickstart and system images to the active supervisor module bootflash, using an FTP or TFTP server.
- ```
switch# copy tftp://tftpserver.cisco.com/n7700/n7700-s3-kickstart.8.4.1.bin bootflash:n7700-s3-kickstart.8.4.1.bin
switch# copy tftp://tftpserver.cisco.com/n7700/n7700-s3-dk9.8.4.1.bin bootflash:system n7700-s3-dk9.8.4.1.bin
```
- Step 2** Use the **migrate sup kickstart** *<sup3-kickstart-image>* **system** *<sup3-system-image>* command in config mode to initiate the migration process. This command triggers image version compatibility checks before initiating the migration process to ensure that the image being used is compatible with the supervisor 3E module.
- A message then appears on the console asking for confirmation to continue the migration procedure. Type **Yes** on the console prompt to continue with the migration procedure.
  - Configuration commands are now blocked.
  - The **migrate sup kickstart** *<sup3-kickstart-image>* **system** *<sup3-system-image>* command will then check if it has to initiate a single supervisor or dual supervisor migration process by checking if there is a standby supervisor 2E module installed in the switch. In this procedure, the switch does not have a standby supervisor module.
  - You can use the **show module** command to display the modules installed in the switch.

### Sup2E syslogs

```
switch# show module
Mod Ports Module-Type Model Status
--- --- -
1 48 1/10 Gbps Ethernet Module N77-F348XP-23 ok
2 30 10/25/40/100 Gbps Ethernet Module N77-F430CQ-36 ok
4 0 Supervisor Module-2 N77-SUP2E active*
5 30 10/25/40/100 Gbps Ethernet Module N77-F430CQ-36 ok
6 30 10/25/40/100 Gbps Ethernet Module N77-F430CQ-36 ok

switch(config)# migrate sup kickstart n7700-s3-kickstart.8.4.1.bin system n7700-s3-dk9.8.4.1.bin
<Thu May 16 01:10:09 2019> Standby Supervisor-2 is not present in slot 3, continuing with migration ...
<Thu May 16 01:10:09 2019> This will start the Supervisor-2 to Supervisor-3 migration. Configuration will be locked until migration is complete.
Do you wish to continue (y/n) [n] y
<Thu May 16 01:10:09 2019> Starting migration, Please do not remove any linecards or fabric cards until migration is complete
```

**Step 3** Insert the supervisor 3E module in the other switch supervisor slot, as explained in the [Installing or Replacing a Supervisor Module](#) section. When the supervisor 3E module is detected in the standby supervisor slot, a netboot is initiated with the image that is provided by using the **migrate sup kickstart <sup3-kickstart-image> system <sup3-system-image>** command.

- Note**
- You have to insert the supervisor 3E module into the switch within a period of 30 minutes after using the **migrate sup kickstart <sup3-kickstart-image> system <sup3-system-image>** command. In case you have not inserted the supervisor 3E module within 30 minutes after using this command, migration is aborted and you have to use the command again to reinitiate the migration process.
  - After the supervisor 3E module is inserted in the slot, a timeout of 45 minutes is triggered for the supervisor 3E module to power up and come online. If the supervisor 3E module fails to power up and come online at the first attempt, a retry is initiated every 15 minutes. In case the supervisor 3E module fails to come online after 3 retries or 45 minutes, you have to remove the supervisor 3E module and restart the migration process by using the **migrate sup kickstart <sup3-kickstart-image> system <sup3-system-image>** command.

### Sup2E syslogs

```
<Thu May 16 01:10:11 2019> Manual-boot is enabled for Standby Supervisor
<Thu May 16 01:10:09 2019> Please insert Supervisor-3 (N77-SUP3E) in slot number : 3 within 30 minutes
```

**Step 4** Wait for the supervisor 3E module to come up in HA-standby mode. After the new supervisor 3E module is detected by the switch, it may take up to 15 minutes for the supervisor 3E module to come online.

### Sup2E syslogs

```
2019 May 16 01:10:19 Switch-m3 %$ VDC-3 %$ %PLATFORM-2-MOD_DETECT: Module 3 detected
(Serial number :unavailable) Module-Type Supervisor Module-3 Model :unavailable 2019
May 16 01:10:19 Switch %$ VDC-1 %$ %PLATFORM-2-MODULE_EJECTOR_POLICY_ENABLED:
All Ejectors closed for module 3. Ejector based shutdown enabled
2019 May 16 01:10:19 Switch %$ VDC-1 %$ %PLATFORM-2-MOD_DETECT: Module 3 detected
(Serial number :unavailable) Module-Type Supervisor Module-3 Model :unavailable
<Thu May 16 01:10:21 2019> Supervisor-3 (N77-SUP3E) is detected in slot 3
<Thu May 16 01:10:21 2019> Reloading standby. This might take up to 15 minutes.
Please wait ...
```

### Sup3E syslogs

```
System is coming up ... Please wait ...
System is coming up ... Please wait ...
Switch(standby) login: 2019May 16 01:32:56 Switch %$ VDC-1 %$ %USBHSD-2-MOUNT:
logflash: online
adminbackup
Switch(standby)# 2019May 16 01:35:37 Switch %$ VDC-1 %$ %CARDCLIENT-2-REG: Sent
2019May 16 01:35:54 Switch %$ VDC-1 %$ %CARDCLIENT-2-SSE: LC_READY sent
2019May 16 01:36:18 Switch %$ VDC-1 %$ %CARDCLIENT-2-SSE: MOD:3 SUP ONLINE
```

**Step 5** After the supervisor 3E module is online, the configurations are copied to the supervisor 3E module.

### Sup2E syslogs

```
<Thu May 16 01:36:43 2019> Standby Supervisor-3 (N77-SUP3E) has come online, configs
will be copied
<Thu May 16 01:36:43 2019> Saving configuration now. Please wait ...
[#####] 100%
Copy complete.
/mnt/plog/migration_cli.log: 3.35 kB 85.81 kB/s
```

- Step 6** System switchover is then initiated. This process moves the supervisor 3E module from the HA-standby mode to Active mode. The SSH/telnet session is disconnected during the switchover. You have to then reconnect to the SSH/telnet session. Also, ensure that the console link and the management link is connected to the newly inserted supervisor-3E module.

#### Sup2E syslogs

```
<Thu May 16 01:37:26 2019> Supervisor-2 (N77-SUP2E) will switchover to Supervisor-3
(N77-SUP3E) now
<Thu May 16 01:37:26 2019> Switchover is successful, Supervisor-3 (N77-SUP3E) is
now active
Switch(config)#
User Access Verification
Switch login:
```

#### Sup3E syslogs

```
Switch(standby)# 2019May 16 01:37:26 Switch %$ VDC-1 %$ %KERN-2-SYSTEM_MSG: [
553.259393] Switchover started by redundancy driver - kernel
2019May 16 01:37:26 Switch %$ VDC-1 %$ %SYSMGR-2-HASWITCHOVER_PRE_START: This
supervisor is becoming active (pre-start phase).
2019May 16 01:37:26 Switch %$ VDC-1 %$ %SYSMGR-2-HASWITCHOVER_START: Supervisor 3 is
becoming active.
2019May 16 01:37:27 Switch %$ VDC-1 %$ %SYSMGR-2-SWITCHOVER_OVER: Switchover
completed.
```

- Step 7** After the switchover to the supervisor 3E module is completed, the boot parameters are set for the supervisor migration process. Do not set any configuration parameters until the boot parameters are set. After the boot parameters are set, the migration process is complete. Use the **show boot** command to display the current boot variables and the **show module** command to display the modules installed in the switch.

#### Sup3E syslogs

```
2019May 16 01:37:39 Switch %$ VDC-1 %$ %BOOTVAR-2-SUP3_MIGRATION_CONFIG_STARTED:
Setting boot parameters for supervisor migration process, it might take some time.
Please do not replace Supervisor-2 (N77-SUP2E) in standby slot with Supervisor-3
(N77-SUP3E) and set any config parameters until migration is complete.
Switch# 2019Apr 23 00:18:53 Switch %$ VDC-1 %$ %BOOTVAR-2-SUP3_MIGRATION_
COMPLETE: Migration process is complete now. Supervisor-2 (N77-SUP2E) in standby slot
can now be replaced with Supervisor-3 (N77-SUP3E).
Switch# show boot
Current Boot Variables:
sup-1
kickstart variable = bootflash:/n7700-s3-kickstart.8.4.1.bin system variable =
bootflash:/n7700-s3-dk9.8.4.1.bin
Boot POAP Disabled
sup-2
kickstart variable = bootflash:/n7700-s3-kickstart.8.4.1.bin system variable =
bootflash:/n7700-s3-dk9.8.4.1.bin
Boot POAP Disabled
Boot Variables on next reload:
sup-1
kickstart variable = bootflash:/n7700-s3-kickstart.8.4.1.bin
system variable = bootflash:/n7700-s3-dk9.8.4.1.bin
Boot POAP Disabled
sup-2
kickstart variable = bootflash:/n7700-s3-kickstart.8.4.1.bin
system variable = bootflash:/n7700-s3-dk9.8.4.1.bin
Boot POAP Disabled
Cisco Nexus Operating System (NX-OS) Software
TAC support: http://www.cisco.com/tac
Copyright (c) 2002-2019, Cisco Systems, Inc. All rights reserved.
The copyrights to certain works contained in this software are
owned by other third parties and used and distributed under
license. Certain components of this software are licensed under
the GNU General Public License (GPL) version 2.0 or the GNU
```

## Viewing Migration Status

Lesser General Public License (LGPL) Version 2.1. A copy of each such license is available at  
<http://www.opensource.org/licenses/gpl-2.0.php> and  
<http://www.opensource.org/licenses/lgpl-2.1.php>

Switch# show module

| Mod | Ports | Module-Type                       | Model         | Status     |
|-----|-------|-----------------------------------|---------------|------------|
| 1   | 48    | 1/10 Gbps Ethernet Module         | N77-F348XP-23 | ok         |
| 2   | 30    | 10/25/40/100 Gbps Ethernet Module | N77-F430CQ-36 | ok         |
| 3   | 0     | Supervisor Module-3               | N77-SUP3E     | active*    |
| 4   | 0     | Supervisor Module-2               | N77-SUP2E     | powered-dn |
| 5   | 30    | 10/25/40/100 Gbps Ethernet Module | N77-F430CQ-36 | ok         |
| 6   | 30    | 10/25/40/100 Gbps Ethernet Module | N77-F430CQ-36 | ok         |

Mod Power-Status Reason

3 powered-dn Reset (powered-down) because of incompatible configuration

After the supervisor 3E module has been moved to Active mode, non-disruptive migration from supervisor 2E modules to supervisor 3E modules is completed. A console message, SUP3\_MIGRATION\_COMPLETE, is then displayed.

## Viewing Migration Status

Use the **show logging onboard migration status** command on any management session to display the status of migration. You can use this command during migration or after migration is complete.

The sample output when this command is used on the supervisor-3E module is as given below. This output has both the supervisor-3E and the supervisor-2E logs.

```
switch# show logging onboard migration status
<Sat May 25 01:58:22 2019> =====
<Sat May 25 01:58:22 2019> Starting Supervisor-3 (N77-SUP3E) migration logging
<Sat May 25 01:58:22 2019> =====
<Sat May 25 01:58:22 2019> Migrate file is created
<Sat May 25 01:58:22 2019> Migration in progress, scratchpad register : 0xfe
and boot_type : 1
<Sat May 25 01:58:22 2019> Written 0xed post migration file creation
<Sat May 25 01:58:22 2019> Post write, read scratchpad_b register 0xed
<Sat May 25 02:05:00 2019> Copying the everland migration log from tmp to plog
succeeded
<Sat May 25 02:05:14 2019> bootvar_handle_mts_msg: migration in progress - 1
<Sat May 25 02:05:14 2019>
bootvar_copy_cfg_for_migration:sup_migration_procjob_hdl : 0
<Sat May 25 02:05:14 2019> bootvar_copy_cfg_for_migration:forking procjob for
copy r s
<Sat May 25 02:05:15 2019> Standby arbiter link of F4 card in slot 6 has been
changed to 12G
<Sat May 25 02:05:15 2019> Standby arbiter link is currently 12G for F4
module : 6
<Sat May 25 02:05:15 2019> bootvar_copy_cfg_proc: sup migration configuration
started
<Sat May 25 02:05:15 2019> bootvar_copy_cfg_proc:isan_img :bootflash:/n7700-
s3-dk9.8.4.1.gbin ks_img :bootflash:/n7700-s3-kickstart.8.4.1.gbin
<Sat May 25 02:05:18 2019> bootvar_copy_cfg_proc: Kickstart cfg - /isan/bin/
vsh -c "configure terminal ; boot kickstart bootflash:/n7700-s3-
kickstart.8.4.1.gbin "
<Sat May 25 02:05:23 2019> bootvar_copy_cfg_proc: System cfg - /isan/bin/vsh -
c "configure terminal ; boot system bootflash:/n7700-s3-dk9.8.4.1.gbin " <Sat
May 25 02:09:03 2019> bootvar_copy_cfg_proc:command for copy r s -
/isan/bin/vsh -c "copy running-config startup-config vdc-all"
<Sat May 25 02:09:18 2019> procjobcb_job_done: Controller PID : 14342,
```

```

sup_migration_procjob_hdl : 14342
<Sat May 25 02:09:18 2019> procjobcb_job_done: sup2_sup3_migration in progress
<Sat May 25 02:09:18 2019> procjobcb_job_done:bootvar config successfully
updated after migration
<Sat May 25 02:09:18 2019> procjobcb_job_done:created migration file
sup2_sup3_migration_standby
<Sat May 25 02:23:28 2019> Read scratchpad_b register 0x96
<Sat May 25 02:31:14 2019> bootvar_handle_mts_msg: migration in progress - 0
<Sat May 25 02:31:30 2019> bootvar_handle_mts_msg: migration in progress - 0
<Sat May 25 02:31:50 2019> bootvar_handle_mts_msg: migration in progress - 0
<Sat May 25 01:55:07 2019> =====
<Sat May 25 01:55:07 2019> Starting Supervisor-2 (N77-SUP2E) migration logging
<Sat May 25 01:55:07 2019> =====
<Sat May 25 01:55:07 2019> System redundancy status data is dumped
successfully <Sat May 25 01:55:07 2019> Active EOBC link is used, continue
migration
<Sat May 25 01:55:07 2019> Deleted EOBC file
/nxos/tmp/eobc_redundant_link_migration.txt successfully
<Sat May 25 01:55:07 2019> Kickstart image file is /bootflash/k3_fin
<Sat May 25 01:55:07 2019> System image file is /bootflash/s3_fin
<Sat May 25 01:55:07 2019> Standby Supervisor-3 (N77-SUP3E) is not preinserted
before starting migration
<Sat May 25 01:55:08 2019> Migration is started by the user
<Sat May 25 01:55:08 2019> system standby manual-boot is invoked and waiting
for Supervisor-3 (N77-SUP3E) to get inserted
<Sat May 25 01:55:08 2019> Migrate file is created
<Sat May 25 01:55:08 2019> Migrate file is created at tftp location
<Sat May 25 01:55:08 2019> F4 arbiter link for standby SUP is : 24
<Sat May 25 01:55:09 2019> Standby arbiter link of F4 card in slot 6 has been
changed to 12G
Viewing Migration Status
<Sat May 25 01:55:09 2019> Standby arbiter link is currently 12G for F4
module : 6
<Sat May 25 01:55:09 2019> Count : 1, Reloading standby
<Sat May 25 01:55:09 2019> subop: 21 Power-management write for migration for
module 3 SUCCESS
<Sat May 25 01:55:09 2019> subop: 21 Power-management read for migration for
module 3 SUCCESS
<Sat May 25 01:55:09 2019> Power-management written value : 0xfe, read_value:
0xfe
<Sat May 25 01:55:09 2019> Waiting for standby Supervisor-3 (N77-SUP3E) to
come online
<Sat May 25 01:55:27 2019> subop: 20 Power-management write for migration for
module 3 SUCCESS
<Sat May 25 01:55:27 2019> subop: 20 Power-management read for migration for
module 3 SUCCESS
<Sat May 25 01:55:27 2019> Power-management written value : 0xfe, read_value:
0xfe
<Sat May 25 01:55:28 2019> subop: 21 Power-management write for migration for
module 3 SUCCESS
<Sat May 25 01:55:28 2019> subop: 21 Power-management read for migration for
module 3 SUCCESS
<Sat May 25 01:55:28 2019> Power-management written value : 0xfe, read_value:
0xfe
<Sat May 25 02:02:04 2019> subop: 20 Power-management write for migration for
module 3 SUCCESS
<Sat May 25 02:02:04 2019> subop: 20 Power-management read for migration for
module 3 SUCCESS
<Sat May 25 02:02:04 2019> Power-management written value : 0xfe, read_value:
0xfe
<Sat May 25 02:04:09 2019> Standby has come online !!!
<Sat May 25 02:04:30 2019> ALL_AUTOGRANTS set to 1
<Sat May 25 02:04:30 2019> Standbyfabricloopback test succeeded
<Sat May 25 02:04:30 2019> Standby ready for Switchover, deleting

```

```
'/nxos/tmp/migration_log.txt'
<Sat May 25 02:04:30 2019> Saving configuration now
<Sat May 25 02:04:59 2019> Deletion of migration file is successful in
Supervisor-2 (N77-SUP2E)
<Sat May 25 02:04:59 2019> Deletion of tftp migration file is successful in
Supervisor-2 (N77-SUP2E)
<Sat May 25 02:04:59 2019> Copying log file to Standby....
<Sat May 25 02:04:59 2019> Command executed for transferring logfile to other
SUP - ncftpput -u ftpuser -p nbv123 127.1.1.3 /nxos/tmp/
/mnt/plog/migration.log
```

The sample output when this command is used on the supervisor-2E module is as given below. This output has the supervisor-2E logs only.

```
switch# show logging onboard migration status
<Sat May 25 01:55:07 2019> =====
<Sat May 25 01:55:07 2019> Starting Supervisor-2 (N77-SUP2E) migration logging
<Sat May 25 01:55:07 2019> =====
<Sat May 25 01:55:07 2019> System redundancy status data is dumped
successfully <Sat May 25 01:55:07 2019> Active EOBC link is used, continue
migration
<Sat May 25 01:55:07 2019> Deleted EOBC file
/nxos/tmp/eobc_redundant_link_migration.txt successfully
<Sat May 25 01:55:07 2019> Kickstart image file is /bootflash/k3_fin
<Sat May 25 01:55:07 2019> System image file is /bootflash/s3_fin
<Sat May 25 01:55:07 2019> Standby Supervisor-3 (N77-SUP3E) is not pre-inserted
before starting migration
<Sat May 25 01:55:08 2019> Migration is started by the user
<Sat May 25 01:55:08 2019> system standby manual-boot is invoked and waiting
for Supervisor-3 (N77-SUP3E) to get inserted
<Sat May 25 01:55:08 2019> Migrate file is created
<Sat May 25 01:55:08 2019> Migrate file is created at tftp location
<Sat May 25 01:55:08 2019> F4 arbiter link for standby SUP is : 24
<Sat May 25 01:55:09 2019> Standby arbiter link of F4 card in slot 6 has been
changed to 12G
<Sat May 25 01:55:09 2019> Standby arbiter link is currently 12G for F4
module : 6
<Sat May 25 01:55:09 2019> Count : 1, Reloading standby
<Sat May 25 01:55:09 2019> subop: 21 Power-management write for migration for
module 3 SUCCESS
<Sat May 25 01:55:09 2019> subop: 21 Power-management read for migration for
module 3 SUCCESS
<Sat May 25 01:55:09 2019> Power-management written value : 0xfe, read_value:
0xfe
<Sat May 25 01:55:09 2019> Waiting for standby Supervisor-3 (N77-SUP3E) to come
online
<Sat May 25 01:55:27 2019> subop: 20 Power-management write for migration for
module 3 SUCCESS
<Sat May 25 01:55:27 2019> subop: 20 Power-management read for migration for
module 3 SUCCESS
<Sat May 25 01:55:27 2019> Power-management written value : 0xfe, read_value:
0xfe
<Sat May 25 01:55:28 2019> subop: 21 Power-management write for migration for
module 3 SUCCESS
<Sat May 25 01:55:28 2019> subop: 21 Power-management read for migration for
module 3 SUCCESS
<Sat May 25 01:55:28 2019> Power-management written value : 0xfe, read_value:
0xfe
<Sat May 25 02:02:04 2019> subop: 20 Power-management write for migration for
module 3 SUCCESS
<Sat May 25 02:02:04 2019> subop: 20 Power-management read for migration for
module 3 SUCCESS
<Sat May 25 02:02:04 2019> Power-management written value : 0xfe, read_value:
0xfe
```



```

<Sat May 25 02:04:09 2019> Standby has come online !!!
<Sat May 25 02:04:30 2019> ALL_AUTOGRANTS set to 1
<Sat May 25 02:04:30 2019> Standbyfabricloopback test succeeded
<Sat May 25 02:04:30 2019> Standby ready for Switchover, deleting
'/nxos/tmp/migration_log.txt'
<Sat May 25 02:04:30 2019> Saving configuration now
<Sat May 25 02:04:59 2019> Deletion of migration file is successful in
Supervisor-2 (N77-SUP2E)
<Sat May 25 02:04:59 2019> Deletion of tftp migration file is successful in
Supervisor-2 (N77-SUP2E)
<Sat May 25 02:04:59 2019> Copying log file to Standby....
<Sat May 25 02:04:59 2019> Command executed for transferring logfile to other
SUP - ncftpput -u ftpuser -p nbv123 127.1.1.3 /nxos/tmp/
/mnt/plog/migration.log

```

## Troubleshooting

This sections lists the error messages that may come up on the console during the migration along with the recommended action to be performed.

- **Problem**

The kickstart or system image is not present on the bootflash of the active supervisor-3E module. The following syslog message is displayed:

```

switch# <Tue Apr 30 10:02:47 2019> Switch %$ VDC-1 %$ %BOOTVAR-2-
SUP3_MIGRATION_IMAGE_DOES_NOT_EXIST: <Kickstart/System> image doesn't exist on
bootflash of the active Supervisor-3. Please clear some space in bootflash, copy
the Supervisor-3 images manually, set the boot variables and save configs before
replacing Standby Supervisor-2

```

**Action to be performed**

Clear space on the bootflash and then copy the supervisor-3E module images manually, as shown in Step 1 in the migration procedures given above. Set the boot variables and save the configuration before replacing the standby Supervisor-2E module. Use the **boot kickstart** *<kickstart\_image>* and the **boot system** *<system\_image>* on the active supervisor 3E module when it becomes active after the migration has been completed.

- **Problem**

The newly inserted supervisor-3E module cannot take over as the active supervisor. The following syslog message is displayed:

```

<Tue Apr 30 10:02:47 2019> ERROR!!! Supervisor-3 (N77-SUP3E) cannot take over as
active Supervisor ...

```

**Action to be performed**

Wait for the next retry attempt by the switch to bring up the supervisor-3E module.

- **Problem**

The migration logging file is already present in the supervisor-2E module. The following syslog message is displayed:

```

<Tue Apr 30 10:02:47 2019> WARNING!!! Migration logging file already exists in
Supervisor-2 (N77-SUP2E), continuing migration ...

```

**Action to be performed**

None. The **show logging onboard migration status** command is used to monitor the migration progress. There is no impact on the migration process.

- **Problem**

Unable to release the configuration lock that was set to prevent any configuration changes before switching over to the supervisor-3E module. The following syslog message is displayed:

```
<Tue Apr 30 10:02:47 2019> ERROR!!! Failed to release config lock before switching over to Supervisor-3 (N77-SUP3E), aborting migration ...
```

- **Action to be performed**

Use the **migrate sup kickstart** *<sup3-kickstart-image>* **system** *<sup3-system-image>* command again.

- **Problem**

The switch cannot initiate migration logging due to internal errors. The following syslog message is displayed:

```
<Tue Apr 30 10:02:47 2019> WARNING!!! Migration logging cannot be done due to Internal Error, continuing migration ...
```

- **Action to be performed**

None. The **show logging onboard migration status** command is used to monitor the migration progress. There is no impact on the migration process.

- **Problem**

The switch cannot initiate migration logging due to insufficient file permissions. The following syslog message is displayed:

```
<Tue Apr 30 10:02:47 2019> WARNING!!! Migration logging cannot be done due to file permission error, continuing migration ...
```

- **Action to be performed**

None. The **show logging onboard migration status** command is used to monitor the migration progress. This error message is displayed if the appropriate file permissions have not been provided.

- **Problem**

The active supervisor-2E module is using the redundant secondary EOBC link instead of the primary EOBC link. The following syslog message is displayed:

```
<Tue Apr 30 10:02:47 2019> ERROR!!! Active Supervisor-2 (N77-SUP2E) is using Redundant EOBC link, this indicates some problem with Primary EOBC link, aborting migration ...
```

- **Action to be performed**

Replace the active supervisor-2E module with another supervisor-2E module.

- **Problem**

Unable to extract the image header from the kickstart or system images. The following syslog messages are displayed:

```
<Tue Apr 30 10:02:47 2019> ERROR!!! Image header extraction failed for Kickstart image <kickstart_image> of Supervisor-3 (N77-SUP3E), aborting migration ...
```

```
<Tue Apr 30 10:02:47 2019> ERROR!!! Image header extraction failed for System image <system_image> of Supervisor-3 (N77-SUP3E), aborting migration ...
```

- **Action to be performed**

Use the **migrate sup kickstart** *<sup3-kickstart-image>* **system** *<sup3-system-image>* command again.

- **Problem**

Unable to retrieve the kickstart or system image information. The following syslogs are displayed:

```
<Tue Apr 30 10:02:47 2019> ERROR!!! Failed to get Kickstart image info,
aborting migration ...
```

```
<Tue Apr 30 10:02:47 2019> ERROR!!! Failed to get System image info, aborting
migration ...
```

**Action to be performed**

Use the **migrate sup kickstart** *<sup3-kickstart-image>* **system** *<sup3-system-image>* command again.

- **Problem**

The kickstart or system images provided are not valid images for the supervisor-3E modules. The following syslog message is displayed:

```
<Tue Apr 30 10:02:47 2019> ERROR!!! Kickstart image provided '<kickstart_image>'
is not a valid Supervisor-3 (N77-SUP3E) image, aborting migration ...
```

```
<Tue Apr 30 10:02:47 2019> ERROR!!! System image provided '<system_image>' is
not a valid Supervisor-3 (N77-SUP3E) image, aborting migration ...
```

**Action to be performed**

Use a valid Supervisor 3E image and use the **migrate sup kickstart** *<sup3-kickstart-image>* **system** *<sup3-system-image>* command again.

- **Problem**

The release versions of the supervisor-3E kickstart and system images provided are not the same as the existing supervisor-2E kickstart and system images. The following syslog messages are displayed:

```
<Tue Apr 30 10:02:47 2019> ERROR!!! Running kickstart version :
<running_version>,
version of kickstart image provided : <Supervisor-3_image_version>
```

```
<Tue Apr 30 10:02:47 2019> ERROR!!! Version of kickstart image provided
('<sup3_image_version>') does not match running version, aborting migration
...
```

```
<Tue Apr 30 10:02:47 2019> ERROR!!! Running System version:
<running_version>, version of system image provided : <Supervisor-
3_image_version>
```

```
<Tue Apr 30 10:02:47 2019> ERROR!!! Version of system image provided
('<sup3_image_version>') does not match running version, aborting migration
...
```

**Action to be performed**

Check the image version. The release versions of the supervisor-3E kickstart and system images provided should be the same as the existing supervisor-2E kickstart and system images.

- **Problem**

Unable to retrieve the chassis information. The following syslog message is displayed:

```
<Tue Apr 30 10:02:47 2019> ERROR!!! Chassis information retrieve failed,
aborting migration ...
```

**Action to be performed**

Use the **migrate sup kickstart** *<sup3-kickstart-image>* **system** *<sup3-system-image>* command again.

- **Problem**

Unable to retrieve the slot number of the supervisor module. The following syslog message is displayed:

```
<Tue Apr 30 10:02:47 2019> ERROR!!! Supervisor slot information retrieve
failed, aborting migration ...
```

- **Action to be performed**

Use the **migrate sup kickstart** *<sup3-kickstart-image>* **system** *<sup3-system-image>* command again.

- **Problem**

Unable to retrieve the slot number of the standby supervisor module. The following syslog message is displayed:

```
<Tue Apr 30 10:02:47 2019> ERROR!!! Standby Supervisor slot information
retrieve failed, aborting migration ...
```

- **Action to be performed**

Use the **migrate sup kickstart** *<sup3-kickstart-image>* **system** *<sup3-system-image>* command again.

- **Problem**

The Cisco Nexus 7702 switch does not support nondisruptive migration from the supervisor-2E module to a supervisor-3E module. In case the **migrate sup kickstart** *<sup3-kickstart-image>* **system** *<sup3-system-image>* command is used on a Cisco Nexus 7702 switch, the following syslog message is displayed:

```
<Tue Apr 30 10:02:47 2019> ERROR!!! Migration is not supported in N7702
chassis, aborting migration ...
```

- **Action to be performed**

None. The **migrate sup kickstart** *<sup3-kickstart-image>* **system** *<sup3-system-image>* command is not supported on a Cisco Nexus 7702 switch.

- **Problem**

In case the **migrate sup kickstart** *<sup3-kickstart-image>* **system** *<sup3-system-image>* command cannot read the stored Supervisor 2E image links, the migration process fails. The following syslog messages are displayed:

```
<Tue Apr 30 10:02:47 2019> ERROR!!! Kickstart image link for Active
Supervisor-2 (N77-SUP2E) could not be found, aborting migration ...
```

```
<Tue Apr 30 10:02:47 2019> Please set the boot parameters using 'boot kickstart
<kickstart_image>' and 'boot system <system_image>'
```

```
<Tue Apr 30 10:02:47 2019> ERROR!!! System image link for Active Supervisor-2
(N77- SUP2E) could not be found, aborting migration ...
```

```
<Tue Apr 30 10:02:47 2019> Please set the boot parameters using 'boot kickstart
<kickstart_image>' and 'boot system <system_image>'
```

- **Action to be performed**

Set the supervisor 2E image links using the **boot kickstart** *<kickstart\_image>* command and the **boot system** *<system\_image>* command before re-inserting the standby supervisor 2E module.

- **Problem**

The supervisor-3E module is already present in the standby slot before initiating the migration procedure. The following syslog message is displayed:

```
<Tue Apr 30 10:02:47 2019> ERROR!!! Supervisor-3 is already inserted in standby slot <slot_number> before starting migration. Please remove Standby supervisor and start single Supervisor migration, aborting migration ...
```

**Action to be performed**

Remove the standby supervisor-3E module and start the migration process again.

**• Problem**

Unable to retrieve VDC information. The following syslog message is displayed:

```
<Tue Apr 30 10:02:47 2019> ERROR!!! Failed to retrieve vdc information, aborting migration ...
```

**Action to be performed**

Restart the migration procedure.

**• Problem**

The standby supervisor-2E module is not in the HA-standby state. The following syslog message is displayed:

```
<Tue Apr 30 10:02:47 2019> ERROR!!! Standby Supervisor-2 (N77-SUP2E) is not yet in ha-standby state, aborting migration ...
```

```
<Tue Apr 30 10:02:47 2019> Please wait for Standby supervisor in slot <slot_number> to become ha-standby or physically remove standby and start migration
```

**Action to be performed**

Wait till the standby supervisor 2E module comes up in the HA-standby state or remove the standby supervisor 2E module and perform single supervisor migration.

**• Problem**

Problem In case of dual supervisor migration, the standby supervisor-2E module is powered down by using the **out-of-service** *<slot-number>* command. If the standby supervisor-2E module does not power down after using this command, the following syslog message is displayed:

```
<Tue Apr 30 10:02:47 2019> ERROR!!! Failed to power down Standby Supervisor-2 in slot <slot_number>, aborting migration ...
```

**Action to be performed**

Use the **migrate sup kickstart** *<sup3-kickstart-image>* **system** *<sup3-system-image>* command again.

**• Problem**

Unable to lock the configuration. The following syslog message is displayed:

```
<Tue Apr 30 10:02:47 2019> ERROR!!! Failed to lock config, aborting migration ...
```

**Action to be performed**

Use the **migrate sup kickstart** *<sup3-kickstart-image>* **system** *<sup3-system-image>* command again.

**• Problem**

In case auto-boot is not disabled before the insertion of the supervisor-3E module, the following syslog message is displayed:

```
<Tue Apr 30 10:02:47 2019> ERROR!!! Standby Supervisor config failed, aborting migration ...
```

**Action to be performed**

Use the **migrate sup kickstart** *<sup3-kickstart-image>* **system** *<sup3-system-image>* command again.

**• Problem**

After powering down the supervisor-2E module, the switch will check for the presence of a module in the slot from which the supervisor-2E module was removed. This check happens every 30 minutes after the supervisor-2E module has been removed. In case this check to detect the presence of the supervisor module fails, the following syslog message is displayed:

```
<Tue Apr 30 10:02:47 2019> ERROR!!! Module information retrieve failed
```

**Action to be performed**

None. There is no impact on the migration process.

**• Problem**

A supervisor-2E module is inserted instead of a supervisor-3E module. The following syslog message is displayed:

```
<Tue Apr 30 10:02:47 2019> ERROR!!! Supervisor-2 (N77-SUP2E) is inserted in slot
<slot_number> instead of Supervisor-3 (N77-SUP3E), aborting migration ...
```

**Action to be performed**

Ensure that the newly inserted supervisor module is the supervisor-3E module.

**• Problem**

In case the supervisor-3E module is not inserted into the standby slot within 30 minutes after the supervisor 2E module has been powered down, the following syslog message is displayed:

```
<Tue Apr 30 10:02:47 2019> ERROR!!! Timeout waiting for Supervisor-3 (N77-SUP3E)
to be inserted in slot <slot_number>, aborting migration ...
```

**Action to be performed**

Use the **migrate sup kickstart** *<sup3-kickstart-image>* **system** *<sup3-system-image>* command again and ensure that the supervisor 3E module is inserted into the standby slot within 30 minutes after the supervisor 2E module has been powered down.

**• Problem**

Unable to create image links for the supervisor-3E module images. The following syslog message is displayed:

```
<Tue Apr 30 10:02:47 2019> ERROR!!! Supervisor-3 (N77-SUP3E) image links could
not be created for Standby Supervisor-3 bootup, aborting migration ...
```

**Action to be performed**

Use the **migrate sup kickstart** *<sup3-kickstart-image>* **system** *<sup3-system-image>* command again.

**• Problem**

After the supervisor-3E module is detected, the arbiter links of the F4-series I/O modules are changed to 12G as the supervisor-3E module supports a speed of 12G compared to 4G in the supervisor-2E module. This change has to be done for all F4-series I/O modules present in the switch. In case of failure in changing to the 12G link for any F4-series I/O module, 3 retry attempts are initiated. After all the attempts to change the arbiter links fail, ensure that the standby supervisor arbiter link for all F4-series I/O modules are set to 4G. In case the standby supervisor arbiter link for all F4-series I/O modules are

not set to 4G, the standby supervisor-2E module will not come up if a supervisor-2E module is inserted instead of the supervisor-3E module after migration failure.

The following syslog messages are displayed in case of failure in changing the standby supervisor arbiter links for the F4-series I/O modules:

```
<Tue Apr 30 10:02:47 2019> ERROR!!! Failed to change Standby Supervisor
arbiter link for F4 linecard in slot <F4_linecard_slot>
```

```
<Tue Apr 30 10:02:47 2019> ERROR!!! Failed to change Standby Supervisor
arbiter link for F4 linecard in slot <F4_linecard_slot> even after 3
retries, aborting migration ...
```

#### Action to be performed

Please contact TAC for assistance.

#### • Problem

Unable to reload the supervisor-3E module after the supervisor-3E module is detected in the switch. The following syslog message is displayed:

```
<Tue Apr 30 10:02:47 2019> ERROR!!! Failed to reload Standby Supervisor-3
(N77-SUP3E), aborting migration ...
```

#### Action to be performed

Use the **migrate sup kickstart** *<sup3-kickstart-image>* **system** *<sup3-system-image>* command again.

#### • Problem

The supervisor-3E module is stuck in loader prompt due to a boot failure. The following syslog message is displayed:

```
<Tue Apr 30 10:02:47 2019> ERROR!!! Standby Supervisor-3 (N77-SUP3E) is stuck
in loader prompt due to boot-up failure ...
```

#### Action to be performed

None. A retry attempt to bring up the supervisor-3E module is initiated by the switch every 15 minutes.

#### • Problem

The supervisor-3E module is unable to come online. The following syslog message is displayed:

```
<Tue Apr 30 10:02:47 2019> ERROR!!! Standby Supervisor-3 (N77-SUP3E) could not
come online ...
```

#### Action to be performed

None. A retry attempt to bring up the supervisor-3E module is initiated by the switch every 15 minutes.

#### • Problem

The supervisor module fails to come online. The following syslogs are displayed:

```
<Tue Apr 30 10:02:47 2019> ERROR!!! Timeout waiting for Supervisor-3 (N77-SUP2E)
to come online, aborting migration ...
```

```
<Tue Apr 30 10:02:47 2019> Powering down Supervisor-3 (N77-SUP3E) in slot
<slot_number>
```

#### Action to be performed

Use the **migrate sup kickstart** *<sup3-kickstart-image>* **system** *<sup3-system-image>* command again and ensure that the supervisor-3E module is inserted in the standby slot within 30 minutes after the supervisor-2E module is powered down.

- **Problem**

The supervisor-2E image links are not restored on the active supervisor-2E module before the switchover to supervisor-3E is initiated. The following syslogs are displayed before saving configuration:

```
<Tue Apr 30 10:02:47 2019> WARNING!!! Error resetting original Supervisor-2
(N77- SUP2E) image links, continuing migration ...
```

```
<Tue Apr 30 10:02:47 2019> WARNING!!! Please set the boot variables manually
before inserting back Supervisor-2 (N77-SUP2E) in standby slot <slot_number>,
continuing migration ...
```

**Action to be performed**

Use the **migrate sup kickstart** *<sup3-kickstart-image>* **system** *<sup3-system-image>* command again.

- **Problem**

The **copy r s vdc-all** command fails on the active supervisor-2E module before the switchover to the supervisor-3E module is initiated. The following syslog is displayed:

```
<Tue Apr 30 10:02:47 2019> ERROR!!! Failed to save configuration,
aborting migration ...
```

**Action to be performed**

Use the **migrate sup kickstart** *<sup3-kickstart-image>* **system** *<sup3-system-image>* command again.

- **Problem**

The switchover fails on the active supervisor-2E module before the switchover to the supervisor-3E module is initiated. The following syslog is displayed:

```
<Tue Apr 30 10:02:47 2019> ERROR !! Switchover failed, aborting
migration ...
```

**Action to be performed**

Use the **migrate sup kickstart** *<sup3-kickstart-image>* **system** *<sup3-system-image>* command again.

- **Problem**

In case the supervisor-3E module is not inserted within 30 minutes after using the **migrate sup kickstart** *<sup3-kickstart-image>* **system** *<sup3-system-image>* command, the switch will try to power up the powered-down supervisor-2E module in the standby slot on reaching the timeout of 30 minutes. If the standby supervisor-2E module fails to power up, the following syslog message is displayed before aborting migration:

```
<Tue Apr 30 10:02:47 2019> ERROR !!! Failed to power up Standby Supervisor-2,
Please power up manually using "no poweroff module <slot_num>" from config mode
```

**Action to be performed**

Use the **no poweroff module** *<slot-number>* command on the active supervisor 2E module to bring up the powered down standby supervisor 2E module in case the supervisor 3E module has not been inserted within 30 minutes after using the **migrate sup kickstart** *<sup3-kickstart-image>* **system** *<sup3-system-image>* command again.

- **Problem**



Once the supervisor-3E module is active after migration has been completed successfully, both the arbiter links of the F4- series I/O modules will be changed to 12G. After migration, in case the other link to the powered down supervisor-2E module is not automatically changed to 12G due to an error, the following syslog message is displayed:

```
Switch %$ VDC-1 %$ %BOOTVAR-2-F4_LC_ARB_LINK_SET_FAIL: ERROR!!! Failed to change Standby Supervisor arbiter link for F4 linecard in slot <F4_linecard_slot>. Please run 'migrate clean' once migration process gets completed, but before replacing Supervisor-2 (N77-SUP2E) in standby slot.
```

#### Action to be performed

After migration has been completed, use the **migrate clean** command before replacing the supervisor-2E module in the standby slot.

#### • Problem

Setting of the boot variable parameters fails after migration when the supervisor-3E module becomes active. The following syslog is displayed:

```
Switch# <Tue Apr 30 10:02:47 2019> Switch %$ VDC-1 %$ %BOOTVAR-2-SUP3_MIGRATION_CONFIG_ERROR: Setting boot parameters failed for Supervisor-3 (N77-SUP3E). Please set boot variables manually using 'boot kickstart <kickstart_image>' and 'boot system <system_image>' and save configs before replacing Standby Supervisor-2 (N77-SUP2E)
```

#### Action to be performed

Use the **boot kickstart** <kickstart\_image> and the **boot system** <system\_image> on the active supervisor 3E module when it becomes active after the migration has been completed.

## Migration Clean Up

- In case any migration clean up errors have been detected on the supervisor-2E module, the following syslog message is displayed:

```
<Tue Apr 30 10:02:47 2019> Please run 'migrate clean' before doing any operation.
```

In such a scenario, use the **migrate clean** command to resolve the errors.

```
switch# migrate clean
<Tue May 28 03:34:58 2019> Manual-boot is disabled for Standby Supervisor
<Tue May 28 03:34:58 2019> Migration clean up done
```

- In case the standby supervisor-3E's arbiter link for the F4 module is not changed, the following syslog message is displayed:

```
<Tue Apr 30 10:02:47 2019> Switch %$ VDC-1 %$ %BOOTVAR-2-F4_LC_ARB_LINK_SET_FAIL: ERROR!!! Failed to change Standby Supervisor arbiter link for F4 linecard in slot <F4_linecard_slot>. Please run 'migrate clean' once migration process gets completed, but before replacing Supervisor-2 (N77-SUP2E) in standby slot.
```

In such a scenario, use the **migrate clean** command to retry changing the arbiter link.

- In case any migration clean up errors have been detected on the supervisor-3E module, the following syslog message is displayed:

```
<Tue Apr 30 10:02:47 2019> Switch %$ VDC-1 %$ %BOOTVAR-2-MIGRATION_CONFIG_CLEAN_ERROR: Please run 'migrate clean' command from active Supervisor before replacing the standby Supervisor.
```

In such a scenario, use the **migrate clean** command to resolve the errors.

```
switch# migrate clean
<Tue May 28 03:34:58 2019> Migration clean up done
```

- In case the **migrate clean** command is used on a supervisor-2E or a supervisor-3E module for which migration has not been initiated, the following syslog is displayed:

```
switch# migrate clean
<Tue May 28 03:34:58 2019> Migration was not done on this Supervisor
```

## Installing or Replacing an I/O Module

### Before you begin

- You must follow ESD protocols, including the following:
  - You must wear a grounded ESD wristband (or other personal grounding device) whenever you handle the electronic modules outside the grounded chassis.
  - You must carry electronic modules by only their covered edges or handles. Do not touch their electronic components.
  - Whenever a module is outside a grounded chassis, place it flat on an antistatic surface or in an antistatic bag. Never lean the module on anything nor place anything else on top of the module nor lean anything on the module.
- Verify that the chassis is grounded.
- Verify that you have the following tools and equipment:
  - Number 1 Phillips torque screwdriver




---

**Note** Manual torque screwdrivers are recommended. Be sure to never exceed the recommended torque setting for the screw that you are working with.

---

- Replacement or new I/O module




---

**Note** You can replace an I/O module with another I/O module while the switch is operational. To do this action, you must first remove an I/O module from the chassis, and then install a new or replacement I/O module in the newly vacated slot within a couple of minutes to maintain the designed airflow.

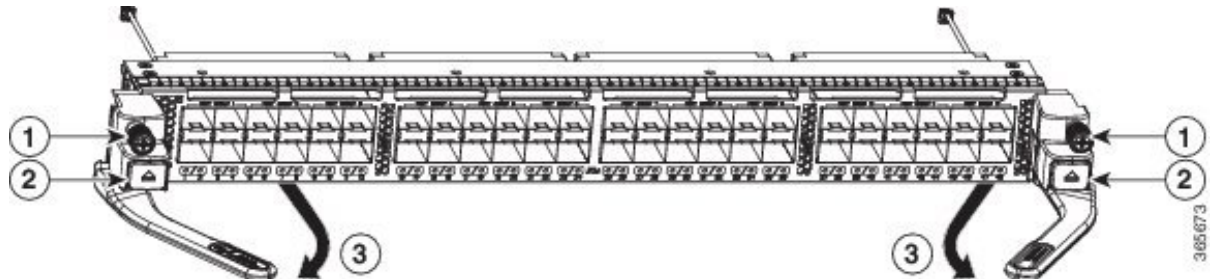
---

**Step 1** Open a slot in the chassis for the new I/O module as follows:

- Note** If you need to remove a blank filler plate from the slot, unscrew the captive screws on either side of the module and pull the handle on the plate to remove it from the slot. Continue with Step 2.

- a) Disconnect all of the networking cables attached to the front of the I/O module to be removed.
- b) Unscrew the captive screw on each side of the module until the screws are loose and no longer connected to the chassis (see Callout 1 in the following figure).

**Figure 29: Removing an I/O Module**



|   |                               |   |                                                              |
|---|-------------------------------|---|--------------------------------------------------------------|
| 1 | Loosen the two captive screws | 3 | Two handles spring out part way from the front of the module |
| 2 | Press the two ejector buttons |   |                                                              |

- c) Press the two ejector buttons on the each side of the module (see Callout 2 in the above figure).  
The two handles spring out part way from the front of the module.
- d) Fully rotate the two handles away from the front of the module and pull on them to move the module part way out of its slot.
- e) Place one hand under the module to support its weight, grasp the front of the module with the other hand, pull the module fully out of its slot, and set the module on an antistatic surface.

**Caution** Do not touch any electrical circuitry on the removed I/O module. Handle the module only by its covered surfaces (front and bottom of the module) and always set the module on an antistatic surface when it is not inside the chassis.

**Step 2** Install the new I/O module in the open slot as follows:

- a) Unpack the new I/O module, set it right side up on an antistatic surface (so that you can see the electrical components from above the module), and inspect the module for damage.

If anything is damaged, contact your customer representative immediately.

- b) Press the two eject buttons (one on each side of the module front) and rotate the handles away from the front of the module.
- c) Without touching any electronic circuitry, grasp the front of the I/O module with one hand, place your other hand under the module to support its weight, and lift the module to the slot.
- d) Align the back of the module to the guides inside the slot, and slide the module fully into the slot by pushing on the front of the module.

If you push the module fully into the slot, you seat it onto its connectors inside the slot and the handles move part way toward the front of the module. The front of the module should be 1/4 inch (0.6 cm) out of the slot.

- e) Simultaneously rotate each of the two handles to the front of the module until they click.  
As you rotate the handles to the front of the module, the module should move fully into the slot.

- f) Verify that the front of the module is even with the fronts of the other installed I/O modules. If not, press both ejector buttons, pull on the handles to partly remove the module, and repeat Steps 2d and 2e to reseat the module in the slot.
- g) Screw in the two captive screws (one on each side of the module) to secure the module to the chassis. Tighten the screws to 8 in-lb (0.9 N·m) of torque.

The Status module LED should be green. If not, see [I/O Module LEDs, on page 208](#) for information about the LED states.

- h) Attach networking cables to the I/O ports.

The LED for each port should be green. If not, see [I/O Module LEDs, on page 208](#) for information about the LED states.

## Replacing a Fan Tray

You can replace a fan tray module during operations so long as there are at least two other fan tray modules operating in the chassis. We recommend that you put a switch in fan tray maintenance mode before removing a fan tray. You can also remove a fan tray in order to replace one of the two fabric modules installed behind it. When not replacing a fan tray or a fabric module, there should be three fan trays operating in the chassis.



**Note** You have up to 72 hours to replace one fan tray as long as the switch air-inlet temperature does not exceed 86° Fahrenheit (30° C). If the temperature exceeds 86° Fahrenheit (30° C), the switch will shut down in 3 minutes. If you remove more than one fan tray at a time, the switch can operate up to three minutes before shutting down. To prevent a shutdown, remove only one fan tray at a time.

Starting from Cisco NX-OS Release 7.2(0)D1(1), use the **hardware fan-tray maintenance-mode [long | medium | short]** command to prepare a switch for fan tray removal. By default, the fans run at 100 percent speed for approximately 4 minutes to prepare for fan tray removal when the **hardware fan-tray maintenance-mode** command is used. Starting from Cisco NX-OS Release 8.1(1), by default, the fans run at 85 percent speed for approximately 4 minutes to prepare for fan tray removal when the **hardware fan-tray maintenance-mode** command is used.

Use the **long** keyword to run the fans at 65 percent speed for approximately 9 minutes to prepare for fan tray removal. Use the **medium** keyword to run the fans at 75 percent speed for approximately 6 minutes to prepare for fan tray removal. Use the **short** keyword to run the fans at 85 percent speed for approximately 4 minutes to prepare for fan tray removal. For more information about the **hardware fan-tray maintenance-mode**, see [Cisco Nexus 7000 Series NX-OS System Management Command Reference](#).

The fan tray maintenance mode will be cancelled in the following cases:

- If a temperature alarm is present.
- Hot-inlet temperature (Sup inlet temperature  $\geq$  30 degrees Celsius)
- Fan-tray is absent.
- Post-cool period (time elapsed after fan tray removal) has crossed 4 minutes.



**Note** Fan tray maintenance mode is cancelled and fan speed is set to normal if fan tray migration or replacement is completed within 2 minutes of using the **hardware fan-tray maintenance-mode** command. If fan tray migration or replacement is not completed within 2 minutes, the remaining fan trays run at 85 percent speed for the next 2 minutes, and at 100 percent speed from then on.

- Pre-cool period (time elapsed before fan tray removal) has crossed 1 hour and 9 minutes—The fan tray has not been removed since the past 1 hour and 9 minutes during which the switch was ready for fan tray removal.

The following example shows the syslogs that are generated when the fan speed increases due to a minor temperature alarm:

```
2017 Apr 3 16:46:07 SWITCH %CARDCLIENT-2-SSE: XBAR:5 FABRIC ONLINE
2017 Apr 3 16:46:07 SWITCH %PLATFORM-5-MOD_STATUS: Fabric-Module 5 current-status is
MOD_STATUS_ONLINE/OK
2017 Apr 3 16:46:07 SWITCH %MODULE-5-XBAR_OK: Xbar 5 is online (Serial number: JAE1921079X)
2017 Apr 3 16:47:00 SWITCH %PLATFORM-2-MOD_TEMPMINALRM: Xbar-5 reported minor temperature
alarm. Sensor=1 Temperature=48 MinT
hreshold=20
2017 Apr 3 16:47:00 SWITCH %VSHD-5-VSHD_SYSLOG_CONFIG_I: Configured from vty by admin on
vsh.12644
2017 Apr 3 16:47:35 SWITCH %PLATFORM-6-PFM_INFO: Fan Zone 1 : Fan Speed will change from
45.88(0x75) to 54.12(0x8a)
2017 Apr 3 16:54:50 SWITCH %PLATFORM-2-PFM_MODULE_POWER_OFF: Manual power-off of Xbar 5
from Command Line Interface
2017 Apr 3 16:54:50 SWITCH %PLATFORM-5-XBAR_PWRDN: Xbar 5 powered down (Serial number
JAE1921079X)
2017 Apr 3 16:54:50 SWITCH %PLATFORM-5-MOD_STATUS: Fabric-Module 5 current-status is
MOD_STATUS_CONFIGPOWERED_DOWN
2017 Apr 3 16:54:50 SWITCH %PLATFORM-5-MOD_STATUS: Fabric-Module 5 current-status is
MOD_STATUS_POWERED_DOWN
2017 Apr 3 16:58:40 SWITCH %PLATFORM-6-PFM_INFO: Fan Zone 1 : Fan Speed will change from
54.12(0x8a) to 45.88(0x75)
2017 Apr 3 17:00:41 SWITCH %PLATFORM-2-PFM_MODULE_POWER_ON: Manual power-on of Xbar 5 from
Command Line Interface
2017 Apr 3 17:00:41 SWITCH %PLATFORM-2-XBAR_DETECT: Xbar 5 detected (Serial number
JAE1921079X)
2017 Apr 3 17:00:41 SWITCH %PLATFORM-5-XBAR_PWRUP: Xbar 5 powered up (Serial number
JAE1921079X)
2017 Apr 3 17:00:41 SWITCH %PLATFORM-5-MOD_STATUS: Fabric-Module 5 current-status is
MOD_STATUS_POWERED_UP
2017 Apr 3 17:00:59 SWITCH %CARDCLIENT-2-SSE: XBAR:5 FABRIC ONLINE
```

The following example shows the syslogs displaying the fan tray maintenance mode being cancelled after the post-cool period of 4 minutes is completed:

```
2017 Apr 3 16:20:08 SWITCH %PLATFORM-2-PFM_CRITICAL: FAN_MAINTENANCE_MODE: system is ready
for fan-removal.
2017 Apr 3 16:21:07 SWITCH %PLATFORM-2-FAN_REMOVED: Fan module 1(Serial number NCV2108V017)
Fan1(sys_fan1) removed
2017 Apr 3 16:21:08 SWITCH %PLATFORM-6-PFM_INFO: Fan Zone 1 : Fan Speed will change from
85.10(0xd9) to 74.90(0xbf)
2017 Apr 3 16:21:11 SWITCH %PLATFORM-1-PFM_ALERT: System shutdown in 3 days 0 hours 0 mins
0 seconds due to fan policy __pfm_
fanabsent_any_singlefan for fan1
2017 Apr 3 16:23:09 SWITCH %PLATFORM-6-PFM_INFO: Fan Zone 1 : Fan Speed will change from
```

```

74.90(0xbf) to 85.10(0xd9)
2017 Apr 3 16:25:09 SWITCH %PLATFORM-6-PFM_INFO: Fan Zone 1 : Fan Speed will change from
85.10(0xd9) to 100.00(0xff)
2017 Apr 3 16:25:33 SWITCH %PLATFORM-5-FAN_DETECT: Fan module 1(Serial number NCV2108V017)
Fan1(sys_fan1) detected
2017 Apr 3 16:25:33 SWITCH %PLATFORM-5-FAN_STATUS: Fan module 1(Serial number NCV2108V017)
Fan1(sys_fan1) current-status is F
AN_OK
2017 Apr 3 16:25:33 SWITCH %PLATFORM-2-FANMOD_FAN_OK: Fan module 1(Fan1(sys_fan1) fan) ok
2017 Apr 3 16:25:33 SWITCH %PLATFORM-6-PFM_INFO: Fan Zone 1 : Fan Speed will change from
100.00(0xff) to 45.88(0x75)
2017 Apr 3 16:25:33 SWITCH %PLATFORM-2-PFM_CRITICAL: FAN_MAINTENANCE_MODE_CANCELLED:
Reason(s): Temperature alarm: No, Superv
isor hot-inlet: No, Absent fans count: 0, Precool period completed: N/A, Postcool period
completed: Yes, Total maint. duratio
n: 564 seconds

```

If you need to remove the fan tray to replace a fabric module, see [Installing or Replacing a Fabric Module, on page 134](#).




---

**Note** The fan tray displays the fabric module LEDs so that you can see the status of the two fabric modules installed behind that fan tray.

---

### Before you begin

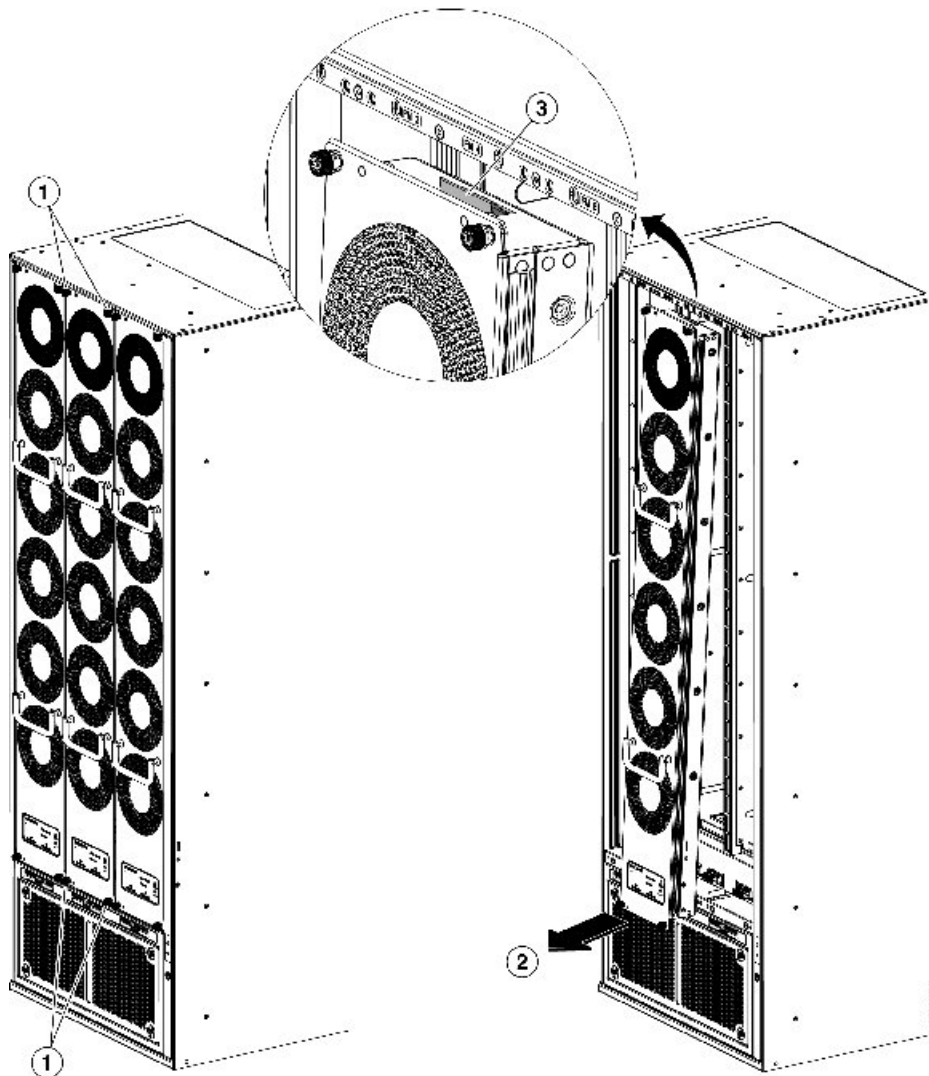
- You must follow ESD protocols, including the following:
  - You must wear a grounded ESD wristband (or other personal grounding device) whenever you handle the electronic modules outside the grounded chassis.
  - You must carry electronic modules by only their covered edges or handles. Do not touch their electronic components.
  - Whenever a module is outside a grounded chassis, place it flat on an antistatic surface or in an antistatic bag. Never lean the module on anything nor place anything else on top of the module nor lean anything on the module.
- Verify that the chassis is grounded.
- Verify that you have the following tools and equipment:
  - ESD wrist strap (or other personal grounding device)
  - Number 1 Phillips torque screwdriver
    - Manual torque screwdrivers are recommended. Be sure to never exceed the recommended torque setting for the screw that you are working with.
  - Replacement fan tray
    - N77-C7718-FAN=
- Put the switch in fan tray maintenance mode.

---

**Step 1** Remove the fan tray as follows:

- a) Use a Phillips torque screwdriver to loosen the four captive screws on the fan tray until they are no longer connected to the chassis.
- b) Grab both fan tray handles with both of your hands.
- c) Pull the fan tray 1/2 inch (1.2 cm) out, pull on the bottom handle to disconnect the connectors at the bottom of the tray, and then pull both handles out and down to remove the whole fan tray from the slot.

**Figure 30: Removing a Fan Tray**



|   |                                                                                                           |   |                                                                          |
|---|-----------------------------------------------------------------------------------------------------------|---|--------------------------------------------------------------------------|
| 1 | Unscrew four captive screws.                                                                              | 3 | Pull out and down to move the spring clip past the top edge of the slot. |
| 2 | Pull the bottom handle to pull the bottom out about 2 inches (5 cm) to disconnect the connectors in back. |   |                                                                          |

- d) Set the fan tray on an antistatic surface or inside an antistatic bag.

**Caution** Do not touch the electrical connectors on the back side and do not set the back side connectors on anything—always set a fan tray down on a covered side to protect its connectors.

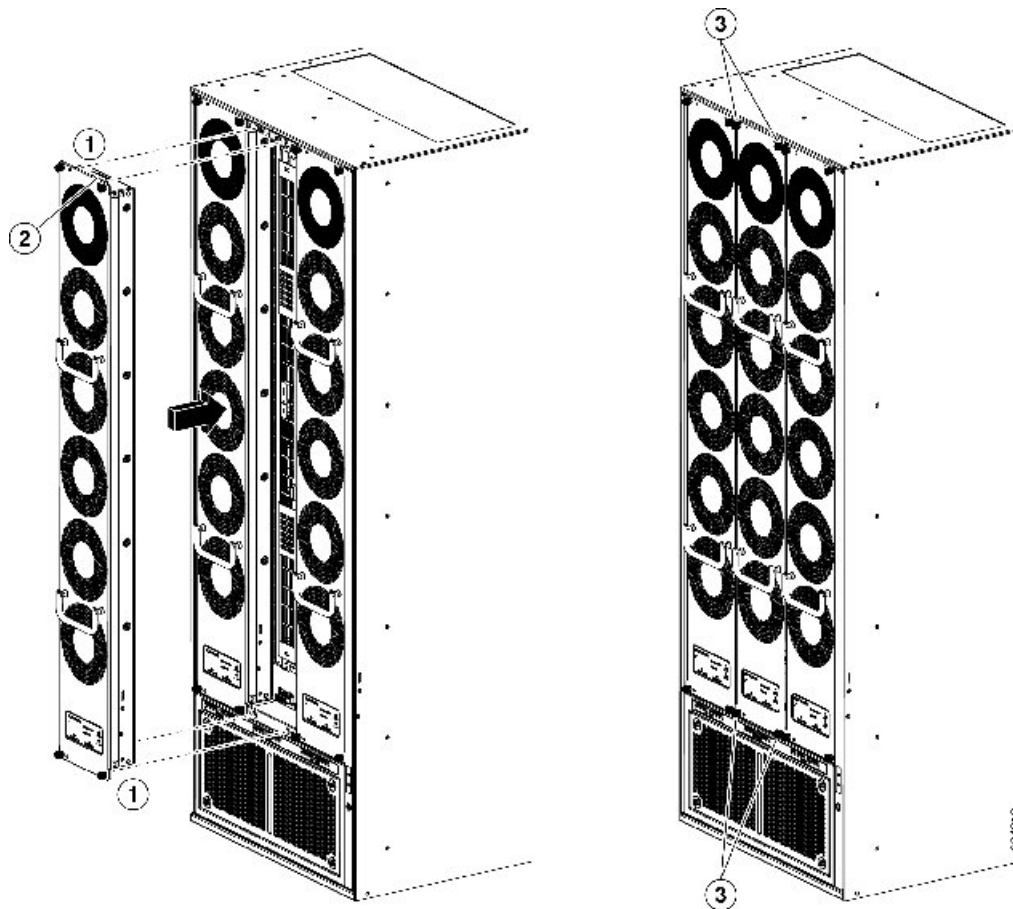
**Step 2** Install the new fan tray in the open slot as follows:

- a) Unpack the new fan tray and inspect it for damage.

If anything is damaged or missing, contact your customer representative immediately.

- b) Tilt the top of the fan tray toward the chassis and press it part way into the slot so that the alignment pins are part way into their holes in the chassis and the spring clip at the top of the module is inside the fan-tray slot and behind the outer surface of the chassis.

**Figure 31: Installing a Fan Tray**



|   |                                                                                                                  |   |                                                   |
|---|------------------------------------------------------------------------------------------------------------------|---|---------------------------------------------------|
| 1 | Align four pins in the fan tray to four holes in the chassis.                                                    | 3 | Tighten four captive screws to 8 in-lb (0.9 N·m). |
| 2 | Position the spring clip behind the edge of the chassis and then press the whole fan tray into the chassis slot. |   |                                                   |

- c) Press the bottom of the fan tray into the slot so that the electrical connectors at the bottom of the module are inserted into the connectors inside the slot.



- d) Press the whole fan tray into the slot so that the front of the fan tray is touching the outer surface of the chassis and the four captive screws on the module are aligned to four screw holes in the chassis.
- e) Screw in each of the four captive screws to secure the fan tray to the chassis and tighten them to 8 in-lb (0.9 N·m) of torque.

**Step 3** Verify that the fan tray is functioning by making sure that its Status LED is green.

For more information about the fan tray LEDs, see the [I/O Module LEDs, on page 208](#) topic.

## Migrating from Gen 1 Fan Trays (N77-C7718-FAN) to Gen 2 Fan Trays (N77-C7718-FAN-2)

Perform the steps given below to replace all the three Gen 1 fan trays in a switch with Gen 2 fan trays:

1. Put the switch in fan tray maintenance mode by using the **hardware fan-tray maintenance-mode [long | medium | short]** command.
2. Remove the left-most Gen 1 fan tray, FAN TRAY 1 (N77-C7718-FAN), from the switch.
3. Insert the Gen 2 fan tray (N77-C7718-FAN-2) into the empty fan tray slot.



**Note** The switch shuts down if a mix of Gen 1 (N77-C7718-FAN) and Gen 2 (N77-C7718-FAN-2) fan trays are present in the same switch for more than 21600 seconds (6 hours). The syslog message "PLATFORM-0-FAN\_MISMATCH\_TIME: Mismatch of Fan modules. Both Gen1 and Gen2 fans are present in the fantray for <number> seconds" is displayed at regular intervals when both Gen 1 and Gen 2 fan trays are present in the same switch.

4. Remove the Gen 1 fan tray from FAN TRAY 2.
5. Insert the Gen 2 fan tray into the empty fan tray slot.
6. Remove the Gen 1 fan tray from FAN TRAY 3.
7. Insert the Gen 2 fan tray into the empty fan tray slot.

The following example shows the syslogs that are generated when only one of the three installed Gen 2 fan trays is replaced by a Gen 1 fan tray, resulting in a fan tray mismatch:

```
2017 Apr 3 17:25:19 SWITCH %PLATFORM-2-FAN_REMOVED: Fan module 3 (Serial number NCV2108V01K)
 Fan3(sys_fan3) removed
2017 Apr 3 17:25:19 SWITCH %PLATFORM-6-PFM_INFO: Fan Zone 1 : Fan Speed will change from
45.88(0x75) to 100.00(0xff)
2017 Apr 3 17:25:32 SWITCH %PLATFORM-5-FAN_DETECT: Fan module 3 (Serial number DCH1910A06N)
 Fan3(sys_fan3) detected
2017 Apr 3 17:25:32 SWITCH %PLATFORM-5-FAN_STATUS: Fan module 3 (Serial number DCH1910A06N)
 Fan3(sys_fan3) current-status is F
AN_OK
2017 Apr 3 17:25:32 SWITCH %PLATFORM-2-FANMOD_FAN_OK: Fan module 3 (Fan3(sys_fan3) fan) ok
2017 Apr 3 17:25:32 SWITCH %PLATFORM-6-PFM_INFO: Fan Zone 1 : Fan Speed will change from
100.00(0xff) to 80.00(0xcc)
```

```

2017 Apr 3 17:25:32 SWITCH %PLATFORM-0-FAN_MISMATCH_TIME: Mismatch of Fan modules. Both
Gen1 and Gen2 fans are present in the
fantray for 1 seconds
2017 Apr 3 17:25:37 SWITCH %PLATFORM-1-PFM_ALERT: System shutdown in 0 days 6 hours 0 mins
0 seconds due to fan policy __pfm__
fanpresent_mismatch for AllFans
2017 Apr 3 17:25:41 SWITCH %PLATFORM-0-FAN_MISMATCH_TIME: Mismatch of Fan modules. Both
Gen1 and Gen2 fans are present in the
fantray for 9 seconds
2017 Apr 3 17:25:51 SWITCH %PLATFORM-0-FAN_MISMATCH_TIME: Mismatch of Fan modules. Both
Gen1 and Gen2 fans are present in the
fantray for 19 seconds
2017 Apr 3 17:26:01 SWITCH %PLATFORM-0-FAN_MISMATCH_TIME: Mismatch of Fan modules. Both
Gen1 and Gen2 fans are present in the
fantray for 29 seconds
2017 Apr 3 17:26:11 SWITCH %PLATFORM-0-FAN_MISMATCH_TIME: Mismatch of Fan modules. Both
Gen1 and Gen2 fans are present in the
fantray for 39 seconds
2017 Apr 3 17:26:21 SWITCH %PLATFORM-0-FAN_MISMATCH_TIME: Mismatch of Fan modules. Both
Gen1 and Gen2 fans are present in the
fantray for 49 seconds
2017 Apr 3 17:26:31 SWITCH %PLATFORM-0-FAN_MISMATCH_TIME: Mismatch of Fan modules. Both
Gen1 and Gen2 fans are present in the
fantray for 59 seconds
2017 Apr 3 17:26:37 SWITCH %PLATFORM-1-PFM_ALERT: System shutdown in 0 days 5 hours 59 mins
0 seconds due to fan policy __pfm__
_fanpresent_mismatch for AllFans
2017 Apr 3 17:26:41 SWITCH %PLATFORM-0-FAN_MISMATCH_TIME: Mismatch of Fan modules. Both
Gen1 and Gen2 fans are present in the
fantray for 69 seconds
2017 Apr 3 17:26:51 SWITCH %PLATFORM-0-FAN_MISMATCH_TIME: Mismatch of Fan modules. Both
Gen1 and Gen2 fans are present in the
fantray for 79 seconds
2017 Apr 3 17:27:01 SWITCH %PLATFORM-0-FAN_MISMATCH_TIME: Mismatch of Fan modules. Both
Gen1 and Gen2 fans are present in the
fantray for 89 seconds
2017 Apr 3 17:27:11 SWITCH %PLATFORM-0-FAN_MISMATCH_TIME: Mismatch of Fan modules. Both
Gen1 and Gen2 fans are present in the
fantray for 99 seconds
2017 Apr 3 17:27:17 SWITCH %PLATFORM-2-FAN_REMOVED: Fan module 3(Serial number DCH1910A06N)
Fan3(sys_fan3) removed
2017 Apr 3 17:27:17 SWITCH %PLATFORM-6-PFM_INFO: Fan Zone 1 : Fan Speed will change from
80.00(0xcc) to 100.00(0xff)
2017 Apr 3 17:27:36 SWITCH %PLATFORM-5-FAN_DETECT: Fan module 3(Serial number NCV2108V01K)
Fan3(sys_fan3) detected
2017 Apr 3 17:27:36 SWITCH %PLATFORM-5-FAN_STATUS: Fan module 3(Serial number NCV2108V01K)
Fan3(sys_fan3) current-status is F
AN_OK
2017 Apr 3 17:27:36 SWITCH %PLATFORM-2-FANMOD_FAN_OK: Fan module 3(Fan3(sys_fan3) fan) ok
2017 Apr 3 17:27:36 SWITCH %PLATFORM-6-PFM_INFO: Fan Zone 1 : Fan Speed will change from
100.00(0xff) to 45.88(0x75)

```

## Installing or Replacing a Fabric Module

The fabric modules are located as follows behind the fan trays on the back side of the chassis:

- Fabric slots 1 and 2 are behind fan tray slot 1
- Fabric slots 3 and 4 are behind fan tray slot 2
- Fabric slots 5 and 6 are behind fan tray slot 3

When the fan trays are installed, they display the LED states for the fabric modules installed behind them.

You can install a fabric module during operations so long as there is at least one other fabric module installed and functioning in the chassis. To install or replace a fabric module, you must first remove the fan tray that is in front of the fabric module. If the chassis has fewer than six fabric modules, leave the empty slots unfilled—the fan tray that you place outside the fabric modules maintains the designed airflow for the chassis.

### Before you begin

- The chassis must be grounded.
- You must be wearing wearing an ESD wrist strap (or other ESD prevention device) that is connected to the ESD port on the grounded chassis.
- Starting from Cisco NX-OS Release 7.2(0)D1(1), put the switch in fan tray maintenance mode to prepare the switch for fan tray removal.

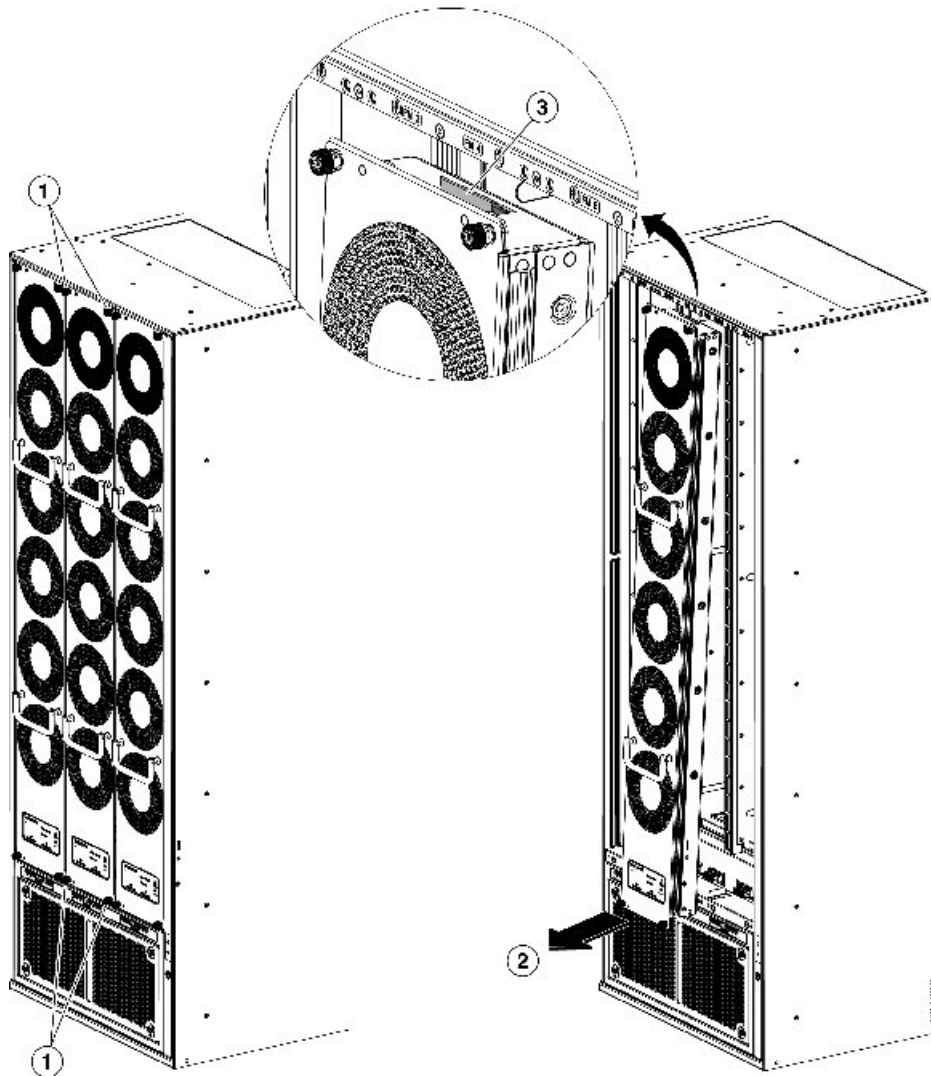
---

### Step 1

Remove the fan tray that covers the fabric module that you are replacing by following these steps:

- a) Loosen four captive screws on the fan tray until they are loose and are no longer connected to the chassis.
- b) Pull the fan tray 1/2 inch (1.2 cm) out, pull on the bottom handle to disconnect the connectors at the bottom of the tray, and then pull both handles out and down to remove the whole fan tray from the slot.

Figure 32: Removing a Fan Tray



|   |                                                                                                           |   |                                                                          |
|---|-----------------------------------------------------------------------------------------------------------|---|--------------------------------------------------------------------------|
| 1 | Unscrew four captive screws.                                                                              | 3 | Pull out and down to move the spring clip past the top edge of the slot. |
| 2 | Pull the bottom handle to pull the bottom out about 2 inches (5 cm) to disconnect the connectors in back. |   |                                                                          |

- c) After the connectors are free of the chassis connections, pull whole fan tray off the chassis.
- d) Set the fan tray down on one of its covered sides only on an antistatic pad or inside an antistatic bag.

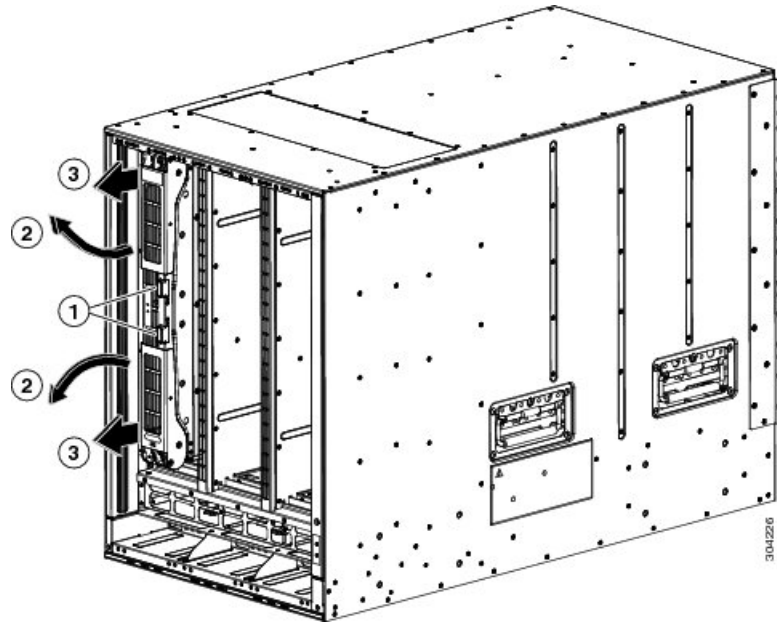
**Caution** Do not touch the electrical connectors on the back side and do not set the back side connectors on anything—always set a fan tray down on a covered side to protect the connectors.

**Step 2** If you need to open a fabric slot for the new fabric module, remove a fabric module as follows:

- a) With your face at least 12 inches (30 cm) away from the front of the fabric module, press both eject buttons on the front of the module (see Callout 1 in the following figure).

**Caution** Keep your face away from the front of the fabric module so that the levers do not hit your face when they spring out from the front of the module.

**Figure 33: Unlocking a Fabric Module from its Slot**



|   |                                     |   |                                                                |
|---|-------------------------------------|---|----------------------------------------------------------------|
| 1 | Press both eject buttons.           | 3 | Pull the handles to partially remove the module from the slot. |
| 2 | Handles spring out from the module. |   |                                                                |

- b) Grasp each of the two levers with your two hands and fully rotate the levers out 90 degrees from the fabric module.  
 c) Pull both levers until the fabric module is about 3 inches (7 cm) out of the chassis (see Callout 3 in the previous figure).  
 d) Rotate both levers back to the front of the module.

Each lever clicks when it locks in place at the front of the module.

- e) Grasp the front of the module with one hand, place the other hand under the module to support its weight, and pull the module out of the slot (see Callout 2 in the previous figure).

**Caution** Be careful not to touch any electrical contacts on the back of the module. Handle only covered sides or edges of the module.

- f) Place the module on an antistatic surface or inside an antistatic bag.

### Step 3

Install the new fabric module in the chassis as follows:

- a) Unpack the new fabric module and inspect it for damage.

If anything is damaged or missing, contact your customer representative immediately.

- b) Hold the front of the module with one hand and place the other hand under the module.

- c) Rotate the module clockwise and align the back of the module to the module guides at the top and bottom of the open fabric slot in the chassis.
- d) Push the module half way into the slot.
- e) With your face away from the fabric module, press both ejector buttons on the front of the module.

**Caution** Keep your face at least 12 inches (30 cm) from the front of the fabric module so that the ejector handles do not hit your face when they spring out from the front of the module.

Both ejector handles spring out from the front of the module (see Callout 2 in the previous figure).

- f) Grasp both handles, fully rotate the levers 90 degrees from the front of the module, and push the module all the way into the slot until it seats.

The front of the module will be about 1/4 inch out from the installed fabric modules.

- g) Simultaneously rotate both handles to the front of the module while pressing the module further into the slot.

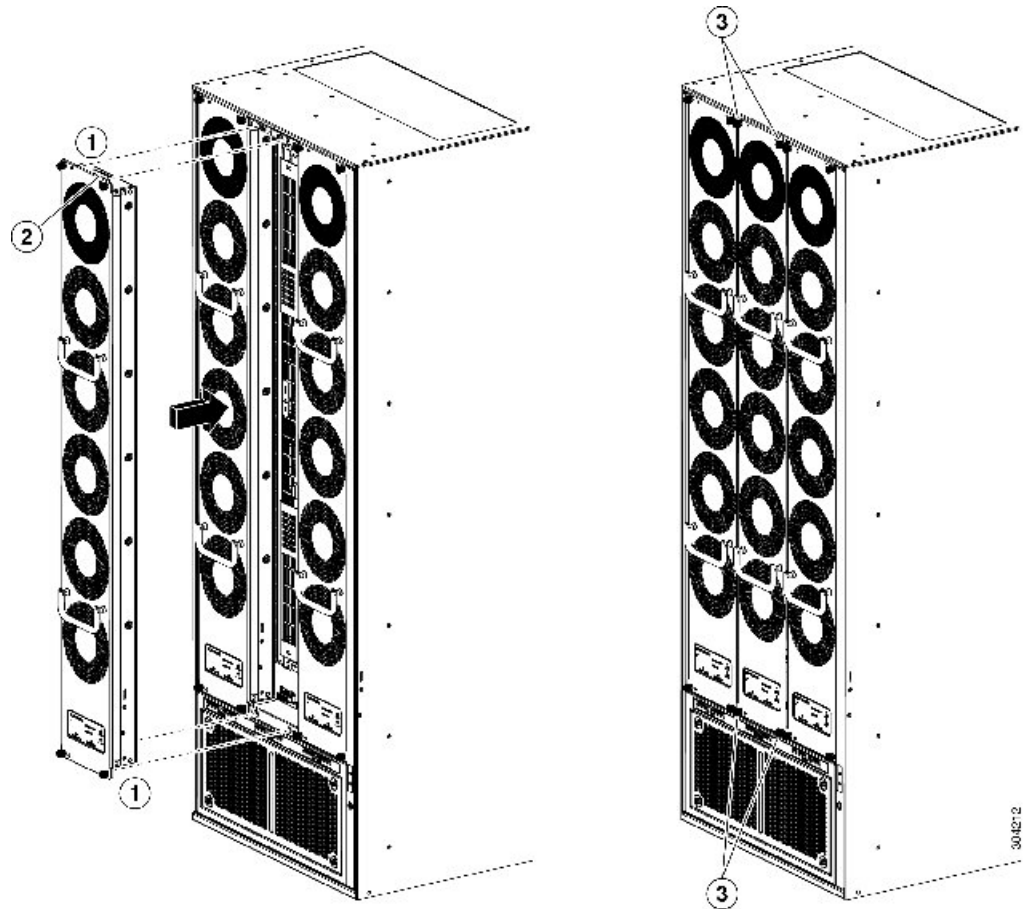
The handles click when fully rotated to the front of the module.

- h) Verify that the module is secured to the chassis and that you cannot remove it without pressing the eject buttons.

**Step 4** Reinstall the fan tray over the installed fabric module as follows:

- a) Tilt the top of the fan tray toward the chassis and press it part way into the slot so that the alignment pins are part way into their holes in the chassis and the spring clip at the top of the module is inside the fan-tray slot and behind the outer surface of the chassis.

Figure 34: Installing a Fan Tray



|   |                                                                                                                  |   |                                                   |
|---|------------------------------------------------------------------------------------------------------------------|---|---------------------------------------------------|
| 1 | Align four pins in the fan tray to four holes in the chassis.                                                    | 3 | Tighten four captive screws to 8 in-lb (0.9 N·m). |
| 2 | Position the spring clip behind the edge of the chassis and then press the whole fan tray into the chassis slot. |   |                                                   |

- b) Press the bottom of the fan tray into the slot so that the electrical connectors at the bottom of the module are inserted into the connectors inside the slot.
- c) Press the whole fan tray into the slot so that the front of the fan tray is touching the outer surface of the chassis and the four captive screws on the module are aligned to four screw holes in the chassis.
- d) With the electrical contacts on the fan tray aligned to contacts on the back plane, press the fan tray fully into the slot. The front of the fan tray should be even with the fronts of the other fan trays and the four captive screws on the fan tray should be aligned to four screw holes in the chassis.
- e) Screw in each of the four captive screws on the front of the fan tray to secure the fan tray to the chassis. Tighten each screw to 8 in-lb (0.9 N·m) of torque.
- f) Verify that the Status LED is green. For more information about the LED states, see [I/O Module LEDs, on page 208](#).

# Installing or Replacing a Power Supply in a Switch Chassis

You can install up to 16 power supplies of the following types:

- 3-kW AC power supply (N77-AC-3KW)
- 3-kW DC power supply (N77-DC-3KW)
- 3.5-kW HVAC/HVDC power supply (N77-HV-3.5KW)

If you leave any power supply slots empty, you must install a blank filler plate (N77-3KPS-BLANK-H=) in that slot to maintain the designed airflow.




---

**Note** The chassis ships with power supplies already installed but you can optionally remove the power supplies to make the chassis lighter for the installation.

---

You follow the same steps to install AC, DC and HVAC/HVDC power supplies into the switch, but you ground them differently. For an AC and HVAC/HVDC power supply, you automatically ground it when you connect its power cable to the power supply and the power source. For a 3-kW DC power supply, you do not directly connect the power supply to the earth ground.

## Before you begin

- The switch chassis must be installed in a cabinet or rack that is secured to the data center.

You need the following additional tools and equipment:

- Nut driver attachment for Number 1 Phillips-head screwdriver or ratchet wrench with torque capability (used only for DC power supplies)
- Crimping tool
- For 3-kW DC power supplies, you need four power cables sized to reach the DC power source or power interface unit (PIU)
- Grounding wire—Size this wire to meet local and national installation requirements. For U.S. installations, you must use a 6 AWG copper conductor. For installations outside the U.S., consult your local and national electrical codes. The length of the grounding wire depends on the proximity of the switch to proper grounding facilities.

---

**Step 1** If you need to open a power supply slot for another power supply, follow these steps:

**Note** If you need to remove a blank filler plate, unscrew its captive screws and pull it off the chassis. Go to Step 2.

a) Turn off the power for the power supply that you are removing, as follows:

1. Ensure that the power switch on the front of the power supply is set to standby (labelled as 0). The Output LED turns off.
2. Verify that the Output LED turns off. If the LED is still on, return to Step 1.



3. If you are removing a DC power supply, ensure that the power is turned off at the power source by turning off the power for that circuit, and verify that the Input LEDs turn off.
- b) If you are removing a power supply, detach the power and ground cables as follows:
    - For a 3-kW AC power supply, unplug the power cables that are attached to the power supply and the power source.
    - For a 3-kW DC power supply, open the terminal box, and use a Phillips screwdriver to remove the power cables from their terminals. Replace the terminal box cover. Remove the power cables from the power source.
    - For a 3.5-kW HVAC/HVDC power supply, release the built-in latch and unplug the power cable from the power source.
  - c) Remove the power supply or blank filler plate from the power supply slot as follows:

**Note** To remove a blank filler plate, unscrew its captive screws and pull on its handle to remove the plate from the slot.

    - For a 3-kW power supply, press its ejector latch to the left, pull the power supply part way out of the slot by its handle, place your other hand under the module to support its weight, and pull it fully from the slot.
    - For a 3.5-kW HVAC/HVDC power supply, disconnect the power cable from the power supply by pressing the release button on the power cable, pull the power supply part way out of the slot by its handle, place your other hand under the module to support its weight, and pull it fully from the slot.

**Step 2** Install the new power supply in the open slot as follows:

- a) Verify that the power switch on the front of the new power supply is set to standby (labelled as 0) and that the power supply is not connected to any power sources.
- b) Hold the handle on the power supply with one hand, place your other hand under the power supply to support its weight, and position the power supply with its back end at the open power supply bay.
- c) Slide the unit all the way into the power supply bay until one of the following situations occurs:
  - For a 3-kW power supply, the release latch on the front of the power supply clicks and prevents you from moving the power supply in or out of the chassis. This action completes the mounting of the power supply on this chassis.
  - For a 3.5-kW power supply, the built-in latch secures the power cable to the power supply.

---

### What to do next

- For an AC and HVAC/HVDC (when used with an input AC source) power supply, you must connect it to an AC power source (see the [Connecting a 3-kW AC Power Supply to AC Power Sources](#) and [Connecting a 3.5-kW HVAC/HVDC Power Supply to AC Power Sources](#) topic). The power supply will be automatically grounded through its power cable.
- For a 3-kW DC power supply, you must connect the power supply to the DC power source (see the “Connecting a DC Power Supply to DC Power Sources” topic).

## Connecting a 3-kW AC Power Supply to AC Power Sources

You use one power cord to connect a 3-kW power supply to its AC power source and to ground the power supply. Depending on the power mode that you use for the switch, you either connect all of the power supplies to one AC power source or you connect half of the power supplies to one AC power source and the other half to another AC power source:

- For combined power mode (no power redundancy), you need enough power supplies to power all switch operations and connect all of the power supplies to the same AC power source. You can install the power supplies in any open power supply slot in the chassis.
- For power supply redundancy mode ( $n+1$  redundancy mode), you need enough power supplies to power all switch operations and one extra power supply that can replace a failing power supply. You connect all power supplies to the same AC power source. You can install the power supplies in any open power supply slot in the chassis.
- For input source redundancy (grid redundancy) mode or full redundancy mode, you need twice the number of power supplies needed to power the switch operations. You connect half of the power supplies to one power source for active power and the other half to another power source for redundant power. You must ensure that the power supplies on the left side of the chassis (slots 1, 2, 5, 6, 9, 10, 13, and 14) are connected to one grid and that the power supplies on the right side of the chassis (slots 3, 4, 7, 8, 11, 12, 15, and 16) are connected to the other grid.

### Before you begin

Before you connect power supplies to one or two power sources, ensure all of the following:

- You have receptacles for one or two AC power sources within reach of the power supply cables. The number of power sources depends on the power mode to be used for the switch.
  - Combined power (no power redundancy)—One AC power source
  - Power supply redundancy ( $n+1$  redundancy)—One AC power source
  - Input source redundancy (power-grid redundancy)—Two AC power sources
  - Full redundancy—Two AC power sources
- The AC power sources are rated as follows:
  - For North American installations—20A with 110V or 220V circuits.
  - For international installations—size the circuits by local and national standards.
- The power supply is already installed in the chassis.
- The chassis is connected to an earth ground.

- 
- Step 1** Ensure that the power supply switch located on the front of the power supply is set at standby (labeled as 0).
  - Step 2** Plug one AC power cable into the power supply, and pull down the retention clip over the plug on the power cable.
  - Step 3** Plug the other end of the power cable into a AC power source supplied by the data center.

**Note** If you are using the combined power mode or power supply redundancy, you connect the power cables to the same 20-A circuit. If you are using the input source redundancy mode or full redundancy mode, you connect half of the power cables to one AC power source and the other half to another AC power source.

**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

**Warning** This product relies on the building's installation for short-circuit (overcurrent) protection. To reduce risk of electric shock or fire, ensure that the protective device is rated not greater than:

250V, 20 A

Statement 1005

**Step 4** Turn the power supply switch from standby to on (from 0 to 1 as labeled on the power switch).

**Step 5** Verify that the power supply is receiving AC power and outputting DC power by making sure that the INPUT and OUTPUT power supply LEDs are lit and the FAULT LED is not lit or flashing. For an explanation of all the power supply LEDs and the conditions that they indicate, see [Power Supply LEDs](#)

**Note** When you first activate the power supply, you can verify the functionality of the LEDs by checking that each LED turns on for a couple of seconds.

If the Fault LED is flashing red, turn the power switch to standby (labeled as 0), check the AC power connections on the power supply and the AC power source, and then turn the power switch back on (labeled as 1). The Input and Output LEDs for the connected power supplies should be green and the Fault LED should be off.

---

## Connecting a 3.5-kW HVAC/HVDC Power Supply to AC Power Sources

You use one power cord to connect a 3.5-kW HVAC/HVDC power supply to its AC power source and to ground the power supply. Depending on the power mode that you use for the switch, you either connect all of the power supplies to one AC power source or you connect half of the power supplies to one AC power source and the other half to another AC power source:

- For combined power mode (no power redundancy), you need enough power supplies to power all switch operations and connect all of the power supplies to the same AC power source. You can install the power supplies in any open power supply slot in the chassis.
- For power supply redundancy mode ( $n+1$  redundancy mode), you need enough power supplies to power all switch operations and one extra power supply that can replace a failing power supply. You connect all power supplies to the same AC power source. You can install the power supplies in any open power supply slot in the chassis.
- For input source redundancy (grid redundancy) mode or full redundancy mode, you need twice the number of power supplies needed to power the switch operations. You connect half of the power supplies to one power source for active power and the other half to another power source for redundant power. You must ensure that the power supplies on the left side of the chassis (slots 1, 2, 5, 6, 9, 10, 13, and 14) are connected to one grid and that the power supplies on the right side of the chassis (slots 3, 4, 7, 8, 11, 12, 15, and 16) are connected to the other grid.

**Before you begin**

Before you connect power supplies to one or two power sources, ensure all of the following:

- You have receptacles for one or two AC power sources within reach of the power supply cables. The number of power sources depends on the power mode to be used for the switch.
  - Combined power (no power redundancy)—One AC power source
  - Power supply redundancy ( $n+1$  redundancy)—One AC power source
  - Input source redundancy (power-grid redundancy)—Two AC power sources
  - Full redundancy—Two AC power sources
- The AC power sources are rated as follows:
  - For North American installations—20A with 110V or 220V circuits.
  - For international installations—size the circuits by local and national standards.
- The power supply is already installed in the chassis.
- The chassis is connected to an earth ground.

---

**Step 1** Ensure that the power supply switch located on the front of the power supply is set at standby (labeled as 0).

**Step 2** Plug the AC power cable into the power supply. The built-in latch secures the power cable to the power supply. You can disconnect the power cable from the power supply by pressing the release button on the power cable.

**Step 3** Plug or connect the other end of the power cable into a AC power source supplied by the data center.

**Note** If you are using the combined power mode or power supply redundancy, you connect the power cables to the same 20-A circuit. If you are using the input source redundancy mode or full redundancy mode, you connect half of the power cables to one AC power source and the other half to another AC power source.

**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

**Warning** This product relies on the building's installation for short-circuit (overcurrent) protection. To reduce risk of electric shock or fire, ensure that the protective device is rated not greater than:

250V, 20 A

Statement 1005

**Step 4** Turn the power supply switch from standby to on (from 0 to 1 as labeled on the power switch).

**Step 5** Verify that the power supply is receiving AC power and outputting DC power by making sure that the INPUT and OUTPUT power supply LEDs are lit and the FAULT LED is not lit or flashing. For an explanation of all the power supply LEDs and the conditions that they indicate, see [Power Supply LEDs](#)

**Note** When you first activate the power supply, you can verify the functionality of the LEDs by checking that each LED turns on for a couple of seconds.

If the Fault LED is flashing red, turn the power switch to standby (labeled as 0), check the power connections on the power supply and the AC power source, and then turn the power switch back on (labeled as 1). The Input and Output LEDs for the connected power supplies should be green and the Fault LED should be off.

---

## Connecting DC Power Supplies with Power Sources

Connect each installed DC power supply with a DC power circuit as follows:



---

**Note** If you are using combined power mode (no power redundancy) or power supply ( $n+1$ ) power mode, connect all of the power supplies to the same power circuit (grid).

If you are using input source ( $n+n$ ) or full power mode, connect half of the power supplies (located in slots 1, 2, 5, 6, 9, 10, 13, and 14) to one AC power circuit and the other half of the power supplies (located in slots 3, 4, 7, 8, 11, 12, 15, and 16) to another AC power circuit.

---

### Before you begin

- The power supplies are installed in the chassis.
- A DC power source is within reach of power cables that will be attached to the power supplies.
- Power cables are available to connect each DC power supply to the DC power source.

---

**Step 1** Turn the power switch to standby (labeled 0 on the power switch).

**Step 2** Turn off the power at the circuit breakers for the portions of the DC grid power that you are connecting to and verify that all of the LEDs on the power supplies are off.

**Warning** Before performing any of the following procedures, ensure that power is removed from the DC circuit.

Statement 1003

**Step 3** Size the power cables to the distance between the power supply and the DC power grid. If you need to cut the cable, cut it at the end that connects to the DC power grid, remove 0.75 inch (19 mm) of insulation from the cut ends, and attach them to the DC power system. Be sure to connect the negative cables to negative lines and positive cables to positive lines.

**Note** For all your power connections, if you are using cables with two different colors, use one color cable for all positive circuits and the other color for all negative circuits.

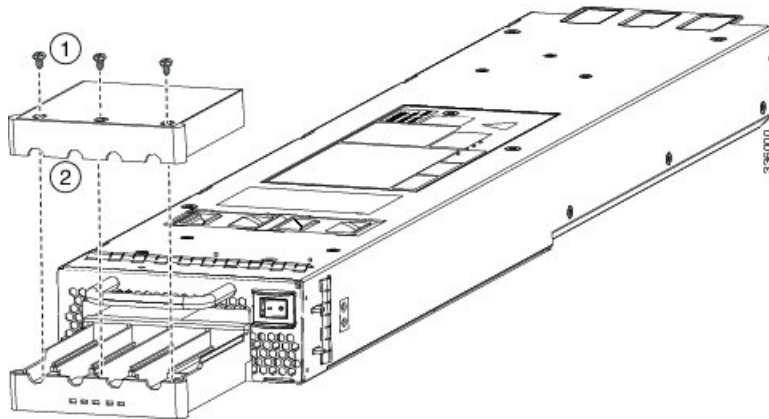
**Warning** Hazardous voltage or energy may be present on DC power terminals. Always replace the cover when the terminals are not in service. Be sure uninsulated conductors are not accessible when cover is in place.

Statement 1075

**Step 4** Remove the three screws that hold down the safety cover for the terminal box on the front of the DC power supply and remove the cover (see the following figure).

**Note** The terminal box has four slots for four power terminals (ordered as negative [-], positive [+], positive [+], and negative [-]). Each terminal has two nuts that you use to fasten a power cable to the terminal.

**Figure 35: Removing the Safety Cover for the Terminal Box on a 3-kW DC Power Supply**



|   |                                            |   |                   |
|---|--------------------------------------------|---|-------------------|
| 1 | Remove three screws from the safety cover. | 2 | Remove the cover. |
|---|--------------------------------------------|---|-------------------|

**Step 5** Install four cables (two positive and two negative cables) in the four terminal slots as follows:

- a) Unscrew the two nuts in each of the four terminal slots.
- b) Attach and crimp each lug to the end of each power cable.
- c) Attach each cable lug to the two terminal posts in each slot, fasten with two nuts, and tighten to 40 in-lb (4.5 N·m).

**Note** For all your power connections, if you are using cables with two different colors, use one color cable for all positive circuits and the other color for all negative circuits.

- d) Replace the safety cover on the terminal box and fasten with three screws.

**Step 6** Install the four cables from the DC power supply to a DC power source as follows:

- a) If the unconnected end of each power cable is not stripped of its insulation for the last 0.75 inches (19 mm), use wire strippers to remove that amount of insulation.
- b) Attach the negative cables to the negative terminals of a DC power source, and attach the positive cables to the positive terminals of the same power source.

**Note** If you are using combined power mode or power supply redundancy mode, connect all the power supplies in the chassis to the same power source. If you are using input source redundancy mode or full redundancy mode, connect half the power supplies to one DC power source and the other half of the power supplies to another DC power source.

**Step 7** For the powered down circuits connected to the power supplies, turn on the power at the circuit breaker. The Input 1 (IN1) and Input 2 (IN2) LEDs turn on each connected power supply.

**Step 8** Turn on the power supply by setting the power switch to 1. The LEDs should flash and then the Output LED should turn on in addition to the Input LEDs.

If the FAULT LED is lit or flashing, call Cisco TAC for assistance.

**What to do next**

You are ready to connect the switch to the network.

## Connecting a 3.5-kW HVAC/HVDC Power Supply to DC Power Sources

You use one power cord to connect a 3.5-kW HVAC/HVDC power supply to its DC power source and to ground the power supply. Depending on the power mode that you use for the switch, you either connect all of the power supplies to one DC power source or you connect half of the power supplies to one DC power source and the other half to another DC power source.

**Before you begin**

Before you connect power supplies to one or two power sources, ensure all of the following:

- The power supply is already installed in the chassis.
- A DC power source is within reach of power cables that will be attached to the power supplies.
- Power cables are available to connect each HVAC/HVDC power supply to the DC power source.

- 
- Step 1** Ensure that the power supply switch located on the front of the power supply is set at standby (labeled as 0).
- Step 2** Plug the DC power cable into the power supply. The built-in latch secures the power cable to the power supply. You can disconnect the power cable from the power supply by pressing the release button on the power cable.
- Step 3** Plug or connect the other end of the power cable into a DC power source supplied by the data center.
- Note** Connect the power supply to the appropriate polarity and ground as indicated on the power cable plug or as marked on the ring lug cable.
- 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
- Warning** This product relies on the building's installation for short-circuit (overcurrent) protection. To reduce risk of electric shock or fire, ensure that the protective device is rated not greater than:
- 250V, 20 A
- Statement 1005
- Step 4** Turn the power supply switch from standby to on (from 0 to 1 as labeled on the power switch).
- Step 5** Verify that the power supply is receiving DC power by making sure that the INPUT and OUTPUT power supply LEDs are lit and the FAULT LED is not lit or flashing. For an explanation of all the power supply LEDs and the conditions that they indicate, see [Power Supply LEDs](#)
- Note** When you first activate the power supply, you can verify the functionality of the LEDs by checking that each LED turns on for a couple of seconds.

If the Fault LED is flashing red, turn the power switch to standby (labeled as 0), check the HVAC/HVDC power connections on the power supply and the DC power source, and then turn the power switch back on (labeled as 1). The Input and Output LEDs for the connected power supplies should be green and the Fault LED should be off.

---





# APPENDIX **A**

## Switch Specifications

This appendix includes the following topics:

- [Environmental Specifications](#), on page 149
- [Switch Dimensions](#), on page 150
- [Power Requirements](#), on page 150
- [Maximum Power Available for 3-kW Power Supplies](#), on page 151
- [Maximum Power Available for 3-kW DC Power Supplies](#), on page 152
- [Maximum Power Available for 3.5-kW Inputs \(AC\)](#), on page 153
- [Maximum Power Available for 3.5-kW Inputs \(DC\)](#), on page 157
- [Weights and Quantities for the Chassis, Modules, Fan Trays, and Power Supplies](#), on page 160
- [Transceivers, Connectors, and Cables Used with Each I/O Module](#), on page 162
- [Power Supply Cable Specifications](#), on page 190

## Environmental Specifications

| Environment       |                                      | Specification                                                                                  |
|-------------------|--------------------------------------|------------------------------------------------------------------------------------------------|
| Temperature       | Ambient operating                    | 32 to 104°F (0 to 40°C)                                                                        |
|                   | Ambient nonoperating                 | −40 to 158°F (−40 to 70°C)                                                                     |
| Relative humidity | Ambient (noncondensing) operating    | 8 to 80%                                                                                       |
|                   | Ambient (noncondensing) nonoperating | 5 to 90%                                                                                       |
| Altitude          | Operating                            | −500 to 13,123 feet (−152 to 4,000 meters), agency certified 0 to 6500 feet (0 to 1980 meters) |
|                   | Storage                              | −1,000 to 30,000 feet (−305 to 9,144 meters)                                                   |

## Switch Dimensions

| Switch Component                       | Width                 | Depth                 | Height                             |
|----------------------------------------|-----------------------|-----------------------|------------------------------------|
| Cisco Nexus 7718 chassis               | 17.3 inches (43.9 cm) | 35.0 inches (88.9 cm) | 45.25 inches (114.9 cm)<br>(26 RU) |
| Cable management system and front door | 18.3 inches (46.5 cm) | 6.5 inches (16.5 cm)  | — <sup>2</sup>                     |

<sup>2</sup> The total height of the cable management system is within the height of the chassis. The cable management system is added to the front of the chassis but does not add any height to the chassis.

## Power Requirements

**Table 4: Power Requirements for the Cisco Nexus 7718 Switch Modules**

| Component                                                      | Quantity                         | Maximum | Typical |
|----------------------------------------------------------------|----------------------------------|---------|---------|
| Supervisor Modules                                             | 1 or 2<br>(same type if using 2) | —       | —       |
| Supervisor 2 Enhanced (N77-SUP2E)                              |                                  | 265 W   | 137 W   |
| Supervisor 3 Enhanced (N77-SUP3E)                              |                                  | 150 W   | 110 W   |
| F2 I/O Modules                                                 | 1 to 16<br>(can mix types)       | —       | —       |
| 48-port 1- and 10-Gigabit Ethernet I/O module (N77-F248XP-23E) |                                  | 500 W   | 451 W   |
| F3 I/O Modules                                                 |                                  | —       | —       |
| 48-port 1- and 10-Gigabit Ethernet I/O module (N77-F348XP-23)  |                                  | 480 W   | 450 W   |
| 24-port 40-Gigabit Ethernet I/O module (N77-F324FQ-25)         |                                  | 740 W   | 650 W   |
| 12-port 100-Gigabit Ethernet I/O module (N77-F312CK-26)        |                                  | 730 W   | 640 W   |
| F4 I/O Module                                                  |                                  | —       | —       |
| 30-port 100-Gigabit Ethernet I/O module (N77-F430CQ-36)        |                                  | 1000 W  | 730 W   |
| M3 I/O Modules                                                 |                                  | —       | —       |
| 48-port 1- and 10-Gigabit Ethernet I/O module (N77-M348XP-23L) |                                  | 560 W   | 500 W   |
| 24-port 40-Gigabit Ethernet I/O module (N77-M324FQ-25L)        | 750 W                            | 700 W   |         |
| 12-port 100-Gigabit Ethernet I/O module (N77-M312CQ-26L)       | 1095 W                           | 800 W   |         |
| Fabric Module                                                  | 3 to 6                           | —       | —       |
| Fabric Module (N77-C7718-FAB-2)                                |                                  | 300 W   | 102 W   |

| Component                              | Quantity | Maximum | Typical |
|----------------------------------------|----------|---------|---------|
| Fan Trays                              | —        | —       | —       |
| 38 mm Gen 1 Fan Tray (N77-C7718-FAN)   | 3        | 900 W   | 51 W    |
| 76 mm Gen 2 Fan Tray (N77-C7718-FAN-2) | 3        | 900 W   | 51 W    |

## Maximum Power Available for 3-kW Power Supplies

The maximum power available for operations depends on the input power from your power source, the number and output capabilities of your power supplies, and the power redundancy mode that you use. The following table lists the amount of power available for 3-kW power supplies depending on power inputs, numbers of power supplies, and the mode used.

| Power Inputs    | Power Supplies | Combined Mode | Power Supply Redundancy Mode | Input Source Redundancy Mode | Full Redundancy Mode |
|-----------------|----------------|---------------|------------------------------|------------------------------|----------------------|
| 1 input (220 V) | 1              | 3000 W        | —                            | —                            | —                    |
|                 | 2              | 6000 W        | 3000 W                       | 3000 W                       | 3000 W               |
|                 | 3              | 9000 W        | 6000 W                       | 3000 W                       | 3000 W               |
|                 | 4              | 12000 W       | 9000 W                       | 6000 W                       | 6000 W               |
|                 | 5              | 15000 W       | 12000 W                      | 6000 W                       | 6000 W               |
|                 | 6              | 18000 W       | 15000 W                      | 9000 W                       | 9000 W               |
|                 | 7              | 21000 W       | 18000 W                      | 9000 W                       | 9000 W               |
|                 | 8              | 24000 W       | 21000 W                      | 12000 W                      | 12000 W              |
|                 | 9              | 27000 W       | 24000 W                      | 12000 W                      | 12000 W              |
|                 | 10             | 30000 W       | 27000 W                      | 15000 W                      | 15000 W              |
|                 | 11             | 33000 W       | 30000 W                      | 15000 W                      | 15000 W              |
|                 | 12             | 36000 W       | 33000 W                      | 18000 W                      | 18000 W              |
|                 | 13             | 39000 W       | 36000 W                      | 18000 W                      | 18000 W              |
|                 | 14             | 42000 W       | 39000 W                      | 21000 W                      | 21000 W              |
|                 | 15             | 45000 W       | 42000 W                      | 21000 W                      | 21000 W              |
|                 | 16             | 48000 W       | 45000 W                      | 24000 W                      | 24000 W              |

| Power Inputs    | Power Supplies | Combined Mode | Power Supply Redundancy Mode | Input Source Redundancy Mode | Full Redundancy Mode |
|-----------------|----------------|---------------|------------------------------|------------------------------|----------------------|
| 1 input (110 V) | 1              | 1450 W        | —                            | —                            | —                    |
|                 | 2              | 2900 W        | 1450 W                       | 1450 W                       | 1450 W               |
|                 | 3              | 4350 W        | 2900 W                       | 1450 W                       | 1450 W               |
|                 | 4              | 5800 W        | 4350 W                       | 2900 W                       | 2900 W               |
|                 | 5              | 7250 W        | 5800 W                       | 2900 W                       | 2900 W               |
|                 | 6              | 8700 W        | 7250 W                       | 4350 W                       | 4350 W               |
|                 | 7              | 10150 W       | 8700 W                       | 4350 W                       | 4350 W               |
|                 | 8              | 11600 W       | 10150 W                      | 5800 W                       | 5800 W               |
|                 | 9              | 13050 W       | 11600 W                      | 5800 W                       | 5800 W               |
|                 | 10             | 14500 W       | 13050 W                      | 7250 W                       | 7250 W               |
|                 | 11             | 15950 W       | 14500 W                      | 7250 W                       | 7250 W               |
|                 | 12             | 17400 W       | 15950 W                      | 8700 W                       | 8700 W               |
|                 | 13             | 18850 W       | 17400 W                      | 8700 W                       | 8700 W               |
|                 | 14             | 20300 W       | 18850 W                      | 10150 W                      | 10150 W              |
|                 | 15             | 21750 W       | 20300 W                      | 10150 W                      | 10150 W              |
|                 | 16             | 23200 W       | 21750 W                      | 11600 W                      | 11600 W              |

## Maximum Power Available for 3-kW DC Power Supplies

The maximum power available for operations depends on the input power from your power source, the number and output capabilities of your power supplies, and the power redundancy mode that you use. The following table lists the amount of power available for 3-kW DC power supplies depending on power inputs, numbers of power supplies, and the mode used.

| Power Inputs | Power Supplies | Combined Mode | Power Supply Redundancy Mode | Input Source Redundancy Mode | Full Redundancy Mode |
|--------------|----------------|---------------|------------------------------|------------------------------|----------------------|
| 1 input      | 1              | 3000 W        | —                            | —                            | —                    |
|              | 2              | 6000 W        | 3000 W                       | 3000 W                       | 3000 W               |
|              | 3              | 9000 W        | 6000 W                       | 3000 W                       | 3000 W               |
|              | 4              | 12000 W       | 9000 W                       | 6000 W                       | 6000 W               |
|              | 5              | 15000 W       | 12000 W                      | 6000 W                       | 6000 W               |
|              | 6              | 18000 W       | 15000 W                      | 9000 W                       | 9000 W               |
|              | 7              | 21000 W       | 18000 W                      | 9000 W                       | 9000 W               |
|              | 8              | 24000 W       | 21000 W                      | 12000 W                      | 12000 W              |
|              | 9              | 27000 W       | 24000 W                      | 12000 W                      | 12000 W              |
|              | 10             | 30000 W       | 27000 W                      | 15000 W                      | 15000 W              |
|              | 11             | 33000 W       | 30000 W                      | 15000 W                      | 15000 W              |
|              | 12             | 36000 W       | 33000 W                      | 18000 W                      | 18000 W              |
|              | 13             | 39000 W       | 36000 W                      | 18000 W                      | 18000 W              |
|              | 14             | 42000 W       | 39000 W                      | 21000 W                      | 21000 W              |
|              | 15             | 45000 W       | 42000 W                      | 21000 W                      | 21000 W              |
|              | 16             | 48000 W       | 45000 W                      | 24000 W                      | 24000 W              |

## Maximum Power Available for 3.5-kW Inputs (AC)

The maximum power available for operations depends on the input power from your power source, the number and output capabilities of your power supplies, and the power redundancy mode that you use. The following table lists the amount of power available for 3.5-kW HVAC/HVDC power supplies depending on AC power inputs, number of power supplies, and the mode used.

| Power Inputs    | Power Supplies | Combined Mode | Power Supply Redundancy Mode | Input Source Redundancy Mode | Full Redundancy Mode |
|-----------------|----------------|---------------|------------------------------|------------------------------|----------------------|
| 1 input (277 V) | 1              | 3500 W        | —                            | —                            | —                    |
|                 | 2              | 7000 W        | 3500 W                       | 3500 W                       | 3500 W               |
|                 | 3              | 10,500 W      | 7000 W                       | 3500 W                       | 3500 W               |
|                 | 4              | 14,000 W      | 10,500 W                     | 7000 W                       | 7000 W               |
|                 | 5              | 17,500 W      | 14,000 W                     | 7000 W                       | 7000 W               |
|                 | 6              | 21,000 W      | 17,500 W                     | 10,500 W                     | 10,500 W             |
|                 | 7              | 24,500 W      | 21,000 W                     | 10,500 W                     | 10,500 W             |
|                 | 8              | 28,000 W      | 24,500 W                     | 14,000 W                     | 14,000 W             |
|                 | 9              | 31,500 W      | 28,000 W                     | 14,000 W                     | 14,000 W             |
|                 | 10             | 35,000 W      | 31,500 W                     | 17,500 W                     | 17,500 W             |
|                 | 11             | 38,500 W      | 35,000 W                     | 17,500 W                     | 17,500 W             |
|                 | 12             | 42,000 W      | 38,500 W                     | 21,000 W                     | 21,000 W             |
|                 | 13             | 45,500 W      | 42,000 W                     | 21,000 W                     | 21,000 W             |
|                 | 14             | 49,000 W      | 45,500 W                     | 24,500 W                     | 24,500 W             |
|                 | 15             | 52,500 W      | 49,000 W                     | 24,500 W                     | 24,500 W             |
|                 | 16             | 56,000 W      | 52,500 W                     | 28,000 W                     | 28,000 W             |

| Power Inputs        | Power Supplies | Combined Mode | Power Supply Redundancy Mode | Input Source Redundancy Mode | Full Redundancy Mode |
|---------------------|----------------|---------------|------------------------------|------------------------------|----------------------|
| 1 input (220/230 V) | 1              | 3500 W        | —                            | —                            | —                    |
|                     | 2              | 7000 W        | 3500 W                       | 3500 W                       | 3500 W               |
|                     | 3              | 10,500 W      | 7000 W                       | 3500 W                       | 3500 W               |
|                     | 4              | 14,000 W      | 10,500 W                     | 7000 W                       | 7000 W               |
|                     | 5              | 17,500 W      | 14,000 W                     | 7000 W                       | 7000 W               |
|                     | 6              | 21,000 W      | 17,500 W                     | 10,500 W                     | 10,500 W             |
|                     | 7              | 24,500 W      | 21,000 W                     | 10,500 W                     | 10,500 W             |
|                     | 8              | 28,000 W      | 24,500 W                     | 14,000 W                     | 14,000 W             |
|                     | 9              | 31,500 W      | 28,000 W                     | 14,000 W                     | 14,000 W             |
|                     | 10             | 35,000 W      | 31,500 W                     | 17,500 W                     | 17,500 W             |
|                     | 11             | 38,500 W      | 35,000 W                     | 17,500 W                     | 17,500 W             |
|                     | 12             | 42,000 W      | 38,500 W                     | 21,000 W                     | 21,000 W             |
|                     | 13             | 45,500 W      | 42,000 W                     | 21,000 W                     | 21,000 W             |
|                     | 14             | 49,000 W      | 45,500 W                     | 24,500 W                     | 24,500 W             |
|                     | 15             | 52,500 W      | 49,000 W                     | 24,500 W                     | 24,500 W             |
|                     | 16             | 56,000 W      | 52,500 W                     | 28,000 W                     | 28,000 W             |

| Power Inputs    | Power Supplies | Combined Mode | Power Supply Redundancy Mode | Input Source Redundancy Mode | Full Redundancy Mode |
|-----------------|----------------|---------------|------------------------------|------------------------------|----------------------|
| 1 input (210 V) | 1              | 3100 W        | —                            | —                            | —                    |
|                 | 2              | 6200 W        | 3100 W                       | 3100 W                       | 3100 W               |
|                 | 3              | 9300 W        | 6200 W                       | 3100 W                       | 3100 W               |
|                 | 4              | 12,400 W      | 9300 W                       | 6200 W                       | 6200 W               |
|                 | 5              | 15,500 W      | 12,400 W                     | 6200 W                       | 6200 W               |
|                 | 6              | 18,600 W      | 15,500 W                     | 9300 W                       | 9300 W               |
|                 | 7              | 21,700 W      | 18,600 W                     | 9300 W                       | 9300 W               |
|                 | 8              | 24,800 W      | 21,700 W                     | 12,400 W                     | 12,400 W             |
|                 | 9              | 27,900 W      | 24,800 W                     | 12,400 W                     | 12,400 W             |
|                 | 10             | 31,000 W      | 27,900 W                     | 15,500 W                     | 15,500 W             |
|                 | 11             | 34,100 W      | 31,000 W                     | 15,500 W                     | 15,500 W             |
|                 | 12             | 37,200 W      | 34,100 W                     | 18,600 W                     | 18,600 W             |
|                 | 13             | 40,300 W      | 37,200 W                     | 18,600 W                     | 18,600 W             |
|                 | 14             | 43,400 W      | 40,300 W                     | 21,700 W                     | 21,700 W             |
|                 | 15             | 46,500 W      | 43,400 W                     | 21,700 W                     | 21,700 W             |
|                 | 16             | 49,600 W      | 46,500 W                     | 24,800 W                     | 24,800 W             |



| Power Inputs    | Power Supplies | Combined Mode | Power Supply Redundancy Mode | Input Source Redundancy Mode | Full Redundancy Mode |
|-----------------|----------------|---------------|------------------------------|------------------------------|----------------------|
| 1 input (110 V) | 1              | 1500 W        | —                            | —                            | —                    |
|                 | 2              | 3000 W        | 1500 W                       | 1500 W                       | 1500 W               |
|                 | 3              | 4500 W        | 3000 W                       | 1500 W                       | 1500 W               |
|                 | 4              | 6000 W        | 4500 W                       | 3000 W                       | 3000 W               |
|                 | 5              | 7500 W        | 6000 W                       | 3000 W                       | 3000 W               |
|                 | 6              | 9000 W        | 7500 W                       | 4500 W                       | 4500 W               |
|                 | 7              | 10,500 W      | 9000 W                       | 4500 W                       | 4500 W               |
|                 | 8              | 12,000 W      | 10,500 W                     | 6000 W                       | 6000 W               |
|                 | 9              | 13,500 W      | 12,000 W                     | 6000 W                       | 6000 W               |
|                 | 10             | 15,000 W      | 13,500 W                     | 7500 W                       | 7500 W               |
|                 | 11             | 16,500 W      | 15,000 W                     | 7500 W                       | 7500 W               |
|                 | 12             | 18,000 W      | 16,500 W                     | 9000 W                       | 9000 W               |
|                 | 13             | 19,500 W      | 18,000 W                     | 9000 W                       | 9000 W               |
|                 | 14             | 21,000 W      | 19,500 W                     | 10,500 W                     | 10,500 W             |
|                 | 15             | 22,500 W      | 21,000 W                     | 10,500 W                     | 10,500 W             |
|                 | 16             | 24,000 W      | 22,500 W                     | 12,000 W                     | 12,000 W             |



**Note** A combination of 3-kW AC and 3.5-kW HVAC/HVDC power supplies can be used.

## Maximum Power Available for 3.5-kW Inputs (DC)

The maximum power available for operations depends on the input power from your power source, the number and output capabilities of your power supplies, and the power redundancy mode that you use. The following table lists the amount of power available for 3.5-kW HVAC/HVDC power supplies depending on DC power inputs, number of power supplies, and the mode used.

| Power Inputs    | Power Supplies | Combined Mode | Power Supply Redundancy Mode | Input Source Redundancy Mode | Full Redundancy Mode |
|-----------------|----------------|---------------|------------------------------|------------------------------|----------------------|
| 1 input (380 V) | 1              | 3500 W        | —                            | —                            | —                    |
|                 | 2              | 7000 W        | 3500 W                       | 3500 W                       | 3500 W               |
|                 | 3              | 10,500 W      | 7000 W                       | 3500 W                       | 3500 W               |
|                 | 4              | 14,000 W      | 10,500 W                     | 7000 W                       | 7000 W               |
|                 | 5              | 17,500 W      | 14,000 W                     | 7000 W                       | 7000 W               |
|                 | 6              | 21,000 W      | 17,500 W                     | 10,500 W                     | 10,500 W             |
|                 | 7              | 24,500 W      | 21,000 W                     | 10,500 W                     | 10,500 W             |
|                 | 8              | 28,000 W      | 24,500 W                     | 14,000 W                     | 14,000 W             |
|                 | 9              | 31,500 W      | 28,000 W                     | 14,000 W                     | 14,000 W             |
|                 | 10             | 35,000 W      | 31,500 W                     | 17,500 W                     | 17,500 W             |
|                 | 11             | 38,500 W      | 35,000 W                     | 17,500 W                     | 17,500 W             |
|                 | 12             | 42,000 W      | 38,500 W                     | 21,000 W                     | 21,000 W             |
|                 | 13             | 45,500 W      | 42,000 W                     | 21,000 W                     | 21,000 W             |
|                 | 14             | 49,000 W      | 45,500 W                     | 24,500 W                     | 24,500 W             |
|                 | 15             | 52,500 W      | 49,000 W                     | 24,500 W                     | 24,500 W             |
|                 | 16             | 56,000 W      | 52,500 W                     | 28,000 W                     | 28,000 W             |

| Power Inputs        | Power Supplies | Combined Mode | Power Supply Redundancy Mode | Input Source Redundancy Mode | Full Redundancy Mode |
|---------------------|----------------|---------------|------------------------------|------------------------------|----------------------|
| 1 input (220/240 V) | 1              | 3500 W        | —                            | —                            | —                    |
|                     | 2              | 7000 W        | 3500 W                       | 3500 W                       | 3500 W               |
|                     | 3              | 10,500 W      | 7000 W                       | 3500 W                       | 3500 W               |
|                     | 4              | 14,000 W      | 10,500 W                     | 7000 W                       | 7000 W               |
|                     | 5              | 17,500 W      | 14,000 W                     | 7000 W                       | 7000 W               |
|                     | 6              | 21,000 W      | 17,500 W                     | 10,500 W                     | 10,500 W             |
|                     | 7              | 24,500 W      | 21,000 W                     | 10,500 W                     | 10,500 W             |
|                     | 8              | 28,000 W      | 24,500 W                     | 14,000 W                     | 14,000 W             |
|                     | 9              | 31,500 W      | 28,000 W                     | 14,000 W                     | 14,000 W             |
|                     | 10             | 35,000 W      | 31,500 W                     | 17,500 W                     | 17,500 W             |
|                     | 11             | 38,500 W      | 35,000 W                     | 17,500 W                     | 17,500 W             |
|                     | 12             | 42,000 W      | 38,500 W                     | 21,000 W                     | 21,000 W             |
|                     | 13             | 45,500 W      | 42,000 W                     | 21,000 W                     | 21,000 W             |
|                     | 14             | 49,000 W      | 45,500 W                     | 24,500 W                     | 24,500 W             |
|                     | 15             | 52,500 W      | 49,000 W                     | 24,500 W                     | 24,500 W             |
|                     | 16             | 56,000 W      | 52,500 W                     | 28,000 W                     | 28,000 W             |

| Power Inputs    | Power Supplies | Combined Mode | Power Supply Redundancy Mode | Input Source Redundancy Mode | Full Redundancy Mode |
|-----------------|----------------|---------------|------------------------------|------------------------------|----------------------|
| 1 input (210 V) | 1              | 3100 W        | —                            | —                            | —                    |
|                 | 2              | 6200 W        | 3100 W                       | 3100 W                       | 3100 W               |
|                 | 3              | 9300 W        | 6200 W                       | 3100 W                       | 3100 W               |
|                 | 4              | 12,400 W      | 9300 W                       | 6200 W                       | 6200 W               |
|                 | 5              | 15,500 W      | 12,400 W                     | 6200 W                       | 6200 W               |
|                 | 6              | 18,600 W      | 15,500 W                     | 9300 W                       | 9300 W               |
|                 | 7              | 21,700 W      | 18,600 W                     | 9300 W                       | 9300 W               |
|                 | 8              | 24,800 W      | 21,700 W                     | 12,400 W                     | 12,400 W             |
|                 | 9              | 27,900 W      | 24,800 W                     | 12,400 W                     | 12,400 W             |
|                 | 10             | 31,000 W      | 27,900 W                     | 15,500 W                     | 15,500 W             |
|                 | 11             | 34,100 W      | 31,000 W                     | 15,500 W                     | 15,500 W             |
|                 | 12             | 37,200 W      | 34,100 W                     | 18,600 W                     | 18,600 W             |
|                 | 13             | 40,300 W      | 37,200 W                     | 18,600 W                     | 18,600 W             |
|                 | 14             | 43,400 W      | 40,300 W                     | 21,700 W                     | 21,700 W             |
|                 | 15             | 46,500 W      | 43,400 W                     | 21,700 W                     | 21,700 W             |
|                 | 16             | 49,600 W      | 46,500 W                     | 24,800 W                     | 24,800 W             |



**Note** A combination of 3-kW DC and 3.5-kW HVAC/HVDC power supplies can be used.

## Weights and Quantities for the Chassis, Modules, Fan Trays, and Power Supplies

| Component                            | Weight per Unit   | Quantity |
|--------------------------------------|-------------------|----------|
| Cisco Nexus 7718 Chassis (N77-C7718) | 300.0 lb (136 kg) | 1        |
| Supervisor module (N77-SUP2E)        | 8.5 lb (3.9 kg)   | 1 or 2   |
| Supervisor module (N77-SUP3E)        | 7.7 lb (3.5 kg)   | 1 or 2   |

| Component                                                      | Weight per Unit    | Quantity |
|----------------------------------------------------------------|--------------------|----------|
| F2 Series I/O Module                                           | —                  | 1 to 16  |
| 48-port 1- and 10-Gigabit Ethernet I/O module (N77-F248XP-23E) | 17.0 lb (7.7 kg)   |          |
| F3 Series I/O Modules                                          | —                  | 1 to 16  |
| 48-port 1- and 10-Gigabit Ethernet I/O module (N77-F348XP-23)  | 17.0 lb (7.7 kg)   |          |
| 24-port 40-Gigabit Ethernet I/O module (N77-F324FQ-25)         | 17.0 lb (7.7 kg)   |          |
| 12-port 100-Gigabit Ethernet I/O module (N77-F312CK-26)        | 21.0 lb (9.5 kg)   |          |
| F4 Series I/O Module                                           | —                  | 1 to 16  |
| 30-port 100-Gigabit Ethernet I/O module (N77-F430CQ-36)        | 23.14 lb (10.5 kg) |          |
| M3 Series I/O Modules                                          | —                  | 1 to 16  |
| 48-port 1- and 10-Gigabit Ethernet I/O module (N77-M348XP-23L) | 18.95 lb (8.60 kg) |          |
| 24-port 40-Gigabit Ethernet I/O module (N77-M324FQ-25L)        | 18.0 lb (8.16 kg)  |          |
| 12-port 100-Gigabit Ethernet I/O module (N77-M312CQ-26L)       | 22.44 lb (10.18kg) |          |
| Fabric Modules                                                 | —                  | 3 to 6   |
| Fabric-2 module (N77-C7718-FAB-2)                              | 20.0 lb (9.1 kg)   |          |
| Fan Trays                                                      | —                  | 3        |
| 38 mm Gen 1 Fan Tray (N77-C7718-FAN)                           | 13.5 lb (6.1 kg)   |          |
| 76 mm Gen 2 Fan Tray (N77-C7718-FAN-2)                         | 17.75 lb (8 kg)    |          |
| Power Supplies                                                 | —                  | 1 to 16  |
| 3-kW AC power supply (N77-AC-3KW)                              | 5.0 lb (2.3 kg)    |          |
| 3-kW DC power supply (N77-DC-3KW)                              | 11.0 lb (5.0 kg)   |          |
| 3.5-kW HVAC/HVDC power supply (N77-HV-3.5KW)                   | 11.0 lb (5.0 kg)   |          |
| Optional Components                                            | —                  | —        |
| Front doors (N77-C7718-FDK)                                    |                    | 0 or 1   |

# Transceivers, Connectors, and Cables Used with Each I/O Module

Table 5: F2-Series 48-Port 1- and 10-Gigabit Ethernet with XL (N77-F248XP-23E) Transceivers and Cables

| Port Type | Transceiver or Connector                                                                                     | Cable Type                                     |
|-----------|--------------------------------------------------------------------------------------------------------------|------------------------------------------------|
| FET       | FET-10G                                                                                                      | <sup>3</sup> Fabric Exchange Transceiver (FET) |
| SFP+      | DWDM-SFP10G-xx.xx<br>SFP-10G-ER<br>SFP-10G-LR<br>SFP-10G-LRM<br>SFP-10G-SR<br>SFP-10G-ZR <sup>4</sup>        | Fiber optic                                    |
|           | SFP-10G-AOC1M<br>SFP-10G-AOC3M<br>SFP-10G-AOC5M<br>SFP-10G-AOC7M<br>SFP-10G-AOC10M                           | Active optical cable assembly                  |
|           | SFP-H10GB-CU1M<br>SFP-H10GB-CU1-5M<br>SFP-H10GB-CU2M<br>SFP-H10GB-CU2-5M<br>SFP-H10GB-CU3M<br>SFP-H10GB-CU5M | Twinax cable, active assembly                  |

| Port Type | Transceiver or Connector                                                                                                           | Cable Type  |
|-----------|------------------------------------------------------------------------------------------------------------------------------------|-------------|
| SFP       | CWDM-SFP-xxxx<br>DWDM-SFP-xxxx<br>GLC-BX-D<br>GLC-BX-U<br>GLC-EX-SMD<br>GLC-LH-SMD<br>GLC-SX-MMD<br>GLC-T<br>GLC-ZX-SM<br>SFP-GE-T | Fiber Optic |

<sup>3</sup> FETs are used only when connecting this I/O module to a Fabric Extender (FEX).

<sup>4</sup> Requires Version 2 or later version.

**Table 6: F3 Series 48-port, 1- and 10-Gigabit Ethernet (N77-F348XP-23) Transceivers and Cables**

| Port Type | Transceiver or Connector | Cable Type                                                                    |
|-----------|--------------------------|-------------------------------------------------------------------------------|
| FET       | FET-10G                  | 10-Gigabit Fabric Extender Transceiver (FET) for FEX connections <sup>5</sup> |

| Port Type        | Transceiver or Connector      | Cable Type                     |
|------------------|-------------------------------|--------------------------------|
| SFP+             | SFP-10G-SR                    | Multi-mode fiber (MMF)         |
|                  | DWDM-SFP10G-xx.xx             | Single-mode fiber (SMF)        |
|                  | SFP-10G-ER                    |                                |
|                  | SFP-10G-LR                    |                                |
|                  | SFP-10G-LRM                   |                                |
|                  | SFP-10G-ZR                    |                                |
|                  | SFP-H10GB-CU1M                | Twinax cable assembly, passive |
| SFP-H10GB-CU1-5M |                               |                                |
| SFP-H10GB-CU2M   |                               |                                |
| SFP-H10GB-CU2-5M |                               |                                |
| SFP-H10GB-CU3M   |                               |                                |
| SFP-H10GB-CU5M   | Twinax cable assembly, active |                                |
| SFP-H10GB-ACU7M  |                               |                                |
| SFP-H10GB-ACU10M | Active optical cable assembly |                                |
| SFP-10G-AOC1M    |                               |                                |
| SFP-10G-AOC3M    |                               |                                |
| SFP-10G-AOC5M    |                               |                                |
| SFP-10G-AOC7M    |                               |                                |
| SFP-10G-AOC10M   |                               |                                |

<sup>5</sup> FETs are used only when connecting this I/O module to a Fabric Extender (FEX).

**Table 7: F3 Series 24-port, 40-Gigabit Ethernet (N77-F324FQ-25) Transceivers and Cables**

| Port Type | Transceiver or Connector | Cable Type                                                                    |
|-----------|--------------------------|-------------------------------------------------------------------------------|
| FET       | FET-40G                  | 40-Gigabit Fabric Extender Transceiver (FET) for FEX connections <sup>6</sup> |



| Port Type | Transceiver or Connector                                                                                              | Cable Type                                                                       |
|-----------|-----------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|
| QSFP+     | QSFP-40G-CSR4<br>QSFP-40G-SR4<br>QSFP-40G-SR-BD                                                                       | Multi-mode fiber (MMF)                                                           |
|           | QSFP-40G-LR4                                                                                                          | Single-mode fiber (SMF)                                                          |
|           | QSFP-H40G-ACU7M<br>QSFP-H40G-ACU10M                                                                                   | Direct attach copper, active                                                     |
|           | QSFP-4X10G-AC7M<br>QSFP-4X10G-AC10M                                                                                   | 40GBASE-CR4 QSFP+ to four SFP+ Twinax direct attach copper breakout cable active |
|           | QSFP-H40G-AOC1M<br>QSFP-H40G-AOC2M<br>QSFP-H40G-AOC3M<br>QSFP-H40G-AOC5M<br>QSFP-H40G-AOC7M<br>QSFP-H40G-AOC10M       | 40GBASE-AOC (Active Optical Cable) QSFP+ cable                                   |
|           | QSFP-4X10G-AOC1M<br>QSFP-4X10G-AOC2M<br>QSFP-4X10G-AOC3M<br>QSFP-4X10G-AOC5M<br>QSFP-4X10G-AOC7M<br>QSFP-4X10G-AOC10M | 40GBASE-AOC QSFP+ to four SFP+ breakout cable                                    |

<sup>6</sup> FETs are used only when connecting this I/O module to a Fabric Extender (FEX).

**Table 8: F3 Series 12-port, 100-Gigabit Ethernet (N77-F312CK-26) Transceivers and Cables**

| Port Type | Transceiver or Connector | Cable Type              |
|-----------|--------------------------|-------------------------|
| CPAK      | CPAK-100G-SR10           | Multi-mode fiber (MMF)  |
|           | CPAK-100G-LR4            | Single-mode fiber (SMF) |

**Table 9: F4 Series 30-port, 100-Gigabit Ethernet (N77-F430CQ-36) Transceivers and Cables**

| Port Type | Transceiver or Connector | Cable Type                                                       |
|-----------|--------------------------|------------------------------------------------------------------|
| FET       | FET-40G                  | 40-Gigabit Fabric Extender Transceiver (FET) for FEX connections |

| Port Type      | Transceiver or Connector                                                                                              | Cable Type                                                          |
|----------------|-----------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|
| QSFP+ (QSFP28) | QSFP-100G-SR4-S<br>QSFP-40G-CSR4<br>QSFP-40G-SR4<br>QSFP-40G-SR4-S                                                    | Multi-mode fiber (MMF), supports breakout                           |
|                | QSFP-40G-SR-BD<br>QSFP-40/100-SRBD                                                                                    | Multi-mode fiber (MMF), no breakout support                         |
|                | QSFP-100G-CWDM4-S<br>QSFP-100G-PSM4-S<br>QSFP-100G-LR4-S<br>QSFP-40G-ER4<br>QSFP-40G-LR4<br>QSFP-4x10G-LR-S           | Single-mode fiber (MMF), supports breakout                          |
|                | QSFP-4X10G-AOC1M<br>QSFP-4X10G-AOC2M<br>QSFP-4X10G-AOC3M<br>QSFP-4X10G-AOC5M<br>QSFP-4X10G-AOC7M<br>QSFP-4X10G-AOC10M | QSFP to four SFP+ active optical breakout cables, supports breakout |
|                |                                                                                                                       | Active optical cable assembly, supports breakout                    |
|                |                                                                                                                       |                                                                     |

| Port Type | Transceiver or Connector | Cable Type |
|-----------|--------------------------|------------|
|           | QSFP-100G-AOC1M          |            |
|           | QSFP-100G-AOC2M          |            |
|           | QSFP-100G-AOC3M          |            |
|           | QSFP-100G-AOC5M          |            |
|           | QSFP-100G-AOC7M          |            |
|           | QSFP-100G-AOC10M         |            |
|           | QSFP-100G-AOC15M         |            |
|           | QSFP-100G-AOC20M         |            |
|           | QSFP-100G-AOC25M         |            |
|           | QSFP-100G-AOC30M         |            |
|           | QSFP-H40G-AOC1M          |            |
|           | QSFP-H40G-AOC2M          |            |
|           | QSFP-H40G-AOC3M          |            |
|           | QSFP-H40G-AOC5M          |            |
|           | QSFP-H40G-AOC7M          |            |
|           | QSFP-H40G-AOC10M         |            |
|           | QSFP-H40G-AOC15M         |            |

Table 10: M3 Series 48-port, 1- and 10-Gigabit Ethernet (N77-M348XP-23L) Transceivers and Cables

| Port Type | Transceiver or Connector                                                                                                                                                                 | Cable Type              |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|
| SFP       | GLC-TE                                                                                                                                                                                   | Category 5              |
|           | GLC-LH-SMD<br>GLC-SX-MMD                                                                                                                                                                 | Multi-mode fiber (MMF)  |
|           | CWDM-SFP-xxxx<br><b>Note</b> CWDM-SFP-xxxx is supported only with 1-Gigabit Ethernet I/O modules.<br><br>DWDM-SFP-xxxx<br>GLC-BX-U<br>GLC-BX-D<br>GLC-EX-SMD<br>GLC-LH-SMD<br>GLC-ZX-SMD | Single-mode fiber (SMF) |

| Port Type | Transceiver or Connector                                                                                     | Cable Type                     |
|-----------|--------------------------------------------------------------------------------------------------------------|--------------------------------|
| SFP+      | SFP-10G-SR                                                                                                   | Multi-mode fiber (MMF)         |
|           | DWDM-SFP10G-xx.xx<br><b>Note</b> DWDM-SFP10G-C is not supported.                                             | Single-mode fiber (SMF)        |
|           | SFP-10G-BXD-I                                                                                                |                                |
|           | SFP-10G-BXU-I                                                                                                |                                |
|           | SFP-10G-ER                                                                                                   |                                |
|           | SFP-10G-LR                                                                                                   |                                |
|           | SFP-10G-LRM                                                                                                  |                                |
|           | SFP-10G-ZR                                                                                                   |                                |
|           | SFP-H10GB-CU1M<br>SFP-H10GB-CU1-5M<br>SFP-H10GB-CU2M<br>SFP-H10GB-CU2-5M<br>SFP-H10GB-CU3M<br>SFP-H10GB-CU5M | Twinax cable assembly, passive |
|           | SFP-H10GB-ACU7M<br>SFP-H10GB-ACU10M                                                                          | Twinax cable assembly, active  |
|           | SFP-10G-AOC1M<br>SFP-10G-AOC2M<br>SFP-10G-AOC3M<br>SFP-10G-AOC5M<br>SFP-10G-AOC7M<br>SFP-10G-AOC10M          | Active optical cable assembly  |

Table 11: M3 Series 24-port, 40-Gigabit Ethernet (N77-M324FQ-25L) Transceivers and Cables

| Port Type        | Transceiver or Connector      | Cable Type                          |
|------------------|-------------------------------|-------------------------------------|
| QSFP+            | QSFP-40G-CSR4                 | Multi-mode fiber (MMF)              |
|                  | QSFP-40G-SR4                  |                                     |
|                  | QSFP-40G-SR4-S                |                                     |
|                  | QSFP-40G-SR-BD                |                                     |
|                  | QSFP-40G-ER4                  | Single-mode fiber (SMF)             |
|                  | QSFP-40G-LR4                  |                                     |
|                  | QSFP-40G-LR4-S                |                                     |
|                  | QSFP-4x10G-LR-S               |                                     |
|                  | WSP-Q40G-LR4L                 |                                     |
|                  | QSFP-4X10G-AC7M               | Direct-attach copper cable assembly |
|                  | QSFP-4X10G-AC10M              |                                     |
|                  | QSFP-4X10G-AOC1M              | Active optical cable assembly       |
|                  | QSFP-4X10G-AOC2M              |                                     |
|                  | QSFP-4X10G-AOC3M              |                                     |
|                  | QSFP-4X10G-AOC5M              |                                     |
|                  | QSFP-4X10G-AOC7M              |                                     |
|                  | QSFP-4X10G-AOC10M             |                                     |
|                  | QSFP-H40G-ACU7M               | Direct attach copper, active        |
| QSFP-H40G-ACU10M |                               |                                     |
| QSFP-H40G-AOC1M  | Active optical cable assembly |                                     |
| QSFP-H40G-AOC2M  |                               |                                     |
| QSFP-H40G-AOC3M  |                               |                                     |
| QSFP-H40G-AOC5M  |                               |                                     |
| QSFP-H40G-AOC7M  |                               |                                     |
| QSFP-H40G-AOC10M |                               |                                     |
| QSFP-H40G-AOC15M |                               |                                     |

Table 12: M3 Series 12-port, 100-Gigabit Ethernet (N77-M312CQ-26L) Transceivers and Cables

| Port Type         | Transceiver or Connector                         | Cable Type                    |
|-------------------|--------------------------------------------------|-------------------------------|
| QSFP+ (QSFP28)    | QSFP-100G-SR4-S                                  | Multi-mode fiber (MMF)        |
|                   | QSFP-40G-CSR4                                    |                               |
|                   | QSFP-40G-SR4                                     |                               |
|                   | QSFP-40G-SR4-S                                   |                               |
|                   | QSFP-40/100-SRBD                                 |                               |
|                   | QSFP-40G-SR-BD                                   |                               |
|                   | QSFP-100G-CWDM4-S                                | Single-mode fiber (SMF)       |
|                   | QSFP-100G-PSM4-S                                 |                               |
|                   | QSFP-100G-LR4-S                                  |                               |
|                   | QSFP-40G-ER4                                     |                               |
|                   | QSFP-40G-LR4                                     |                               |
|                   | QSFP-4x10G-LR-S                                  |                               |
|                   | QSFP-H40G-ACU7M                                  | Direct attach copper, active  |
| QSFP-H40G-ACU10M  |                                                  |                               |
| QSFP-4X10G-AOC1M  | QSFP to four SFP+ active optical breakout cables |                               |
| QSFP-4X10G-AOC2M  |                                                  |                               |
| QSFP-4X10G-AOC3M  |                                                  |                               |
| QSFP-4X10G-AOC5M  |                                                  |                               |
| QSFP-4X10G-AOC7M  |                                                  |                               |
| QSFP-4X10G-AOC10M |                                                  |                               |
| QSFP-4X10G-AC7M   | QSFP to 4 SFP+ copper break-out cables           |                               |
| QSFP-4X10G-AC10M  |                                                  |                               |
|                   |                                                  | Active optical cable assembly |

| Port Type | Transceiver or Connector | Cable Type |
|-----------|--------------------------|------------|
|           | QSFP-100G-AOC1M          |            |
|           | QSFP-100G-AOC2M          |            |
|           | QSFP-100G-AOC3M          |            |
|           | QSFP-100G-AOC5M          |            |
|           | QSFP-100G-AOC7M          |            |
|           | QSFP-100G-AOC10M         |            |
|           | QSFP-100G-AOC15M         |            |
|           | QSFP-100G-AOC20M         |            |
|           | QSFP-100G-AOC25M         |            |
|           | QSFP-100G-AOC30M         |            |
|           | QSFP-H40G-AOC1M          |            |
|           | QSFP-H40G-AOC2M          |            |
|           | QSFP-H40G-AOC3M          |            |
|           | QSFP-H40G-AOC5M          |            |
|           | QSFP-H40G-AOC7M          |            |
|           | QSFP-H40G-AOC10M         |            |
|           | QSFP-H40G-AOC15M         |            |

## 100-Gb CPAK Transceiver Specifications

The 100-Gigabit CPAK transceivers are used with the F3-Series 100-Gigabit I/O module (N77-F312CK-26).

For the cable specifications that apply to these transceivers, see the following table.

| Transceiver   | Cable Type | Connector Type   | Wavelength (nm) | Core Size (microns) | Modal Bandwidth (MHz-km) | Maximum Cable Distance |
|---------------|------------|------------------|-----------------|---------------------|--------------------------|------------------------|
| CPAK-100GLR4  | SMF        | LC Duplex        | 1310            | G.652               | —                        | 6.21 miles (10 km)     |
| CPAK-100GSR10 | MMF        | 24-fiber MPO/MTP | 850             | 50.0                | 2000 (OM3)               | 328 feet (100 m)       |
|               |            |                  |                 | 50.0                | 4700 (OM4)               | 492 feet (150 m)       |

For the environmental specifications, see the following table.

| Parameter                   | Specification                  |
|-----------------------------|--------------------------------|
| Storage temperature         | −40 to 158°F (−40 to 70°C)     |
| Operating temperature       | 32 to 104°F (0 to 40°C)        |
| Storage relative humidity   | 5 to 95 percent, noncondensing |
| Operating relative humidity | 5 to 90 percent, noncondensing |

## 100-Gb QSFP+ Transceiver Specifications



**Note** The 100-Gigabit QSFP+ transceivers are used with the M3-Series 100-Gigabit I/O module (N77-M312CQ-26L) and the F4-Series 100-Gigabit Ethernet I/O module (N77-F430CQ-36). These I/O modules support Forward Error Correction (FEC) with the 100-Gigabit QSFP+ transceivers. For more information, refer [FEC Support on Optic Modules](#).

For the cable specifications that apply to these transceivers, see the following table.

| Transceiver       | Cable Type           | Connector Type | Wavelength (nm)        | Core Size (microns) | Modal Bandwidth (MHz-km) | Maximum Cable Distance                                                                                                                                                                 |
|-------------------|----------------------|----------------|------------------------|---------------------|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| QSFP-100G-SR4-S   | MMF                  | 12-fiber MPO   | 850                    | 50.0<br>50.0        | 2000 (OM3)<br>4700 (OM4) | 230 feet (70 m) over OM3 Multimode Fiber<br>328 feet (100 m) over OM4 Multimode Fiber                                                                                                  |
| QSFP-100G-LR4-S   | SMF                  | LC Duplex      | 1295, 1300, 1304, 1309 | G.652               | —                        | 6.21 miles (10 km)                                                                                                                                                                     |
| QSFP-100G-CWDM4-S | SMF                  | LC Duplex      | 1271, 1291, 1311, 1331 | G.652               | —                        | 1.24 miles (2 km)                                                                                                                                                                      |
| QSFP-100G-PSM4-S  | SMF                  | 12-fiber MPO   | 1310                   | G.652               | —                        | 1640 feet (500 m)                                                                                                                                                                      |
| QSFP-100G-AOCxM   | Active optical cable | QSFP+ to QSFP+ | —                      | —                   | —                        | 3.3 feet (1 m)<br>6.6 feet (2 m)<br>9.8 feet (3 m)<br>16.4 feet (5 m)<br>23 feet (7 m)<br>33 feet (10 m)<br>49.4 feet (15 m)<br>65.6 feet (20 m)<br>82 feet (25 m)<br>98.4 feet (30 m) |
| QSFP-40/100-SRBD  | MMF                  | LC             | 855, 908               | 50.0<br>50.0        | 2000 (OM3)<br>4700 (OM4) | 230 feet (70 m)<br>328 feet (100m)                                                                                                                                                     |

For the optical specifications, see the following table.



Table 13:

| Transceiver       | Transceiver Type | Transmit Power (dBm)                                                                   | Receive Power (dBm)                                                                    | Transmit and Receive Wavelength (nm) |
|-------------------|------------------|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|--------------------------------------|
| QSFP-100G-SR4-S   | QSFP+            | 2.4 (maximum per lane)<br>-8.4 (minimum per lane)                                      | 2.4 (maximum per lane)<br>-5.2 (minimum per lane)                                      | 840 to 860 nm                        |
| QSFP-100G-LR4-S   | QSFP+            | 4.5 (maximum per lane)<br>-4.3 (minimum per lane)                                      | 4.5 (maximum per lane)<br>-8.6 (minimum per lane)                                      | Four lanes: 1295, 1300, 1304, 1309   |
| QSFP-100G-CWDM4-S | QSFP+            | 2.5 (maximum per lane)<br>-6.5 (minimum per lane)                                      | 2.5 (maximum per lane)<br>-10 (minimum per lane)                                       | Four lanes: 1271, 1291, 1311, 1331   |
| QSFP-100G-PSM4-S  | QSFP+            | 2.9 (maximum per lane)<br>-9.4 (minimum per lane)                                      | 2 (maximum per lane)<br>-26 (minimum per lane)                                         | 1295 to 1325                         |
| QSFP-40/100G-SRBD | QSFP+            | +4 (100G), +5 (40G)<br>(maximum per lane)<br>-6 (100G), -4 (40G)<br>(minimum per lane) | 4 (100G), 5 (40G)<br>(maximum per lane)<br>-7.9 (100G), -6<br>(40G) (minimum per lane) | 855, 908                             |

For the environmental specifications, see the following table.

| Parameter                 | Specification              |
|---------------------------|----------------------------|
| Storage temperature       | -40 to 185°F (-40 to 85°C) |
| Operating temperature     | 32 to 158°F (0 to 70°C)    |
| Case temperature          | -40 to 158°F (-40 to 70°C) |
| Storage relative humidity | 5 to 95 percent            |

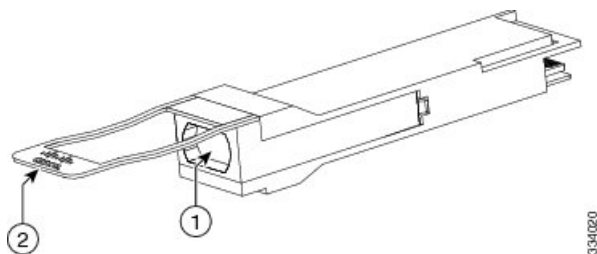
## 40-Gb QSFP+ Transceiver Specifications



**Note** The 40-Gigabit QSFP+ transceivers are used with the F3-Series 40-Gigabit I/O modules (N77-F324FQ-25), F4-Series 100-Gigabit I/O modules (N77-F430CQ-36), M3-Series 40-Gigabit I/O modules (N77-M324FQ-25L), and the M3-Series 100-Gigabit I/O modules (N77-M312CQ-26L).

The following figure identifies the major features of these transceivers.

**Figure 36:**



|   |              |   |          |
|---|--------------|---|----------|
| 1 | Optical bore | 2 | Pull tab |
|---|--------------|---|----------|

For the cable specifications that apply to these transceivers, see the following table.

| Transceiver                                                                             | Cable Type                   | Connector Type | Wavelength (nm) | Core Size (microns)  | Modal Bandwidth (MHz-km) | Maximum Cable Distance                                                                                                       |
|-----------------------------------------------------------------------------------------|------------------------------|----------------|-----------------|----------------------|--------------------------|------------------------------------------------------------------------------------------------------------------------------|
| FET-40G<br><b>Note</b> FET-40G is not supported with N77-M324FQ-25L and N77-M312CQ-26L. | MMF                          | QSFP+ to QSFP+ | 850             | 50.0<br>50.0<br>50.0 | 500<br>2000<br>4700      | 98 feet (30 m)<br>328 feet (100 m)<br>328 feet (100 m)                                                                       |
| QSFP-H40G-ACUxM                                                                         | Direct attach copper, active | QSFP+ to QSFP+ | —               | —                    | —                        | 23 feet (7 m)<br>33 feet (10 m)                                                                                              |
| QSFP-H40G-AOCxM                                                                         | Active optical cable         | QSFP+ to QSFP+ | —               | —                    | —                        | 3.3 feet (1 m)<br>6.6 feet (2 m)<br>9.8 feet (3 m)<br>16.4 feet (5 m)<br>23 feet (7 m)<br>33 feet (10 m)<br>49.4 feet (15 m) |

| Transceiver      | Cable Type                          | Connector Type    | Wavelength (nm) | Core Size (microns) | Modal Bandwidth (MHz-km) | Maximum Cable Distance |
|------------------|-------------------------------------|-------------------|-----------------|---------------------|--------------------------|------------------------|
| QSFP-40G-CSR4    | MMF                                 | 12-fiber MTP/MPO  | 850             | 62.5                | 200                      | 108 feet (33 m)        |
|                  |                                     |                   |                 | 50.0                | 500                      | 269 feet (82 m)        |
|                  |                                     |                   |                 | 50.0                | 2000                     | 984 feet (300 m)       |
|                  |                                     |                   |                 | 50.0                | 4700                     | 1312 feet (400 m)      |
| QSFP-40G-ER4     | SMF                                 | LC                | 1310            | G.652               | —                        | 40 km <sup>4</sup>     |
| QSFP-40G-LR4     | SMF                                 | LC Duplex         | 1310            | G.652               | —                        | 6.21 miles (10 km)     |
| QSFP-40G-SR4     | MMF                                 | PC or UPC         | 850             | 50.0                | 500 (OM2)                | 98 feet (30 m)         |
|                  |                                     |                   |                 | 50.0                | 2000 (OM3)               | 328 feet (100 m)       |
|                  |                                     |                   |                 | 50.0                | 4700 (OM4)               | 492 feet (150 m)       |
| QSFP-4X10G-AOCxM | Active optical cable assembly       | QSFP to four SFP+ | -               | -                   | -                        | 3 feet (1 m)           |
|                  |                                     |                   |                 |                     |                          | 6.5 feet (2 m)         |
|                  |                                     |                   |                 |                     |                          | 9.8 feet (3 m)         |
|                  |                                     |                   |                 |                     |                          | 16.4 feet (5 m)        |
|                  |                                     |                   |                 |                     |                          | 23 feet (7 m)          |
| 33 feet (10 m)   |                                     |                   |                 |                     |                          |                        |
| QSFP-4X10G-ACxM  | Direct-attach copper cable assembly | QSFP to four SFP+ | -               | -                   | -                        | 23 feet (7 m)          |
|                  |                                     |                   |                 |                     |                          | 33 feet (10 m)         |
| QSFP-4X10G-LR-S  | SMF                                 | MPO-12            | 1310            | G.652               | -                        | 10 km                  |
| QSFP-40G-SR-BD   | MMF                                 | LC Duplex         | 850/900         | 50.0                | 500 (OM2)                | 98 feet (30 m)         |
|                  |                                     |                   |                 | 50.0                | 2000 (OM3)               | 328 feet (100 m)       |
|                  |                                     |                   |                 | 50.0                | 4700 (OM4)               | 328 feet (100 m)       |
| WSP-Q40G-LR4L    | SMF                                 | LC                | 1310            | G.652               | —                        | 1.24 miles (2 km)      |

For the optical specifications, see the following table.

| Transceiver   | Transceiver Type | Transmit Power (dBm)                            | Receive Power (dBm)                             | Transmit and Receive Wavelength (nm) |
|---------------|------------------|-------------------------------------------------|-------------------------------------------------|--------------------------------------|
| QSFP-40G-CSR4 | 40GBASE-CSR4     | 0 (maximum per lane)<br>-7.3 (minimum per lane) | 0 (maximum per lane)<br>-9.9 (minimum per lane) | 840 to 860                           |

| Transceiver     | Transceiver Type | Transmit Power (dBm)                                 | Receive Power (dBm)                                 | Transmit and Receive Wavelength (nm) |
|-----------------|------------------|------------------------------------------------------|-----------------------------------------------------|--------------------------------------|
| QSFP-40G-ER4    | 40GBASE-ER4      | 4.5 (maximum per lane)<br>-2.7 (minimum per lane)    | -4.5 (maximum per lane)<br>-21.2 (minimum per lane) | Four lanes: 1271, 1291, 1311, 1331   |
| QSFP-40G-LR4    | 40GBASE-LR4      | 2.3 (maximum per lane)<br>-7 (minimum per lane)      | 2.3 (maximum per lane)<br>-13.7 (minimum per lane)  | Four lanes: 1271, 1291, 1311, 1331   |
| QSFP-40G-SR4    | 40GBASE-SR4      | -1.0 (maximum per lane*6)<br>-7.6 (minimum per lane) | 2.4 (maximum per lane)<br>-9.5 (minimum per lane)   | 840 to 860 nm                        |
| QSFP-4X10G-LR-S | 4x10GBASE-LR     | 0.5 (maximum per lane)<br>-8.2 (minimum per lane)    | 0.5 (maximum per lane)<br>-14.4 (minimum per lane)  | 1260 to 1355                         |
| QSFP-40G-SR-BD  | 40GBASE-SR-BiDi  | 5 (maximum per lane)<br>-4 (minimum per lane)        | 5 (maximum per lane)<br>-6 (minimum per lane)       | 832 to 918                           |
| WSP-Q40G-LR4L   | 40GBASE-LR4-Lite | 2.3 (maximum per lane)<br>-10 (minimum per lane)     | 2.3 (maximum per lane)<br>-13.7 (minimum per lane)  | Four lanes: 1271, 1291, 1311, 1331   |

For the environmental specifications, see the following table.

| Parameter                 | Specification              |
|---------------------------|----------------------------|
| Storage temperature       | -40 to 185°F (-40 to 85°C) |
| Operating temperature     | 32 to 104°F (0 to 40°C)    |
| Case temperature          | -40 to 158°F (-40 to 70°C) |
| Storage relative humidity | 5 to 95 percent            |

## 10-Gb SFP+ Optical Transceivers and Fabric Extender Transceivers

The following table indicates which 10-Gigabit SFP+ transceivers are used with the 10-Gigabit Ethernet (GE) I/O modules:

| Transceiver       | F2 Series 48-Port 1-/10-GE (N77-F248XP-23E)    | F3 Series 48-port 1-/10-GE (N77-F348XP-23)     | M3 Series 48-port 1-/10-GE (N77-M348XP-23L)      |
|-------------------|------------------------------------------------|------------------------------------------------|--------------------------------------------------|
| CWDM-SFP10G-xxxx  | —                                              | —                                              | —                                                |
| DWDM-SFP10G-xx.xx | X<br><b>Note</b> DWDM-SFP10G is not supported. | X<br><b>Note</b> DWDM-SFP10G is not supported. | X<br><b>Note</b> DWDM-SFP10G-C is not supported. |
| FET-10G           | X                                              | X                                              | —                                                |
| SFP-H10GB-CUxM    | X                                              | X                                              | X                                                |
| SFP-H10GB-ACUxM   | X                                              | X                                              | X                                                |
| SFP-10G-AOCxM     | X                                              | X                                              | X                                                |
| SFP-10G-BXD-I     | —                                              | X                                              | X                                                |
| SFP-10G-BXU-I     | —                                              | X                                              | X                                                |
| SFP-10G-ER        | —                                              | X                                              | X                                                |
| SFP-10G-LR        | X                                              | X                                              | X                                                |
| SFP-10G-LRM       | X                                              | X                                              | X                                                |
| SFP-10G-SR        | X                                              | X                                              | X                                                |
| SFP-10G-ZR        | —                                              | X                                              | X                                                |

You can use the SFP-10G-SR, SFP-10G-LR, and the 10-Gigabit Fabric Extender Transceiver (FET) to connect the following I/O modules to Fabric Extenders (FEXs):

- F2 Series Enhanced 48-port 1- and 10-Gigabit I/O module (N77-F248XP-23E)
- F3 Series 48-port, 1- and 10-Gigabit Ethernet I/O module (N77-F348XP-23)

On the other end of the connections using the SFP-10G-SR, SFP-10G-LR, and FET transceivers, you can connect to the following FEXs:

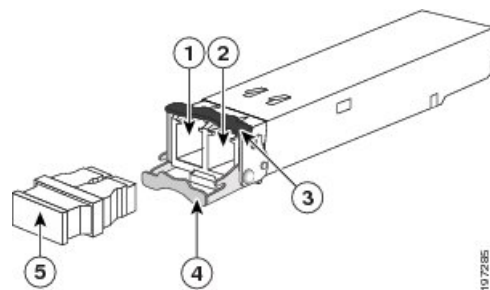
- Cisco Nexus 2248TP FEX
- Cisco Nexus 2248TP-E FEX
- Cisco Nexus 2248PQ-E FEX
- Cisco Nexus 2232TM-E FEX
- Cisco Nexus 2232TM FEX
- Cisco Nexus 2232PP FEX

Using the QSFP-40G-SR4, QSFP-40G-LR4, and FET transceivers, you can connect the F3 Series 24-port 40-Gigabit Ethernet I/O module (N77-F324FQ-25) to the following FEXs:

- Cisco Nexus 2348TQ-10GE
- Cisco Nexus 2348UPQ
- Cisco Nexus B22IBM

The following figure identifies the major features of these transceivers.

**Figure 37:**



|   |                                |   |                              |
|---|--------------------------------|---|------------------------------|
| 1 | Receive optical bore           | 4 | Clasp shown in open position |
| 2 | Transmit optical bore          | 5 | Dust plug                    |
| 3 | Clasp shown in closed position |   |                              |

For the cable specifications that apply to the supported transceivers, see the following table. For information about the DWDM transceivers, see [10BASE-DWDM SFP+ Transceiver Specifications, on page 180](#)

| Transceiver     | Cable Type                                   | Connector Type | Wavelength (nm) | Core Size (microns) | Modal Bandwidth (MHz-km) | Maximum Cable Distance                                                                                        |
|-----------------|----------------------------------------------|----------------|-----------------|---------------------|--------------------------|---------------------------------------------------------------------------------------------------------------|
| FET-10G         | MMF                                          | Dual LC/PC     | 850             | 50.0<br>50.0        | 500<br>2000              | 82 feet (25 m)<br>328 feet (100 m)                                                                            |
| SFP-H10GB-CUxM  | Twinax cable, passive, 30-AWG cable assembly | —              | —               | —                   | —                        | 3.3 feet (1 m)<br>4.9 feet (1.5 m)<br>6.6 feet (2 m)<br>8.2 feet (2.5 m)<br>9.8 feet (3 m)<br>16.4 feet (5 m) |
| SFP-H10GB-ACUxM | Twinax cable, active, 30-AWG cable assembly  | —              | —               | —                   | —                        | 22.8 feet (7 m)<br>32.5 feet (10 m)                                                                           |

| Transceiver   | Cable Type                    | Connector Type | Wavelength (nm) | Core Size (microns)            | Modal Bandwidth (MHz-km)         | Maximum Cable Distance                                                                                       |
|---------------|-------------------------------|----------------|-----------------|--------------------------------|----------------------------------|--------------------------------------------------------------------------------------------------------------|
| SFP-10G-AOCxM | Active optical cable assembly | —              | —               | —                              | —                                | 3.3 feet (1 m)<br>6.6 feet (2 m)<br>9.8 feet (3 m)<br>16.4 feet (5 m)<br>22.8 feet (7 m)<br>32.5 feet (10 m) |
| SFP-10G-BXD-I | SMF                           | —              | 1330            | G.652                          | —                                | 6.2 miles (10 km)                                                                                            |
| SFP-10G-BXU-I | SMF                           | —              | 1270            | G.652                          | —                                | 6.2 miles (10 km)                                                                                            |
| SFP-10G-ER    | SMF                           | Dual LC/PC     | 1550            | G.652 fiber                    | —                                | 24.9 miles (40 km)                                                                                           |
| SFP-10G-LR    | SMF                           | Dual LC/PC     | 1310            | G.652 fiber                    | —                                | 6.2 miles (10 km)                                                                                            |
| SFP-10G-LRM   | SMF                           | Dual LC/PC     | 1310            | G.652                          | —                                | 984 feet (300 m)                                                                                             |
| SFP-10G-SR    | MMF                           | Dual LC/PC     | 850             | 62.5<br>62.5<br>50<br>50<br>50 | 160<br>200<br>400<br>500<br>2000 | 85 feet (26 m)<br>108 feet (33 m)<br>216 feet (66 m)<br>269 feet (82 m)<br>984 feet (300 m)                  |
| SFP-10G-ZR    | SMF                           | —              | 1550            | G.652                          | —                                | 49.7 miles (80 km)                                                                                           |

For the optical specifications, see the following table.

| Transceiver | Transceiver Type        | Transmit Power (dBm)                              | Receive Power (dBm)                                 | Transmit and Receive Wavelength (nm) |
|-------------|-------------------------|---------------------------------------------------|-----------------------------------------------------|--------------------------------------|
| SFP-10G-ER  | 10GBASE-ER, 1550-nm SMF | 4.0 (maximum per lane)<br>-4.7 (minimum per lane) | -1.0 (maximum per lane)<br>-15.8 (minimum per lane) | 1530 to 1565 nm                      |
| SFP-10G-LR  | 10GBASE-LR, 1310-nm SMF | 0.5 (maximum per lane)<br>-8.2 (minimum per lane) | 0.5 (maximum per lane)<br>-14.4 (minimum per lane)  | 1260 to 1355 nm                      |

| Transceiver | Transceiver Type         | Transmit Power (dBm)                                            | Receive Power (dBm)                                                                                             | Transmit and Receive Wavelength (nm) |
|-------------|--------------------------|-----------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|--------------------------------------|
| SFP-10G-LRM | 10GBASE-LRM, 1310-nm SMF | 0.5 (maximum per lane)<br>-6.5 (minimum per lane)               | 0.5 (maximum per lane)<br>-8.4 (minimum per lane) (in average)<br>-6.4 (minimum per lane) (in OMA) <sup>7</sup> | 1260 to 1355 nm                      |
| SFP-10G-SR  | 10GBASE-SR, 850-nm MMF   | -1.2 (maximum per lane) <sup>8</sup><br>-7.3 (minimum per lane) | 0.5 (maximum per lane)<br>-8.2 (minimum per lane)                                                               | 840 to 860 nm                        |

<sup>7</sup> Both the average and the OMA specifications must be met simultaneously.

<sup>8</sup> The launch power shall be the lesser of the class 1 safety limit or the maximum receive power. Class 1 laser requirements are defined by IEC 60825-1:2001.

For the environmental specifications, see the following table.

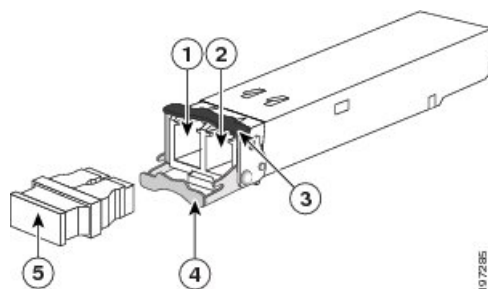
| Parameter             | Specification              |
|-----------------------|----------------------------|
| Storage temperature   | -40 to 185°F (-40 to 85°C) |
| Operating temperature | 32 to 158°F (0 to 70°C)    |
| Case temperature      | -40 to 158°F (-40 to 70°C) |
| Module supply voltage | 3.1 to 3.5 V               |

## 10GBASE-DWDM SFP+ Transceiver Specifications

The Dense Wavelength Division Multiplexing (DWDM) SFP+ transceivers are part of a DWDM optical network to provide high-capacity bandwidth across a fiber-optic network. There are 32 fixed-wavelength DWDM SFP+ transceivers that support the International Telecommunications Union (ITU) 100-GHz wavelength grid. These transceivers have duplex SC connectors. DWDM SFP+ transceivers can transmit and receive optical signals up to 50 miles (80 km) depending on the quality of the fiber-optic cable used.

DWDM SFP+ transceivers look like the typical 10GBASE-X SFP+ transceivers as shown in the following figure.

**Figure 38:**





|   |                                |   |                              |
|---|--------------------------------|---|------------------------------|
| 1 | Receive optical bore           | 4 | Clasp shown in open position |
| 2 | Transmit optical bore          | 5 | Dust plug                    |
| 3 | Clasp shown in closed position |   |                              |

For the Cisco DWDM SFP+ transceiver cable specifications, see the following table.

| Transceiver Type | Cable Type       | Connector Type       | Wavelength (nm)                                                                                                                                                                                                                                                                                                                    | ITU Channel |
|------------------|------------------|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
|                  | SMF <sup>9</sup> | Dual LC/PC connector | 1530.33, 1531.12, 1531.90, 1532.68, 1533.46, 1534.25, 1535.04, 1535.82, 1536.61, 1537.39, 1538.19, 1538.98, 1539.77, 1540.56, 1542.14, 1542.94, 1543.73, 1544.53, 1546.12, 1546.92, 1547.72, 1548.51, 1549.31, 1550.12, 1550.92, 1551.72, 1552.52, 1554.13, 1554.94, 1555.75, 1556.55, 1558.17, 1558.98, 1559.79, 1560.61, 1561.41 |             |

| Transceiver Type  | Cable Type | Connector Type | Wavelength (nm) | ITU Channel |
|-------------------|------------|----------------|-----------------|-------------|
| DWDM-SFP10G-30.33 |            |                |                 | 59          |
| DWDM-SFP10G-31.12 |            |                |                 | 58          |
| DWDM-SFP10G-31.90 |            |                |                 | 57          |
| DWDM-SFP10G-32.68 |            |                |                 | 56          |
| DWDM-SFP10G-33.47 |            |                |                 | 55          |
| DWDM-SFP10G-34.25 |            |                |                 | 54          |
| DWDM-SFP10G-35.04 |            |                |                 | 53          |
| DWDM-SFP10G-35.82 |            |                |                 | 52          |
| DWDM-SFP10G-36.61 |            |                |                 | 51          |
| DWDM-SFP10G-37.40 |            |                |                 | 50          |
| DWDM-SFP10G-38.19 |            |                |                 | 49          |
| DWDM-SFP10G-38.98 |            |                |                 | 48          |
| DWDM-SFP10G-39.77 |            |                |                 | 47          |
| DWDM-SFP10G-40.56 |            |                |                 | 46          |
| DWDM-SFP10G-41.35 |            |                |                 | 45          |
| DWDM-SFP10G-42.14 |            |                |                 | 44          |
| DWDM-SFP10G-42.94 |            |                |                 | 43          |
| DWDM-SFP10G-43.73 |            |                |                 | 42          |
| DWDM-SFP10G-44.53 |            |                |                 | 41          |
| DWDM-SFP10G-45.32 |            |                |                 | 40          |
| DWDM-SFP10G-46.12 |            |                |                 | 39          |
| DWDM-SFP10G-46.92 |            |                |                 | 38          |
| DWDM-SFP10G-47.72 |            |                |                 | 37          |
| DWDM-SFP10G-48.51 |            |                |                 | 36          |
| DWDM-SFP10G-49.32 |            |                |                 | 35          |
| DWDM-SFP10G-50.12 |            |                |                 | 34          |
| DWDM-SFP10G-50.92 |            |                |                 | 33          |
| DWDM-SFP10G-51.72 |            |                |                 | 32          |
| DWDM-SFP10G-52.52 |            |                |                 | 31          |
| DWDM-SFP10G-53.33 |            |                |                 | 30          |
| DWDM-SFP10G-54.13 |            |                |                 | 29          |
| DWDM-SFP10G-54.94 |            |                |                 | 28          |
| DWDM-SFP10G-55.75 |            |                |                 | 27          |

| Transceiver Type  | Cable Type | Connector Type | Wavelength (nm) | ITU Channel |
|-------------------|------------|----------------|-----------------|-------------|
| DWDM-SFP10G-56.55 |            |                |                 | 26          |
| DWDM-SFP10G-57.36 |            |                |                 | 25          |
| DWDM-SFP10G-58.17 |            |                |                 | 24          |
| DWDM-SFP10G-58.98 |            |                |                 | 23          |
| DWDM-SFP10G-59.79 |            |                |                 | 22          |
| DWDM-SFP10G-60.61 |            |                |                 | 21          |
| DWDM-SFP10G-61.41 |            |                |                 | 20          |

<sup>9</sup> Single-mode fiber optic (SMF)

For the specifications that differentiate the 10GBASE-DWDM SFP+ transceivers, see the [10-Gigabit Ethernet Transceiver Modules Compatibility Matrix](#).

## 1-Gb SFP Transceivers

The following table indicates which 1-Gigabit SFP transceivers can be used with the 1-Gigabit Ethernet (GE) I/O modules:

| Transceiver   | F2 Series 48-Port 1-/10-GE (N77-F248XP-23E) | F3 Series 48-port 1-/10-GE (N77-F348XP-23) | M3 Series 48-port 1-/10-GE (N77-M348XP-23L) |
|---------------|---------------------------------------------|--------------------------------------------|---------------------------------------------|
| CWDM-SFP-xxxx | X                                           | X                                          | X                                           |
| DWDM-SFP-xxxx | X                                           | X                                          | X                                           |
| GLC-BX-D      | X                                           | X                                          | X                                           |
| GLC-BX-U      | X                                           | X                                          | X                                           |
| GLC-EX-SMD    | X                                           | X                                          | X                                           |
| GLC-LH-SMD    | X                                           | X                                          | X                                           |
| GLC-SX-MMD    | X                                           | X                                          | X                                           |
| GLC-T         | X                                           | X                                          | X                                           |
| GLC-ZX-SMD    | X                                           | X                                          | X                                           |
| SFP-GE-T      | X                                           | X                                          | X                                           |

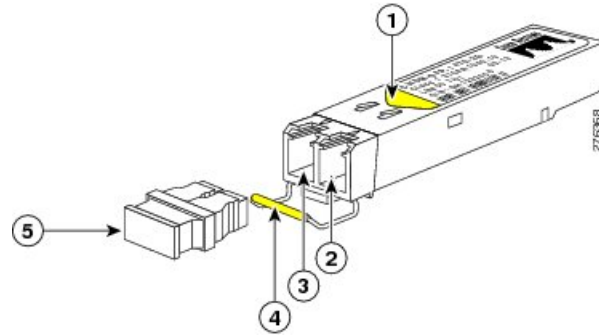
## 1000BASE-CWDM SFP Transceiver Cables

The Coarse Wavelength Division Multiplexing (CWDM) SFP transceivers are hot-swappable transceivers that you plug into SFP-compatible I/O modules. The CWDM SFP transceiver uses an LC optical connector to connect to a single-mode fiber-optic (SMF) cable. You can connect the CWDM SFPs to CWDM passive optical system optical add/drop multiplexer (OADM) modules or multiplexer/demultiplexer plug-in modules

using SMF cables. CWDM SFP transceivers can transmit and receive optical signals up to 61 miles (100 km) depending on the quality of the fiber-optic cable used.

CWDM SFP transceivers are color coded to indicate their designated optical wavelength. The following figure shows the CWDM transceiver, which looks like a standard 1000BASE-X SFP transceiver with a colored arrow and bail clasp to indicate the designated wavelength.

**Figure 39: CWDM SFP Transceiver (Yellow Color Code)**



|   |                                                 |   |            |
|---|-------------------------------------------------|---|------------|
| 1 | Colored arrow on label specifies the wavelength | 4 | Bail clasp |
| 2 | Receive optical bore                            | 5 | Dust plug  |
| 3 | Transmit optical bore                           |   |            |

Whenever the transceiver receive optical bores are not filled with optical cables, you should minimize the chance of contamination by plugging the transceiver with its dust plug.

For the Cisco CWDM SFP transceiver cable specifications, see the following table.

| Transceiver Type                                                                                                                     | Cable Type        | Connector Type       | Wavelength (nm)                                | Core Size (microns) | Modal Bandwidth (MHz-km) | Maximum Cable Distance |
|--------------------------------------------------------------------------------------------------------------------------------------|-------------------|----------------------|------------------------------------------------|---------------------|--------------------------|------------------------|
| CWDM-SFP-1470<br>CWDM-SFP-1490<br>CWDM-SFP-1510<br>CWDM-SFP-1530<br>CWDM-SFP-1550<br>CWDM-SFP-1570<br>CWDM-SFP-1590<br>CWDM-SFP-1610 | SMF <sup>10</sup> | Dual LC/PC connector | 1470, 1490, 1510, 1530, 1550, 1570, 1590, 1610 | G.652 <sup>11</sup> | —                        | 62 miles (100 km)      |

<sup>10</sup> Single-mode fiber optic (SMF)

<sup>11</sup> ITU-T G652 SMF as specified by the IEEE 802.32 standard.

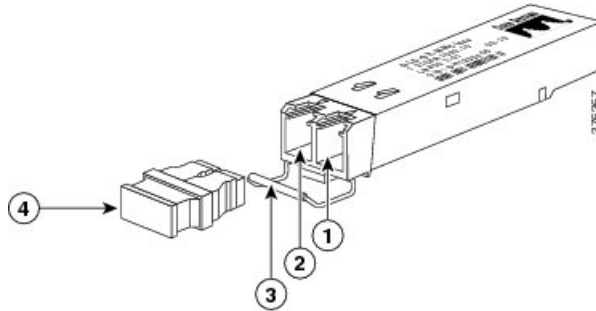
For the specifications that differentiate the 1000BASE-CWDM SFP transceivers, see the [Cisco Gigabit Ethernet Transceiver Modules Compatibility Matrix](#). For specifications and installation information that apply to all CWDM SFP transceivers, see the [Cisco SFP and SFP+ Transceiver Module Installation Notes](#).

## 1000BASE-DWDM SFP Transceiver Specifications

The Dense Wavelength Division Multiplexing (DWDM) SFP transceivers are part of a DWDM optical network to provide high-capacity bandwidth across a fiber-optic network. There are 40 fixed-wavelength DWDM SFP transceivers that support the International Telecommunications Union (ITU) 100-GHz wavelength grid. These transceivers have duplex SC connectors. DWDM SFP transceivers can transmit and receive optical signals up to 50 miles (80 km) depending on the quality of the fiber-optic cable used.

DWDM SFP transceivers look like the typical 1000BASE-X transceivers as shown in the following figure.

**Figure 40: 1000BASE-DWDM SFP Transceiver**



|   |                       |   |            |
|---|-----------------------|---|------------|
| 1 | Receive optical bore  | 3 | Bail clasp |
| 2 | Transmit optical bore | 4 | Dust plug  |

For the Cisco DWDM SFP transceiver cable specifications, see the following table.

| Transceiver Type | Cable Type        | Connector Type       | Wavelength (nm)   | ITU Channel |
|------------------|-------------------|----------------------|-------------------|-------------|
| DWDM-SFP-3033    | SMF <sup>12</sup> | Dual LC/PC connector | 1530.33, 1531.12, | 59          |
| DWDM-SFP-3112    |                   |                      | 1531.90, 1532.68, | 58          |
| DWDM-SFP-3190    |                   |                      | 1534.25, 1535.04, | 57          |
| DWDM-SFP-3268    |                   |                      | 1535.82, 1536.61, | 56          |
| DWDM-SFP-3425    |                   |                      | 1537.39, 1538.19, | 54          |
| DWDM-SFP-3504    |                   |                      | 1539.98, 1539.77, | 53          |
| DWDM-SFP-3582    |                   |                      | 1540.56, 1542.14, | 52          |
| DWDM-SFP-3661    |                   |                      | 1542.94, 1543.73, | 51          |
| DWDM-SFP-3819    |                   |                      | 1544.53, 1546.12, | 49          |
| DWDM-SFP-3998    |                   |                      | 1546.92, 1547.72, | 48          |
| DWDM-SFP-3977    |                   |                      | 1548.51, 1550.12, | 47          |
| DWDM-SFP-4056    |                   |                      | 1550.92, 1551.72, | 46          |
| DWDM-SFP-4214    |                   |                      | 1552.52, 1554.13, | 44          |
| DWDM-SFP-4294    |                   |                      | 1554.94, 1555.75, | 43          |
| DWDM-SFP-4373    |                   |                      | 1556.55, 1558.17, | 42          |
| DWDM-SFP-4453    |                   |                      | 1558.98, 1559.79, | 41          |
| DWDM-SFP-4612    |                   |                      | 1560.61           | 39          |
| DWDM-SFP-4692    |                   |                      |                   | 38          |
| DWDM-SFP-4772    |                   |                      |                   | 37          |
| DWDM-SFP-4851    |                   |                      |                   | 36          |
| DWDM-SFP-5012    |                   |                      |                   | 34          |
| DWDM-SFP-5092    |                   |                      |                   | 33          |
| DWDM-SFP-5172    |                   |                      |                   | 32          |
| DWDM-SFP-5252    |                   |                      |                   | 31          |
| DWDM-SFP-5413    |                   |                      |                   | 29          |
| DWDM-SFP-5494    |                   |                      |                   | 28          |
| DWDM-SFP-5575    |                   |                      |                   | 27          |
| DWDM-SFP-5655    |                   |                      |                   | 26          |
| DWDM-SFP-5817    |                   |                      |                   | 24          |
| DWDM-SFP-5898    |                   |                      |                   | 23          |
| DWDM-SFP-5979    |                   |                      |                   | 22          |
| DWDM-SFP-6061    |                   |                      |                   | 21          |

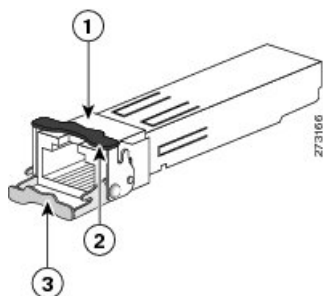
<sup>12</sup> Single-mode fiber optic (SMF)

For the specifications that differentiate the 1000BASE-DWDM SFP transceivers, see the [Cisco Gigabit Ethernet Transceiver Modules Compatibility Matrix](#). For specifications and installation information that apply to all CWDM SFP transceivers, see the [Cisco SFP and SFP+ Transceiver Module Installation Notes](#).

## 1000BASE-T and 1000BASE-X SFP Transceiver Specifications

The 1000BASE-T and 1000BASE-X SFPs are hot-swappable transceivers that you plug into SFP-compatible I/O modules. The 1000BASE-T transceiver, shown in the following figure, provides an RJ-45 connection for copper cables.

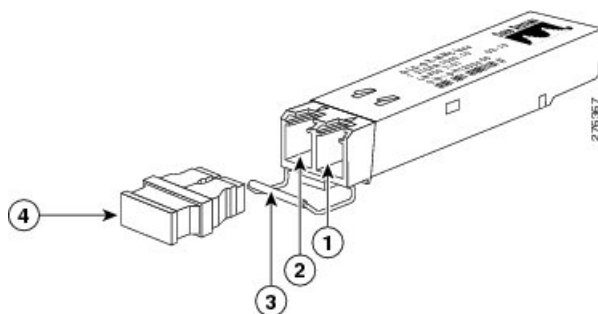
**Figure 41: 1000BASE-T SFP Transceiver**



|   |                                                  |   |                                                  |
|---|--------------------------------------------------|---|--------------------------------------------------|
| 1 | RJ-45 connector                                  | 3 | Bail clasp shown in the open (unlocked) position |
| 2 | Bail clasp shown in the closed (locked) position |   |                                                  |

The 1000BASE-X transceiver, shown in the following figure, provides an optical connection for fiber-optic cables.

**Figure 42: 1000BASE-X SFP Transceiver**



|   |                       |   |            |
|---|-----------------------|---|------------|
| 1 | Receive optical bore  | 3 | Bail clasp |
| 2 | Transmit optical bore | 4 | Dust plug  |

For the 1000BASE-T and 1000BASE-X transceiver cable specifications, see the following table.

| Transceiver Type         | Cable Type        | Connector Type | Wavelength (nm) | Core Size (microns) | Modal Bandwidth (MHz-km) | Maximum Cable Distance |
|--------------------------|-------------------|----------------|-----------------|---------------------|--------------------------|------------------------|
| 1000BASE-BX10 (GLC-BX-U) | SMF <sup>13</sup> | Single LC/PC   | 1310            | G.652 <sup>14</sup> | —                        | 6.2 miles (10 km)      |



| Transceiver Type                | Cable Type                   | Connector Type | Wavelength (nm) | Core Size (microns) | Modal Bandwidth (MHz-km) | Maximum Cable Distance                                               |
|---------------------------------|------------------------------|----------------|-----------------|---------------------|--------------------------|----------------------------------------------------------------------|
| 1000BASE-BX10 (GLC-BX-D)        | SMF <sup>13</sup>            | Single LC/PC   | 1490            | G.652 <sup>2</sup>  | —                        | 6.2 miles (10 km)                                                    |
| 1000BASE-SX (GLC-SX-MMD)        | MMF <sup>15</sup>            | LC duplex      | 850             | 62.5                | 160                      | 722 feet (220 m)                                                     |
|                                 |                              |                |                 | 62.5                | 200                      | 902 feet (275 m)                                                     |
|                                 |                              |                |                 | 50.0                | 400                      | 1640 feet (500 m)                                                    |
|                                 |                              |                |                 | 50.0                | 500                      | 1804 feet (550 m)                                                    |
| 1000BASE-LX (GLC-LH-SMD)        | MMF <sup>3</sup>             | LC duplex      | 1310            | 62.5                | 500                      | 1804 feet (550 m) <sup>16</sup>                                      |
|                                 |                              |                |                 | 50.0                | 400                      | 1804 feet (550 m) <sup>4</sup>                                       |
|                                 |                              |                |                 | 50.0                | 500                      | 1804 feet (550 m) <sup>4</sup>                                       |
|                                 | SMF <sup>1</sup>             | LC duplex      | 1310            | G.652 <sup>2</sup>  | —                        | 6.2 miles (10 km)                                                    |
| 1000BASE-ZX (GLC-ZX-SMD)        | SMF <sup>1</sup>             | LC duplex      | 1550            | G.652 <sup>2</sup>  | —                        | Approximately 43.4 to 60 miles (70 to 100 km) depending on link loss |
| 1000BASE-T (GLC-T and SFP-GE-T) | Category 5, 5E, or 6 UTP/FTP | RJ-45          | —               | —                   | —                        | 328 feet (100 meters)                                                |

<sup>13</sup> Single-mode fiber optic (SMF)

<sup>14</sup> ITU-T G652 SMF as specified by the IEEE 802.32 standard.

<sup>15</sup> Multimode fiber optic (MMF)

<sup>16</sup> You must use a mode-conditioning patch cord, as specified by the IEEE standard, regardless of the amount of span.

The transceivers that support Digital Optical Monitoring have a greater range of temperatures for operations, as shown in the following table.

| Transceiver Type | Part Number | Digital Optical Monitoring Support | Operating Temperature | Storage Temperature        |
|------------------|-------------|------------------------------------|-----------------------|----------------------------|
| 1000BASE-SX      | GLC-SX-MMD  | Yes                                | EXT <sup>17</sup>     | -40 to 185°F (-40 to 85°C) |
| 1000BASE-LX      | GLC-LH-SMD  | Yes                                | EXT <sup>5</sup>      |                            |
| 1000BASE-ZX      | GLC-ZX-SMD  | No                                 | COM <sup>6</sup>      |                            |
| 1000BASE-T       | GLC-T       | —                                  | COM <sup>6</sup>      |                            |
|                  | SFP-GE-T    | —                                  | EXT <sup>5</sup>      |                            |

<sup>17</sup> Extended (EXT) temperature range is 23 to 185°F (-5 to 85°C)

## RJ-45 Module Connectors

The RJ-45 connector connects Category 3, Category 5, Category 5e, Category 6, or Category 6A foil twisted-pair or unshielded twisted-pair cable from the external network to the following module interface connectors:

- Supervisor modules
  - CONSOLE port
  - MGMT ETH port
- Fabric Extenders (Cisco Nexus 2232PP, 2232TM, 2232TM-E, 2248PQ, 2248TP, and 2248TP-E FEXs)

- 100/1000 downlink ports

Cisco Nexus C2348UPQ FEX

- 1000/10000 downlink ports

Cisco Nexus C2348TQ-10GE FEX

- 100/1000/10000 downlink ports

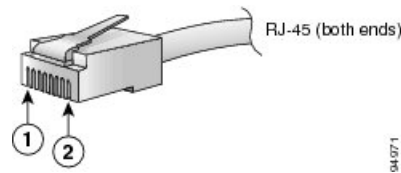


**Caution**

To comply with GR-1089 intrabuilding, lightning immunity requirements, you must use a foil twisted-pair (FTP) cable that is properly grounded at both ends.

The following figure shows the RJ-45 connector.

*Figure 43: RJ-45 Connector*



|   |       |   |       |
|---|-------|---|-------|
| 1 | Pin 1 | 2 | Pin 2 |
|---|-------|---|-------|

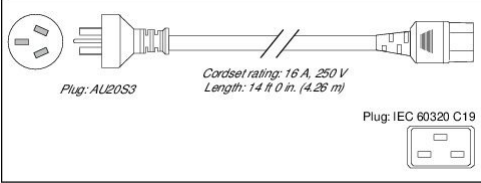
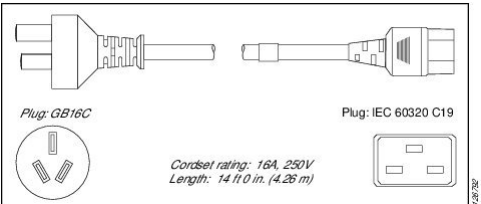
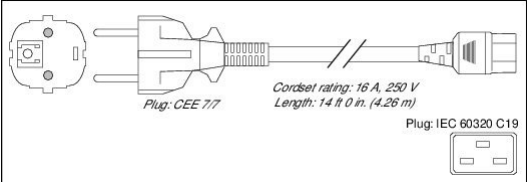
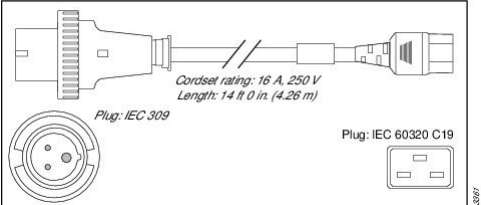
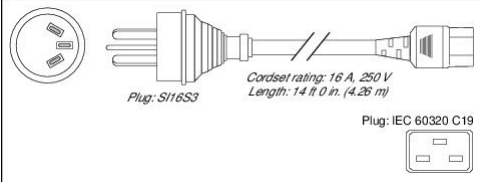
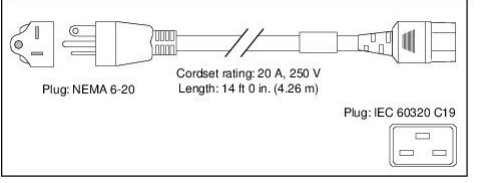
## Power Supply Cable Specifications



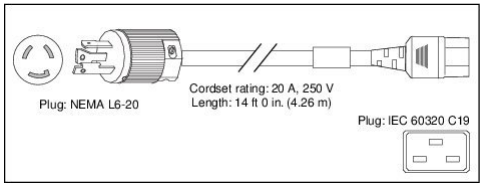
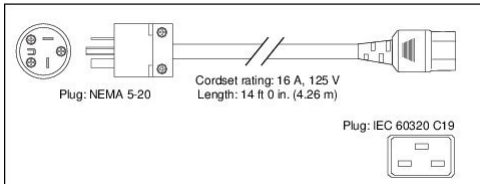
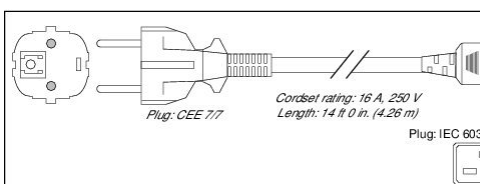
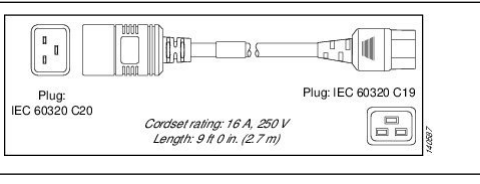
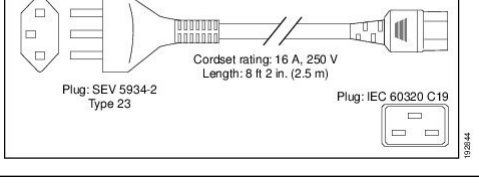
**Note**

If you do not order the optional power cord with the system, you are responsible for selecting the appropriate power cord for the product. Using a non-compatible power cord with this product may result in electrical safety hazard. Orders delivered to Argentina, Brazil, and Japan must have the appropriate power cord ordered with the system.

## 3-kW AC Power Cord Specifications

| Locale                                                      | Power Cord Part Number | Cord Set Rating | Power Cord Illustration                                                                                                                                                                                    |
|-------------------------------------------------------------|------------------------|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Australia and New Zealand                                   | CAB-AC-16A-AUS         | 16A, 250 VAC    |  <p>Plug: AU20S3</p> <p>Cordset rating: 16 A, 250 V<br/>Length: 14 ft 0 in. (4.26 m)</p> <p>Plug: IEC 60320 C19</p>      |
| Peoples Republic of China                                   | CAB-AC-16A-CH          | 16A, 250 VAC    |  <p>Plug: GB16C</p> <p>Cordset rating: 16 A, 250 V<br/>Length: 14 ft 0 in. (4.26 m)</p> <p>Plug: IEC 60320 C19</p>       |
| Continental Europe                                          | CAB-AC-2500W-EU        | 16A, 250 VAC    |  <p>Plug: CEE 7/7</p> <p>Cordset rating: 16 A, 250 V<br/>Length: 14 ft 0 in. (4.26 m)</p> <p>Plug: IEC 60320 C19</p>    |
| International                                               | CAB-AC-2500W-INT       | 16A, 250 VAC    |  <p>Plug: IEC 309</p> <p>Cordset rating: 16 A, 250 V<br/>Length: 14 ft 0 in. (4.26 m)</p> <p>Plug: IEC 60320 C19</p>   |
| Israel                                                      | CAB-AC-2500W-ISRL      | 16A, 250 VAC    |  <p>Plug: SI16S3</p> <p>Cordset rating: 16 A, 250 V<br/>Length: 14 ft 0 in. (4.26 m)</p> <p>Plug: IEC 60320 C19</p>    |
| Japan and North America (non locking) 200-240 VAC operation | CAB-9K16A-US1          | 16A, 250 VAC    |  <p>Plug: NEMA 6-20</p> <p>Cordset rating: 20 A, 250 V<br/>Length: 14 ft 0 in. (4.26 m)</p> <p>Plug: IEC 60320 C19</p> |

## 3.5-kW HVAC/HVDC Power Supply AC Power Cord Specifications

| Locale                                                     | Power Cord Part Number | Cord Set Rating | Power Cord Illustration                                                              |
|------------------------------------------------------------|------------------------|-----------------|--------------------------------------------------------------------------------------|
| Japan and North America (locking)<br>200-240 VAC operation | CAB-AC-16A-TWLK        | 16A, 250 VAC    |    |
| Japan and North America<br>100-120 VAC operation           | CAB-7513AC             | 16A, 250 VAC    |    |
| Korea                                                      | CAB-9K16A-KOR          | 16A, 250 VAC    |    |
| Power distribution unit (PDU)                              | CAB-C19-CBN            | 16A, 250 VAC    |   |
| Switzerland                                                | CAB-ACS-16             | 16A, 250 VAC    |  |

## 3.5-kW HVAC/HVDC Power Supply AC Power Cord Specifications

| Locale and Description             | PID              | Cisco Part Number (CPN) | Length             | Cord Set Rating | Power Cord Illustration                                                                                                  |
|------------------------------------|------------------|-------------------------|--------------------|-----------------|--------------------------------------------------------------------------------------------------------------------------|
| Argentina, IRSM<br>2073/Saf-D-Grid | CAB-AC-16A-SG-AR | 37-1649-01              | 14' 0"<br>(4.26 m) | 16A, 250 VAC    | <a href="#">Figure 44: CAB-AC-16A-SG-AR Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit, on page 196</a> |

| Locale and Description                        | PID               | Cisco Part Number (CPN) | Length             | Cord Set Rating | Power Cord Illustration                                                                                      |
|-----------------------------------------------|-------------------|-------------------------|--------------------|-----------------|--------------------------------------------------------------------------------------------------------------|
| Australia and New Zealand, AU20LS3/Saf-D-Grid | CAB-AC-16A-SG-AZ  | 37-1661-01              | 14' 0"<br>(4.26 m) | 16A, 250 VAC    | Figure 45:<br>CAB-AC-16A-SG-AZ Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit, on page 197  |
| Brazil, EL224/Saf-D-Grid                      | CAB-AC-16A-SG-BR  | 37-1650-01              | 14' 0"<br>(4.26 m) | 16A, 250 VAC    | Figure 46:<br>CAB-AC-16A-SG-BR Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit, on page 197  |
| Peoples Republic of China, GB 16C/Saf-D-Grid  | CAB-AC-16A-SG-CH  | 37-1655-01              | 14' 0"<br>(4.26 m) | 16A, 250 VAC    | Figure 47:<br>CAB-AC-16A-SG-CH Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit, on page 197  |
| Continental Europe, CEE 7-7/Saf-D-Grid        | CAB-AC-16A-SG-EU  | 37-1660-01              | 14' 0"<br>(4.26 m) | 16A, 250 VAC    | Figure 48:<br>CAB-AC-16A-SG-EU Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit, on page 197  |
| India, SABS 164-1/Saf-D-Grid                  | CAB-AC-16A-SG-IND | 37-1648-01              | 14' 0"<br>(4.26 m) | 16A, 250 VAC    | Figure 49:<br>CAB-AC-16A-SG-IND Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit, on page 198 |
| International, IEC60309/Saf-D-Grid            | CAB-AC-16A-SG-IN  | 37-1659-01              | 14' 0"<br>(4.26 m) | 16A, 250 VAC    | Figure 50:<br>CAB-AC-16A-SG-IN Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit, on page 198  |

| Locale and Description                                                                                 | PID               | Cisco Part Number (CPN) | Length             | Cord Set Rating | Power Cord Illustration                                                                                                     |
|--------------------------------------------------------------------------------------------------------|-------------------|-------------------------|--------------------|-----------------|-----------------------------------------------------------------------------------------------------------------------------|
| Israel, SI<br>16S3/Saf-D-Grid                                                                          | CAB-AC-16A-SG-IS  | 37-1658-01              | 14' 0"<br>(4.26 m) | 16A, 250<br>VAC | Figure 51:<br>CAB-AC-16A-SG-IS<br>Power Cord and Plugs<br>for the 3.5-kW<br>HVAC/HVDC Power<br>Supply Unit, on page<br>198  |
| Italy, CEI<br>23-50/Saf-D-Grid to<br>IEC-C19                                                           | CAB-AC-16A-SG-IT  | 37-1651-01              | 14' 0"<br>(4.26 m) | 16A, 250<br>VAC | Figure 52:<br>CAB-AC-16A-SG-IT<br>Power Cord and Plugs<br>for the 3.5-kW<br>HVAC/HVDC Power<br>Supply Unit, on page<br>199  |
| North America (non<br>locking) 110 VAC<br>operation, Straight<br>Blade, NEMA<br>5-20P/Saf-D-Grid       | CAB-AC-20A-SG-US  | 37-1662-01              | 14' 0"<br>(4.26 m) | 20A, 110<br>VAC | Figure 53:<br>CAB-AC-20A-SG-US<br>Power Cord and Plugs<br>for the 3.5-kW<br>HVAC/HVDC Power<br>Supply Unit, on page<br>199  |
| North America<br>(locking) 125 VAC<br>operation, Twist<br>Lock, NEMA<br>L5-20/Saf-D-Grid               | CAB-AC-20A-SG-US1 | 37-1652-01              | 14' 0"<br>(4.26 m) | 20A, 125<br>VAC | Figure 54:<br>CAB-AC-20A-SG-US1<br>Power Cord and Plugs<br>for the 3.5-kW<br>HVAC/HVDC Power<br>Supply Unit, on page<br>199 |
| North America (non<br>locking) 200-240<br>VAC operation,<br>Straight Blade,<br>NEMA<br>6-20/Saf-D-Grid | CAB-AC-20A-SG-US2 | 37-1657-01              | 14' 0"<br>(4.26 m) | 20A, 250<br>VAC | Figure 55:<br>CAB-AC-20A-SG-US2<br>Power Cord and Plugs<br>for the 3.5-kW<br>HVAC/HVDC Power<br>Supply Unit, on page<br>199 |
| North America<br>(locking) 200-240<br>VAC operation,<br>Twist Lock, NEMA<br>L6-20/Saf-D-Grid           | CAB-AC-20A-SG-US3 | 37-1656-01              | 14' 0"<br>(4.26 m) | 20A, 250<br>VAC | Figure 56:<br>CAB-AC-20A-SG-US3<br>Power Cord and Plugs<br>for the 3.5-kW<br>HVAC/HVDC Power<br>Supply Unit, on page<br>200 |

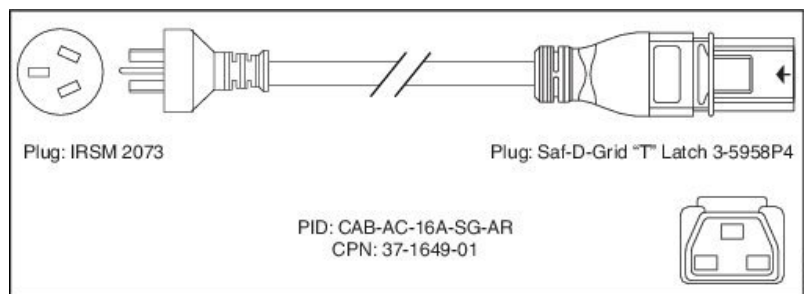
| Locale and Description                                                                             | PID               | Cisco Part Number (CPN) | Length             | Cord Set Rating      | Power Cord Illustration                                                                                      |
|----------------------------------------------------------------------------------------------------|-------------------|-------------------------|--------------------|----------------------|--------------------------------------------------------------------------------------------------------------|
| North America 277 VAC operation, NEMA L7-20P/Saf-D-Grid                                            | CAB-AC-20A-SG-US4 | 37-1645-01              | 14' 0"<br>(4.26 m) | 20A, 277 VAC         | Figure 57:<br>CAB-AC-20A-SG-US4 Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit, on page 200 |
| North America Cabinet Jumper Power Distribution Unit (PDU), Cabinet Jumper PDU, IEC C20/Saf-D-Grid | CAB-AC-20A-SG-C20 | 37-1653-01              | 14' 0"<br>(4.26 m) | 20A, 250 VAC         | Figure 58:<br>CAB-AC-20A-SG-C20 Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit, on page 200 |
| South Africa, EL/Saf-D-Grid                                                                        | CAB-AC-16A-SG-SA  | 37-1647-01              | 14' 0"<br>(4.26 m) | 16A, 250 VAC         | Figure 59:<br>CAB-AC-16A-SG-SA Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit, on page 200  |
| Korea, Src/Saf-D-Grid                                                                              | CAB-AC-16A-SG-SK  | 37-1646-01              | 14' 0"<br>(4.26 m) | 16A, 250 VAC         | Figure 60:<br>CAB-AC-16A-SG-SK Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit, on page 201  |
| Switzerland, SEV 5934-2/Saf-D-Grid                                                                 | CAB-AC-16A-SG-SW  | 37-1654-01              | 14' 0"<br>(4.26 m) | 16A, 250 VAC         | Figure 61:<br>CAB-AC-16A-SG-SW Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit, on page 201  |
| IEC/EU, Ring Terminal source plug, Ring Terminal/Saf-D-Grid                                        | CAB-HV-25A-SG-IN2 | 37-1640-01              | 14' 0"<br>(4.26 m) | 20A, 300 VAC/500 VDC | Figure 62:<br>CAB-HV-25A-SG-IN2 Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit, on page 201 |

| Locale and Description                                             | PID               | Cisco Part Number (CPN) | Length             | Cord Set Rating            | Power Cord Illustration                                                                                                     |
|--------------------------------------------------------------------|-------------------|-------------------------|--------------------|----------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| IEC/EU, Saf-D-Grid P10/Saf-D-Grid P4                               | CAB-HV-25A-SG-IN3 | 37-100904-01            | 14' 0"<br>(4.26 m) | 20A, 300<br>VAC            | Figure 63:<br>CAB-HV-25A-SG-IN3<br>Power Cord and Plugs<br>for the 3.5-kW<br>HVAC/HVDC Power<br>Supply Unit, on page<br>201 |
| North America, Ring Terminal source plug, Ring Terminal/Saf-D-Grid | CAB-HV-25A-SG-US2 | 37-1641-01              | 14' 0"<br>(4.26 m) | 20A, 300<br>VAC/500<br>VDC | Figure 64:<br>CAB-HV-25A-SG-US2<br>Power Cord and Plugs<br>for the 3.5-kW<br>HVAC/HVDC Power<br>Supply Unit, on page<br>202 |
| North America, Saf-D-Grid P10/Saf-D-Grid P4                        | CAB-HV-25A-SG-US5 | 37-100903-01            | 14' 0"<br>(4.26 m) | 20A, 300<br>VAC            | Figure 65:<br>CAB-HV-25A-SG-US5<br>Power Cord and Plugs<br>for the 3.5-kW<br>HVAC/HVDC Power<br>Supply Unit, on page<br>202 |



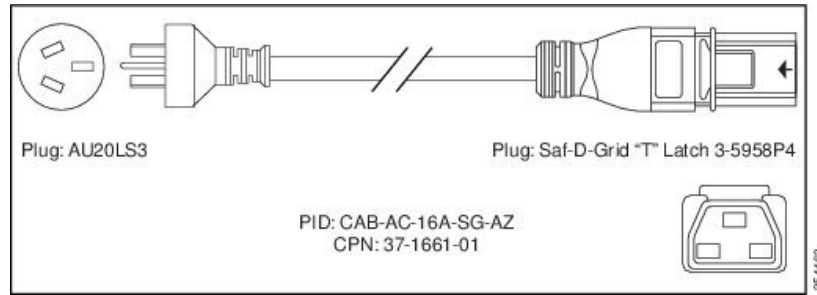
**Note** All power cords will not be orderable at first customer shipment (FCS).

**Figure 44: CAB-AC-16A-SG-AR Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit**

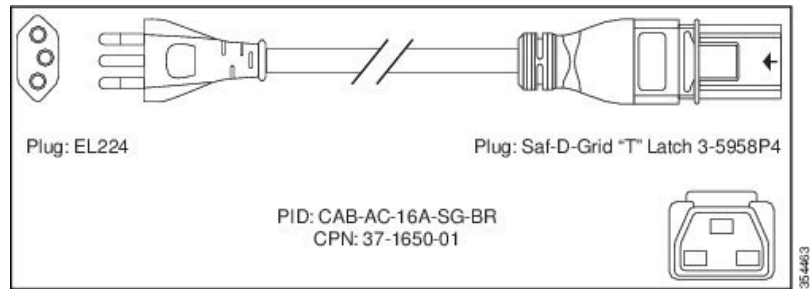




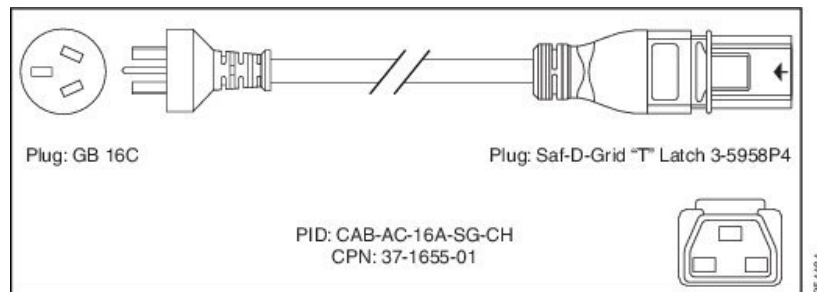
**Figure 45: CAB-AC-16A-SG-AZ Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit**



**Figure 46: CAB-AC-16A-SG-BR Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit**



**Figure 47: CAB-AC-16A-SG-CH Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit**



**Figure 48: CAB-AC-16A-SG-EU Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit**

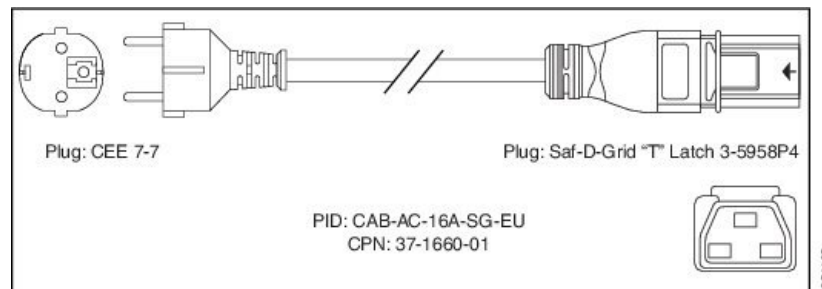


Figure 49: CAB-AC-16A-SG-IND Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit

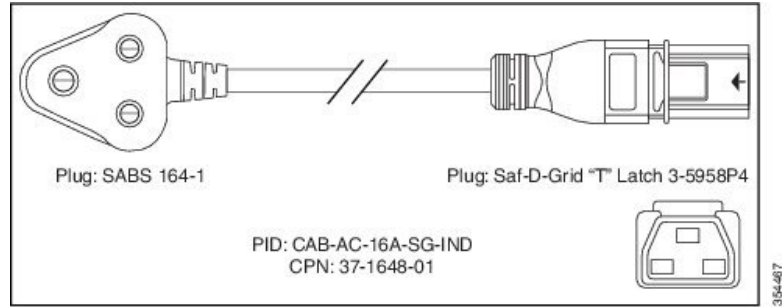


Figure 50: CAB-AC-16A-SG-IN Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit

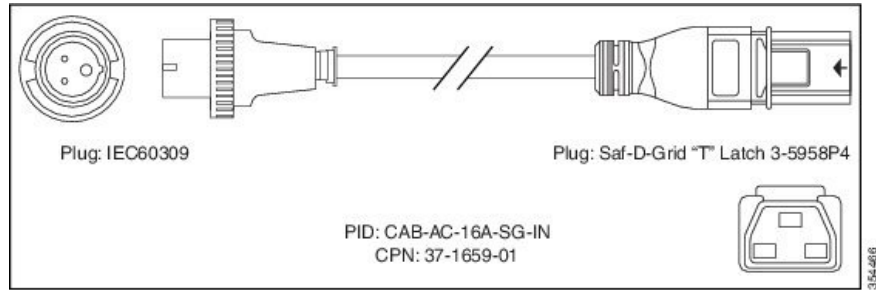
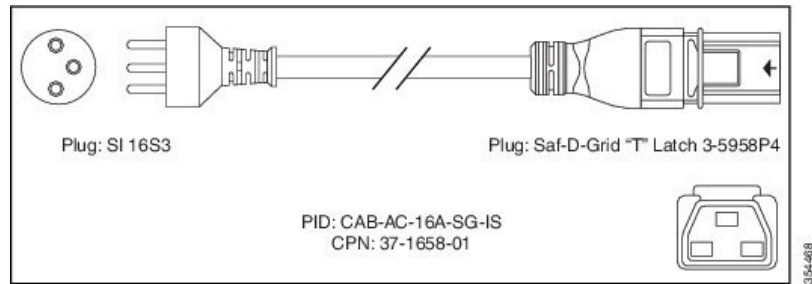
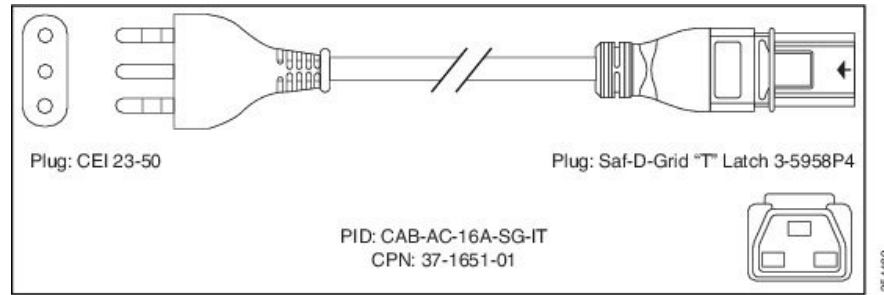


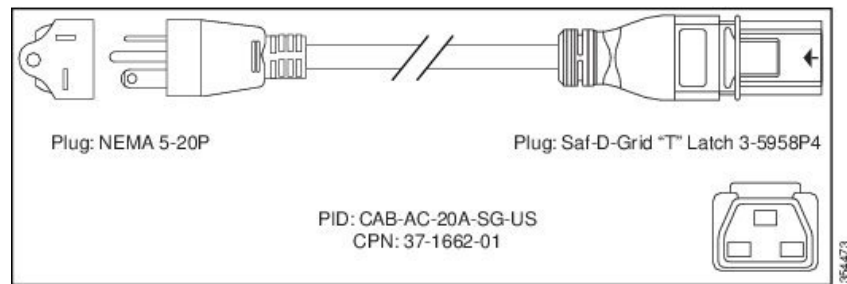
Figure 51: CAB-AC-16A-SG-IS Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit



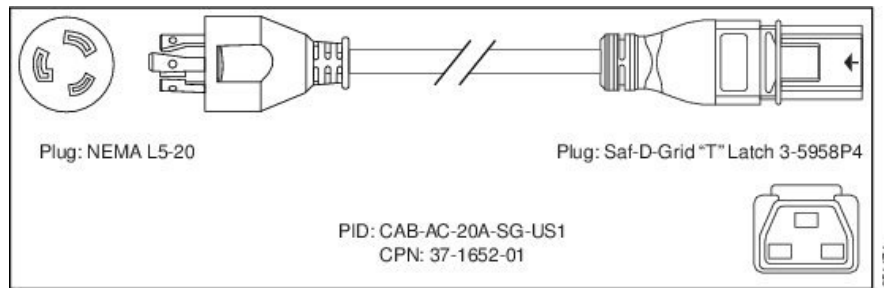
**Figure 52: CAB-AC-16A-SG-IT Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit**



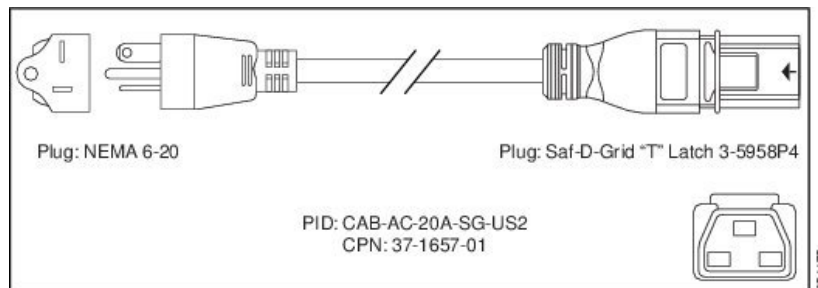
**Figure 53: CAB-AC-20A-SG-US Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit**



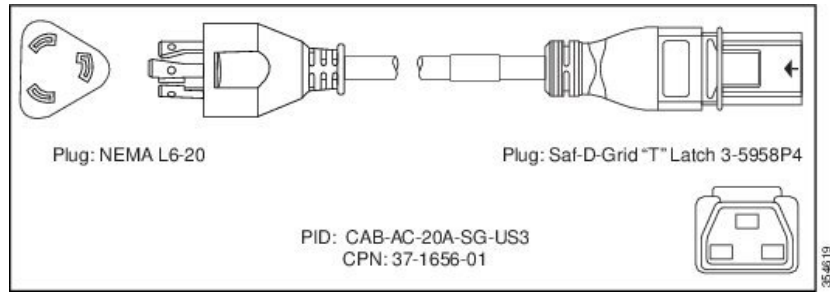
**Figure 54: CAB-AC-20A-SG-US1 Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit**



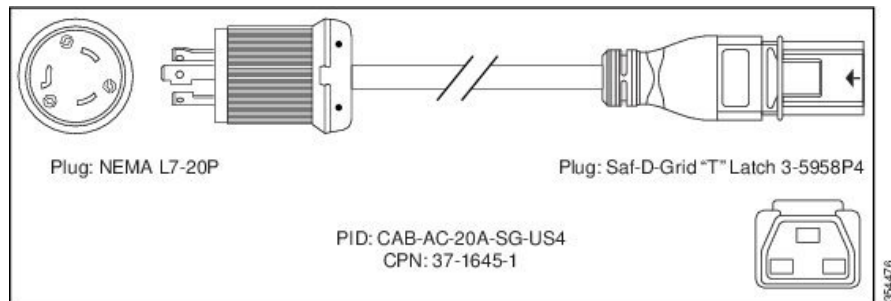
**Figure 55: CAB-AC-20A-SG-US2 Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit**



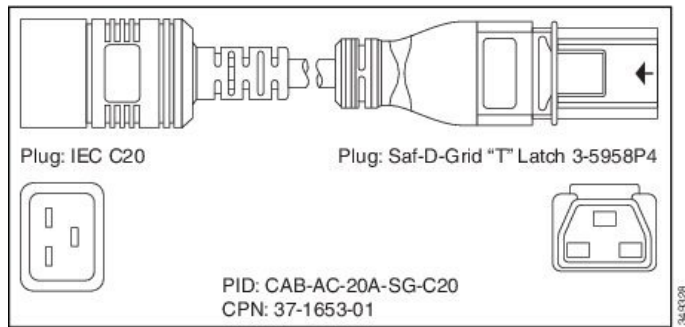
**Figure 56: CAB-AC-20A-SG-US3 Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit**



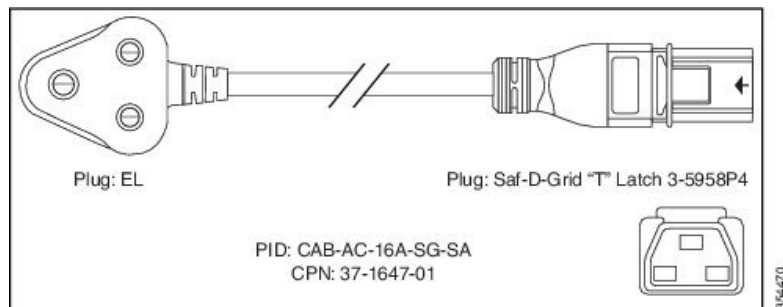
**Figure 57: CAB-AC-20A-SG-US4 Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit**



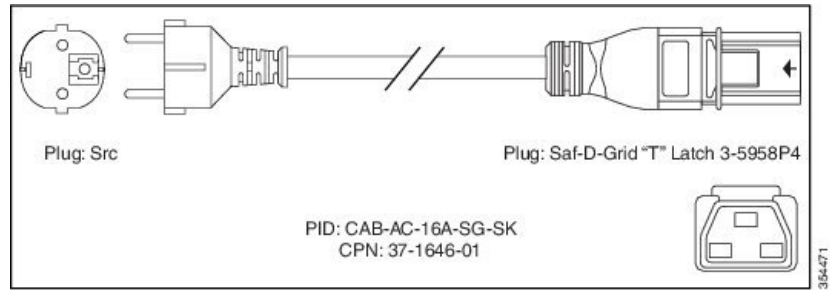
**Figure 58: CAB-AC-20A-SG-C20 Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit**



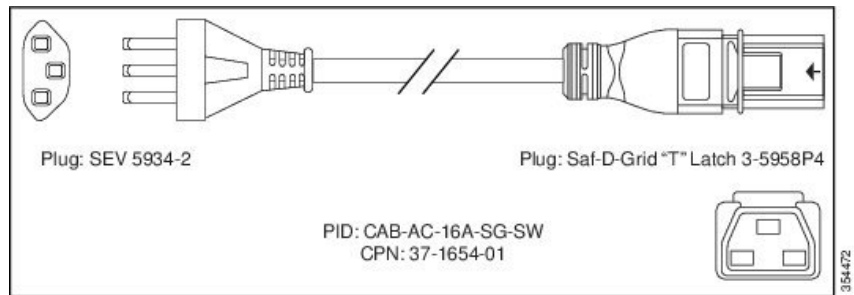
**Figure 59: CAB-AC-16A-SG-SA Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit**



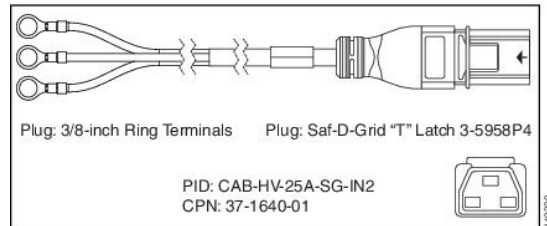
**Figure 60: CAB-AC-16A-SG-SK Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit**



**Figure 61: CAB-AC-16A-SG-SW Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit**



**Figure 62: CAB-HV-25A-SG-IN2 Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit**



**Figure 63: CAB-HV-25A-SG-IN3 Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit**

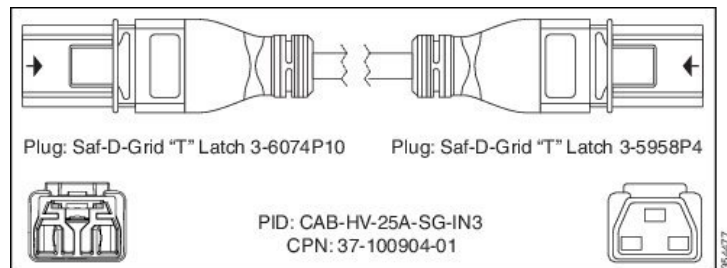


Figure 64: CAB-HV-25A-SG-US2 Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit

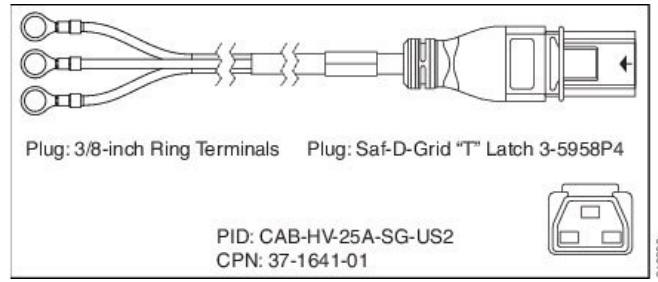
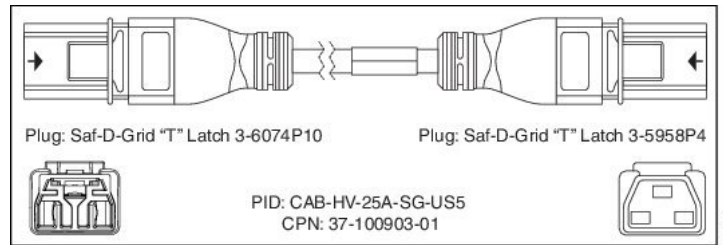


Figure 65: CAB-HV-25A-SG-US5 Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit



### 3-kW DC Power Cord Specifications

| Locale | Part Number        | Cord Ratings | Power Cord Comments |
|--------|--------------------|--------------|---------------------|
| All    | <a href="#">18</a> | 45 A         | 6 AWG               |

<sup>18</sup> Power cords used for the 3-kW DC power supply are supplied by the customer.

### 3.5-kW HVAC/HVDC Power Supply DC Power Cord Specifications

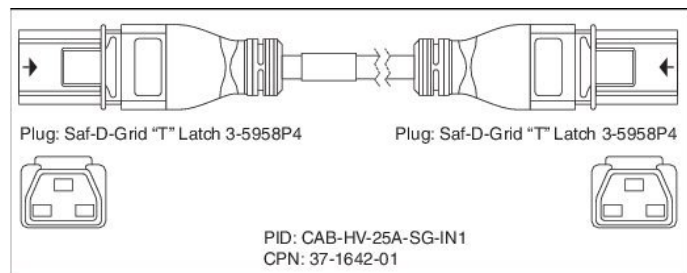
| Locale and Description               | PID               | Cisco Part Number (CPN) | Length          | Cord Set Rating | Power Cord Illustration                                                                                                   |
|--------------------------------------|-------------------|-------------------------|-----------------|-----------------|---------------------------------------------------------------------------------------------------------------------------|
| International, Saf-D-Grid/Saf-D-Grid | CAB-HV-25A-SG-IN1 | 37-1642-01              | 14' 0" (4.26 m) | 20 A, 400 VDC   | <a href="#">Figure 66: CAB-HV-25A-SG-IN1 Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit, on page 203</a> |

| Locale and Description                                             | PID               | Cisco Part Number (CPN) | Length          | Cord Set Rating       | Power Cord Illustration                                                                                   |
|--------------------------------------------------------------------|-------------------|-------------------------|-----------------|-----------------------|-----------------------------------------------------------------------------------------------------------|
| International, Ring Terminal source plug, Ring Terminal/Saf-D-Grid | CAB-HV-25A-SG-IN2 | 37-1640-01              | 14' 0" (4.26 m) | 20 A, 300 VAC/500 VDC | Figure 67: CAB-HV-25A-SG-IN2 Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit, on page 204 |
| North America, Saf-D-Grid/Saf-D-Grid                               | CAB-HV-25A-SG-US1 | 37-1643-01              | 14' 0" (4.26 m) | 20 A, 400 VDC         | Figure 68: CAB-HV-25A-SG-US1 Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit, on page 204 |
| North America, Ring Terminal source plug, Ring Terminal/Saf-D-Grid | CAB-HV-25A-SG-US2 | 37-1641-01              | 14' 0" (4.26 m) | 20 A, 300 VAC/500 VDC | Figure 69: CAB-HV-25A-SG-US2 Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit, on page 204 |

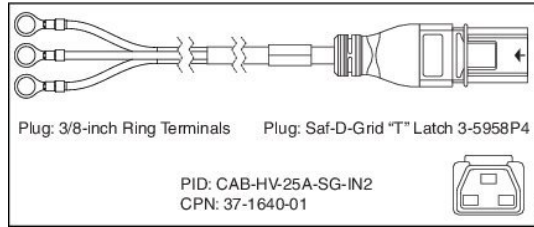


**Note** All power cords will not be orderable at first customer shipment (FCS).

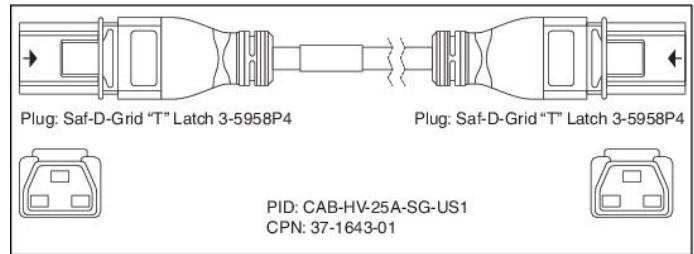
**Figure 66: CAB-HV-25A-SG-IN1 Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit**



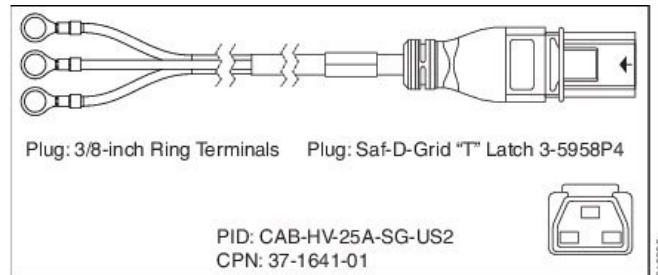
**Figure 67: CAB-HV-25A-SG-IN2 Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit**



**Figure 68: CAB-HV-25A-SG-US1 Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit**



**Figure 69: CAB-HV-25A-SG-US2 Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit**







# APPENDIX **B**

## LEDs

This appendix includes the following topics:

- [Chassis LEDs, on page 205](#)
- [Supervisor Module LEDs, on page 206](#)
- [I/O Module LEDs, on page 208](#)
- [Fan Tray LEDs, on page 210](#)
- [Power Supply LEDs, on page 210](#)

## Chassis LEDs

### Chassis LEDs

| LED | Color | Status                                                                                                                                                                       |
|-----|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PSU | Green | Power supplies are all operational.                                                                                                                                          |
|     | Amber | One of the following problems exist: <ul style="list-style-type: none"> <li>• At least one power supply LED is red.</li> <li>• At least one power supply is down.</li> </ul> |
| FAN | Green | Fan trays are all operational.                                                                                                                                               |
|     | Amber | At least one fan tray module LED is red.                                                                                                                                     |
| SUP | Green | Supervisor modules are all operational.                                                                                                                                      |
|     | Amber | At least one supervisor module LED is red.                                                                                                                                   |
| FAB | Green | Fabric modules are all operational.                                                                                                                                          |
|     | Amber | At least one fabric module LED is red.                                                                                                                                       |
| IOM | Green | I/O modules are all operational.                                                                                                                                             |
|     | Amber | At least one I/O module LED is red.                                                                                                                                          |

## Supervisor Module LEDs

| LED    | Color         | Status                                                                                                                                                                                                                                                                                                                                                                                                   |
|--------|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| STATUS | Green         | All diagnostics pass. The module is operational (normal initialization sequence).                                                                                                                                                                                                                                                                                                                        |
|        | Amber         | Indicates one of the following: <ul style="list-style-type: none"> <li>• The module has detected a slot ID parity error and will not power on or boot up.</li> <li>• The module is booting or running diagnostics (normal initialization sequence).</li> <li>• An over temperature condition has occurred. (A minor temperature threshold has been exceeded during environmental monitoring.)</li> </ul> |
|        | Flashing red  | Indicates one of the following: <ul style="list-style-type: none"> <li>• The diagnostic test has failed.</li> <li>• The module is not operational because a fault occurred during the initialization sequence.</li> <li>• An over temperature condition has occurred. (A major temperature threshold has been exceeded during environmental monitoring.)</li> </ul>                                      |
|        | Red           | The module has detected a slot ID parity error and will not power on or boot up.                                                                                                                                                                                                                                                                                                                         |
|        | Off           | The module is not receiving power.                                                                                                                                                                                                                                                                                                                                                                       |
| ID     | Flashing blue | The operator has activated this LED to identify this module in the chassis.                                                                                                                                                                                                                                                                                                                              |
|        | Off           | This module is not being identified.                                                                                                                                                                                                                                                                                                                                                                     |

| LED       | Color          | Status                                                                                                                                                                                                                                                                                                                             |
|-----------|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SYSTEM    | Green          | All chassis environmental monitors are reporting okay.                                                                                                                                                                                                                                                                             |
|           | Amber          | Indicates one of the following: <ul style="list-style-type: none"> <li>• At least one power supply has failed or the power supply fan has failed.</li> <li>• Incompatible power supplies are installed.</li> <li>• At least one redundant fan or fan controller has failed in the chassis. Overheating is not imminent.</li> </ul> |
|           | Red            | Indicates one of the following: <ul style="list-style-type: none"> <li>• The temperature of the Supervisor engine has exceeded the major threshold level.</li> <li>• At least one non-redundant fan or fan controller, or both redundant, have failed in the chassis. Overheating is imminent.</li> </ul>                          |
| ACTIVE    | Green          | The supervisor module is operational and active.                                                                                                                                                                                                                                                                                   |
|           | Amber          | The supervisor module is in standby mode.                                                                                                                                                                                                                                                                                          |
| PWR MGMT  | Green          | Sufficient power is available for all installed modules.                                                                                                                                                                                                                                                                           |
|           | Amber          | Sufficient power is not available for all installed modules.                                                                                                                                                                                                                                                                       |
| LINK      | Green          | The module has detected a link.                                                                                                                                                                                                                                                                                                    |
|           | Off            | The module does not detect a link.                                                                                                                                                                                                                                                                                                 |
| ACT       | Flashing green | The module is transmitting or receiving.                                                                                                                                                                                                                                                                                           |
|           | Off            | The module is not transmitting or receiving.                                                                                                                                                                                                                                                                                       |
| MGMT ETH  | Green          | The management port is operational.                                                                                                                                                                                                                                                                                                |
|           | Amber          | The management port link has been disabled through the software.                                                                                                                                                                                                                                                                   |
|           | Flashing Amber | The management port link is bad and has been disabled due to a hardware failure.                                                                                                                                                                                                                                                   |
|           | Off            | The module has not detected a signal.                                                                                                                                                                                                                                                                                              |
| LOG FLASH | Green          | The log flash CompactFlash or USB disk is being accessed. Do not remove the media until the LED is off.                                                                                                                                                                                                                            |
|           | Off            | The expansion flash CompactFlash or USB disk is not being accessed. You can remove the media while this LED is off.                                                                                                                                                                                                                |

**Note** This is available only on Supervisor-2 modules.

| LED    | Color                                                                                                         | Status                                                                                                        |
|--------|---------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
| Slot 0 | Green                                                                                                         | The expansion flash CompactFlash or USB disk is being accessed. Do not remove the media until the LED is off. |
|        | Off                                                                                                           | The log flash CompactFlash or USB disk is not being accessed. You can remove the media while this LED is off. |
| Off    | The log flash CompactFlash or USB disk is not being accessed. You can remove the media while this LED is off. |                                                                                                               |
| USB1   | Green                                                                                                         | The expansion flash CompactFlash or USB disk is being accessed. Do not remove the media until the LED is off. |
|        | Off                                                                                                           | The log flash CompactFlash or USB disk is not being accessed. You can remove the media while this LED is off. |

## I/O Module LEDs

| LED | Color         | Status                                                                      |
|-----|---------------|-----------------------------------------------------------------------------|
| ID  | Flashing blue | The operator has activated this LED to identify this module in the chassis. |
|     | Off           | This LED is not being used.                                                 |

| LED                  | Color          | Status                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|----------------------|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Status               | Green          | All diagnostics passed. This module is operational (normal initialization sequence).                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                      | Amber          | Indicates one of the following: <ul style="list-style-type: none"> <li>• The module is booting or running diagnostics.</li> <li>• An overtemperature condition has occurred. (A minor temperature threshold has been exceeded during environmental monitoring.)</li> </ul>                                                                                                                                                                                                                                               |
|                      | Flashing red   | Indicates one of the following: <ul style="list-style-type: none"> <li>• The switch has just been powered on, and the module is resetting.</li> <li>• The module has been inserted during the initialization process.</li> <li>• An overtemperature condition has occurred. A major temperature threshold has been exceeded during environmental monitoring.</li> <li>• The module has failed to download code and configuration information successfully during the initial reset. The module is not online.</li> </ul> |
|                      | Red            | Indicates one of the following: <ul style="list-style-type: none"> <li>• The module has detected a slot ID parity error and will not power on or boot up.</li> <li>• The module is not fully inserted, and it is not making a reliable connection with the supervisor.</li> </ul>                                                                                                                                                                                                                                        |
|                      | Off            | The module is not receiving power.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Link (for each port) | Green          | The port is active (the link is connected and active).                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|                      | Amber          | The module or port is disabled by using a CLI command or the module is initializing.                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                      | Flashing amber | The port is faulty and disabled.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                      | Off            | The port is not active or the link is not connected.                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

## Fan Tray LEDs

| LED           | Color         | Status                                                                                                                                                                                                                                                                                                                                                                                                                     |
|---------------|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| STATUS        | Green         | The fan tray is operational.                                                                                                                                                                                                                                                                                                                                                                                               |
|               | Flashing red  | One or more fans is running below the threshold speed.<br>The fan tray is receiving insufficient power.                                                                                                                                                                                                                                                                                                                    |
|               | Off           | No power is going to the fan tray.                                                                                                                                                                                                                                                                                                                                                                                         |
| ID            | Flashing blue | The operator has activated this LED to identify this module in the chassis.                                                                                                                                                                                                                                                                                                                                                |
|               | Off           | This module is not being identified.                                                                                                                                                                                                                                                                                                                                                                                       |
| FABRIC STATUS | Green         | All diagnostics pass. The module is operational (normal initialization sequence).                                                                                                                                                                                                                                                                                                                                          |
|               | Red           | Indicates one of the following: <ul style="list-style-type: none"> <li>The diagnostic test has failed. The module is not operational because a fault has occurred during the initialization sequence.</li> <li>The inlet air temperature of the system has exceeded the safe operating temperature limits of the card (a major environmental warning). The card has been shut down to prevent permanent damage.</li> </ul> |
|               | Flashing red  | Indicates one of the following: <ul style="list-style-type: none"> <li>The fabric module has just been inserted and is booting up.</li> <li>An overtemperature condition has occurred and the module has powered down.</li> <li>The power was turned off with a CLI command.</li> <li>The module is resetting and both ejector levers are out.</li> </ul>                                                                  |

## Power Supply LEDs

Depending on the power supply (AC, DC and HVAC/HVDC power supplies), there are 1 or 2 input LEDs. The Output, Fault, and ID LEDs have the same function for the AC, DC and HVAC/HVDC power supply units.

| LED     | Color | Status                                                             |
|---------|-------|--------------------------------------------------------------------|
| Input 1 | Green | The AC, HVAC/HVDC, or DC input voltage is within the valid range.  |
|         | Off   | The AC, HVAC/HVDC, or DC input voltage is outside the valid range. |

| LED                                                  | Color         | Status                                                                          |
|------------------------------------------------------|---------------|---------------------------------------------------------------------------------|
| Input 2<br>(available only on DC power supply units) | Green         | The DC input voltage is within the valid range.                                 |
|                                                      | Off           | The DC input voltage is outside the valid range.                                |
| Output                                               | Green         | The AC or DC output power is within the valid range.                            |
|                                                      | Off           | The AC or DC output power is outside the valid range.                           |
| Fault                                                | Off           | The AC or DC output voltage and power supply unit tests are okay.               |
|                                                      | Flasing red   | Self-diagnostic tests have failed or another power supply failure has occurred. |
| ID                                                   | Flashing blue | The operator has activated this LED to identify this module in the chassis.     |
|                                                      | off           | This module is not being identified.                                            |







# APPENDIX C

## Accessory Kits

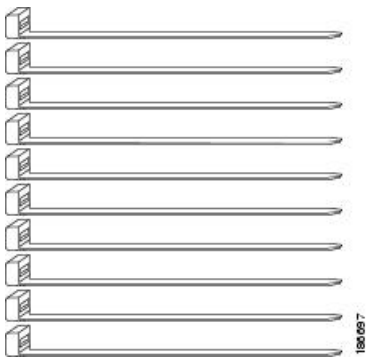
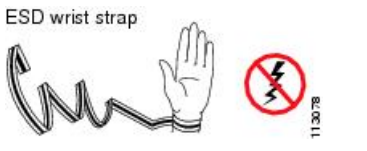
This appendix includes the following sections:

- [Accessory Kit Contents, on page 213](#)

## Accessory Kit Contents

The following table lists and illustrates the contents for the accessory kit.

| Illustration | Description                                                                                                                                                                                                        | Quantity |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
|              | <b>Bottom-support rails kit</b> <ul style="list-style-type: none"> <li>• 12-24 x 3/4 in. Phillips screws (34)</li> <li>• M6 x 19-mm Phillips screws (34)</li> <li>• Adjustable bottom-support rails (2)</li> </ul> | 1 kit    |
|              | RJ-45 rollover cable                                                                                                                                                                                               | 1        |
|              | DB9F/RJ-45F PC terminal                                                                                                                                                                                            | 1        |
|              | <b>Ground lug kit</b> <ul style="list-style-type: none"> <li>• Two-hole lug (1)</li> <li>• M4 x 8-mm Phillips pan-head screws (2)</li> </ul>                                                                       | 1 kit    |

| Illustration                                                                      | Description                                      | Quantity |
|-----------------------------------------------------------------------------------|--------------------------------------------------|----------|
|  | Cable tie, 8.5 inches (10)                       | 1 set    |
|  | ESD wrist strap (disposable)                     | 1        |
| Not applicable                                                                    | Hazardous substances list for customers in China | 1        |
| Not applicable                                                                    | Cisco Information Packet                         | 1        |
| Not applicable                                                                    | 1-Year Limited Warranty for Hardware             | 1        |
| Not applicable                                                                    | GR-1089 Installation and Caution Instructions    | 1        |



**Note**

If you do not receive a part listed in this document, contact Cisco Technical Support at this URL: <http://www.cisco.com/warp/public/687/Directory/DirTAC.shtml>.

If you purchased this product through a Cisco reseller, you might receive additional contents in your kit, such as documentation, hardware, and power cables.

The product shipment includes power cords for the following power supplies:

- 3-kW AC power supplies—one power cord per power supply
- 3-kW DC power supplies—no power cords supplied (you must supply a 6 AWG cable for up to 45 A)

If your switch includes 3-kW AC power supplies, the product shipment includes one country-specific power cord for each of those power supplies. The shipped cables depend on your specification when placing your order for the switch. The available power cords for the 3-kW AC power supplies are as follows:

- CAB-AC-16A-AUS—power cord, 250-VAC 16A, C19, Australia
- CAB-AC-16A-CH—power cord, 16-A, China
- CAB-AC-2500W-EU—power cord, 250-VAC 16A, Europe
- CAB-AC-2500W-INT—power cord, 250-VAC 16A, International

- CAB-AC-2500W-ISRL—power cord, 250-VAC 16-A, Israel
- CAB-9K16A-US1—power cord, 250-VAC 16A, Src Plug NEMA 6-20, US/Japan
- CAB-AC-C6K-TWLK—power cord, 250-VAC 16A, twist lock, NEMA L6-20
- CAB-7513AC—power cord, AC 110V North America
- CAB-C19-CBN—cabinet jumper power cord, 250-VAC, 16A, C20C
- CAB-ACS-16—power cord, 16-A, Switzerland
- CAB-L520P-C19-US—NEMA L5-20 to IEC-C19 6ft US



---

**Note** All power cords will not be orderable at first customer shipment (FCS).

---



---

**Note** All power cords will not be orderable at first customer shipment (FCS).

---





## APPENDIX **D**

# Site Preparation and Maintenance Records

- [Site Preparation Checklist, on page 217](#)
- [Contact and Site Information, on page 218](#)
- [Chassis and Module Information, on page 219](#)

## Site Preparation Checklist

Planning the location and layout of your equipment rack or cabinet is essential for successful switch operation, ventilation, and accessibility.

The following table lists the site planning tasks that we recommend that you complete before you install the switch. Your completion of each task ensures a successful switch installation.

| Planning Activity         | Verification Time and Date |
|---------------------------|----------------------------|
| Space evaluation:         |                            |
| Space and layout          |                            |
| Floor covering            |                            |
| Impact and vibration      |                            |
| Lighting                  |                            |
| Physical access           |                            |
| Maintenance access        |                            |
| Environmental evaluation: |                            |
| Ambient temperature       |                            |
| Humidity                  |                            |
| Altitude                  |                            |
| Atmospheric contamination |                            |
| Airflow                   |                            |

| Planning Activity                                  | Verification Time and Date |
|----------------------------------------------------|----------------------------|
| Power evaluation:                                  |                            |
| Input power type                                   |                            |
| Power receptacles                                  |                            |
| Receptacle proximity to the equipment              |                            |
| Dedicated (separate) circuits for power redundancy |                            |
| UPS for power failures                             |                            |
| Grounding: proper wire gauge and lugs              |                            |
| Circuit breaker size                               |                            |
| Grounding evaluation:                              |                            |
| Data center ground                                 |                            |
| Cable and interface equipment evaluation:          |                            |
| Cable type                                         |                            |
| Connector type                                     |                            |
| Cable distance limitations                         |                            |
| Interface equipment (transceivers)                 |                            |
| EMI evaluation:                                    |                            |
| Distance limitations for signaling                 |                            |
| Site wiring                                        |                            |
| RFI levels                                         |                            |

## Contact and Site Information

Use the following worksheet to record contact and site information

|                |  |
|----------------|--|
| Contact person |  |
| Contact phone  |  |

|                      |  |
|----------------------|--|
| Contact e-mail       |  |
| Building/site name   |  |
| Data center location |  |
| Floor location       |  |
| Address (line 1)     |  |
| Address (line 2)     |  |
| City                 |  |
| State                |  |
| ZIP code             |  |
| Country              |  |

## Chassis and Module Information

Use the following worksheets to record information about the chassis and modules.

**Table 14: Chassis Information**

|                        |  |
|------------------------|--|
| Contract number        |  |
| Chassis serial number  |  |
| Product number         |  |
| Switch IP address      |  |
| Switch IP netmask      |  |
| Hostname               |  |
| Domain name            |  |
| IP broadcast address   |  |
| Gateway/router address |  |
| DNS address            |  |

*Table 15: Module Information for a Cisco Nexus 7718 Switch*

| Slot | Module Type | Module Serial Number | Notes |
|------|-------------|----------------------|-------|
| 1    |             |                      |       |
| 2    |             |                      |       |
| 3    |             |                      |       |
| 4    |             |                      |       |
| 5    |             |                      |       |
| 6    |             |                      |       |
| 7    |             |                      |       |
| 8    |             |                      |       |
| 9    | Supervisor  |                      |       |
| 10   | Supervisor  |                      |       |
| 11   |             |                      |       |
| 12   |             |                      |       |
| 13   |             |                      |       |
| 14   |             |                      |       |
| 15   |             |                      |       |
| 16   |             |                      |       |
| 17   |             |                      |       |
| 18   |             |                      |       |





## INDEX

1-Gb SFP transceivers [184](#)  
10-Gb SFP+ transceivers [176](#)  
100-Gb CPAK transceivers [171](#)  
10BASE-DWDM SFP+ transceivers [180](#)  
3-kW AC power cords [191](#)  
3-kw DC power cords [202](#)  
40-Gb QSFP+ transceivers [174](#)

### A

AC power supply connection [142, 143, 147](#)  
accessory kit [213](#)  
air particulate requirements [8](#)  
airflow [14](#)  
altitude requirements [7](#)  
Altitude specifications [149](#)  
attach console module command [70](#)  
attach module command [64](#)

### B

back plane contents, displaying [58](#)  
bottom-support rails installation [19](#)

### C

cabinet installation [17](#)  
cabinet requirements [12](#)  
cable management frames [33](#)  
    Cisco Nexus 7718 [33](#)  
cable management system dimensions [150](#)  
chassis dimensions [150](#)  
chassis installation [21](#)  
chassis LEDs [205](#)  
clearances [14](#)  
COM1/AUX serial port [46](#)  
connecting ports guidelines [45](#)  
connectors used with modules [162](#)  
console connection [46](#)  
console serial port [46](#)  
console settings [46](#)  
contact and site information [218](#)  
copy running-config startup-config command [65](#)  
CPAK transceivers [171](#)

### D

DB9F/RJ-45 adapter [46](#)  
DC power cords [202](#)  
DC power supply, connecting [145](#)  
dimensions [150](#)  
door installation [38](#)  
dust requirements [8](#)

### E

electromagnetic interference, minimizing [8](#)  
environmental information, displaying [59](#)

### F

fabric module [75, 134](#)  
    installation [134](#)  
    out-of-service [75](#)  
    power up [75](#)  
    poweroff [75](#)  
fabric modules identified [1](#)  
fabric modules supported [74, 133](#)  
fabric modules: amount of power reserved [75](#)  
fan tray installation [128](#)  
fan tray LEDs [210](#)  
fan tray status [95](#)  
fan trays identified [1](#)  
fan trays, managing [92](#)  
FEX support [69](#)  
front door identified [1](#)

### G

grounding requirements [9](#)

### H

handles, chassis [1](#)  
hardware [53, 56](#)  
    information, displaying [53](#)  
    inventory, displaying [56](#)  
humidity requirements [7](#)  
humidity specifications [149](#)

**I**

I/O module **70, 126**  
     Cisco Nexus 7700 **126**  
         installation **126**  
         console, access through **70**  
 I/O module LEDs **208**  
 I/O module support **69**  
 I/O modules identified **1**  
 initial switch configuration **48**  
 inspecting the chassis shipment **18**  
 interface cables **50**  
     care **50**  
 interface ports **49**  
     connecting **49**  
 IP address, setting for switch **48**

**L**

LEDs **205, 206, 208, 210**  
     chassis **205**  
     fan tray **210**  
     I/O module **208**  
     supervisor module **206**

**M**

management interface, connecting **47**  
 maximum power **84, 89, 152, 157**  
     3-kW DC power supplies **84, 89, 152, 157**  
 maximum power availability **83, 85, 151, 153**  
 module **56, 65, 66, 67, 73**  
     configuration, purging **73**  
     configuration, saving **65**  
     inventory, displaying **56**  
     power cycle **66**  
     supervisor **67**  
 module powerup **74**  
 module shutdown **74**  
 module state, displaying status **71**  
 module temperature, displaying **63**  
 module, connecting to **64**  
 modules identified **1**  
 modules, transceivers used for **162**

**O**

optical cable **50**  
     care **50**  
 out-of-band management, connecting **47**  
 out-of-service module command **68**

**P**

particulate requirements **8**

password, setting **48**  
 port connection guidelines **45**  
 port types for modules **162**  
 power cables **190**  
 power cycle a module **66**  
 power mode, configuring **82**  
 power modes **76**  
     defined **76**  
 power redundancy-mode command **82**  
 power requirements **9, 150**  
 power reserved for fabric modules **75**  
 power supplies identified **1**  
 power supply (AC) connection **142, 143, 147**  
 power supply installation **140**  
 power usage information, displaying **66**  
 purge module command **73**

**Q**

QSFP+ transceivers **174**

**R**

rack installation **17**  
 rack requirements **12**  
 radio frequency interference, minimizing **8**  
 rebooting the switch **67**  
 reload command **67**  
 reload module command **65, 66**  
 RJ-45 connectors **190**  
     specifications **190**  
 RJ-45 rollover cable **46**

**S**

Serial number, displaying **58**  
 service clearances **14**  
 SFP transceivers **184**  
 SFP+ transceivers **176**  
 shock and vibration requirements **9**  
 show environment command **59**  
 show environment power command **66**  
 show environment temperature command **63**  
 show hardware command **53**  
 show srom backplane command **58**  
 site preparation **7, 8, 9**  
     air particulate requirements **8**  
     altitude requirements **7**  
     dust requirements **8**  
     electromagnetic interference, minimizing **8**  
     grounding requirements **9**  
     humidity requirements **7**  
     particulate requirements **8**  
     radio frequency interference, minimizing **8**  
     shock and vibration requirements **9**

site preparation (*continued*)  
vibration and shock requirements [9](#)  
site preparation checklist [217](#)  
supervisor LEDs [206](#)  
supervisor module [67, 68, 98](#)  
installation [98](#)  
overview [67](#)  
shutting down [68](#)  
supervisor module: installing [102](#)  
Supervisor modules identified [1](#)  
switch IP address [48](#)

## T

temperature specifications [149](#)

transceivers [50, 171, 174, 176, 180, 184](#)  
1-Gb SFP [184](#)  
10-Gb SFP+ [176](#)  
100 Gb CPAK [171](#)  
10BASE-DWDM SFP+ [180](#)  
40-Gb QSFP+ [174](#)  
care [50](#)  
transceivers used with modules [162](#)

## V

vibration and shock requirements [9](#)

