Cisco Nexus 7000 Series Hardware Installation and Reference Guide

For the Cisco Nexus 7004, 7009, 7010, and 7018 Switches

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You can determine whether your equipment is causing interference by turning it off. If the interference stops, it was probably caused by the Cisco equipment or one of its peripheral devices. If the equipment causes interference to radio or television reception, try to correct the interference by using one or more of the following measures:

• Turn the television or radio antenna until the interference stops.

• Move the equipment to one side or the other of the television or radio.

• Move the equipment farther away from the television or radio.

• Plug the equipment into an outlet that is on a different circuit from the television or radio. (That is, make certain the equipment and the television or radio are on circuits controlled by different circuit breakers or fuses.)

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Cisco Nexus 7000 Series Hardware Installation and Reference Guide

CONTENTS

New and Changed Information

This chapter provides release-specific information for each new and changed feature in the *Cisco Nexus 7000 Series Hardware Installation and Reference Guide*. The latest version of this document is available at the following Cisco website:
http://www.cisco.com/en/US/docs/switches/datacenter/hw/nexus7000/installation/guide/n7k_hig_book.html

Table 1 summarizes the new and changed features for the *Cisco Nexus 7000 Series Hardware Installation and Reference Guide*, and tells you where they are documented.

Table 1 New and Changed Features for Release 6.2(8)

Feature	Description	Changed in Release	Where Documented
Supported optics and cables	Additional optics and cables supported by the 12-port 40-Gigabit Ethernet I/O module (N7K-F312FQ-25) and 6-port 40-Gigabit Ethernet I/O module (N7K-M206FQ-23)	6.2(8)	Chapter 7, "Connecting the Cisco Nexus 7000 Series Switch to the Network"
EPLD images	Updated EPLD images for the NAM and various I/O modules	6.2(8)	Chapter 8, "Managing the Switch Hardware"
10-Mbps support for Cisco Nexus 2248TP-E FEX	Support for 10-Mbps speed for the Cisco Nexus 2248TP-E FEX	6.2(8)	Appendix B, "Transceivers and Module Connectors"

Preface

This preface describes the audience, organization, and conventions of the *Cisco Nexus 7000 Series Hardware Installation and Reference Guide*. It also provides information on how to obtain related documentation.

This preface includes the following sections:

Audience

This guide is for experienced network system administrators who configure and maintain Cisco Nexus 7004, 7009, 7010, and 7018 switches.

Organization

This document describes how to install the Cisco Nexus 7004, 7009, 7010, and 7018 switches. For information about installing the Cisco Nexus 7706, 7710, or 7718 switches, see the individual hardware installation guide for each product.

This document is organized as follows:

Chapter	Description
Chapter 1, “Overview”	Provides an overview of the installation process.
Chapter 2, “Installing a Cisco Nexus 7004 Chassis”	Describes how to install the Cisco Nexus 7004 hardware components.
Chapter 3, “Installing a Cisco Nexus 7009 Chassis”	Describes how to install the Cisco Nexus 7009 hardware components.

Chapter	Description
Chapter 4, “Installing a Cisco Nexus 7010 Chassis”	Describes how to install the Cisco Nexus 7010 hardware components.
Chapter 5, “Installing a Cisco Nexus 7018 Chassis”	Describes how to install the Cisco Nexus 7018 hardware components.
Chapter 6, “Installing Power Supplies”	Describes how to install the power supply units in the Cisco Nexus 7000 Series switches.
Chapter 7, “Connecting the Cisco Nexus 7000 Series Switch to the Network”	Describes how to connect a Cisco Nexus 7000 Series switch to AC power and the network.
Chapter 8, “Managing the Switch Hardware”	Describes how to manage the hardware for the Cisco Nexus 7000 Series switch.
Chapter 9, “Troubleshooting”	Describes how to troubleshoot the Cisco Nexus 7000 Series hardware.
Chapter 10, “Installing or Replacing Components”	Describes how to replace Cisco Nexus 7000 Series components during system operations.
Appendix A, “Technical Specifications”	Provides system and site requirements that you should use for planning the installation of the Cisco Nexus 7000 Series switch.
Appendix B, “Transceivers and Module Connectors”	Provides the specifications for the connection devices used to connect the Cisco Nexus 7000 Series switch to the Internet.
Appendix D, “Chassis and Module LEDs”	Describes the switch and module LEDs that indicate system conditions.
Appendix E, “Repacking the Cisco Nexus 7000 Series Switch for Shipment”	Explains how you should repack the Cisco Nexus 7000 Series switch in case you need to ship it.
Appendix F, “Site Preparation and Maintenance Records”	Provides contact information and a table for recording site records.

Document Conventions

Command descriptions use these conventions:

Convention	Description
boldface font	Commands and keywords are in boldface.
italic font	Arguments for which you supply values are in italics.
[ ]	Elements in square brackets are optional.
[x | y | z]	Optional alternative keywords are grouped in brackets and separated by vertical bars.
string	A nonquoted set of characters. Do not use quotation marks around the string or the string will include the quotation marks.

Screen examples use these conventions:

`screen font`	Terminal sessions and information that the switch displays are in screen font.
`boldface screen font`	Information you must enter is in boldface screen font.
`italic screen font`	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 publication.

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

Warning **IMPORTANT SAFETY INSTRUCTIONS**

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

SAVE THESE INSTRUCTIONS

Waarschuwing **BELANGRIJKE VEILIGHEIDSINSTRUCTIES**

Dit waarschuwingssymbool betekent gevaar. U verkeert in een situatie die lichamelijk letsel kan veroorzaken. Voordat u aan enige apparatuur gaat werken, dient u zich bewust te zijn van de bij elektrische schakelingen betrokken risico's en dient u op de hoogte te zijn van de standaard praktijken om ongelukken te voorkomen. Gebruik het nummer van de verklaring onderaan de waarschuwing als u een vertaling van de waarschuwing die bij het apparaat wordt geleverd, wilt raadplegen.

BEWAAR DEZE INSTRUCTIES

Varoitus **TÄRKEITÄ TURVALLISUUSOHJEITA**

Tämä varoitusmerkki merkitsee vaaraa. Tilanne voi aiheuttaa ruumiillisia vammoja. Ennen kuin käsittelet laitteistoa, huomioi sähköpiirien käsittelemiseen liittyvät riskit ja tutustu onnettomuuksien yleisiin ehkäisytapoihin. Turvallisuusvaroitusten käännökset löytyvät laitteen mukana toimitettujen käännettyjen turvallisuusvaroitusten joukosta varoitusten lopussa näkyvien lausuntonumeroiden avulla.

SÄILYTÄ NÄMÄ OHJEET

Attention **IMPORTANTES INFORMATIONS DE SÉCURITÉ**

Ce symbole d'avertissement indique un danger. Vous vous trouvez dans une situation pouvant entraîner des blessures ou des dommages corporels. Avant de travailler sur un équipement, soyez conscient des dangers liés aux circuits électriques et familiarisez-vous avec les procédures couramment utilisées pour éviter les accidents. Pour prendre connaissance des traductions des avertissements figurant dans les consignes de sécurité traduites qui accompagnent cet appareil, référez-vous au numéro de l'instruction situé à la fin de chaque avertissement.

CONSERVEZ CES INFORMATIONS

Warnung **WICHTIGE SICHERHEITSHINWEISE**

Dieses Warnsymbol bedeutet Gefahr. Sie befinden sich in einer Situation, die zu Verletzungen führen kann. Machen Sie sich vor der Arbeit mit Geräten mit den Gefahren elektrischer Schaltungen und den üblichen Verfahren zur Vorbeugung vor Unfällen vertraut. Suchen Sie mit der am Ende jeder Warnung angegebenen Anweisungsnummer nach der jeweiligen Übersetzung in den übersetzten Sicherheitshinweisen, die zusammen mit diesem Gerät ausgeliefert wurden.

BEWAHREN SIE DIESE HINWEISE GUT AUF.

Avvertenza **IMPORTANTI ISTRUZIONI SULLA SICUREZZA**

Questo simbolo di avvertenza indica un pericolo. La situazione potrebbe causare infortuni alle persone. Prima di intervenire su qualsiasi apparecchiatura, occorre essere al corrente dei pericoli relativi ai circuiti elettrici e conoscere le procedure standard per la prevenzione di incidenti. Utilizzare il numero di istruzione presente alla fine di ciascuna avvertenza per individuare le traduzioni delle avvertenze riportate in questo documento.

CONSERVARE QUESTE ISTRUZIONI

Advarsel **VIKTIGE SIKKERHETSINSTRUKSJONER**

Dette advarselssymbolet betyr fare. Du er i en situasjon som kan føre til skade på person. Før du begynner å arbeide med noe av utstyret, må du være oppmerksom på farene forbundet med elektriske kretser, og kjenne til standardprosedyrer for å forhindre ulykker. Bruk nummeret i slutten av hver advarsel for å finne oversettelsen i de oversatte sikkerhetsadvarslene som fulgte med denne enheten.

TA VARE PÅ DISSE INSTRUKSJONENE

Aviso **INSTRUÇÕES IMPORTANTES DE SEGURANÇA**

Este símbolo de aviso significa perigo. Você está em uma situação que poderá ser causadora de lesões corporais. Antes de iniciar a utilização de qualquer equipamento, tenha conhecimento dos perigos envolvidos no manuseio de circuitos elétricos e familiarize-se com as práticas habituais de prevenção de acidentes. Utilize o número da instrução fornecido ao final de cada aviso para localizar sua tradução nos avisos de segurança traduzidos que acompanham este dispositivo.

GUARDE ESTAS INSTRUÇÕES

¡Advertencia! **INSTRUCCIONES IMPORTANTES DE SEGURIDAD**

Este símbolo de aviso indica peligro. Existe riesgo para su integridad física. Antes de manipular cualquier equipo, considere los riesgos de la corriente eléctrica y familiarícese con los procedimientos estándar de prevención de accidentes. Al final de cada advertencia encontrará el número que le ayudará a encontrar el texto traducido en el apartado de traducciones que acompaña a este dispositivo.

GUARDE ESTAS INSTRUCCIONES

Varning! **VIKTIGA SÄKERHETSANVISNINGAR**

Denna varningssignal signalerar fara. Du befinner dig i en situation som kan leda till personskada. Innan du utför arbete på någon utrustning måste du vara medveten om farorna med elkretsar och känna till vanliga förfaranden för att förebygga olyckor. Använd det nummer som finns i slutet av varje varning för att hitta dess översättning i de översatta säkerhetsvarningar som medföljer denna anordning.

SPARA DESSA ANVISNINGAR

Figyelem **FONTOS BIZTONSÁGI ELOÍRÁSOK**

Ez a figyelmezeto jel veszélyre utal. Sérülésveszélyt rejto helyzetben van. Mielott bármely berendezésen munkát végezte, legyen figyelemmel az elektromos áramkörök okozta kockázatokra, és ismerkedjen meg a szokásos balesetvédelmi eljárásokkal. A kiadványban szereplo figyelmeztetések fordítása a készülékhez mellékelt biztonsági figyelmeztetések között található; a fordítás az egyes figyelmeztetések végén látható szám alapján keresheto meg.

ORIZZE MEG EZEKET AZ UTASÍTÁSOKAT!

Предупреждение **ВАЖНЫЕ ИНСТРУКЦИИ ПО СОБЛЮДЕНИЮ ТЕХНИКИ БЕЗОПАСНОСТИ**

Этот символ предупреждения обозначает опасность. То есть имеет место ситуация, в которой следует опасаться телесных повреждений. Перед эксплуатацией оборудования выясните, каким опасностям может подвергаться пользователь при использовании электрических цепей, и ознакомьтесь с правилами техники безопасности для предотвращения возможных несчастных случаев. Воспользуйтесь номером заявления, приведенным в конце каждого предупреждения, чтобы найти его переведенный вариант в переводе предупреждений по безопасности, прилагаемом к данному устройству.

СОХРАНИТЕ ЭТИ ИНСТРУКЦИИ

警告　重要的安全性说明

此警告符号代表危险。您正处于可能受到严重伤害的工作环境中。在您使用设备开始工作之前，必须充分意识到触电的危险，并熟练掌握防止事故发生的标准工作程序。请根据每项警告结尾提供的声明号码来找到此设备的安全性警告说明的翻译文本。

请保存这些安全性说明

警告　安全上の重要な注意事項

「危険」の意味です。人身事故を予防するための注意事項が記述されています。装置の取り扱い作業を行うときは、電気回路の危険性に注意し、一般的な事故防止策に留意してください。警告の各国語版は、各注意事項の番号を基に、装置に付属の「Translated Safety Warnings」を参照してください。

これらの注意事項を保管しておいてください。

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이 지시 사항을 보관하십시오.

Aviso　**INSTRUÇÕES IMPORTANTES DE SEGURANÇA**

Este símbolo de aviso significa perigo. Você se encontra em uma situação em que há risco de lesões corporais. Antes de trabalhar com qualquer equipamento, esteja ciente dos riscos que envolvem os circuitos elétricos e familiarize-se com as práticas padrão de prevenção de acidentes. Use o número da declaração fornecido ao final de cada aviso para localizar sua tradução nos avisos de segurança traduzidos que acompanham o dispositivo.

GUARDE ESTAS INSTRUÇÕES

Advarsel　**VIGTIGE SIKKERHEDSANVISNINGER**

Dette advarselssymbol betyder fare. Du befinder dig i en situation med risiko for legemesbeskadigelse. Før du begynder arbejde på udstyr, skal du være opmærksom på de involverede risici, der er ved elektriske kredsløb, og du skal sætte dig ind i standardprocedurer til undgåelse af ulykker. Brug erklæringsnummeret efter hver advarsel for at finde oversættelsen i de oversatte advarsler, der fulgte med denne enhed.

GEM DISSE ANVISNINGER

تحذير　**إرشادات الأمان الهامة**

يوضح رمز التحذير هذا وجود خطر. وهذا يعني أنك متواجد في مكان قد ينتج عنه التعرض لإصابات. قبل بدء العمل، احذر مخاطر التعرض للصدمات الكهربائية وكن على علم بالإجراءات القياسية للحيلولة دون وقوع أي حوادث. استخدم رقم البيان الموجود في أخر كل تحذير لتحديد مكان ترجمته داخل تحذيرات الأمان المترجمة التي تأتي مع الجهاز.
قم بحفظ هذه الإرشادات

Upozorenje

VAŽNE SIGURNOSNE NAPOMENE

Ovaj simbol upozorenja predstavlja opasnost. Nalazite se u situaciji koja može prouzročiti tjelesne ozljede. Prije rada s bilo kojim uređajem, morate razumjeti opasnosti vezane uz električne sklopove, te biti upoznati sa standardnim načinima izbjegavanja nesreća. U prevedenim sigurnosnim upozorenjima, priloženima uz uređaj, možete prema broju koji se nalazi uz pojedino upozorenje pronaći i njegov prijevod.

SAČUVAJTE OVE UPUTE

Upozornění

DŮLEŽITÉ BEZPEČNOSTNÍ POKYNY

Tento upozorňující symbol označuje nebezpečí. Jste v situaci, která by mohla způsobit nebezpečí úrazu. Před prací na jakémkoliv vybavení si uvědomte nebezpečí související s elektrickými obvody a seznamte se se standardními opatřeními pro předcházení úrazům. Podle čísla na konci každého upozornění vyhledejte jeho překlad v přeložených bezpečnostních upozorněních, která jsou přiložena k zařízení.

USCHOVEJTE TYTO POKYNY

Προειδοποίηση

ΣΗΜΑΝΤΙΚΕΣ ΟΔΗΓΙΕΣ ΑΣΦΑΛΕΙΑΣ

Αυτό το προειδοποιητικό σύμβολο σημαίνει κίνδυνο. Βρίσκεστε σε κατάσταση που μπορεί να προκαλέσει τραυματισμό. Πριν εργαστείτε σε οποιοδήποτε εξοπλισμό, να έχετε υπόψη σας τους κινδύνους που σχετίζονται με τα ηλεκτρικά κυκλώματα και να έχετε εξοικειωθεί με τις συνήθεις πρακτικές για την αποφυγή ατυχημάτων. Χρησιμοποιήστε τον αριθμό δήλωσης που παρέχεται στο τέλος κάθε προειδοποίησης, για να εντοπίσετε τη μετάφρασή της στις μεταφρασμένες προειδοποιήσεις ασφαλείας που συνοδεύουν τη συσκευή.

ΦΥΛΑΞΤΕ ΑΥΤΕΣ ΤΙΣ ΟΔΗΓΙΕΣ

אזהרה

הוראות בטיחות חשובות

סימן אזהרה זה מסמל סכנה. אתה נמצא במצב העלול לגרום לפציעה. לפני שתעבוד עם ציוד כלשהו, עליך להיות מודע לסכנות הכרוכות במעגלים חשמליים ולהכיר את הנהלים המקובלים למניעת תאונות. השתמש במספר ההוראה המסופק בסופה של כל אזהרה כד לאתר את התרגום באזהרות הבטיחות המתורגמות שמצורפות להתקן.

שמור הוראות אלה

Opomena

ВАЖНИ БЕЗБЕДНОСНИ НАПАТСТВИЈА
Симболот за предупредување значи опасност. Се наоѓате во ситуација што може да предизвика телесни повреди. Пред да работите со опремата, бидете свесни за ризикот што постои кај електричните кола и треба да ги познавате стандардните постапки за спречување на несреќни случаи. Искористете го бројот на изјавата што се наоѓа на крајот на секое предупредување за да го најдете неговиот период во преведените безбедносни предупредувања што се испорачани со уредот.
ЧУВАЈТЕ ГИ ОВИЕ НАПАТСТВИЈА

Ostrzeżenie **WAŻNE INSTRUKCJE DOTYCZĄCE BEZPIECZEŃSTWA**

Ten symbol ostrzeżenia oznacza niebezpieczeństwo. Zachodzi sytuacja, która może powodować obrażenia ciała. Przed przystąpieniem do prac przy urządzeniach należy zapoznać się z zagrożeniami związanymi z układami elektrycznymi oraz ze standardowymi środkami zapobiegania wypadkom. Na końcu każdego ostrzeżenia podano numer, na podstawie którego można odszukać tłumaczenie tego ostrzeżenia w dołączonym do urządzenia dokumencie z tłumaczeniami ostrzeżeń.

NINIEJSZE INSTRUKCJE NALEŻY ZACHOWAĆ

Upozornenie **DÔLEŽITÉ BEZPEČNOSTNÉ POKYNY**

Tento varovný symbol označuje nebezpečenstvo. Nachádzate sa v situácii s nebezpečenstvom úrazu. Pred prácou na akomkoľvek vybavení si uvedomte nebezpečenstvo súvisiace s elektrickými obvodmi a oboznámte sa so štandardnými opatreniami na predchádzanie úrazom. Podľa čísla na konci každého upozornenia vyhľadajte jeho preklad v preložených bezpečnostných upozorneniach, ktoré sú priložené k zariadeniu.

USCHOVAJTE SI TENTO NÁVOD

Related Documentation

Cisco Nexus 7000 Series documentation includes the following documents:

Hardware Documents

Cisco Nexus 7000 Series Site Preparation Guide

Cisco Nexus 7000 Series Hardware Installation and Reference Guide

Cisco Nexus 7710 Site Preparation and Hardware Installation Guide

Cisco Nexus 7718 Site Preparation and Hardware Installation Guide

Cisco Nexus 7000 Series Regulatory Compliance and Safety Information

Cisco Nexus 7000 Series Connectivity Management Processor Configuration Guide

Software Documents

The Cisco Nexus 7000 Series switches ship with the Cisco NX-OS software. You can find software documentation for the Cisco NX-OS software at the following URL:

http://www.cisco.com/en/US/products/ps9402/tsd_products_support_series_home.html

The Cisco Data Center Network Manager (DCNM) supports the Cisco Nexus 7000 Series. You can find documentation for DCNM at the following URL:

http://www.cisco.com/en/US/products/ps9369/tsd_products_support_series_home.html

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Overview

This chapter provides an overview of the Cisco Nexus 7000 Series switch and includes the following sections:

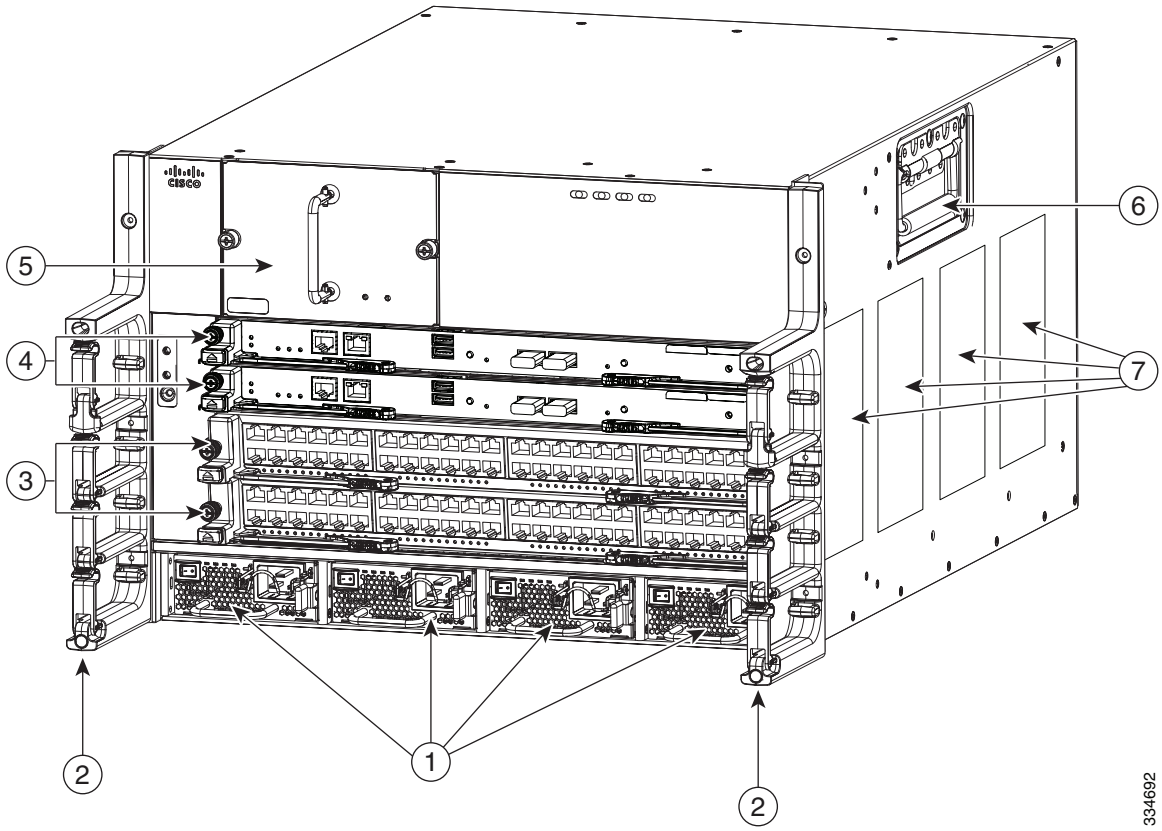
Cisco Nexus 7000 Series

The Cisco Nexus 7000 Series switches are multiprotocol-capable, high-density, and high-performance switches that incorporate Ethernet/IP, virtualization, Layer 4 to Layer 7 services, and low-latency interconnect (LLI) technologies. The Cisco Nexus 7000 Series models are described in the following topics:

Cisco Nexus 7004 Switch

The Cisco Nexus 7004 chassis has four slots that allow for one or two supervisor modules and up to two I/O modules. Additionally, the chassis holds a fan tray, up to four power supplies, and cable management frames. Optionally, you can include a door and air filter. Figure 1-1 identifies these features as seen from the front of the chassis.

Figure 1-1 Standard Hardware Features on the Front and Sides of the Cisco Nexus 7004 Chassis



1	Air intake areas for up to four AC or DC power supplies (N7K-AC-3KW/N7K-DC-3KW/N7K-HV-3.5KW) or blank filler plates in place of missing power supplies to maintain the designed airflow.	**5**	Fan tray
2	Cable management side frames	**6**	Handles used for moving the chassis (reduce the chassis weight to less than 120 lbs (54.4 kg) in order to use these handles to lift the chassis)
3	I/O or NAM modules (1 to 2 modules in slots 3 to 4).	**7**	Air intake areas for supervisor and I/O modules

4	Supervisor modules (1 or 2 modules in slots 1 and 2). These modules are of only one of the following types (if installing two supervisor modules, both modules must be the same type with the same amount of memory): • Supervisor 2 (N7K-SUP2) • Supervisor 2 Enhanced (N7K-SUP2E) **Note** On a Cisco Nexus 7004 switch that has only one supervisor module installed along with multiple I/O modules, the I/O modules are not brought down even after the supervisor module goes down or is removed from the switch. This scenario could lead to blackholing of traffic for a short period of time. To prevent this scenario, we recommend installing two supervisor modules on the Cisco Nexus 7004 switch to ensure maximum redundancy.		

Note Figure 1-1 shows the Cisco Nexus 7004 chassis as it appears when it is fully configured before including cables for management and network connections. The systems that are not fully configured with the maximum number of supervisor modules, I/O modules, or power supply units have blank panels installed in place of the missing components to maintain the designed airflow for system cooling.

The I/O module slots hold one or two of the following types of modules:

- F2 Series I/O modules
  - 48-port 1-/10-Gigabit SFP+ with XL option and FEX support (N7K-F248XP-25 and N7K-F248XP-25E[1])
  - 48-port 1-/10-GBASE-T with XL option (N7K-F248XT-25E)
- F3 Series I/O modules
  - 48-port 1-/10-Gigabit Ethernet SFP/SFP+ (N7K-F348XP-25)
  - 12-port 40-Gigabit Ethernet QSFP+ (N7K-F312FQ-25)
  - 6-port 100-Gigabit Ethernet CPAK (N7K-F306CK-25)
- M1 Series I/O modules
  - 48-port 10/100/1000 with XL option (N7K-M148GT-11L)

1. The Cisco Nexus F2-Series 48-port 1/10-Gigabit SFP+ module supports all of the standard features of F2 modules and it functions like an F2-series module with Layer 2 and Layer 3 enabled. These modules also support IPv6 DSCP-to-Queue mapping.

  - 48-port 1-Gigabit Ethernet with XL option (N7K-M148GS-11L)
  - 32-port 10-Gigabit Ethernet with XL option and FEX support (N7K-M132XP-12L)
  - 8-port 10-Gigabit Ethernet with XL option (N7K-M108X2-12L)
- M2 Series I/O modules
  - 24-port 10-Gigabit Ethernet with XL option and FEX support (N7K-M224XP-23L)
  - 6-port 40-Gigabit Ethernet with XL option (N7K-M206XP-23L)
  - 2-port 100-Gigabit Ethernet with XL option (N7K-M202XP-23L)
- M3 Series I/O modules
  - 48-port 1-/10-Gigabit Ethernet SFP+ (N7K-M348XP-25L)
  - 24-port 40-Gigabit Ethernet QSFP+ (N7K-M324FQ-25L)
- Network Analysis modules (N7K-SM-NAM-K9)

Note

- Starting with Cisco NX-OS Release 8.0(1), the following I/O modules are not supported:
  - 48-port 1-/10-Gigabit SFP+ (N7K-F248XP-25)
  - 48-port 10/100/1000 with XL option (N7K-M148GT-11L)
  - 48-port 1-Gigabit Ethernet with XL option (N7K-M148GS-11L)
  - 32-port 10-Gigabit Ethernet with XL option and FEX support (N7K-M132XP-12L)
  - 8-port 10-Gigabit Ethernet with XL option (N7K-M108X2-12L)

You must install the Cisco Nexus 7004 chassis in a two- or four-post 19-inch EIA rack that meets the following specifications:

- Mounting rails that conform to the English universal hole spacing as specified in ANSI/EIA-310-D-1992.
- The minimum vertical rack space is 12.25 inches (31.1 cm) or 7 rack units (RU) for a single chassis installation.

Install the Cisco Nexus 7004 chassis at the lowest possible RU on the rack for stability. If there are other devices in the rack, install the heavier chassis below the lighter chassis.

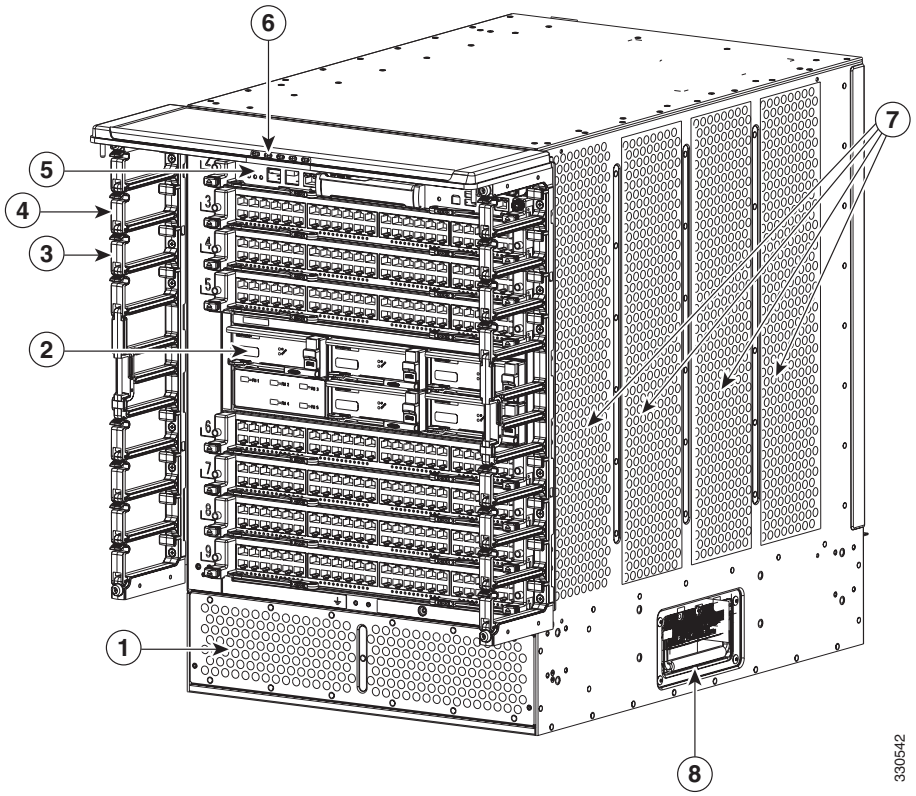
Warning **Stability hazard. The rack stabilizing mechanism must be in place, or the rack must be bolted to the floor before you slide the unit out for servicing. Failure to stabilize the rack can cause the rack to tip over.** Statement 1048

Cisco Nexus 7009 Switch

The Cisco Nexus 7009 chassis has 9 slots that allow for one or two supervisor modules and up to seven I/O modules. Additionally, the chassis also holds up to five fabric modules, one fan tray, up to two power supplies, and cable management frames. The chassis also has a front-mount bracket (an alternative center-mount bracket can be ordered) and four positioning handles (two on each side) that you use to position the chassis after you place it on a mechanical lift or bottom-support brackets. Optionally, you can include a door and air intake frame.

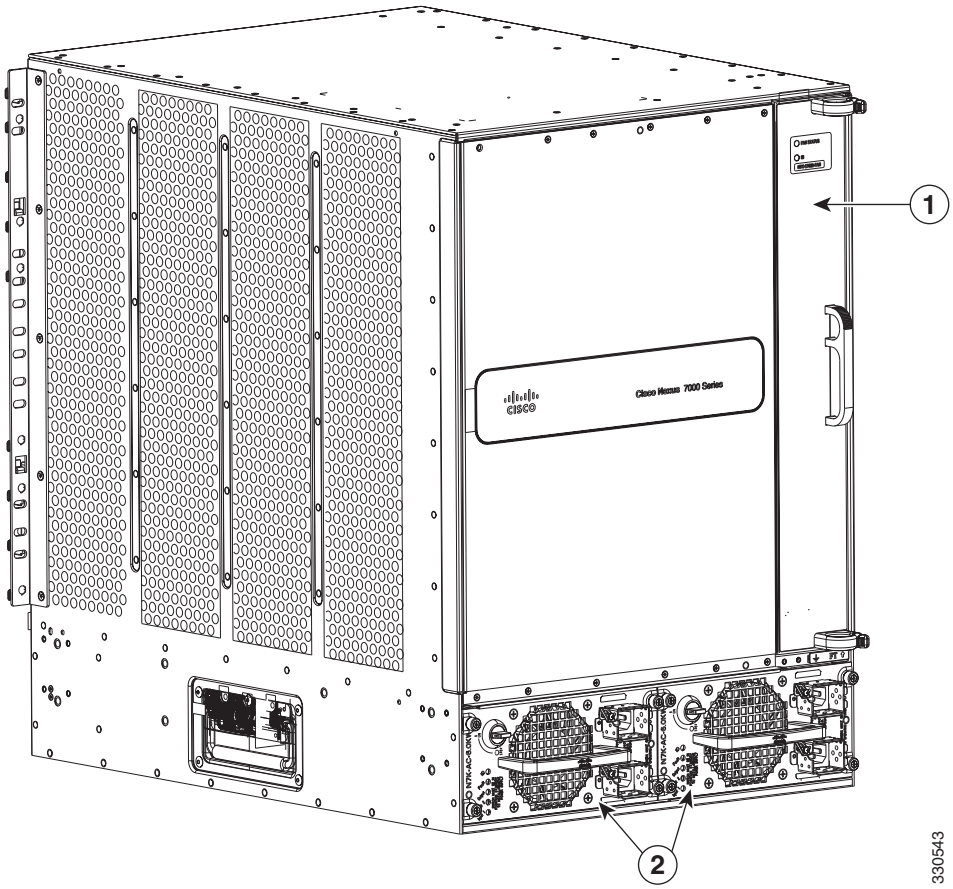
Figure 1-2 identifies the standard features on the front and sides of the Cisco Nexus 7009 chassis, and Figure 1-3 identifies the standard features on the rear of the chassis.

Figure 1-2 Standard Hardware Features on the Front and Sides of the Cisco Nexus 7009 Chassis



1	Air intake area for power supply units	**5**	Supervisor modules (1 or 2 modules in slots 1 and 2). These modules are of only one of the following types (if installing two supervisor modules, both modules must be the same type with the same amount of memory): • Supervisor 1 (N7K-SUP1) • Supervisor 2 (N7K-SUP2) • Supervisor 2 Enhanced (N7K-SUP2E)
2	Fabric modules (up to 5) (N7K-C7009-FAB-2)	**6**	Cable management top hood with LEDs
3	Cable management side frame	**7**	Air intake areas for supervisor, I/O, and fabric modules
4	I/O or NAM modules (1 to 7 modules in slots 3 to 9).	**8**	Handles used for adjusting placement of chassis on mechanical lift

Figure 1-3 Standard Hardware Features on the Rear of a Cisco Nexus 7009 Chassis



1	Fan tray (1)	**2**	Power supplies (1 or 2)—these modules are a combination of the following: • 6 kW AC power supply (N7K-AC-6.0KW) • 7.5 kW AC power supply (N7K-AC-7.5KW-INT [international plugs]) (N7K-AC-7.5KW-US [US plugs]) • 6 kW DC power supply (N7K-DC-6.0KW) • Blank filler plate (installed in place of a missing power supply to maintain the designed airflow)

Note Figure 1-2 and Figure 1-3 show the Cisco Nexus 7009 chassis as it appears when it is fully configured before including cables for management and network connections. The systems that are not fully configured with the maximum number of supervisor modules, I/O modules, fabric modules, or power supplies have blank panels installed in place of the missing components to maintain the designed airflow for system cooling.

The I/O module slots hold one or two of the following types of modules:

- F1 Series I/O modules
  - 32-port 1- and 10-Gigabit Ethernet I/O modules (N7K-F132XP-15)
  - 48-port 1-/10-GBASE-T with XL option (N7K-F248XT-25E)
- F2 Series I/O modules
  - 48-port 1-/10-Gigabit SFP+ with XL option and FEX support (N7K-F248XP-25 and N7K-F248XP-25E[1])
- F3 Series I/O modules
  - 48-port 1-/10-Gigabit Ethernet SFP/SFP+ (N7K-F348XP-25)
  - 12-port 40-Gigabit Ethernet QSFP+ (N7K-F312FQ-25)
  - 6-port 100-Gigabit Ethernet CPAK (N7K-F306CK-25)
- M1 Series I/O modules
  - 48-port 10/100/1000 I/O modules (N7K-M148GT-11)
  - 48-port 10/100/1000 I/O modules with XL option (N7K-M148GT-11L)
  - 48-port 1-Gigabit Ethernet I/O modules (N7K-M148GS-11)
  - 48-port 1-Gigabit Ethernet I/O modules with XL option (N7K-M148GS-11L)
  - 32-port 10-Gigabit Ethernet I/O modules with FEX support (N7K-M132XP-12)
  - 32-port 10-Gigabit Ethernet I/O modules with XL option and FEX support (N7K-M132XP-12L)
  - 8-port 10-Gigabit Ethernet I/O modules with XL option (N7K-M108X2-12L)
- M2 Series I/O modules
  - 24-port 10-Gigabit Ethernet I/O modules with XL option and FEX support (N7K-M224XP-23L)
  - 6-port 40-Gigabit Ethernet I/O modules with XL option (N7K-M206XP-23L)
  - 2-port 100-Gigabit Ethernet I/O modules with XL option (N7K-M202XP-23L)
- M3 Series I/O modules
  - 48-port 1-/10-Gigabit Ethernet SFP+ (N7K-M348XP-25L)
  - 24-port 40-Gigabit Ethernet QSFP+ (N7K-M324FQ-25L)
- Network Analysis Modules (NAMs) (N7K-SM-NAM-K9)

Note M3-Series I/O modules are not compatible with Sup-1 and Fab-1 modules. M3-Series I/O modules cannot be combined with M1-,F1- or F2-Series I/O modules in the same Cisco Nexus 7009 switch.

Note
- Starting with Cisco NX-OS Release 7.3(0)D1(1), the following I/O modules are not supported:
  - 32-port 1- and 10-Gigabit Ethernet I/O modules (N7K-F132XP-15)
  - 48-port 10/100/1000 I/O modules (N7K-M148GT-11)

1. The Cisco Nexus F2-Series 48-port 1/10-Gigabit SFP+ module supports all of the standard features of F2 modules and it functions like an F2-series module with Layer 2 and Layer 3 enabled. These modules also support IPv6 DSCP-to-Queue mapping.

  - 32-port 10-Gigabit Ethernet I/O modules with FEX support (N7K-M132XP-12)
  - 48-port 1-Gigabit Ethernet I/O modules (N7K-M148GS-11)
- Starting with Cisco NX-OS Release 8.0(1), the following I/O modules are not supported:
  - 48-port 1-/10-Gigabit SFP+ (N7K-F248XP-25)
  - 48-port 10/100/1000 with XL option (N7K-M148GT-11L)
  - 48-port 1-Gigabit Ethernet with XL option (N7K-M148GS-11L)
  - 32-port 10-Gigabit Ethernet with XL option and FEX support (N7K-M132XP-12L)
  - 8-port 10-Gigabit Ethernet with XL option (N7K-M108X2-12L)

You must install the Cisco Nexus 7009 chassis in a two- or four-post 19-inch EIA rack that meets the following specifications:

- Mounting rails that conform to the English universal hole spacing as specified in ANSI/EIA-310-D-1992.
- The minimum vertical rack space is 24.5 inches (62.2 cm) or 14 rack units (RU) for a single chassis installation (15 RU if you use the bottom support rails, which are required for center-mount installations and optional for front-mount installations).

Install the Cisco Nexus 7009 chassis at the lowest possible RU on the rack for stability. If there are other devices in the rack, install the heaviest chassis below the lighter chassis.

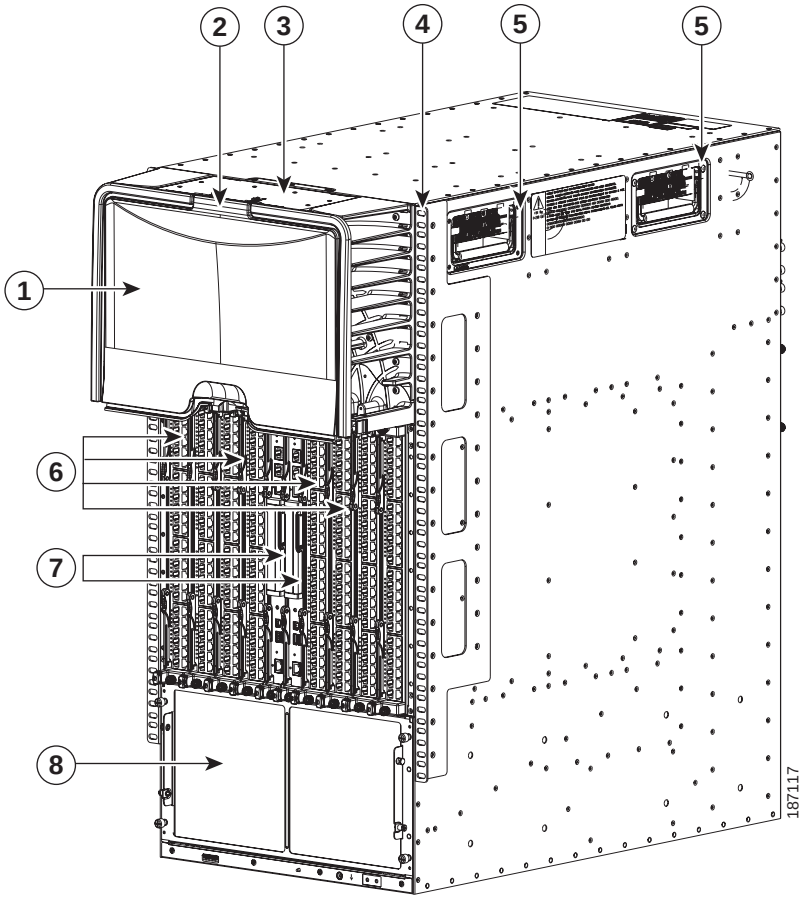
Warning **Stability hazard. The rack stabilizing mechanism must be in place, or the rack must be bolted to the floor before you slide the unit out for servicing. Failure to stabilize the rack can cause the rack to tip over.** Statement 1048

Cisco Nexus 7010 System

The Cisco Nexus 7010 chassis has 10 slots that allow for two supervisor modules and up to eight I/O modules. Additionally, the chassis holds up to five fabric modules, two system fan trays, two fabric fan trays, up to three power supplies, and cable management frames. The chassis also has mounting brackets and four positioning handles (two on each side) that you use to install the chassis after you position it on a rack. Optionally, you can include an air filter and mid-frame doors.

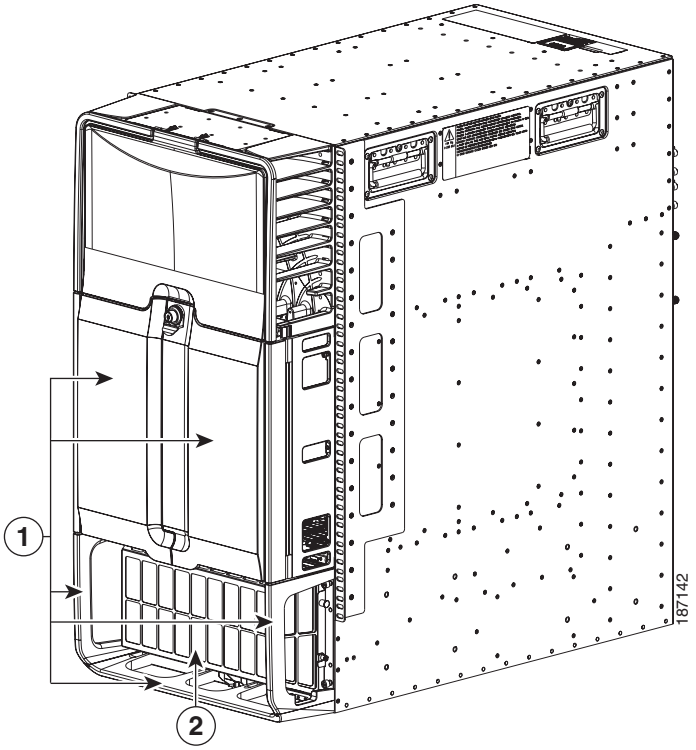
Figure 1-4 identifies the standard features on the front and sides of the Cisco Nexus 7010 chassis, Figure 1-5 identifies the optional features on the front side of the chassis, and Figure 1-6 identifies the standard features on the rear of the chassis.

Figure 1-4 Standard Hardware Features on the Front and Sides of the Cisco Nexus 7010 Chassis



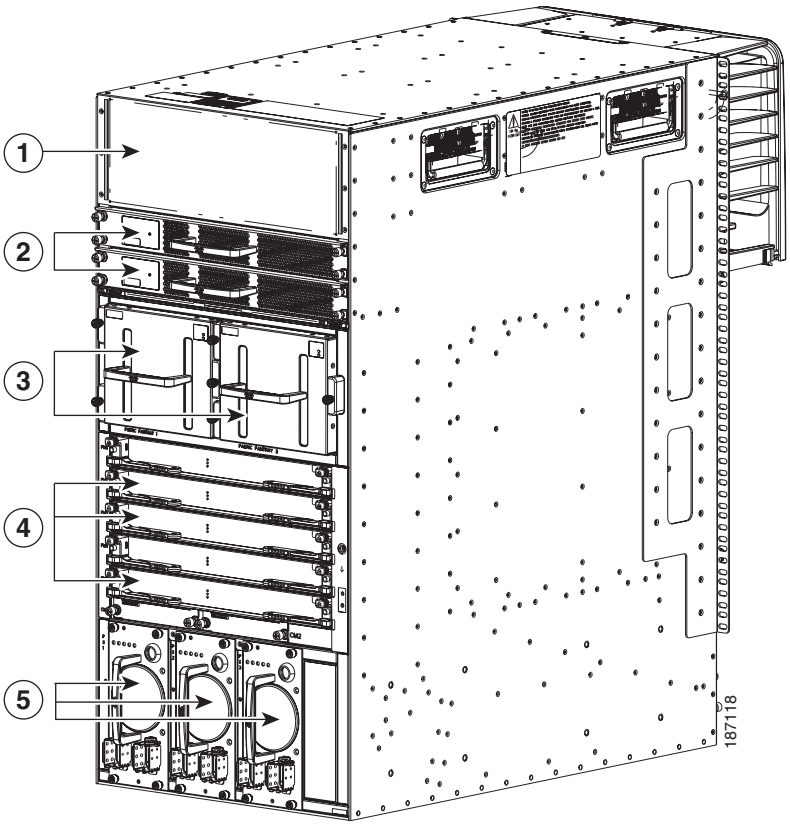
1	Door for the cable management area	**5**	Handles used to reposition the chassis (do not lift the chassis with these handles—use a mechanical lift)
2	System status LEDs	**6**	I/O or NAM modules (1 to 8 modules in slots 1 to 4 and 7 to 10).
3	Cable management area (upper routing portion can be removed if necessary)	**7**	Supervisor modules (1 or 2 modules in slots 5 and 6). These modules are of only one of the following types (if installing two supervisor modules, both modules must be the same type with the same amount of memory): • Supervisor 1 (N7K-SUP1) • Supervisor 2 (N7K-SUP2) • Supervisor 2 Enhanced (N7K-SUP2E)
4	Rack-mount bracket (2) (one on each side)	**8**	Air intake (shown without the optional air filter)

Figure 1-5 Optional Hardware Features on the Front Side of the Cisco Nexus 7010 Chassis



1	Mid-frame door assembly	**2**	Air filter

Figure 1-6 Standard Hardware Features on the Back of the Cisco Nexus 7010 Chassis



1	Fan exhaust for the supervisor and I/O modules	**4**	Fabric modules (up to 5) [N7K-C7010-FAB-1 or N7K-C7010-FAB-2])
2	System fan trays (2) (N7K-C7010-FAN-S) and exhaust for the supervisor and I/O modules	**5**	Power supply units (up to 3) and exhaust for the power supply units—these modules are a combination of the following: • 6 kW AC power supply (N7K-AC-6.0KW) • 7.5 kW AC power supply (N7K-AC-7.5KW-INT [international plugs] and N7K-AC-7.5KW-US [US plugs]) • 6 kW DC power supply (N7K-DC-6.0KW) • Blank filler plate (replaces a missing power supply to maintain the designed airflow)
3	Fabric fan trays (2) (N7K-C7010-FAN-F) and exhaust for the fabric modules		

Note Figure 1-4 and Figure 1-6 show the Cisco Nexus 7000 Series chassis as it appears when it is fully configured before including cables for connections to the Internet and the console. The systems that are not fully configured with the maximum number of supervisor modules, I/O modules, fabric modules, or power supplies have blank filler panels installed in place of the missing components to maintain the designed airflow for system cooling.

The I/O module slots hold one or two of the following types of modules:

- F1 Series I/O modules
  - 32-port 1- and 10-Gigabit Ethernet I/O modules (N7K-F132XP-15)
  - 48-port 1-/10-GBASE-T with XL option (N7K-F248XT-25E)
- F2 Series I/O modules
  - 48-port 1-/10-Gigabit SFP+ with XL option and FEX support (N7K-F248XP-25 and N7K-F248XP-25E[1])
- F3 Series I/O modules
  - 48-port 1-/10-Gigabit Ethernet SFP/SFP+ (N7K-F348XP-25)
  - 12-port 40-Gigabit Ethernet QSFP+ (N7K-F312FQ-25)
  - 6-port 100-Gigabit Ethernet CPAK (N7K-F306CK-25)
- M1 Series I/O modules
  - 48-port 10/100/1000 I/O modules (N7K-M148GT-11)
  - 48-port 10/100/1000 I/O modules with XL option (N7K-M148GT-11L)
  - 48-port 1-Gigabit Ethernet I/O modules (N7K-M148GS-11)
  - 48-port 1-Gigabit Ethernet I/O modules with XL option (N7K-M148GS-11L)
  - 32-port 10-Gigabit Ethernet I/O modules with FEX support (N7K-M132XP-12)
  - 32-port 10-Gigabit Ethernet I/O modules with XL option and FEX support (N7K-M132XP-12L)
  - 8-port 10-Gigabit Ethernet I/O modules with XL option (N7K-M108X2-12L)
- M2 Series I/O modules
  - 24-port 10-Gigabit Ethernet I/O modules with XL option and FEX support (N7K-M224XP-23L)
  - 6-port 40-Gigabit Ethernet I/O modules with XL option (N7K-M206XP-23L)
  - 2-port 100-Gigabit Ethernet I/O modules with XL option (N7K-M202XP-23L)
- M3 Series I/O modules
  - 48-port 1-/10-Gigabit Ethernet SFP+ (N7K-M348XP-25L)
  - 24-port 40-Gigabit Ethernet QSFP+ (N7K-M324FQ-25L)
- Network Analysis Modules (NAMs) (N7K-SM-NAM-K9

Note M3-Series I/O modules are not compatible with Sup-1 and Fab-1 modules. M3-Series I/O modules cannot be combined with M1-,F1- or F2-Series I/O modules in the same Cisco Nexus 7010 switch.

Note
- Starting with Cisco NX-OS Release 7.3(0)D1(1), the following I/O modules are not supported:
  - 32-port 1- and 10-Gigabit Ethernet I/O modules (N7K-F132XP-15)
  - 48-port 10/100/1000 I/O modules (N7K-M148GT-11)

1. The Cisco Nexus F2-Series 48-port 1/10-Gigabit SFP+ module supports all of the standard features of F2 modules and it functions like an F2-series module with Layer 2 and Layer 3 enabled. These modules also support IPv6 DSCP-to-Queue mapping.

  - 32-port 10-Gigabit Ethernet I/O modules with FEX support (N7K-M132XP-12)
  - 48-port 1-Gigabit Ethernet I/O modules (N7K-M148GS-11)
- Starting with Cisco NX-OS Release 8.0(1), the following I/O modules are not supported:
  - 48-port 1-/10-Gigabit SFP+ (N7K-F248XP-25)
  - 48-port 10/100/1000 with XL option (N7K-M148GT-11L)
  - 48-port 1-Gigabit Ethernet with XL option (N7K-M148GS-11L)
  - 32-port 10-Gigabit Ethernet with XL option and FEX support (N7K-M132XP-12L)
  - 8-port 10-Gigabit Ethernet with XL option (N7K-M108X2-12L)

You must install the Cisco Nexus 7010 system chassis in a four-post 19-inch EIA rack that meets the following specifications:

- Mounting rails that conform to the English universal hole spacing as specified in ANSI/EIA-310-D-1992.
- The minimum vertical rack space is 36.75 inches (93.3 cm) or 21 rack units (RU) for a single chassis installation and 73.5 inches (186.6 cm) or 42 rack units for a dual-chassis installation. We recommend that you use a 45 RU rack for a dual-chassis installation.

If you install one chassis, install it at the lowest possible RU on the rack for stability, as shown in Figure 1-7. If you install two chassis in the same rack, install the bottom chassis first and then install the other chassis on top as shown in Figure 1-8.

Warning **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

Figure 1-7 One Cisco Nexus 7010 Chassis Installed in a Four-Post Rack

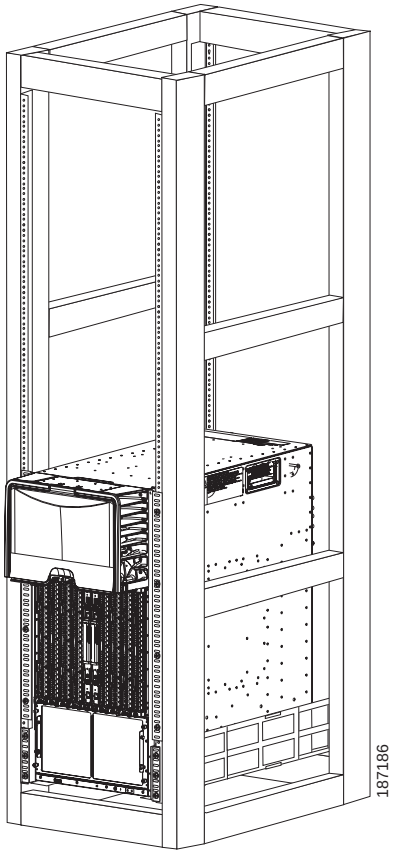
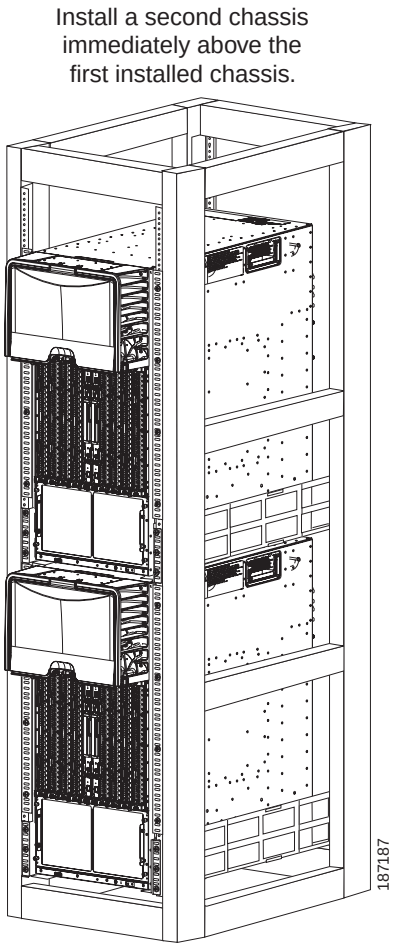


Figure 1-8 Two Cisco Nexus 7010 Chassis Installed in a Four-Post Rack

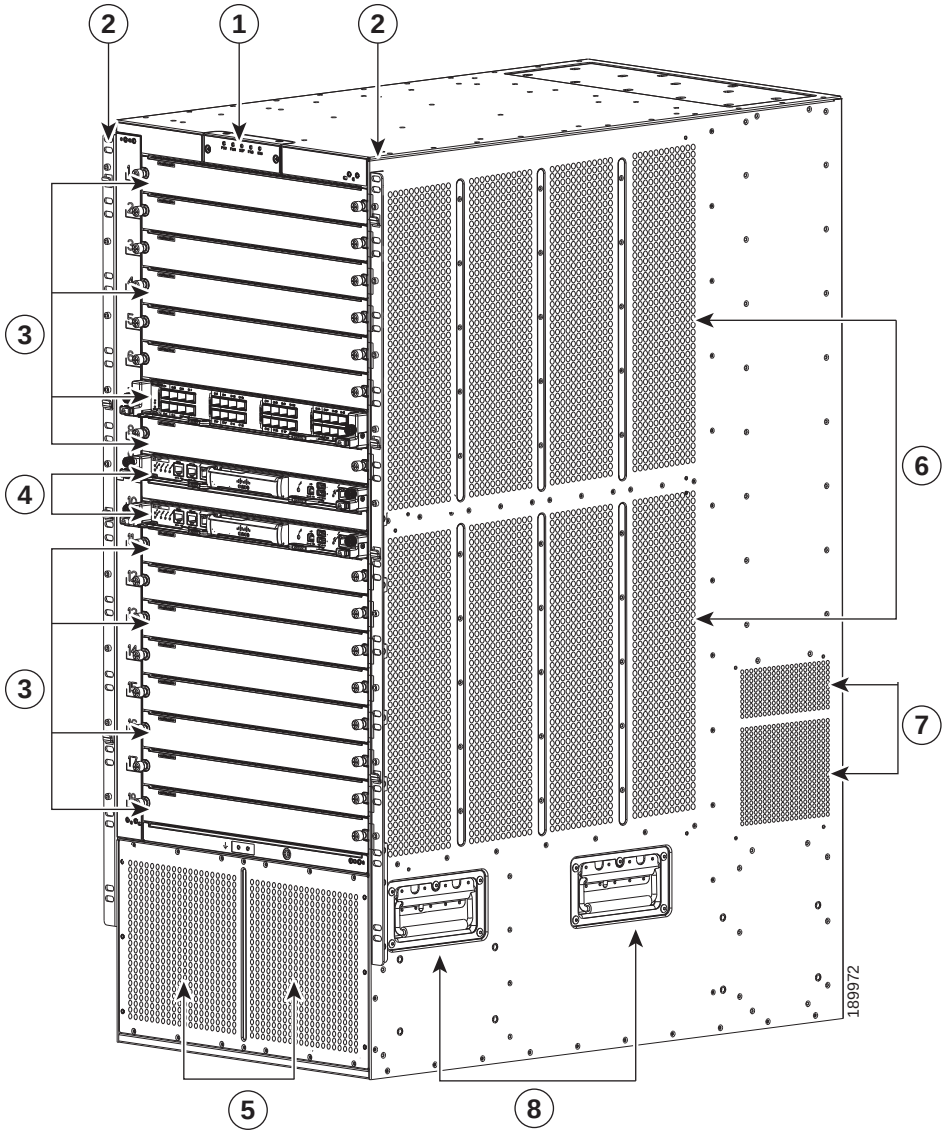


Cisco Nexus 7018 System

The Cisco Nexus 7018 chassis has 18 slots that allow for two supervisor modules and up to 16 I/O modules. The chassis also holds up to five fabric modules, two fan trays, up to four power supplies, and a cable management system. The chassis also has a mounting bracket and four positioning handles (two on each side) that you use to install the chassis after you position it on a rack. Optionally, you can include a front door to protect the I/O cable connections.

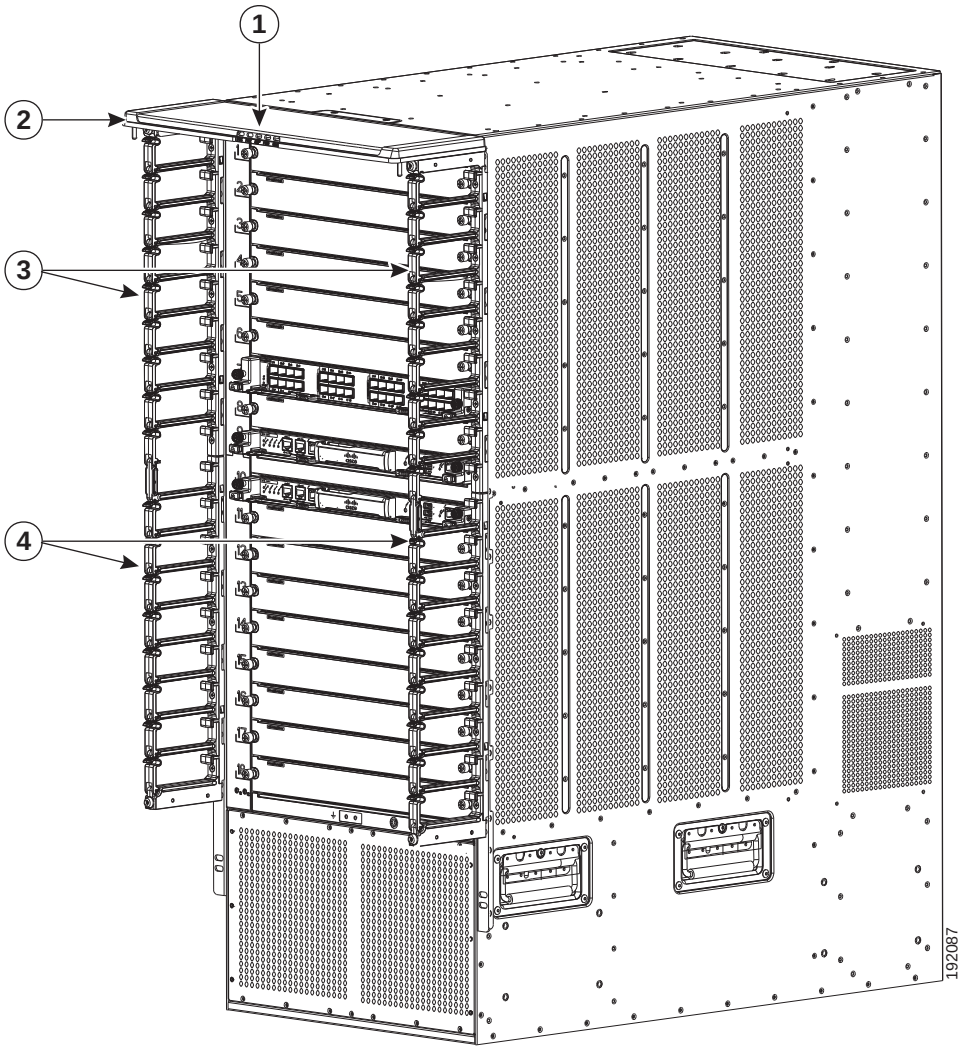
Figure 1-9 identifies the standard features on the front and sides of the Cisco Nexus 7018 chassis, Figure 1-10 identifies the components of the cable management system, Figure 1-11 identifies the optional feature on the front side of the chassis, and Figure 1-12 identifies the standard features on the rear of the chassis.

Figure 1-9 Standard Hardware Features on the Front and Sides of the Cisco Nexus 7018 Chassis



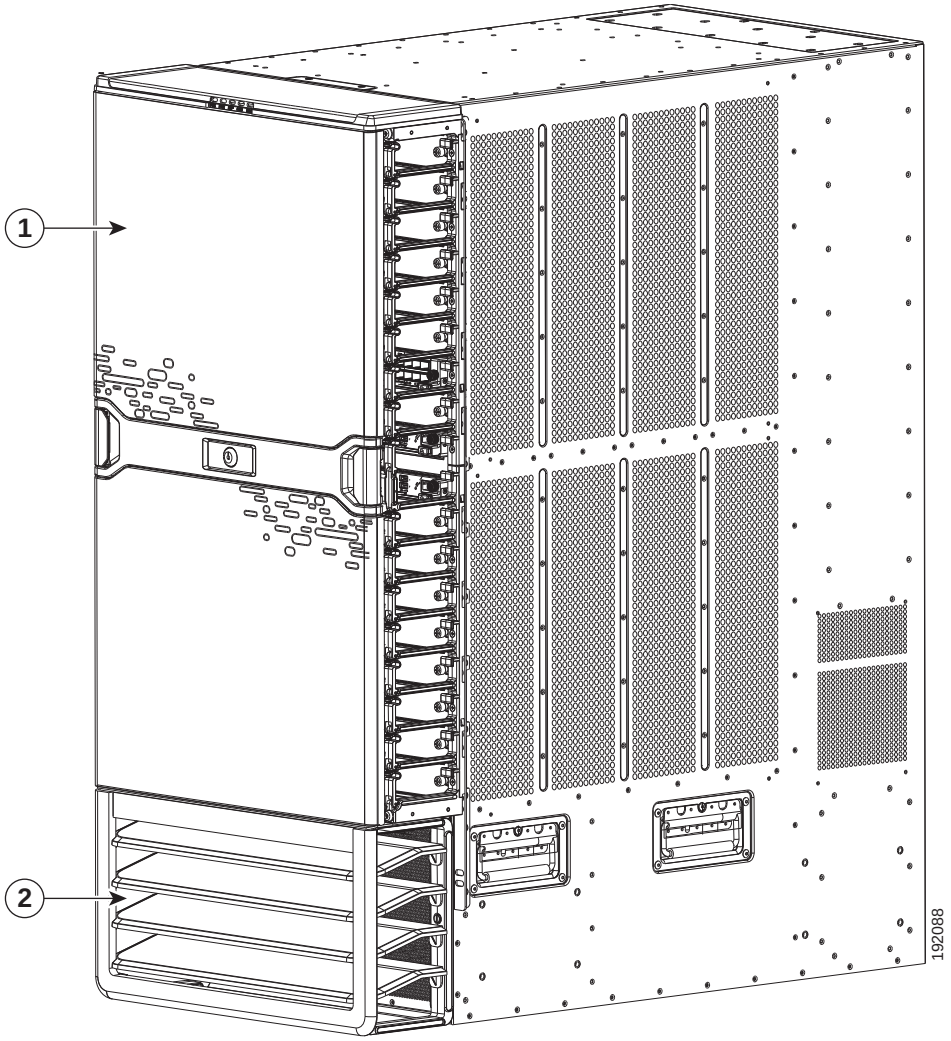
1	System status LEDs	**5**	Air intake for power supply units
2	Rack-mount brackets (2)	**6**	Air intake for the supervisor modules and I/O modules
3	I/O or NAM modules (1 to 16 in slots 1 to 8 and slots 11 to 18).	**7**	Air intake for fabric modules
4	Supervisor modules (1 or 2 modules in slots 9 and 10). These modules are of only one of the following types (if installing two supervisor modules, both modules must be the same type with the same amount of memory): • Supervisor 1 (N7K-SUP1) • Supervisor 2 (N7K-SUP2) • Supervisor 2 Enhanced (N7K-SUP2E)	**8**	Handles used to reposition the chassis (do not lift the chassis with these handles—use a mechanical lift)

Figure 1-10 Cable Management System for the Cisco Nexus 7018 Chassis



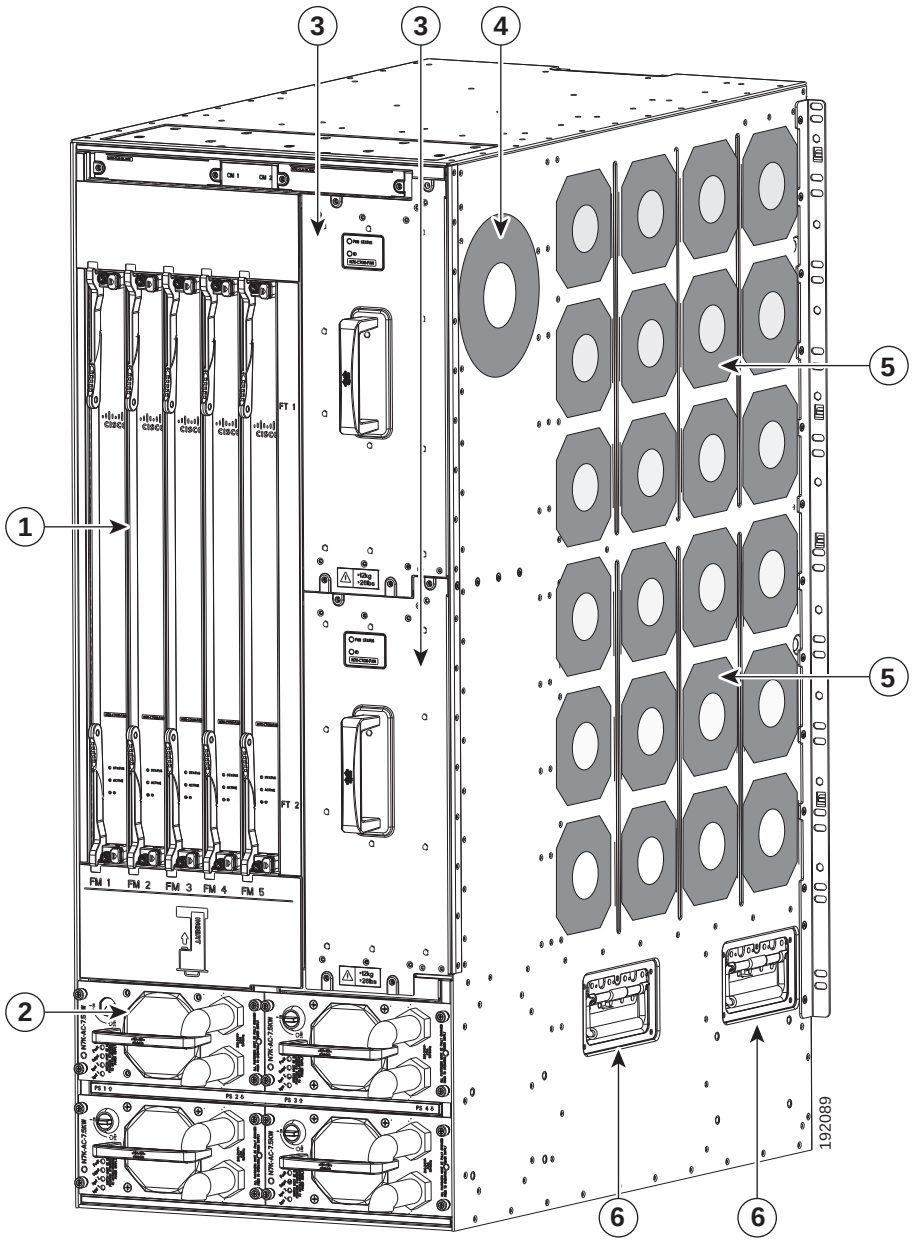
1	System status LEDs (these LEDs show the system status displayed by the chassis LEDs)	**3**	Upper cable management assemblies
2	Top hood	**4**	Lower cable management assemblies

Figure 1-11 Optional Front Door for the Cisco Nexus 7018 Chassis



1	Front doors	**2**	Air intake frame for power supply units

Figure 1-12 Standard Hardware Features on the Back of the Cisco Nexus 7018 Chassis



1	Fabric modules (up to 5) (N7K-C7018-FAB-1 or N7K-C7018-FAB-2)	**4**	Fan exhaust for fabric modules
2	Power supply units (up to 4)—these modules are a combination of the following: • 6 kW AC power supply (N7K-AC-6.0KW) • 7.5 kW AC power supply (N7K-AC-7.5KW-INT [international plugs]) (N7K-AC-7.5KW-US [US plugs]) • 6 kW DC power supply (N7K-DC-6.0KW) • Blank filler plate (replaces missing power supplies to maintain the designed airflow)	**5**	Fan exhaust for supervisor and I/O modules
3	Fan trays for cooling the supervisor, I/O, and fabric modules	**6**	Handles used to reposition the chassis (do not lift the chassis with these handles—use a mechanical lift)

Note Figure 1-9 and Figure 1-12 show the Cisco Nexus 7018 chassis as it appears when it is fully configured before including cables for connections to the Internet and the console. The systems that are not fully configured with the maximum number of supervisor modules, I/O modules, fabric modules, or power supplies have blank panels installed in place of the missing components to maintain the designed airflow for system cooling.

The I/O module slots hold one or two of the following types of modules:

- F1 Series I/O modules
  - 32-port 1- and 10-Gigabit Ethernet I/O modules (N7K-F132XP-15)
  - 48-port 1-/10-GBASE-T with XL option (N7K-F248XT-25E)
- F2 Series I/O modules
  - 48-port 1-/10-Gigabit SFP+ with XL option and FEX support (N7K-F248XP-25 and N7K-F248XP-25E[1])
- F3 Series I/O modules
  - 48-port 1-/10-Gigabit Ethernet SFP/SFP+ (N7K-F348XP-25)
  - 12-port 40-Gigabit Ethernet QSFP+ (N7K-F312FQ-25)
  - 6-port 100-Gigabit Ethernet CPAK (N7K-F306CK-25)
- M1 Series I/O modules
  - 48-port 10/100/1000 I/O modules (N7K-M148GT-11)
  - 48-port 10/100/1000 I/O modules with XL option (N7K-M148GT-11L)
  - 48-port 1-Gigabit Ethernet I/O modules (N7K-M148GS-11)
  - 48-port 1-Gigabit Ethernet I/O modules with XL option (N7K-M148GS-11L)
  - 32-port 10-Gigabit Ethernet I/O modules with FEX support (N7K-M132XP-12)

1. The Cisco Nexus F2-Series 48-port 1/10-Gigabit SFP+ module supports all of the standard features of F2 modules and it functions like an F2-series module with Layer 2 and Layer 3 enabled. These modules also support IPv6 DSCP-to-Queue mapping.

  - 32-port 10-Gigabit Ethernet I/O modules with XL option and FEX support (N7K-M132XP-12L)
  - 8-port 10-Gigabit Ethernet I/O modules with XL option (N7K-M108X2-12L)
- M2 Series I/O modules
  - 24-port 10-Gigabit Ethernet I/O modules with XL option and FEX support (N7K-M224XP-23L)
  - 6-port 40-Gigabit Ethernet I/O modules with XL option (N7K-M206XP-23L)
  - 2-port 100-Gigabit Ethernet I/O modules with XL option (N7K-M202XP-23L)
- M3 Series I/O modules
  - 48-port 1-/10-Gigabit Ethernet SFP+ (N7K-M348XP-25L)
  - 24-port 40-Gigabit Ethernet QSFP+ (N7K-M324FQ-25L)
- Network Analysis Modules (NAMs) (N7K-SM-NAM-K9

Note M3-Series I/O modules are not compatible with Sup-1 and Fab-1 modules. M3-Series I/O modules cannot be combined with M1-,F1- or F2-Series I/O modules in the same Cisco Nexus 7018 switch.

Note
- Starting with Cisco NX-OS Release 7.3(0)D1(1), the following I/O modules are not supported:
  - 32-port 1- and 10-Gigabit Ethernet I/O modules (N7K-F132XP-15)
  - 48-port 10/100/1000 I/O modules (N7K-M148GT-11)
  - 32-port 10-Gigabit Ethernet I/O modules with FEX support (N7K-M132XP-12)
  - 48-port 1-Gigabit Ethernet I/O modules (N7K-M148GS-11)
- Starting with Cisco NX-OS Release 8.0(1), the following I/O modules are not supported:
  - 48-port 1-/10-Gigabit SFP+ (N7K-F248XP-25)
  - 48-port 10/100/1000 with XL option (N7K-M148GT-11L)
  - 48-port 1-Gigabit Ethernet with XL option (N7K-M148GS-11L)
  - 32-port 10-Gigabit Ethernet with XL option and FEX support (N7K-M132XP-12L)
  - 8-port 10-Gigabit Ethernet with XL option (N7K-M108X2-12L)

You can insert a maximum of ten 24-port 40-Gigabit Ethernet QSFP+ (N7K-M324FQ-25L) I/O modules in the Cisco Nexus 7018 switch. This I/O module uses 96 VQI per slot. The maximum VQI of a Cisco Nexus 7018 switch is 1024 and a total of eleven 24-port 40-Gigabit Ethernet QSFP+ I/0 modules will require 1056 VQI. In such a scenario, the eleventh I/O module will attempt to come online 3 times and then will get powered down. During a reload of a switch with eleven 24-port 40-Gigabit Ethernet QSFP+ I/0 modules, the I/O module that comes up last will be powered down.

You must install the Cisco Nexus 7018 chassis in a four-post 19-inch EIA rack that meets the following specifications:

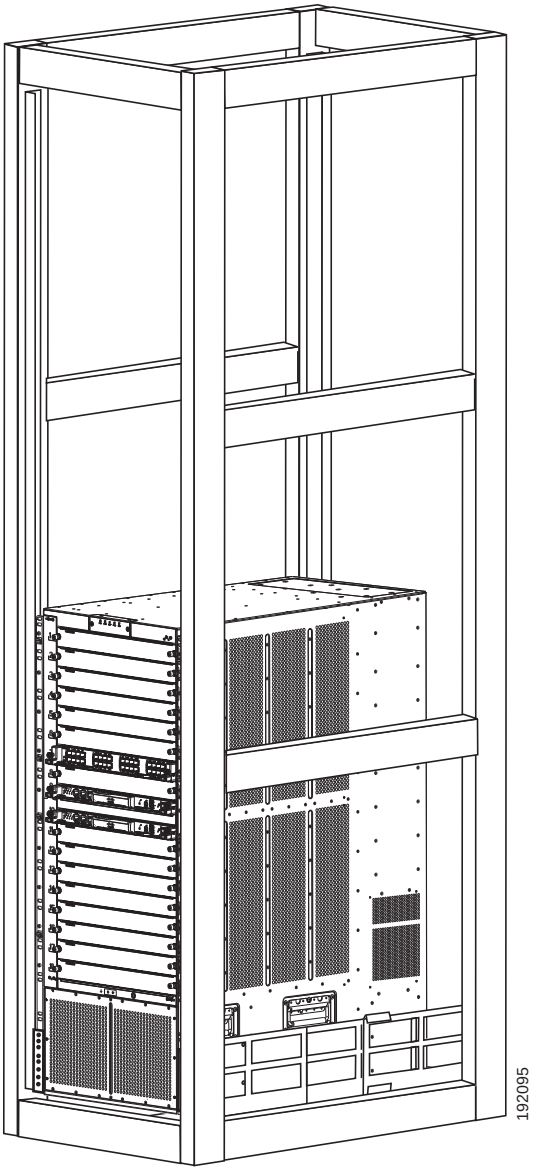
- Mounting rails that conform to the English universal hole spacing as specified in ANSI/EIA-310-D-1992.

- The minimum vertical rack space is 43.75 inches (111.1 cm) or 25 rack units (RU) for a single chassis installation and 87.5 inches (222.2 cm).

Install the Cisco Nexus 7018 chassis at the lowest possible RU on the rack for stability, as shown in Figure 1-13. If there is another device in the rack, install the heaviest one at the bottom.

Warning **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

Figure 1-13 Cisco Nexus 7018 Chassis Installed in a Four-Post Rack



Preparing the Site

Warning **Installation of the equipment must comply with local and national electrical codes.** Statement 1074

Before you can install a Cisco Nexus 7000 Series system, you must prepare the site for the installation. You must make sure that the altitude, temperature, humidity, air quality, airflow, electromagnetic and radio frequency interference, floor structure, power, and earth grounding of the installation site all meet the requirements of the Cisco Nexus 7000 Series system that you are installing. In addition, you must set up a rack or cabinet that can hold the number of chassis that you are installing. To see the general requirements for this system, see Appendix A, "Technical Specifications." To see detailed information about preparing the data center for the installation, see the *Cisco Nexus 7000 Series Site Preparation Guide*.

Safety Guidelines

Warning **Only trained and qualified personnel should be allowed to install, replace, or service this equipment.** Statement 1030

The prerequisites listed for any procedure are required conditions that you must verify before you start that procedure. If the prerequisites have not been met, you must satisfy those requirements before carrying out the procedure.

Safety warnings appear in this publication wherever procedures present conditions that could endanger you or others installing this system. Adhering to these warnings and following their recommended actions are required actions for these procedures. For regulatory compliance and safety information on these warnings, see the *Cisco Nexus 7000 Series Regulatory Compliance and Safety Information* document.

Installation and Connection Guidelines

After you fully prepare the site as specified in the *Cisco Nexus 7000 Series Site Preparation Guide*, install a two-post 19-inch EIA rack for Cisco Nexus 7004 and 7009 chassis or a four-post 19-inch EIA rack for all chassis. To install the system, you must make sure that you have the proper mounting brackets (front-mount or center-mount brackets) installed on the chassis, move the chassis to the rack, elevate it to the lowest possible RU for that chassis, and fasten the chassis to the rack. With the chassis fastened to the rack, you can ground the chassis, install its cable management frames, install the optional door and optional air filter, and connect the switch to the console and network. For detailed instructions on installing a Cisco Nexus 7000 Series switch, see the following chapters:

- Chapter 2, "Installing a Cisco Nexus 7004 Chassis"
- Chapter 2, "Installing a Cisco Nexus 7004 Chassis"
- Chapter 3, "Installing a Cisco Nexus 7009 Chassis"
- Chapter 4, "Installing a Cisco Nexus 7010 Chassis"
- Chapter 5, "Installing a Cisco Nexus 7018 Chassis"

- Chapter 6, “Installing Power Supplies”

For detailed instructions on connecting the switch to the console and network, see Chapter 7, “Connecting the Cisco Nexus 7000 Series Switch to the Network.”

Caution Do not use the handles on the side of the chassis to lift the Cisco Nexus 7009, 7010, or 7018 chassis or a fully loaded Cisco Nexus 7004 chassis (you can use these handles to lift a Cisco Nexus 7004 chassis if you remove the power supplies so that the chassis weighs less than 120 pounds [52 kg]). For the Cisco Nexus 7009, 7010, and 7018, use these handles only for adjusting the position of the chassis while the chassis rests on a platform or bottom-support rails.

If you are replacing Fabric 1 modules with Fabric 2 modules (Cisco Nexus 7010 and 7018 models only), you must replace all of the Fabric 1 modules with Fabric 2 modules or the Fabric 2 modules will perform like Fabric 1 modules. If you power up a switch with both Fabric 1 and Fabric 2 modules installed, only the Fabric 2 modules will power up.

Note The Cisco NX-OS software may require 8 GB of memory, depending on the software version you use and the software features that you enable. If your switch has Supervisor 1 modules with only 4 GB of memory, then you might need to upgrade the modules to 8 GB of memory by using the 8 GB supervisor upgrade kit (N7K-SUP1-8GBUPG=). This upgrade is not needed for switches that have at least 8 GB of memory (which includes Supervisor 1 modules with 8 GB and all Supervisor 2 and Supervisor 2E modules). To verify the amount of memory installed in the supervisor modules or to upgrade the memory, see the “Upgrading Memory for Supervisor 1 Modules” section on page 10-31.

Managing the System Hardware

After the Cisco Nexus 7000 Series system is installed and operating, you can use the Cisco NX-OS operating system to manage the system hardware. These management functions include displaying system and module information, setting the power supply modes, and managing module functions. For more information about these functions, see Chapter 8, “Managing the Switch Hardware.”

Replacing Components

While the Cisco Nexus 7000 Series system is operational, you can replace any one of the following components if they are redundant:

- Power supply
- Supervisor module
- Fabric module (Cisco Nexus 7009, 7010, and 7018 models only)
- I/O modules
- Fan trays

For detailed information on replacing these components, see Chapter 10, “Installing or Replacing Components.”

Installing a Cisco Nexus 7004 Chassis

This chapter describes how to install a new or relocated Cisco Nexus 7004 chassis in a rack or cabinet. For information about installing other Cisco Nexus 7000 Series chassis or power supplies, see the following chapters:

- Chapter 3, “Installing a Cisco Nexus 7009 Chassis”
- Chapter 4, “Installing a Cisco Nexus 7010 Chassis”
- Chapter 4, “Installing a Cisco Nexus 7010 Chassis”
- Chapter 6, “Installing Power Supplies”

This chapter includes the following sections:

Preparing to Install the Switch

This section includes the following topics:

Note You must set up one two- or four-post, 19-inch EIA rack or cabinet before you can install the Cisco Nexus 7004 chassis. Make sure that you order the rack or cabinet and have it delivered before installing the chassis.

Required Tools

Before you install the Cisco Nexus 7004 chassis into a rack, make sure that you have the Cisco Nexus 7004 Accessory Kit (see the "Cisco Nexus 7004 Switch Accessory Kit" section on page C-1 for the contents list) and the following equipment, which are not provided by Cisco:

- Mechanical lift capable of lifting 150 pounds (68 kg)

Note This lift is required only if moving or lifting a fully loaded chassis that weighs at least 120 pounds (54.4 kg). If you remove the power supplies, the chassis weighs 93 pounds (42.2 kg) or less and you can manually lift it with two persons.

- Number 1 Phillips-head screwdriver with torque capability
- 3/16-inch flat-blade screwdriver
- Crimping tool
- Wire stripping tool
- Tape measure and level
- Grounding wire—Use a wire size that meets 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.

Note For a list of tools required to assemble and secure the two- or four-post rack or cabinet, see the documentation that the manufacturer shipped with the rack or cabinet.

Installing a Rack or Cabinet

Before you install the Cisco Nexus 7004 chassis, you must install a standard two- or four-post, 19-inch EIA data center rack (or a cabinet that contains such a rack) that meets the requirements listed in the *Cisco Nexus 7000 Series Site Preparation Guide*. To maximize safety, you should do the following for the rack:

- Bolt the rack to the concrete subfloor before moving the Cisco Nexus 7004 chassis onto it.

Warning **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

- If the rack has bonded construction, connect it to the earth ground to enable you to easily ground the system components that you install and to ground your ESD wrist strap. This step minimizes the chance of electrostatic discharge when you handle ungrounded components while working with them.

Be sure that the rack includes AC power receptacles with the amperage required for the power supplies that you will be installing in the chassis. For 3-kW power supplies, you must have 20-A circuits.

Warning **Take care when connecting units to the supply circuit so that wiring is not overloaded.** Statement 1018

For instructions on setting up the rack, see the documentation that the manufacturer shipped with the rack.

Unpacking and Inspecting a New Switch

Caution When you handle the Cisco Nexus 7004 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.

Before you install a new Cisco Nexus 7004 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.

Tip Do not discard the shipping container when you unpack the Cisco Nexus 7004 system. 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. For repacking instructions, see Appendix E, "Repacking the Cisco Nexus 7004 Switch."

To inspect the shipment, follow these steps:

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:
  - 2 supervisor modules
  - 1 or 2 I/O modules
  - 1 fan tray
  - 2 to 4 power supply units
  - Blank filler plates for any missing supervisor modules, I/O modules, or power supply modules
- Cisco Nexus 7004 system accessory kit

  To see a list of what is in the accessory kit, see the "Cisco Nexus 7004 Switch Accessory Kit" section on page C-1.
- Cable management frames
- Front door (optional)
- Air filter (optional)

Step 2 Check the contents of each box or package for damage.

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

- 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 Chassis

This section describes how to install the Cisco Nexus 7004 chassis in a rack or cabinet. These installation steps include checking for installation prerequisites, setting up the center-mount brackets if needed, removing the power supplies from the chassis if lifting the chassis manually, and installing the chassis in a rack. When you finish this task, you can connect the chassis to the earth ground, install the cable management frames, install the front door (optional), and reinstall any removed power supplies.

Caution You must use a mechanical lift whenever lifting a device over 120 pounds (54.4 kg). A fully loaded chassis can weigh up to 137 pounds (62 kg). If you prefer to lift the chassis manually, you must remove the power supplies and use at least two persons to lift it.

This section includes the following topics:

Prerequisites for Installing the Chassis

Before you install the chassis, you must make sure that the following items are available for the installation:

- Data center ground is accessible where you are installing the Cisco Nexus 7004 chassis.
- Two- or four-post, 19-inch EIA rack or cabinet that includes such a rack.

  For more information on the rack or cabinet, see the "Installing a Rack or Cabinet" section on page 2-2.

Warning **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

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

- Center-mount brackets (2) and M4 x 6 mm screws (12) if you need to center the chassis on the rack. If you are mounting the front of the chassis on to the rack (typical installation), then you do not need the center-mount brackets.

Installing the Center-Mount Brackets

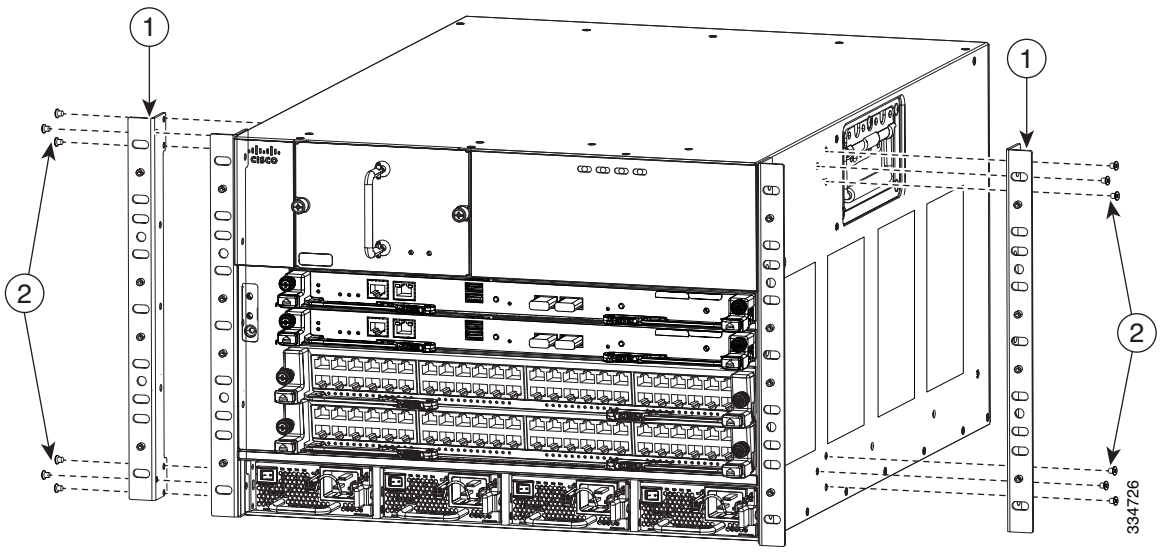
Before you install a Cisco Nexus 7004 chassis, you need to determine whether you need to mount the front of the chassis or the center of the chassis to the rack. The chassis is already set up for mounting its front to the rack, but you can include center-mount brackets to position the front of the chassis 5.7 inches (14.4 cm) in front of the rack.

Note If you need to install the center-mount brackets, you must separately order the Cisco Nexus 7004 Rack Mount Kit (part number is N7K-C7004-RMK).

To install the center-mount brackets on the chassis, follow these steps:

Step 1 Align one of two center-mount brackets so that its six screw holes align to six screw holes on the side of the chassis as shown in Figure 2-1.

Figure 2-1 Installing Center-Mount Brackets on the Chassis



1	Center mount bracket (left and right versions)	**2**	Six M4 x 6 mm screws for each bracket

Step 2 Use a Phillips-head screw driver to secure the bracket to the chassis with the six M4 x 6 mm screws. Tighten each screw to 11.5 to 15 in-lbs (1.3 to 1.7 N·m).

Step 3 Repeat steps 1 and 2 to install the other center-mount bracket on the other side of the chassis.

Installing the Chassis in a Rack

Before you install the chassis in the rack, you must determine how you are going to lift the chassis to its position on the rack. You can either lift the chassis with a mechanical lift and slide it on top of another installed Cisco Nexus 7004 chassis, or you can lighten the chassis and lift it manually into position with a couple of people. To lighten the chassis for lifting, you can remove the power supplies so that the chassis weighs no more than 93 pounds (42 kg) and can be lifted by two people.

After lifting the chassis into position, you fasten it to the rack, and replace any power supplies that you might have removed earlier.

To install a Cisco Nexus 7004 chassis in a two- or four-post rack or cabinet, follow these steps:

Step 1 Prepare the chassis for moving by doing one of the following:

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 move the chassis, either use the chassis handles (one found on each side) or push on the sides or edges of the chassis without touching any of the modules or module handles.

- To move the chassis with a mechanical lift, position the lift at the elevation of the chassis on its shipping pallet (or no more than 0.25 inches [0.64 cm] below the level of the pallet) and use two persons to push the chassis fully onto the lift.
- To move the chassis manually, remove the power supplies as explained in one of the following sections and then use two persons to lift the chassis:
  - To remove an AC power supply, see the "Removing a 3-kW AC Power Supply Unit During Operations" section on page 10-3.
  - To remove a DC power supply, see the "Removing a 3-kW DC Power Supply Unit During Operations" section on page 10-9.
  - To remove an HVAC/HVDC power supply, see the "Removing a 3.5-kW HVAC/HVDC Power Supply Unit During Operations" section on page 10-16.

Note We do not recommend that you remove any of the supervisor modules, I/O modules, or the fan tray to make the chassis easier to lift because that removal can put those modules at risk of being damaged. If you do remove any of those modules, be sure to have antistatic pads or antistatic bags to hold these modules until you are ready to reinstall them in the chassis.

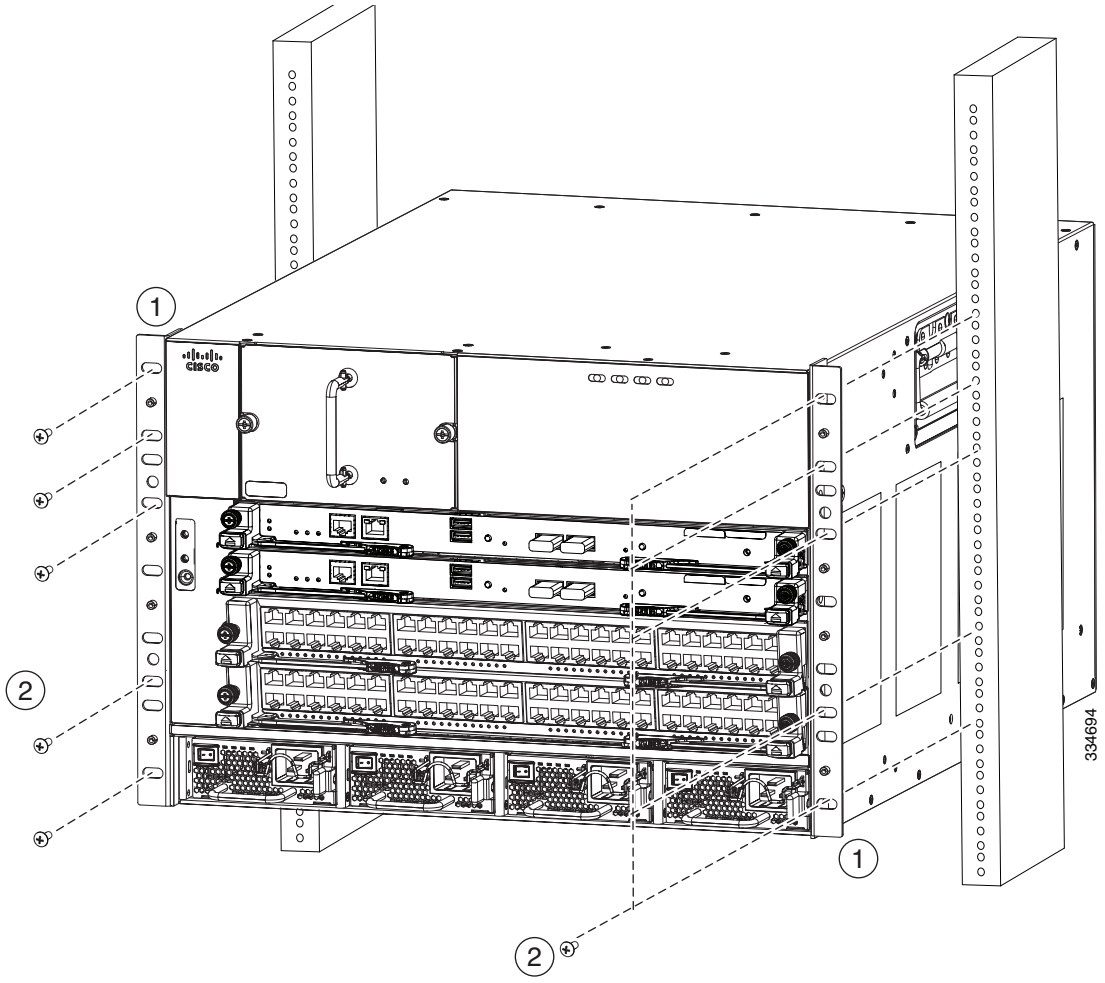
Step 2 Lift the chassis to its position on a rack in one of the following ways:

- If you use a mechanical lift, position the chassis next to the front of another Cisco Nexus 7004 chassis already installed in the rack, elevate the new chassis to the level of the installed chassis (or no more than 0.25 inches [0.64 cm] above the installed chassis, use two persons to align the back side of the new chassis to the opening between the two front posts of the rack and push the chassis into the installed chassis until the chassis mounting brackets come in contact with the rack mounting rails.
- If you are lifting the chassis manually, use two or more persons to move the back end of the chassis through the front posts until the chassis mounting brackets come in contact with the mounting rails on the rack, lift the chassis to the lowest possible RU for it on the rack, and align the screw holes in the chassis mounting brackets to the rack mounting rails.

Caution Use two persons to lift the chassis by using the handle on each side of the chassis. Do not use the handles on any of the modules installed on the chassis to lift or move the chassis—these handles are for only removing or installing the modules.

Step 3 Use five M6 x 19 mm screws (or 12-24 x 3/4 inch screws) to fasten each side of the chassis to the rack. Tighten each of the 10 screws to 40 in. lbs (4.5 N.m) (see Figure 2-2).

Figure 2-2 Mounting the Cisco Nexus 7004 Chassis on a Rack



1	Handles used to adjust the chassis placement or to lift a chassis that weighs less than 120 pounds (54.4 kg).	**2**	Five M4 x 6 mm Phillips-head screws used to attach each front-mount or center-mount bracket to a mounting rail (use a total of 12 screws for two brackets).

Step 4 If you removed any power supplies, replace them as explained in one of the following sections:

- To install an AC power supply unit, see the "Installing a 3-kW AC Power Supply Unit During Operations" section on page 10-3.
- To install a DC power supply unit, see the "Installing a 3-kW DC Power Supply Unit During Operations" section on page 10-10.
- To install a HVAC/HVDC power supply unit, see the "Installing a 3.5-kW HVAC/HVDC Power Supply Unit During Operations" section on page 10-17.

Grounding the Cisco Nexus 7004 Chassis

The Cisco Nexus 7004 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 grounded and fully bonded rack or to the data center ground. This ground connection is active even when the power supplies are not installed.

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 power cables are not connected to the system.

- You connect the AC power supplies to the earth ground automatically when you connect an AC power supply to an AC power source.
- You connect the DC power supplies to the earth ground before connecting the power supplies to the DC power source (see the "Connecting a DC Power Supply Directly to DC Power Sources" section on page 6-11).
- You automatically ground an HVAC/HVDC power supply when you connect the HVAC/HVDC power supply to a power source.

This section includes the following topics:

Prerequisites for Grounding the Chassis

Before you can ground the chassis, you must have a connection to the earth ground for the data center building. If you installed the Cisco Nexus 7004 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 port to the rack. Otherwise, you must connect the chassis grounding port directly to the data center ground.

Connecting the System Ground

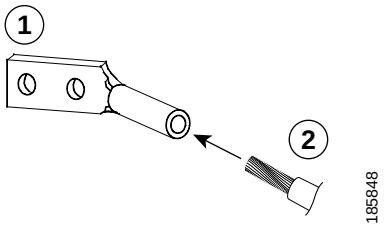
After you have moved the chassis into the rack or cabinet, you are ready to connect the system to the data center earth ground. After you ground the chassis, you can ground your ESD wrist strap by connecting it to the chassis.

To connect the system ground to the data center earth ground, follow these steps:

Step 1 Use a wire-stripping tool to remove approximately 0.75 inch (19 mm) of the covering from the end of the grounding wire.

Step 2 Insert the stripped end of the grounding wire into the open end of the grounding lug as shown in Figure 2-3.

Figure 2-3 Inserting the Grounding Wire in the Grounding Lug



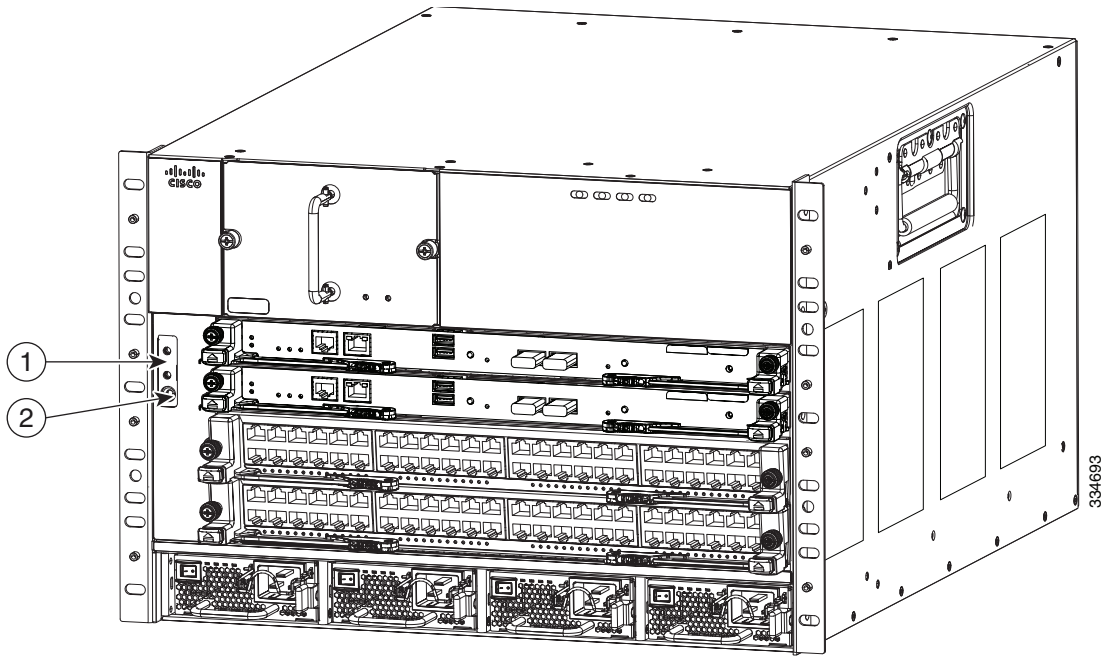
1	NRTL listed 45-degree grounding lug	**2**	Grounding cable with 0.75 in. (19 mm) of insulation stripped from the end

Step 3 Use the crimping tool to crimp the lug to the grounding wire. Verify that the ground wire is securely attached to the ground lug by attempting to pull the wire out of the crimped lug.

Step 4 Remove the adhesive label from the system grounding pad on the chassis, secure the grounding wire lug to the grounding pad with two M4 screws, and tighten the screws to 11.5 to 15 in-lb (1.3 to 1.7 N·m). Callout 1 in Figure 2-4 shows the location of the grounding pad on the front side of the chassis.

Note Be sure that the grounding lug and wire do not block the ESD port by positioning the lug and wire connection above the grounding port.

Figure 2-4 Grounding Pad and ESD Port Locations on the Cisco Nexus 7004 Chassis



1	Grounding pad	**2**	ESD port

Step 5 Prepare the other end of the grounding wire and connect it to an appropriate grounding point in your site to ensure an adequate earth ground for the switch. If the rack is grounded, connect the grounding wire as explained in the documentation provided by the vendor for the rack.

Connecting Your ESD Wrist Strap to the Chassis

After you connect the chassis to the data center earth ground, you can ground your ESD wrist strap by plugging it into the ESD port shown by Callout 2 in Figure 2-4 on page 2-10.

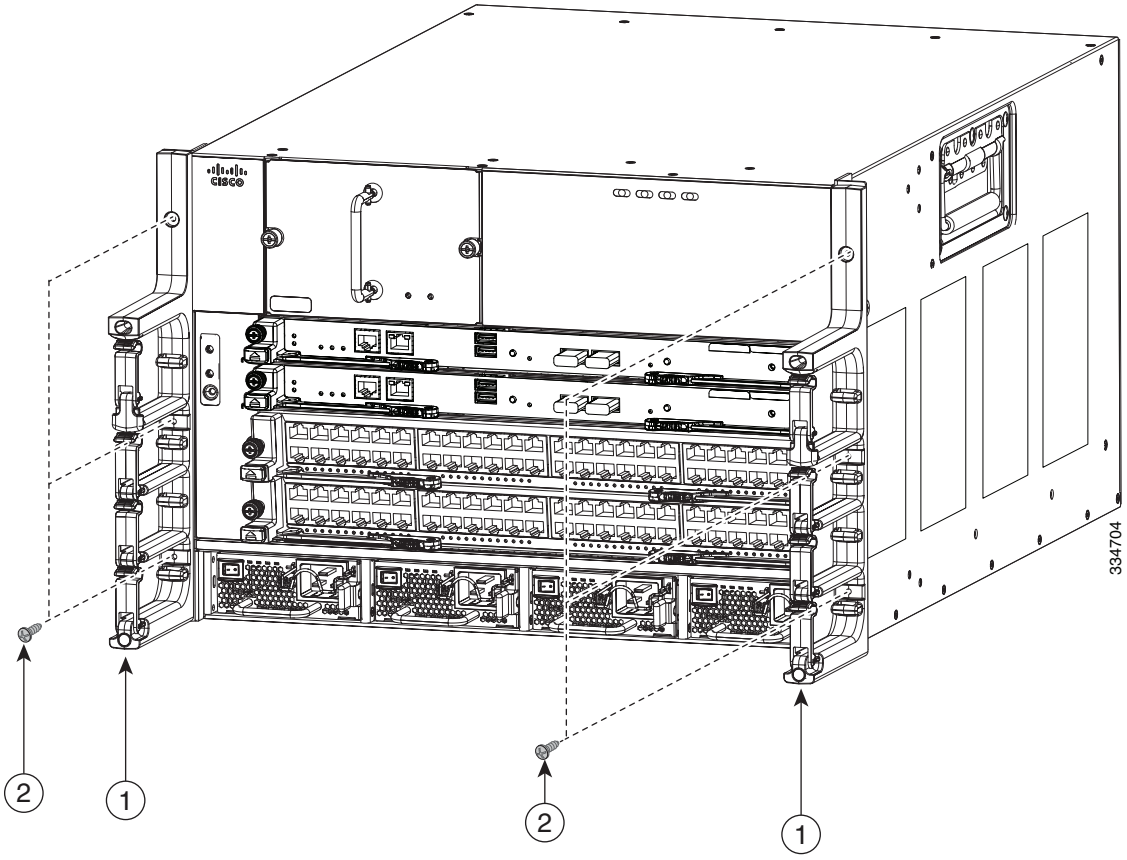
Installing the Cable Management Frames

After you have fastened the chassis to the rack, you can fasten the cable management frames to the front of the chassis.

To fasten the cable management frames to the chassis, follow these steps:

Step 1 Align the guide guide pin on one of the two cable management frames to a guide-pin hole of the same size on the front-mounting bracket that is already attached to the chassis. The top of the frame should be at the same level as the top of the chassis (see Figure 2-5).

Figure 2-5 Installing the Cable Management Frames on a Cisco Nexus 7004 Chassis



1	Guide pins on the cable management frame aligned to two holes in the front-mount bracket.	**2**	Three M3 x 10 mm screws used to fasten the frame to the chassis (total of six screws for two frames).

Step 2 Fasten the frame to the chassis with three M3 x 10 mm screws (see Callout 2 in Figure 2-5). Tighten the screws to 5 to 7 in-lb (0.56 to 0.79 N.m).

Step 3 Repeat Steps 1 and 2 to install the other cable management frame to the chassis.

Installing USB Storage Media in a Supervisor 2 or 2E Module

Each Supervisor 2 or 2E module on a Cisco Nexus 7004 switch has a USB drive installed in the LOG FLASH reader. The Slot0 port is left empty, but you can optionally install a USB drive in the that port. To allow this storage media to function with the USB port, you must make sure that it is either already formatted for the port before installing it or format it after installing it.

Note The LOG FLASH and Slot0 USB ports use different formats for their data.

To install storage media in a supervisor module, follow these steps:

Step 1 Insert the USB drive in the LOG FLASH or SLOT0 port.

Step 2 Wait for the reader or port LED to turn green and for a message to appear on the console as follows:

- If you are installing a USB drive into the log flash reader, the message will end with "logflash:online."
- If you are installing a USB drive into the expansion flash reader, the message will end with "slot0:online."
- If you see an "offline" message or do not see a message, either the USB drive is not fully inserted or it is improperly formatted.

  Make sure that the USB drive is fully inserted inside the reader. If it is fully inserted, either format the card (see the *Cisco Nexus 7000 Series NX-OS Fundamentals Configuration Guide*) or replace the USB drive with another that is properly formatted for the reader.

Installing the Air Filter

The Cisco Nexus 7004 air filter is an optional feature (part number N7K-C7004-FAN=). To install an air filter, follow these steps:

Step 1 Place the air filter over the air intake area on the right side of the chassis and align the eight screw holes in the filter to screw holes in the chassis.

Step 2 Fasten the air filter to the chassis using eight M3 x 5 mm screws that came with the air filter.. Tighten the screws to 5 to 7 in-lb (0.56 to 0.79 N.m).

Installing a Cisco Nexus 7009 Chassis

This chapter describes how to install a new or relocated Cisco Nexus 7009 chassis in a rack or cabinet. For information about installing other Cisco Nexus 7000 Series chassis or power supplies, see the following chapters:

- Chapter 2, “Installing a Cisco Nexus 7004 Chassis”
- Chapter 4, “Installing a Cisco Nexus 7010 Chassis”
- Chapter 5, “Installing a Cisco Nexus 7018 Chassis”
- Chapter 6, “Installing Power Supplies”

This chapter includes the following sections:

Preparing to Install the Switch

This section includes the following topics:

Note You must set up a two- or four-post, 19-inch EIA rack or cabinet before you can install the Cisco Nexus 7009 chassis. Make sure that you order the rack or cabinet and have it delivered before installing the chassis.

Required Tools

Before you install the Cisco Nexus 7009 chassis into a rack, make sure that you have the following tools and equipment:

- Mechanical lift capable of lifting 300 pounds (136 kg)
- Number 1 Phillips screwdriver with torque capability
- 3/16-inch flat-blade screwdriver
- Crimping tool
- Wire stripping tool
- Tape measure and level
- Grounding cable

Note These tools and equipment do not ship with the chassis.

Additional tools and equipment, such as an electrostatic discharge (ESD) wrist strap, that you will also need to install the Cisco Nexus 7009 chassis, are included in the Cisco Nexus 7009 accessory kit. To see what is included in the accessory kit, see the "Cisco Nexus 7009 Switch Accessory and Optional Kits" section on page C-4.

Caution When you handle the Cisco Nexus 7009 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.

Note For a list of tools required to assemble and secure the rack or cabinet, see the documentation that the manufacturer shipped with the rack or cabinet.

Installing a Rack or Cabinet

Before you install the Cisco Nexus 7009 chassis, you must install a qualified two- or four-post, 19-inch EIA data center rack (or a cabinet that contains such a rack) that meets the requirements listed in the *Cisco Nexus 7000 Series Site Preparation Guide*. To maximize safety, you should do the following for the rack:

- Bolt the rack to the concrete subfloor before moving the Cisco Nexus 7009 chassis onto it.

Warning **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

- If the rack has bonded construction, connect it to the earth ground to enable you to easily ground the system components that you install and to ground your ESD wrist strap. This step minimizes the chance of electrostatic discharge when you handle ungrounded components before you install them.

If you are using AC power, be sure that the rack includes AC power receptacles with the amperage required for the power supply units that you will be installing in the chassis. If you are installing 6-kW power supply units, you must have 20-A circuits. If you are installing 7.5-kW power supply units, you must have 30-A circuits.

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 though a power interface unit (PIU). You must connect the DC power supply to the earth ground before connecting it to the facility DC power.

Warning **Take care when connecting units to the supply circuit so that wiring is not overloaded.** Statement 1018

For instructions on setting up the rack, see the documentation that the manufacturer shipped with the rack.

Unpacking and Inspecting a New Switch

Before you install a new Cisco Nexus 7009 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.

Tip Do not discard the shipping container when you unpack the Cisco Nexus 7009 system. 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.

To inspect the shipment, follow these steps:

Step 1 Compare the shipment to the equipment list 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:
  - 2 supervisor modules
  - 1 to 7 I/O modules
  - 3 to 5 fabric modules
  - 1 fan tray
- 1 to 2 power supply units

  The power supply units are shipped with the chassis but are boxed separately.
- Cisco Nexus 7009 system accessory kit

  To see a list of what is in the accessory kit, see the "Cisco Nexus 7009 Switch Accessory and Optional Kits" section on page C-4.
- Cable management frames
  - Left and right cable management frames
  - Top hood
- Center-mount kit (optional—must be ordered separately for center-mount installations)
  - Left and right center-mount bottom-support rails

  - Left and right center-mount vertical mounting brackets
- Door and air intake frame (optional)

Step 2 Check the contents of each box or package for damage.

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

- 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 on the Rack

You can use the following two types of bottom-support rails to install and hold a Cisco Nexus 7009 chassis to its rack:

- Front-mount bottom-support rails
- Center-mount bottom-support rails (part number N7K-C7009-CMK)

Typically, you use the two front-mount bottom-support rails in the Bottom Support Kit (part of the Cisco Nexus 7009 Accessory Kit or ordered separately as part number N7K-C7009-BSK). If you additionally ordered the Center Mount Kit (part number N7K-C7009-CMK) for centering the chassis on a two-post rack, you will receive an additional kit with two center-mount bottom support rails and two center-mount rail mounting brackets. You must install either the front-mount bottom-support rails or the center-mount bottom-support rails before installing the chassis.

Note If you are installing three Cisco Nexus 7009 chassis with front-mount brackets in a 42-RU rack and you can safely position the bottom chassis at the lowest RU using a mechanical lift, you can fasten the chassis directly to the rack or cabinet with the maximum number of screws. After you install the bottom chassis, you can slide the additional chassis onto the fully installed lower chassis (without using additional bottom-support rails) and then fasten the upper chassis to the rack. This process enables you to install three 14-RU Cisco Nexus 7009 chassis in a 42-RU rack. If you do not need to install three chassis in a 42 RU rack, we recommend that you always install each chassis on its own set of bottom-support rails.

Note When you install a Cisco Nexus 7009 chassis with center-mount brackets, you must always install the chassis onto center-mount bottom-support rails.

Caution Do not remove the center-mount brackets when a chassis is installed on them. They are required at all times for holding a center-mount chassis to the rack.

The prerequisites, tools, and process for installing the bottom-support rails are included in the following topics:

- Prerequisites for Attaching the Bottom-Support Rails, page 3-5
- Required Tools and Equipment, page 3-5

Prerequisites for Attaching the Bottom-Support Rails

Before you can attach the bottom-support rails, you must fully install the rack or cabinet and use bolts to anchor the rack to the concrete subfloor. To maximize the stability of the rack, install everything as low as possible on the rack with heavier items below lighter items. Be sure that there is 15 RU available for installing the Cisco Nexus 7009 chassis (14 RU) and its bottom-support rack (1 RU).

Required Tools and Equipment

You need the following tools and equipment to attach the bottom-support rails:

- Number 1 Phillips-head screwdriver with torque capability.
- One of the following types of bottom-support rails:
  - Front-mount bottom-support rails (shipped with the Bottom-Support Kit, which is found in the accessory kit or ordered separately [part number N7K-C7009-BSK])
  - Center-mount bottom-support rails (not shipped with the chassis unless special ordered [part number N7K-C7009-CMK])

Table 3-1 lists the items in the Bottom-Support Kit and Table 3-2 lists the items in the Center-Mount Kit.

Table 3-1 Bottom-Support Kit Contents

Part Description	Quantity
Front-mount bottom-support rails	2
Crossbar	1
12-24 x 3/4 in. Phillips screws	20
M6 x 19 mm Phillips screws	20
M4 x 8 mm Phillips screws	2

Table 3-2 Center-Mount Kit Contents

Part Description	Quantity
Center-mount rack mounting brackets	2
Center-mount bottom-support rails	2
Crossbar	1
12-24 x 3/4 in. Phillips screws	20
M6 x 19 mm Phillips screws	20
M4 x 8 mm Phillips screws	2

Attaching the Front-Mount Bottom-Support Rails

To maximize the stability of the rack, you should install the chassis as low as possible on the rack. Install the heaviest chassis first at the bottom of the rack. If you install a second chassis in the same rack, install it immediately above the lower chassis if there is enough vertical space.

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:**

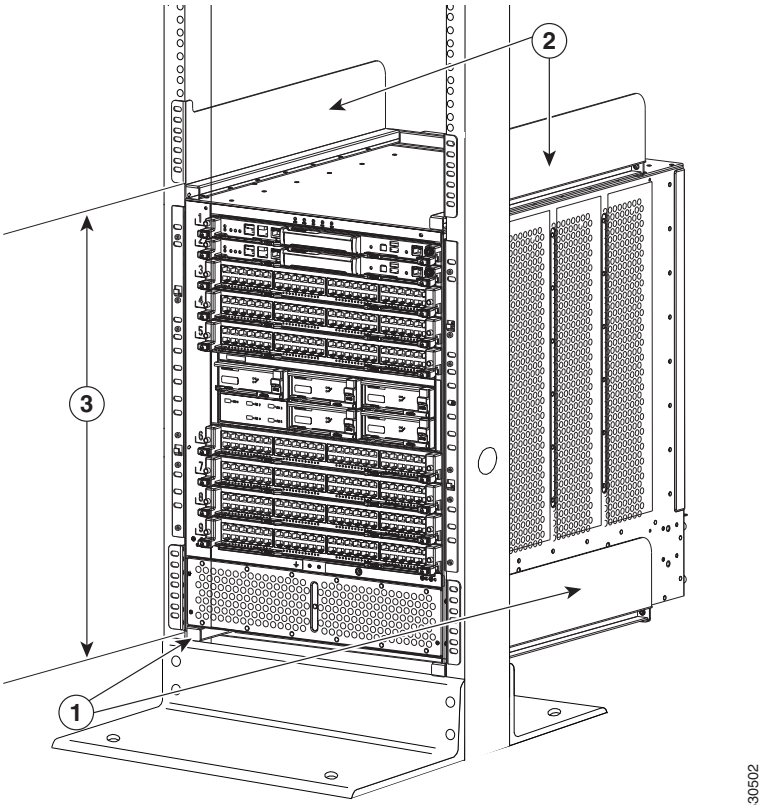
- **This unit should be mounted at the bottom of the rack if it is the only unit in the rack.**
- **When mounting this unit in a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack.**
- **If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the unit in the rack.** Statement 1006

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

Step 1 Position one of the two front-mount bottom-support rails at the lowest possible RU on the rack. If you are installing a chassis above another Cisco Nexus 7009 chassis, position the rail 26.25 inches (66.7 cm) (15 RU) above the bottom-support rails for the lower chassis as shown in Figure 3-1.

Note When installing the chassis without bottom-support rails, you can skip this step.

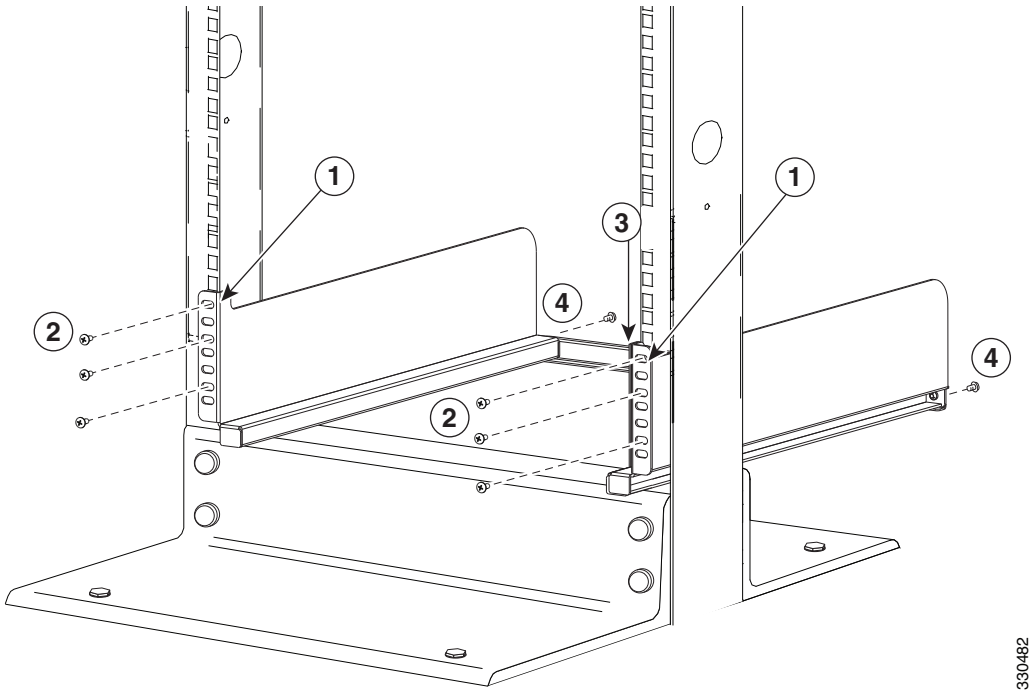
Figure 3-1 Positioning the Front-Mount Bottom-Support Rails



1	For the heaviest Cisco Nexus 7009 chassis to be installed in the rack, position two front-mount bottom-support rails at the lowest RU on the rack.	**3**	The distance between the bottom-support rails must be at least 26.25 inches (66.7 cm) (15 RU) for each Cisco Nexus 7009 chassis.
2	For the next lightest Cisco Nexus 7009 chassis to be installed in the rack, position two front-mount bottom-support rails immediately above the first installed chassis.		

Step 2 Use a Phillips screwdriver to screw in two or three (three are recommended if you have three screw holes) M6 x 19 mm or 12-24 x 3/4 in. Phillips screws on the front end of each bracket (using a total of 6 screws for both brackets) as shown in Figure 3-2.

Figure 3-2 Attaching a Front-Mount Bottom-Support Rail to a Rack



1	Left and right front-mount bottom-support rails positioned at the lowest possible RU	**3**	Crossbar
2	Two sets of two or three M6 x 19 mm Phillips screws or two sets of two or three 12-24 x 3/4 in. Phillips screws	**4**	M4 x 8 mm Phillips screws (2)

Step 3 Align the crossbar to the lower back of the two bottom-support rails and use two M4 x 8 mm screws to attach it to each rail (one screw for each rail).

Attaching the Center-Mount Bottom-Support Rails

To maximize the stability of the rack, you should install the chassis as low as possible on the rack. Install the heaviest chassis first at the bottom of the rack. If you install a second chassis in the same rack, install it immediately above the lower system if there is enough vertical space.

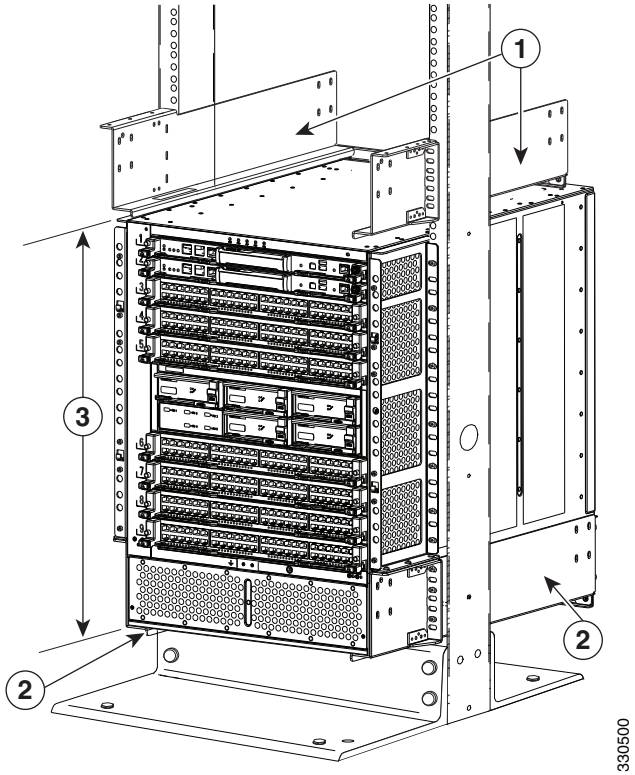
Warning **To prevent bodily injury when mounting or servicing this unit in a rack, you must take special precautions to ensure that the system remains stable. The following guidelines are provided to ensure your safety:**

- **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 center-mount bottom-support rails to a two- or four-post EIA rack, follow these steps:

Step 1 Position one of the two center-mount brackets at the lowest possible RU. If you are installing a chassis above another Cisco Nexus 7009 chassis, position the rail 26.25 inches (66.7 cm) (15 RU) above the center-mount bottom-support rails for the lower chassis as shown in Figure 3-3.

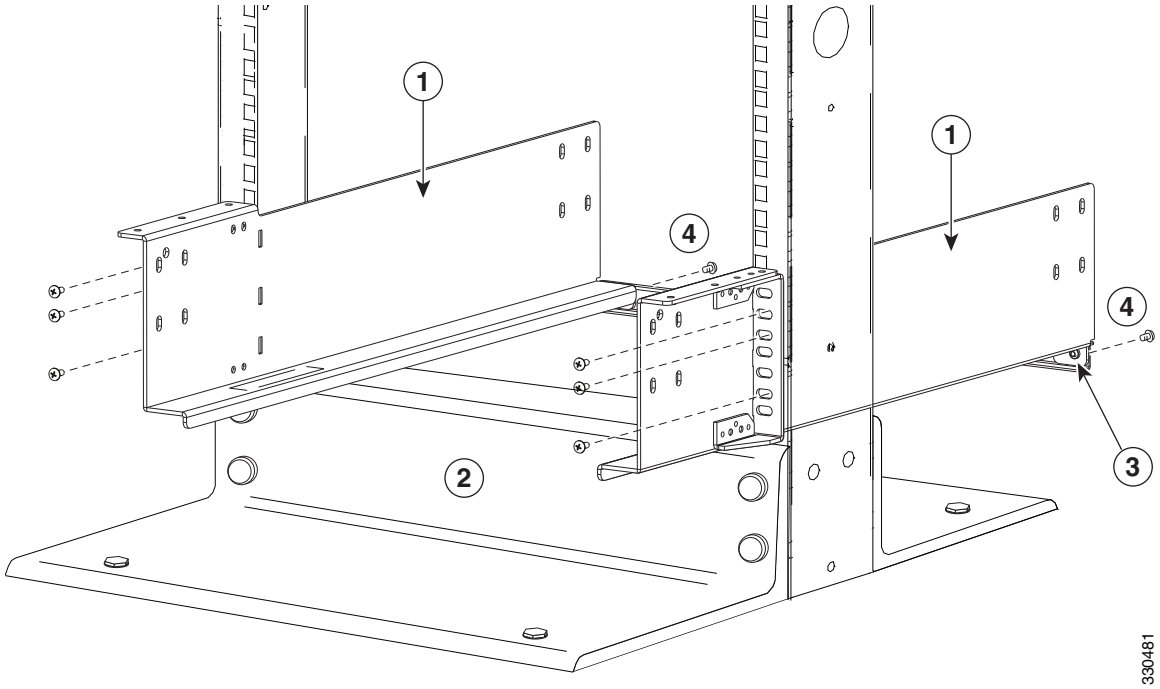
Figure 3-3 Positioning the Center-Mounted Bottom-Support Rails



1	For the first and heaviest Cisco Nexus 7009 chassis installed in a rack, position two center-mount bottom-support rails at the lowest RU on the rack.	**3**	Allow at least 26.25 inches (66.7 cm) (15 RU) for each Cisco Nexus 7009 system.
2	For the second Cisco Nexus 7009 chassis installed in a rack, position two center-mount bottom-support rails immediately above the first installed switch.		

Step 2 Use a Phillips screwdriver to screw in two or three (three are recommended if you have three screw holes) M6 x 19 mm or 12-24 x 3/4 inch Phillips screws on each bracket (using a total of 6 screws for both brackets) as shown in Figure 3-4.

Figure 3-4 Attaching a Center-Mount Bottom-Support Rail to a Rack



1	Left and right center-mount bottom-support rails	**3**	Crossbar
2	Two sets of 3 M6 x 19 mm Phillips screws or two sets of 3 12-24 x 3/4 in. Phillips screws	**4**	M4 x 8 mm Phillips screws (2)

Step 3 Align the crossbar to the lower back of the two bottom-support rails and use two M4 x 8 mm screws to attach it to each rail (one screw for each rail).

Installing the Chassis

This section describes how to install the Cisco Nexus 7009 chassis in a rack or cabinet. Depending on your data center requirements, you can choose to mount the front of the chassis to a rack or cabinet (standard method of mounting the chassis), or you can choose to mount the center of the chassis to a rack or cabinet. To mount the center of the chassis, you must order the center-mount brackets separately from the chassis.

This section includes the following topics:

Prerequisites for Installing the Chassis

Before you install the chassis, you must make sure that the following items are available for the installation:

- Data center ground that is accessible where you are installing the Cisco Nexus 7009 chassis.
- Two- or four-post, 19-inch EIA rack or cabinet that includes such a rack. These installation instructions show how to install the chassis in a two-post rack. You follow the same steps for installing the chassis on the front two posts of a four-post rack or cabinet.

  For more information on the rack or cabinet, see the "Installing a Rack or Cabinet" section on page 3-2.

Warning **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

- Bottom-support rails that are installed in the rack or cabinet—You must already have two front-mount bottom-support rails or two center-mount bottom-support rails attached to the lowest possible rack unit on the chassis.

  For more information, see the "Installing the Bottom-Support Rails on the Rack" section on page 3-4.
- Two front-mount brackets attached to the chassis. If you are mounting the chassis at its center to the rack or cabinet, you must also have two center-mount brackets, in the center-mount kit, which you order separately from the Cisco Nexus 7009 chassis.

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

- Cisco Nexus 7009 chassis and its components that are accounted for and undamaged.

  For more information, see the "Unpacking and Inspecting a New Switch" section on page 3-3.

Required Tools and Equipment

You need the following tools and equipment to install the Cisco Nexus 7009 chassis:

- Mechanical lift capable of lifting at least 300 pounds (136 kg)

Caution You must use a mechanical lift whenever lifting a device over 120 pounds (55 kg).

- Number 1 Phillips-head screwdriver with torque capability
- Rack-mount kit (shipped with the Cisco Nexus 7009 system accessory kit)

  Table 3-3 lists the items in the rack-mount kit.

Table 3-3 Contents for the Rack-Mount Kit

Part Description	Quantity
12-24 x 3/4 in. Phillips screws	20
M6 x 19 mm Phillips screws	20
Front-mount bottom-support rails	2
Crossbar	1
M4 x 8 mm Phillips screws	2

Note You should also have at least two persons to push the chassis, which can weigh up to 300 pounds (136 kg), onto and off the mechanical lift and rack.

- If you are going to mount the center of the chassis to the rack or cabinet, you must also have the optional center-mount kit. Table 3-4 lists the items in the center-mount kit.

Table 3-4 Contents for the Optional Center-Mount Kit

Part Description	Quantity
Center-mount bottom-support rails	2
Center-mount bracket	2

Mounting the Chassis by its Front Brackets

To install a Cisco Nexus 7009 chassis by its front brackets to a rack or cabinet, follow these steps:

Step 1 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 0.25 inches [0.635 cm] below the bottom of the chassis).

c. Use at least two 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.

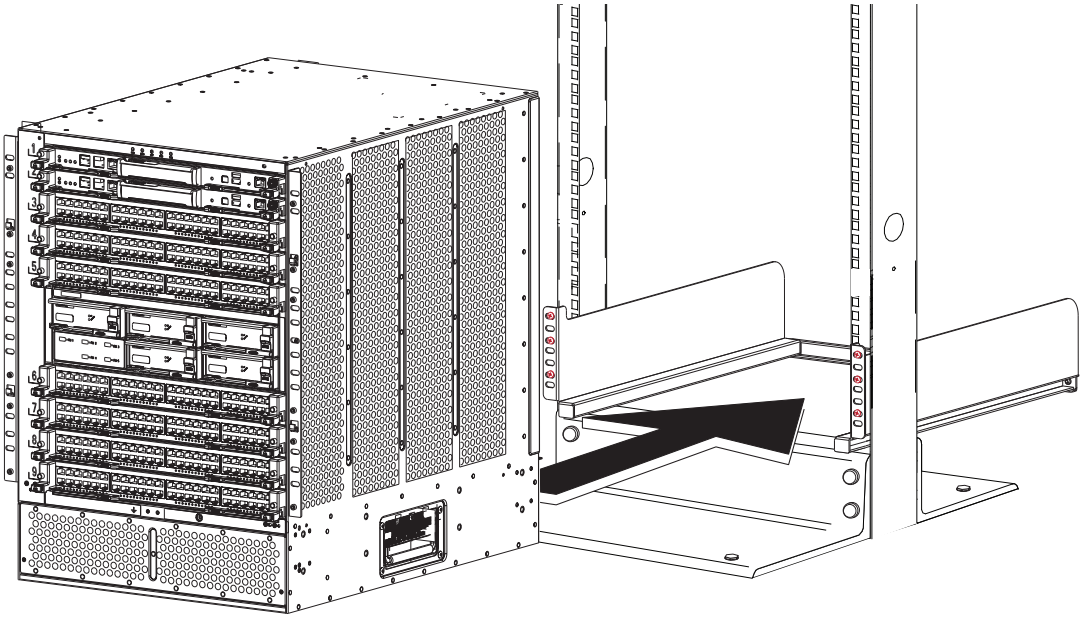
Warning **To prevent personal injury or damage to the chassis, never attempt to lift or tilt the chassis using the handles on modules (such as power supplies, fans, or cards); these types of handles are not designed to support the weight of the unit.** Statement 1032

Caution To lift the chassis, use a mechanical lift. Use the handles on the side of the chassis for only repositioning the chassis after it is already on the mechanical lift or in the rack or cabinet.

Step 2 Use the mechanical lift to move and align the rear of the chassis to the front of the rack or cabinet. Make sure that the bottom of the chassis is elevated to the height of the bottom-support rails or no more than 0.25 inch (0.635 cm) above the bracket.

Step 3 Use at least two persons to push the chassis onto the installed bottom-support rails until the front mount brackets come in contact with the rack rails. Push the lower half of the front side of the chassis so that the back side enters the rack first, and push until the chassis vertical front-mounting brackets or center-mounting brackets come in contact with the front of the rack. (See Figure 3-5.)

Figure 3-5 Moving a Cisco Nexus 7009 Chassis onto a Rack (Front-Mount Installation)



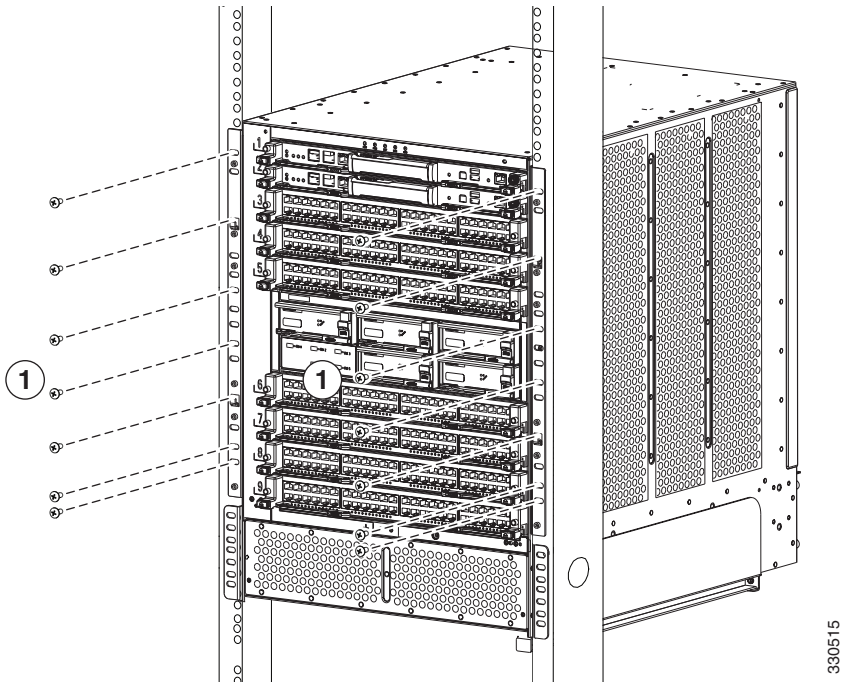
1	Push the lower half of the front side of the chassis	**3**	Rack with vertical mounting rails
2	Front-mounting brackets		

Step 4 Make sure that the screw holes in the chassis mounting brackets align with the screw holes in the vertical mounting rails.

Tip To adjust the placement of the chassis so that the screw holes in the chassis mounting brackets align with the screw holes in the vertical mounting rails, use the chassis handles shown in Figure 3-6.

Step 5 Use a Phillips screwdriver to screw in seven to eight M6 x 19-mm or 12-24 x 3/4-inch screws in each of the two chassis vertical mounting brackets (use a total of 12 to 14 screws for each of two mounting brackets) as shown in Figure 3-6.

Figure 3-6 Attaching the Front of the Cisco Nexus 7009 Chassis to the Rack



1	Seven to eight 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 eight screws)		

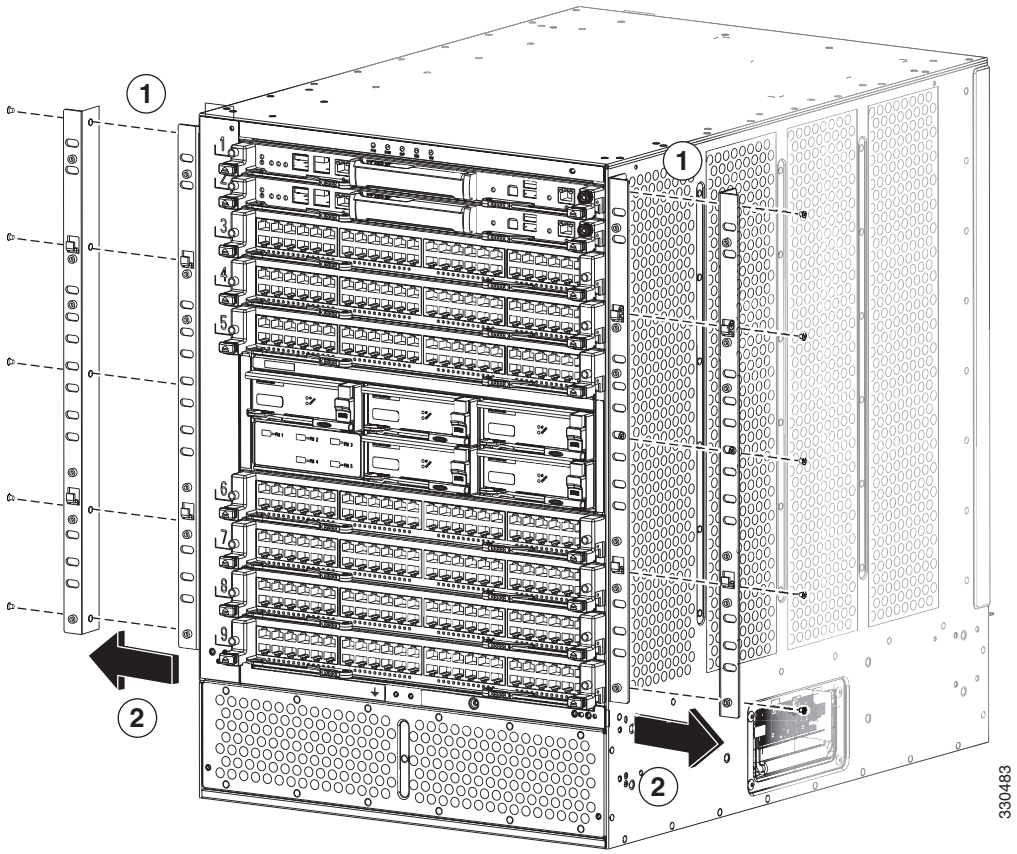
Mounting the Chassis by its Center Brackets

To install a Cisco Nexus 7009 chassis by its optional center bracket to a rack or cabinet, follow these steps:

Step 1 Follow these steps to replace the front-mount bracket on the chassis with center-mount brackets:

a. Remove the two front-mount brackets from the chassis by unscrewing the five screws that hold each bracket to the front sides of the chassis (see Figure 3-7).

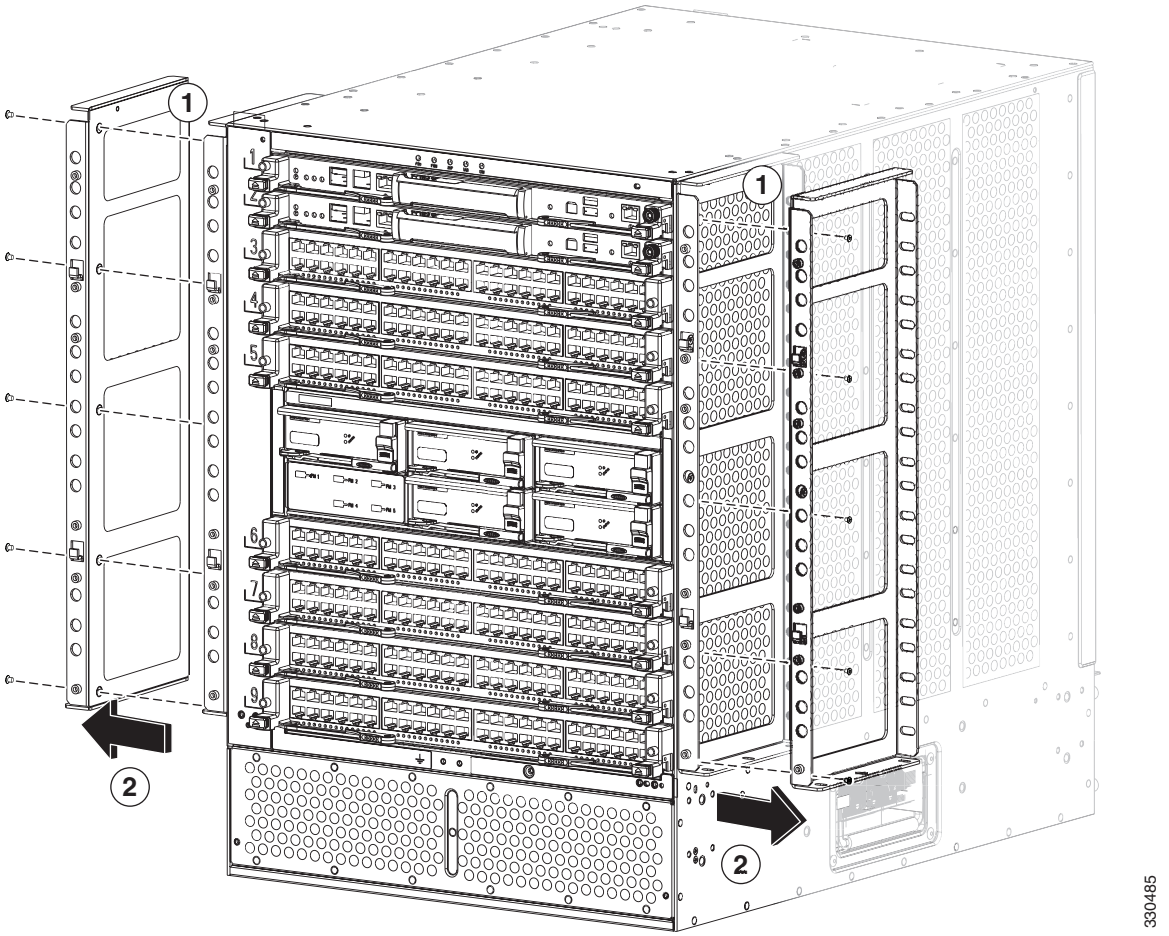
Figure 3-7 Removing the Front-Mount Brackets



1	Remove five screws from each bracket	**2**	Remove the bracket from the chassis

b. Position the center-mount bracket so that its five screw holes are aligned to the five screw holes used for the front-mount bracket (see Figure 3-8).

Figure 3-8 Attaching Center-Mount Brackets to the Chassis



1	Position the center-mount bracket with its five screw holes aligned to the five screw holes in the chassis.	**2**	Fasten the bracket to the chassis using five screws previously used to hold a front-mount bracket to the chassis.

c. Fasten the bracket to the chassis with the five screws previously removed from the front-mount bracket.

d. Repeat Steps b and c for attaching the other center-mount bracket to the other side 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 0.25 inches [0.635 cm] below the bottom of the chassis).

c. Use at least two 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.

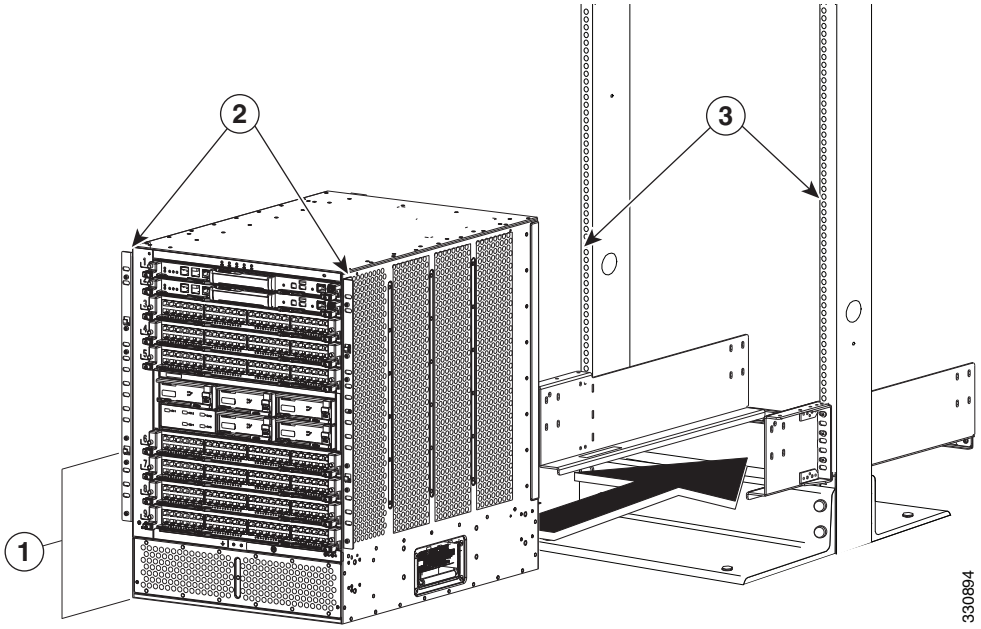
Warning **To prevent personal injury or damage to the chassis, never attempt to lift or tilt the chassis using the handles on modules (such as power supplies, fans, or cards); these types of handles are not designed to support the weight of the unit.** Statement 1032

Caution To lift the chassis, use a mechanical lift. Use the handles on the side of the chassis 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 move and align the rear of the chassis to the front of the rack or cabinet. Make sure that the bottom of the chassis is elevated to the height of the bottom-support rails or no more than 0.25 inch (0.635 cm) above the bracket.

Step 4 Use at least two persons to push the chassis onto the installed bottom-support rails until the front-mount brackets come in contact with the rack rails. Push the lower half of the front side of the chassis so that the back side enters the rack first, and push until the chassis vertical front-mounting brackets or center-mounting brackets come in contact with the front of the rack. (See Figure 3-9.)

Figure 3-9 Moving a Cisco Nexus 7009 Chassis onto a Rack (Center-Mount Installation)



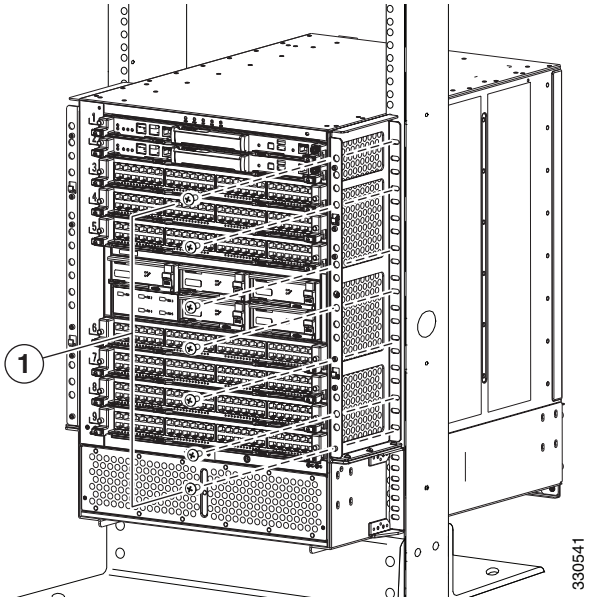
1	Push the lower half of the front side of the chassis	**3**	Rack with vertical mount rails
2	Center-mount brackets		

Step 5 Make sure that the screw holes in the chassis mounting brackets align with the screw holes in the vertical mounting rails.

Tip To adjust the placement of the chassis so that the screw holes in the chassis mounting brackets align with the screw holes in the vertical mounting rails, use the chassis handles shown in Figure 3-6.

Step 6 Use a Phillips screwdriver to screw in seven to eight M6 x 19-mm or 12-24 x 3/4-inch screws in each of the two chassis vertical mounting brackets (use a total of 12 to 14 screws for each of two mounting brackets) as shown in Figure 3-10.

Figure 3-10 Attaching the Center-Mounted Cisco Nexus 7009 Chassis to the Rack



1	Seven to eight 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 eight screws)		

Grounding the Cisco Nexus 7009 Chassis

If you are using AC power supply units, the Cisco Nexus 7009 system is grounded through the AC power supply cables and one of two grounding connections on the chassis. The AC power supply cables provide a connection to an earth ground whenever you connect the AC power to the system. 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 power cables are not connected to the system. You establish this ground by connecting one of the two grounding pads on the chassis to the rack (if it is connected to an earth ground) or directly to the earth ground for the data center building.

If you are using DC power supply units, you must connect each DC power supply unit to the earth ground before connecting the DC power source to the DC power supply units. You also connect the chassis to the NEBS ground for EMI shielding requirements and for the low-voltage supplies on the modules.

This section includes the following topics:

Prerequisites for Grounding the Chassis

Before you can ground the chassis, you must have a connection to the earth ground for the data center building. If you installed the Cisco Nexus 7009 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 ports to the rack. Otherwise, you must connect the chassis grounding ports directly to the data center ground.

Required Tools and Equipment

To connect the system 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 Cisco Nexus 7009 system accessory kit.
- Grounding screws—Two M4 x 8 mm (metric) pan-head screws. These screws are shipped with the Cisco Nexus 7009 accessory kit.
- Grounding wire—Not supplied with the Cisco Nexus 7009 system 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 Phillips-head screwdriver with torque capability.
- Crimping tool to crimp the grounding wire to the grounding lug.
- Wire-stripping tool to remove the insulation from the grounding wire.

Connecting the System Ground

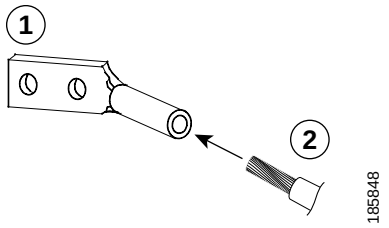
After you have moved the chassis into the rack or cabinet, you are ready to connect the system to the data center earth ground. After you ground the chassis, you can ground your ESD wrist strap by connecting it to the chassis.

To connect the system ground to the data center earth ground, follow these steps:

Step 1 Use a wire-stripping tool to remove approximately 0.75 inch (19 mm) of the covering from the end of the grounding wire.

Step 2 Insert the stripped end of the grounding wire into the open end of the grounding lug as shown in Figure 3-11.

Figure 3-11 Inserting the Grounding Wire in the Grounding Lug

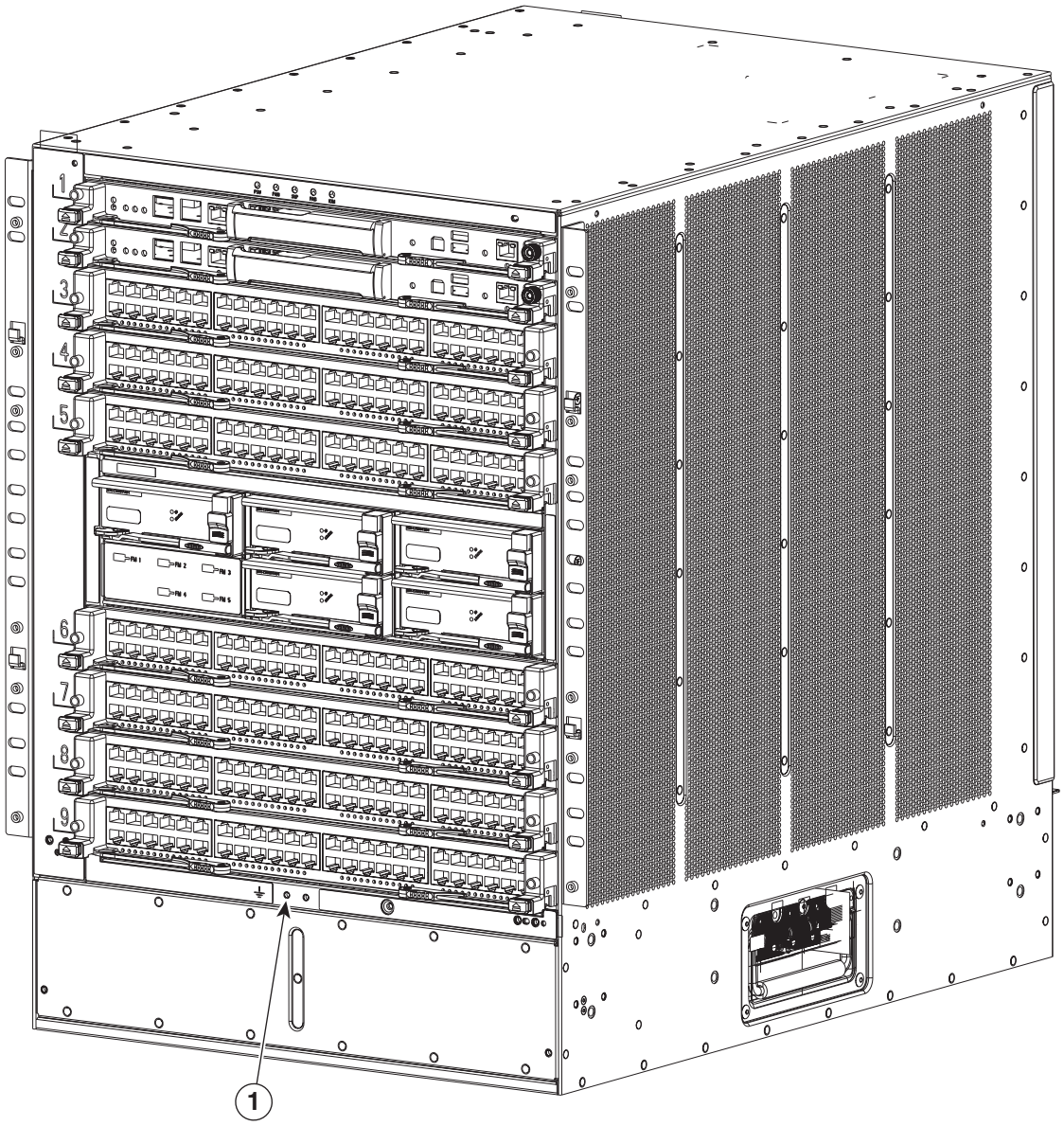


1	NRTL listed 45-degree grounding lug	**2**	Grounding cable with 0.75 in. (19 mm) of insulation stripped from the end

Step 3 Use the crimping tool to crimp the lug to the grounding wire. Verify that the ground wire is securely attached to the ground lug by attempting to pull the wire out of the crimped lug.

Step 4 Remove the adhesive label from one of the two system grounding pads, and secure the grounding wire lug to the grounding pad with two M4 screws. Figure 3-12 shows the location of the grounding pads on the front side of the chassis. Ensure that the grounding lug and the grounding wire do not interfere with other switch hardware or rack equipment.

Figure 3-12 Grounding Pad on the Front of the Cisco Nexus 7009 Chassis



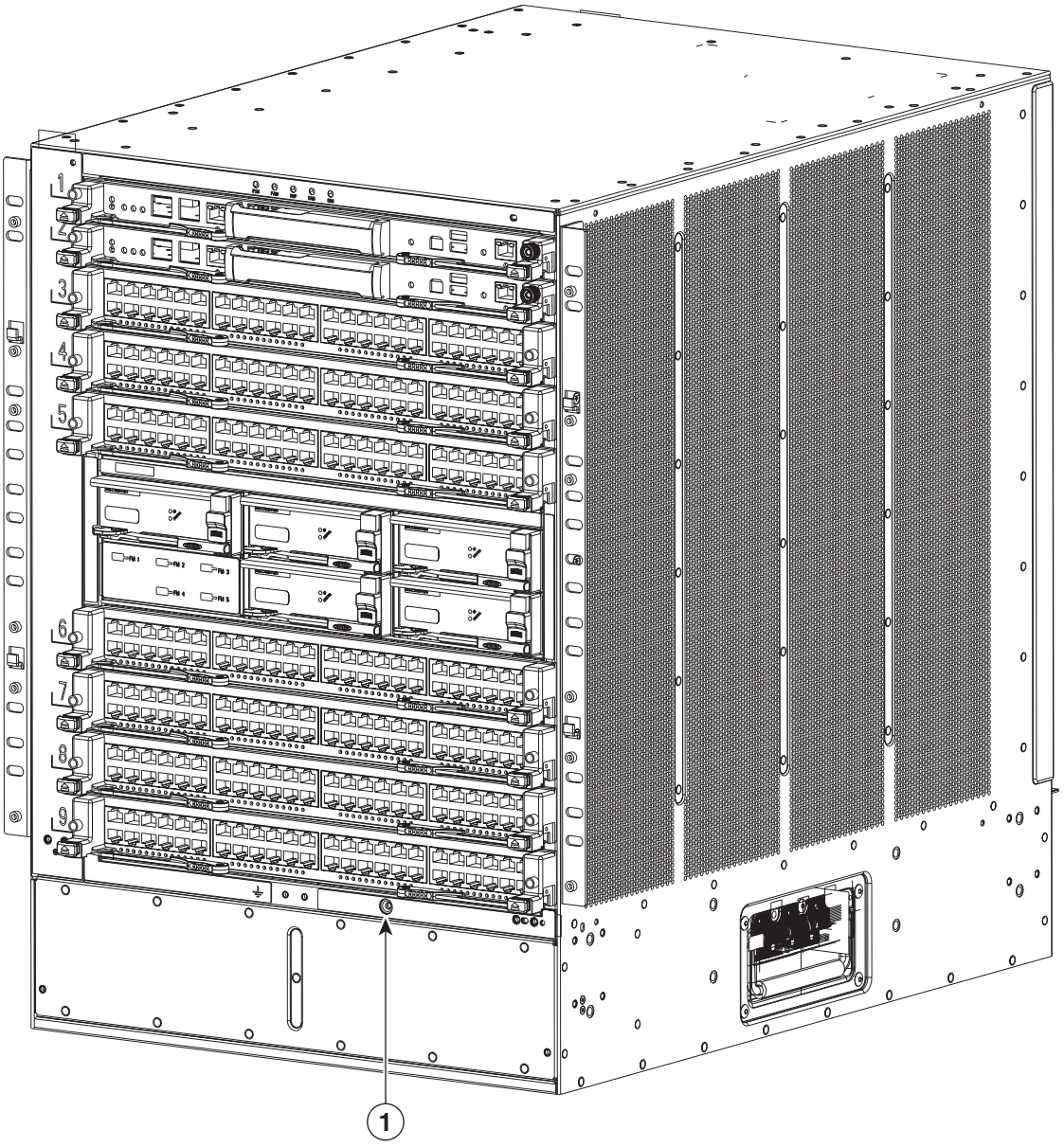
1	Grounding pad		

Prepare the other end of the grounding wire and connect it to an appropriate grounding point in your site to ensure an adequate earth ground for the switch. If the rack is grounded, connect the grounding wire as explained in the documentation provided by the vendor for the rack.

Connecting Your ESD Wrist Strap to the Chassis

After you connect the chassis to the data center earth ground, you can ground your ESD wrist strap by plugging it into an ESD port (shown in Figure 3-13).

Figure 3-13 ESD Grounding Port on the Front of the Cisco Nexus 7009 Chassis



1	ESD grounding port		

Installing the Cable Management Frames

After you have fully installed the Cisco Nexus 7009 switch chassis in the rack or cabinet (see the "Installing the Chassis" section on page 3-11), you can install the cable management frames on the front of the chassis.

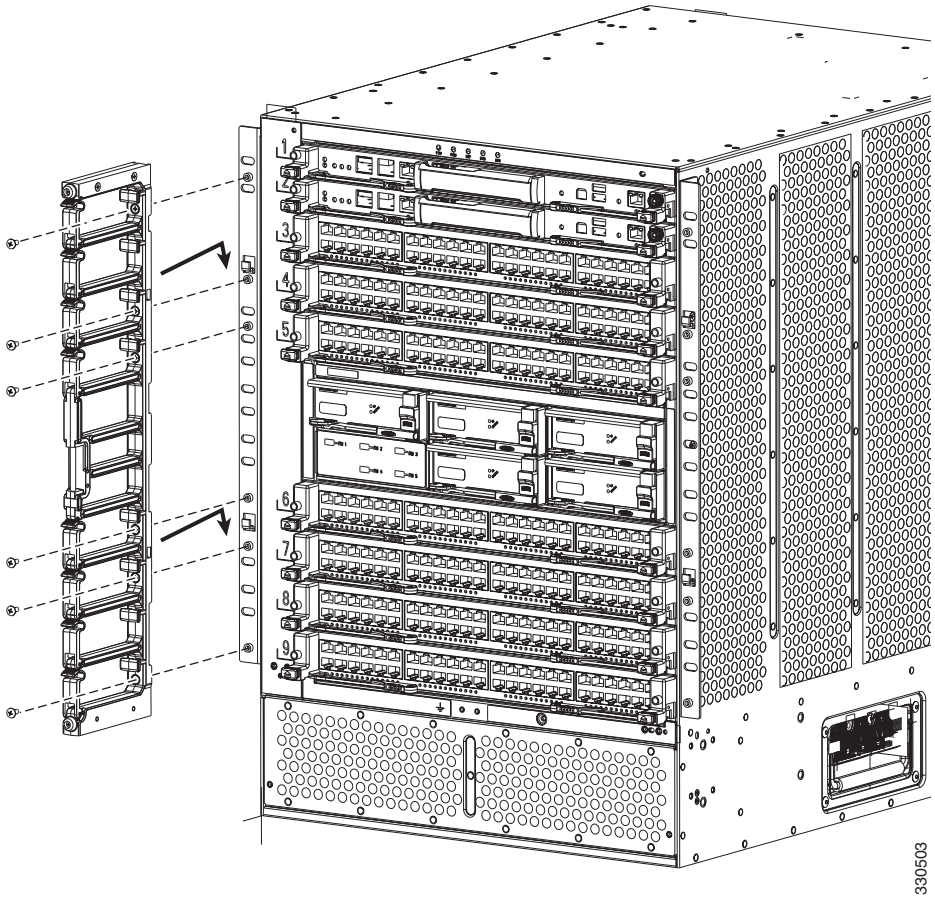
When you install the cable management frames, you attach two side frames to the front-mount brackets on the chassis and then attach a top hood to the top of the two side frames and the chassis.

Note Chassis with center-mount brackets include front-mount brackets for holding the cable management frames.

To install the cable management frames on the Cisco Nexus 7009 switch chassis, follow these steps:

Step 1 Attach a cable management frame (part number 800-33786) onto the two hooks that protrude from the lower half of the left front-mount bracket that is attached to the Cisco Nexus 7009 switch chassis, and loosely fasten the frame to the chassis with four flat-head M4x10 screws as shown in Figure 3-14.

Figure 3-14 Attaching a Cable Management Frame to a Front-Mount Bracket

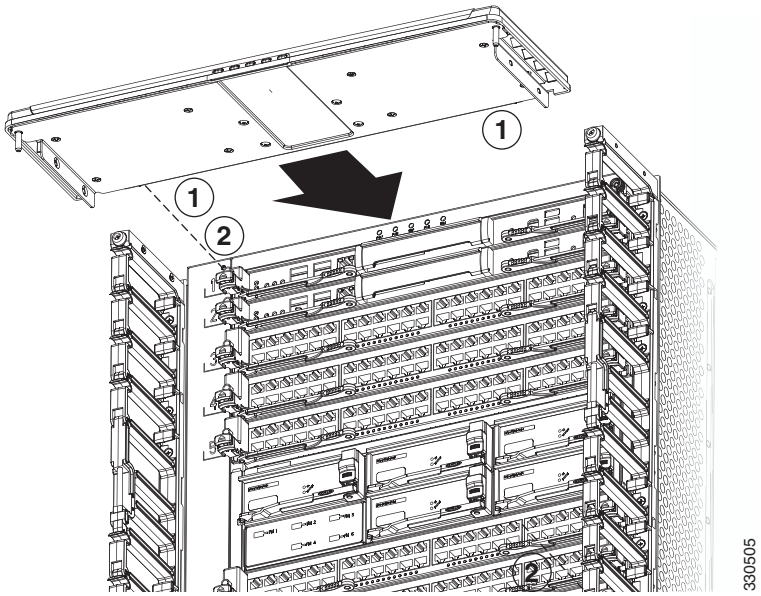


1	Cable management frame.	**3**	Position the frame so that the two lower hooks on the front-mount bracket fit inside the two holes on the frame and then slide the assembly down so that it is held by the hooks.
2	Front-mount bracket.	**4**	Loosely fasten the assembly to the front-mount bracket with four M4x10 screws. Do not tighten these screws.

Step 2 Repeat Step 1 to attach a cable management frame to the right side of the chassis.

Step 3 Place the top hood (part number 800-33785-01) on top of the two cable management frames that are already installed. Push the top hood toward the chassis so that its alignment pins enter the alignment holes and the top hood rests against the chassis as shown in Figure 3-15.

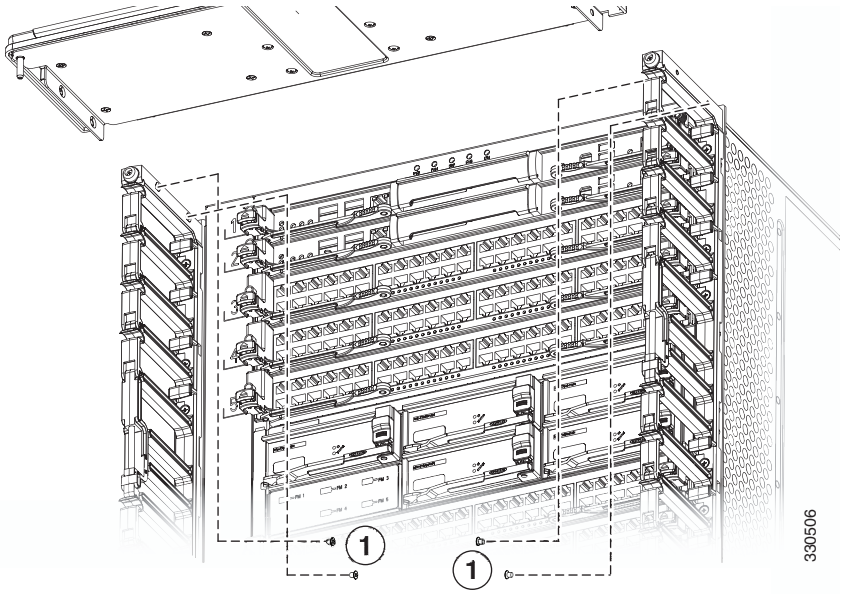
Figure 3-15 Positioning the Top Hood with the Cable Management Frames and the Chassis



1	Alignment pins	**2**	Alignment holes

Step 4 Use four M4x8 pan-head screws to loosely fasten the top hood to the chassis as shown in Figure 3-16.

Figure 3-16 Fastening the Top Hood to the Chassis and Cable Management Assemblies



1	Four M4x8 pan-head screws that fasten the top hood to the left and right cable management assemblies (two screws for each side).		

Step 5 Use four M4x8 pan-head screws to loosely fasten the top hood to each of the two cable management frames as shown in Figure 3-16.

Step 6 Tighten each of the four screws that fasten the top hood to the cable management frames to 11 to 15 in-lb (1.2 to 1.7 N·m).

Step 7 Tighten each of the eight screws that fasten the cable management frames to the rack-mount brackets to 11 to 15 in-lb (1.2 to 1.7 N·m).

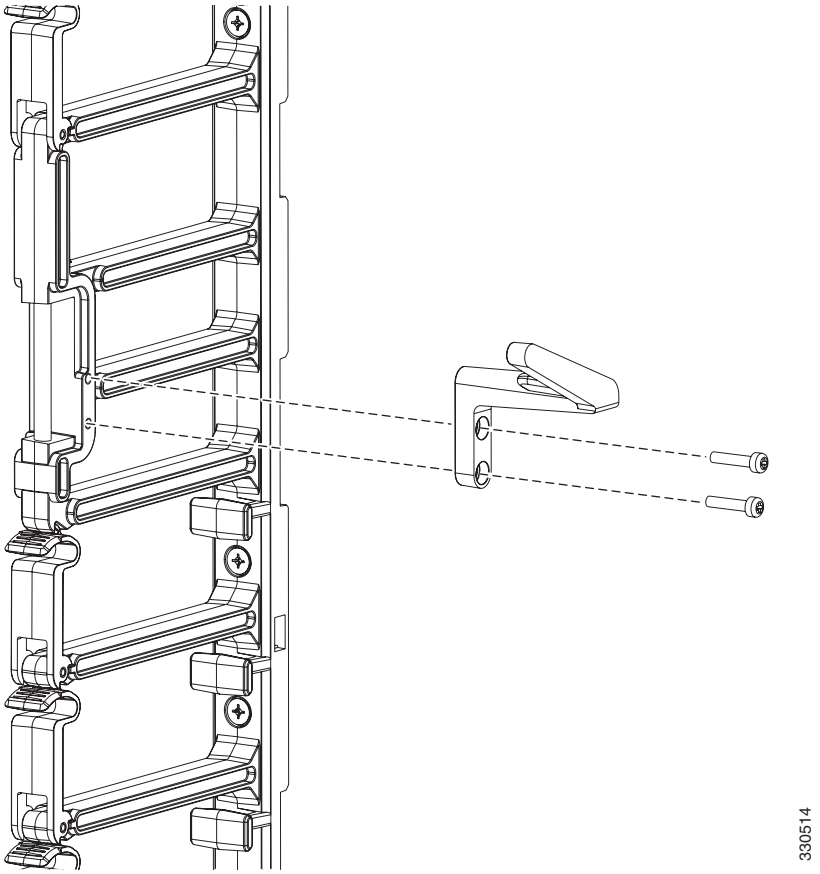
Installing the Front Door and Air Intake Frame

If you need to install the optional double-hinged door and air intake frame, you must install them after installing the cable management frame on the chassis.

To install the front door and air intake frame to the Cisco Nexus 7009 cable management system, follow these steps:

Step 1 Position the left door stop on the middle of the left cable management frame and fasten it with two M3x10 pan-head screws as shown in Figure 3-17. Tighten these two screws to 5 to 7 in-lb (0.6 to 0.8 N·m).

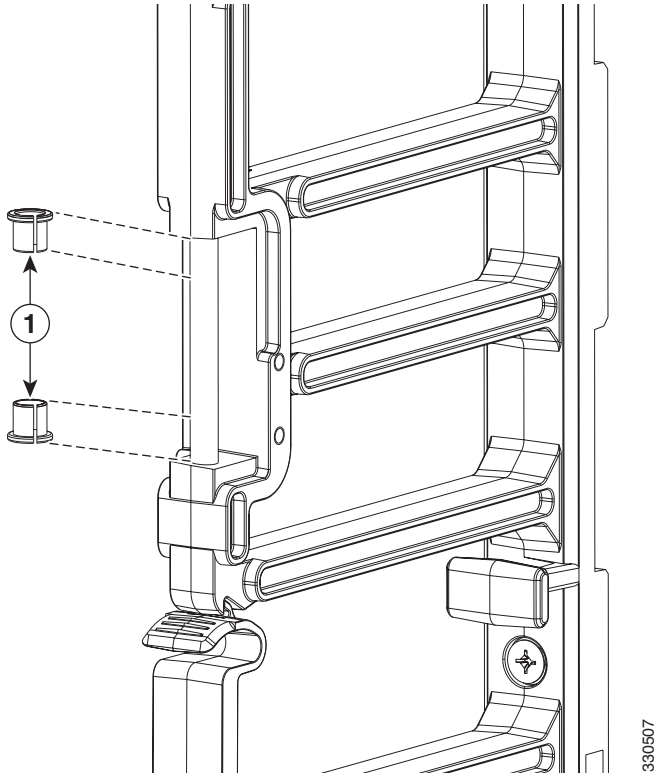
Figure 3-17 Attaching the Left Door Stop



1	Align the left door stopper to the cable management frame.	**2**	Fasten the left door stopper to the frame with two M3 x 10 mm screws.

Step 2 Place two bushings on the vertical post located half way up the right cable management frame (see Figure 3-18). You must open each bushing to fit it around the post.

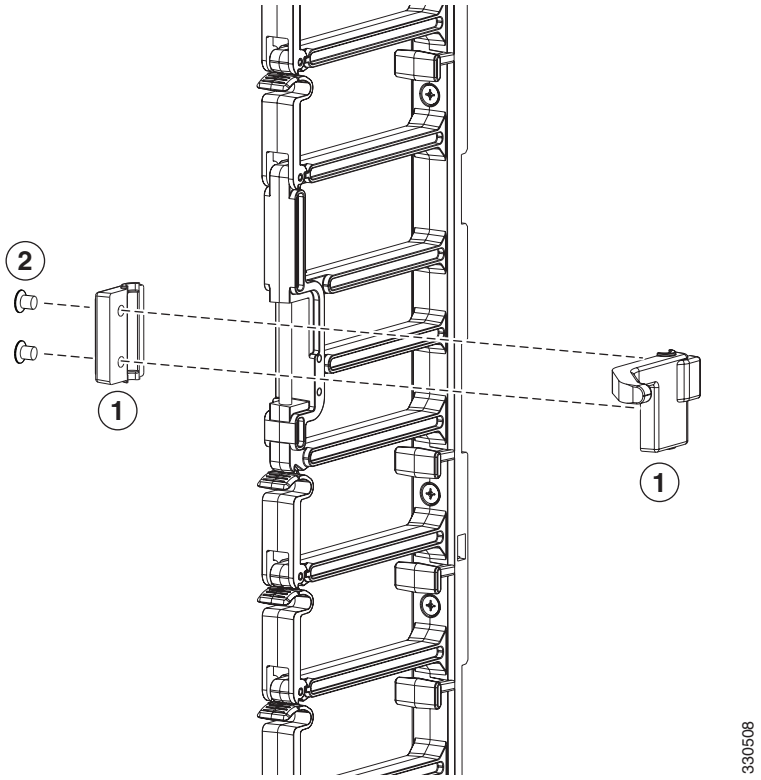
Figure 3-18 Placing Two Bushings on a Cable Management Frame Hinge Post



1	Split open the bushings and fit them around the cable management frame post.		

Step 3 Assemble the two pieces of the right door stop over the bushings and post. Fasten the two pieces together with two M4 flathead screws (see Figure 3-19).

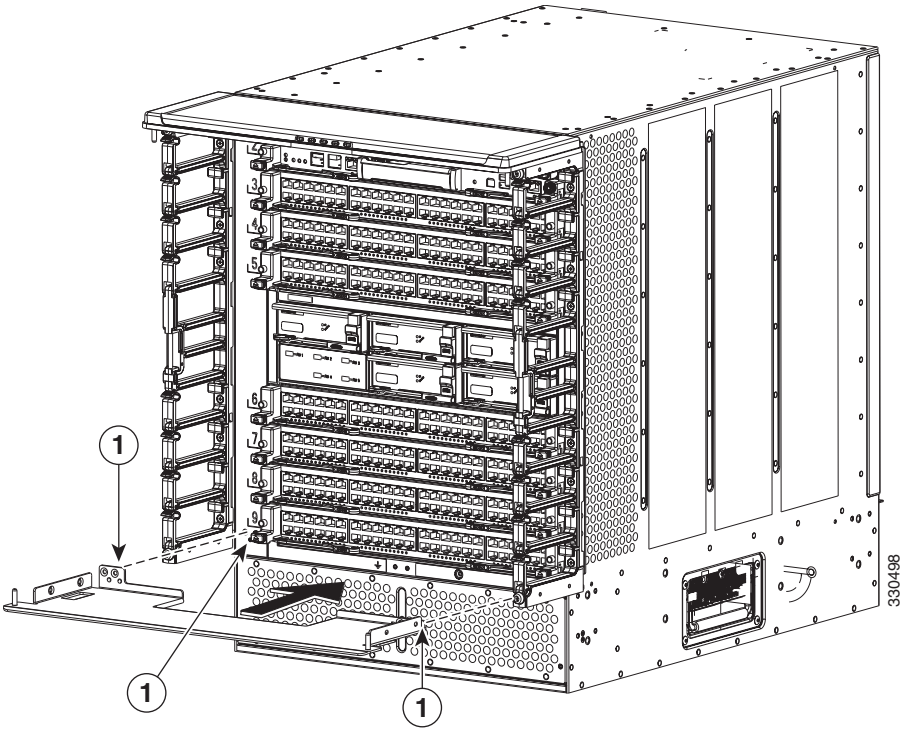
Figure 3-19 Assembling the Right Door Stop



1	Assemble the right and left sides of the right door stop around the cable management post. Be sure that each bushing sticks out above or below the assembled door stop.	**2**	Use two M4 flat head screws to fasten the two door stop pieces together.

Step 4 Position the hinge bracket at the bottom of the two cable management side frames and align two alignment pins on the hinge bracket (part number 700-31339-01) to two alignment holes in the chassis as shown in Figure 3-20. Push the hinge bracket to the chassis so that the pins go into the chassis. Two screw holes in each of the cable management side frames should align to screw holes in the hinge bracket.

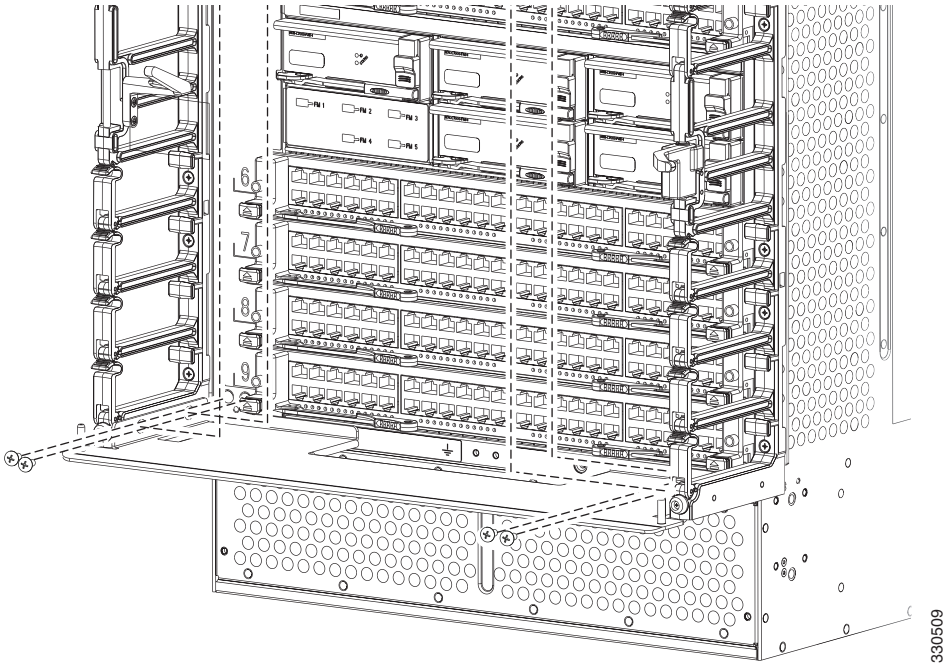
Figure 3-20 Positioning the Hinge Bracket to the Cable Management Frames and Chassis



1	Alignment pins	**2**	Alignment holes

Step 5 Attach the bracket to the chassis and cable management frames with eight loosely fastened M4x8 screws, as shown in Figure 3-21.

Figure 3-21 Attaching the Hinge Bracket to the Cable Management Frames and Chassis



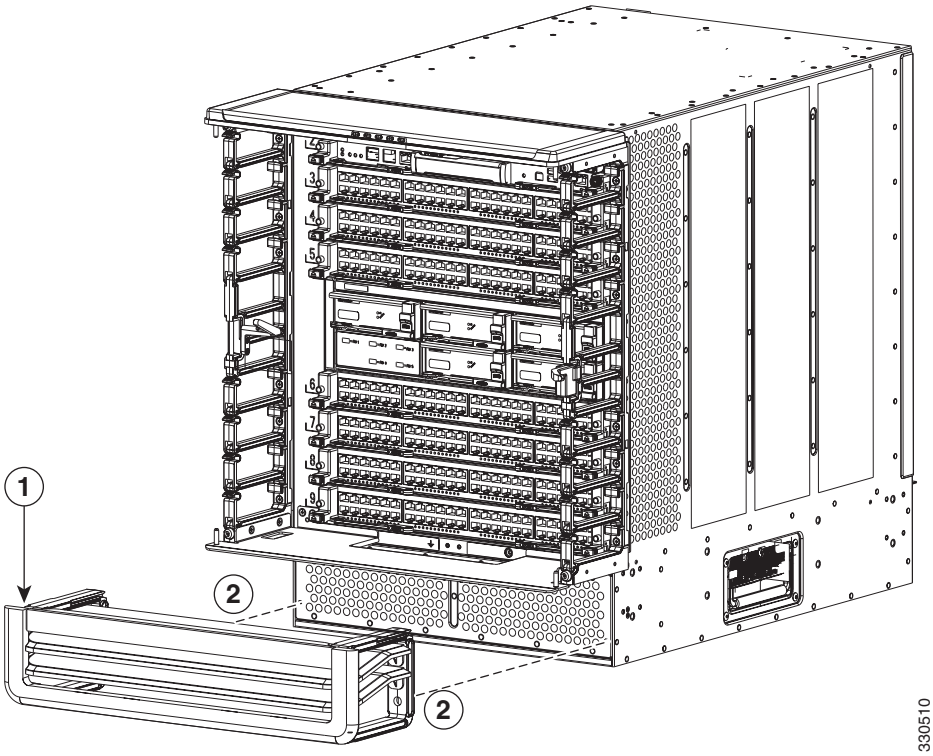
1	Four M4x8 pan-head screws that fasten the hinge bracket to the chassis.	**2**	Four M4x8 pan-head screws that fasten the hinge bracket to the left and right cable management assemblies.

Step 6 Tighten the four M4x8 screws that fasten the hinge bracket to the chassis to 11 to 15 in-lb (1.2 to 1.7 N·m).

Step 7 Tighten the four M4x8 screws that fasten the hinge bracket to the cable management frame to 11 to 15 in-lb (1.2 to 1.7 N·m).

Step 8 Align the two captive screws on the air intake frame to the two screw holes below the cable management frames on the chassis as shown in Figure 3-22.

Figure 3-22 Positioning the Air Intake Frame on the Chassis



1	Air intake frame.	**2**	Align captive screws to their holes in the chassis and fasten them to the chassis.

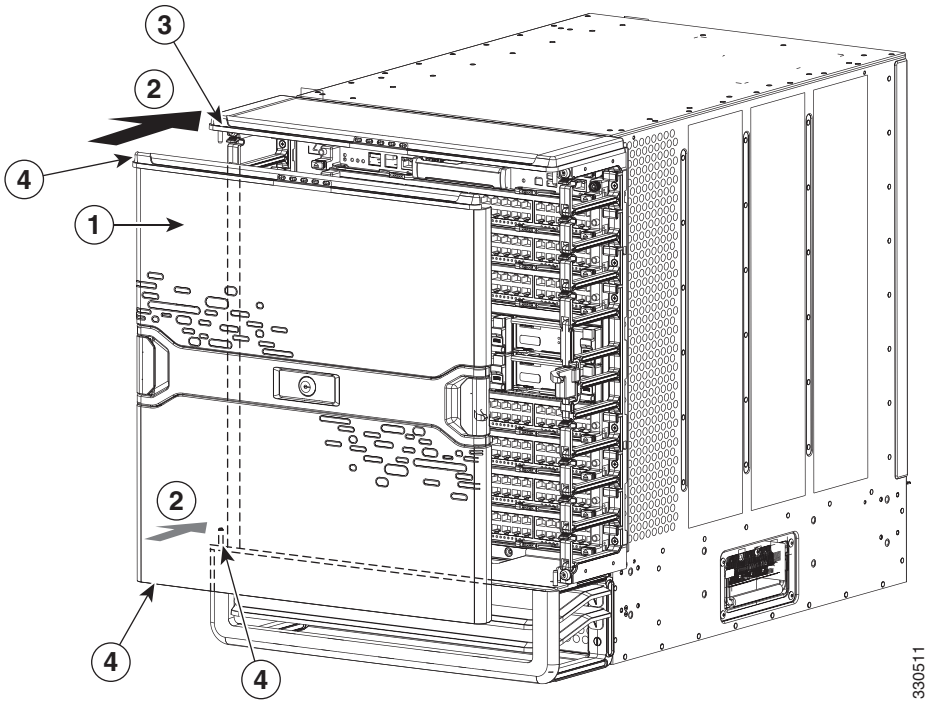
Step 9 Fasten the captive screws on the air-intake frame to the chassis and tighten to 11 to 15 in-lb (95 to 130 N·m).

Step 10 On the chassis door, pull the door handle open on one of the two sides of the door until the handle clicks (the handle clicks when you pull it about 30 degrees).

Step 11 Move the side of the door with the opened handle onto the two hinge pins as shown in Figure 3-23. Make sure that the top and bottom hinge pins on the hood and hinge bracket fit through the slots on the top and bottom of that side of the door. Position the door so that the hinge pins are located at the ends of the slots.

Note The double-hinge door can be installed and opened on either side. The figures in this procedure show how to install the door on the left side first, but you can use the instructions to install it on either side.

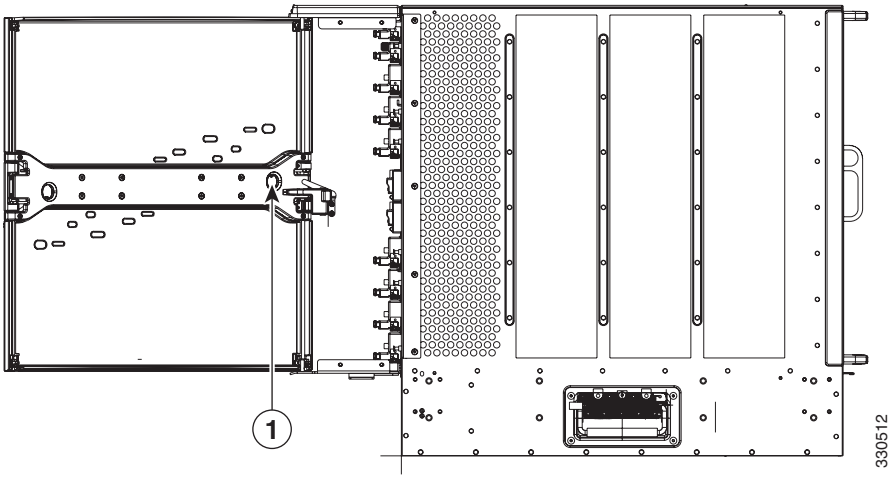
Figure 3-23 Attaching One Side of the Door to the Chassis



1	Double-hinged door	**3**	Hinge pins
2	Move one side to the hinge pins	**4**	Slot for hinge pin

Step 12 While holding the door on the hinge pins with one hand, use your other hand to press the locking button on the interior side of the door. See Figure 3-24. This action locks the latches around the hinge pins so that you no longer need to hold the door onto the chassis.

Figure 3-24 Attaching the Left Side of the Door

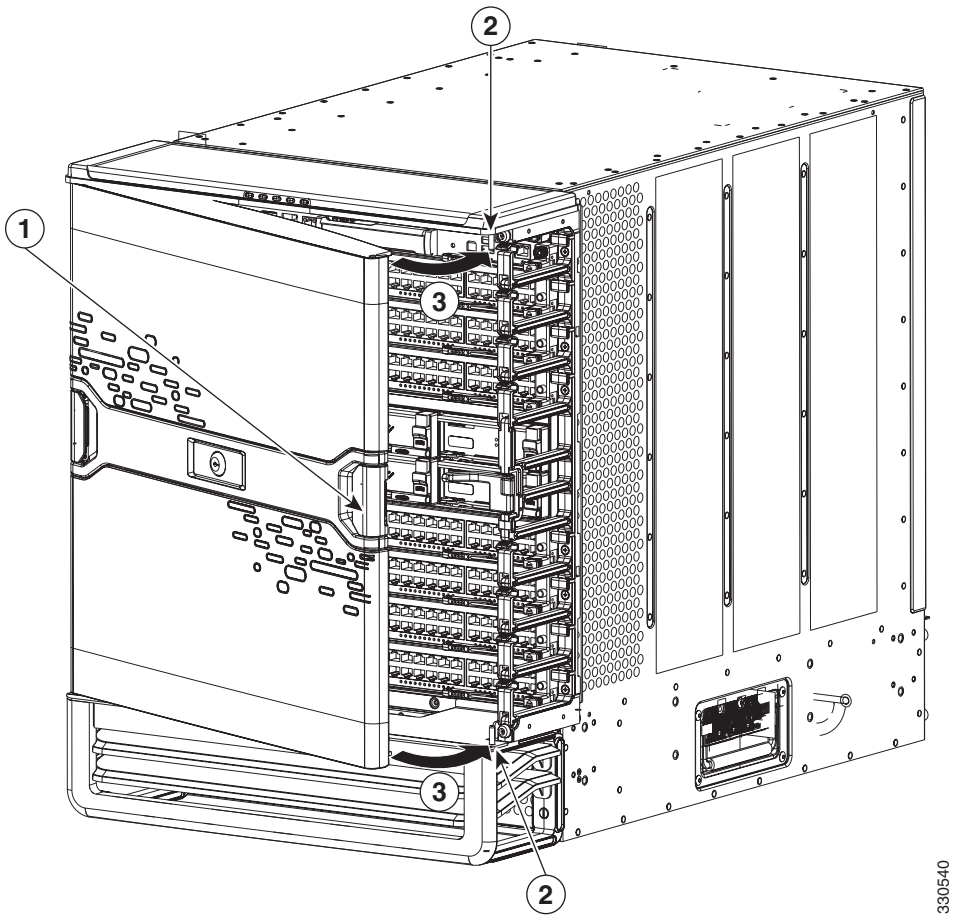


1	Press the locking button to lock the door onto the hinge pins.		

Note Be sure that the door is firmly latched to the two hinge pins. If both of the hinge pins are not secured behind the door latch, hold the door securely with one hand while opening the door handle for the unsecured side until the handle clicks, press that side of the door so that the pins are positioned all the way inside the door slots, press the door latch button on the interior side of the door, and then make sure that the door is firmly secured to both hinge pins.

Step 13 Open the door handle on the open side of the door until it clicks. This action opens the latches on the open side of the door. See Figure 3-25.

Figure 3-25 Attaching the Right Side of the Door



1	Door handle pulled out until it clicks	3	Door closed onto the hinge pins
2	Hinge pins		

Step 14 Swing the door closed so that the unused hinge pins fit inside the slots on the top and bottom of the door. When you close the door, the door stopper automatically presses the lock button on the inside of the door so that the door is locked on the hinge pins. If the door stopper does not close the latches, press the door closed at the handle until you hear the latches click. Make sure that the door is fully secured to the frames on both sides.

Note If a hinge pin is not secured behind a door latch, open the door handle for that side of the door until it clicks, open that side of the door, and then press the door closed so that the pins are positioned all the way inside the door slots. When you close the door, the door stopper automatically closes the door latches. If you do not hear the latches click, press the door at the handle to fully close it and to activate the latches. Test the door to make sure that it is fully secured to the four hinge pins.

Tip Whenever you need to open the door, pull one of the door handles open until it clicks and then swing that side of the door open.

Installing Storage Media in a Supervisor Module

Each supervisor module on a Cisco Nexus 7000 Series switch is shipped with a CompactFlash card installed in the LOG FLASH reader (Supervisor 1 modules) or a USB drive installed in the LOG FLASH reader (Supervisor 2 and Supervisor 2E modules). The EXPANSION FLASH reader (Supervisor 1) or Slot0 port (Supervisor 2 and 2E) is left empty, but you can optionally install a card in that reader or a USB drive in the USB port. To allow this storage media to function with the reader or port, you must make sure that it is either formatted for the reader before installing it or format it after installing it.

Note The LOG FLASH and EXPANSION FLASH or Slot0 readers require different formats for their storage media.

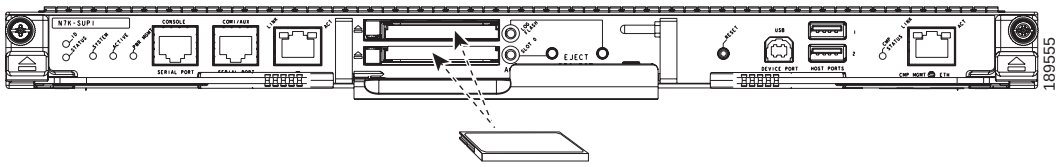
To replace an installed CompactFlash card, see the "Replacing Storage Media for a Supervisor Module" section on page 10-61.

To install storage media in a supervisor module, follow these steps:

Step 1 Align the storage media to its slot or port on the supervisor module as follows:

- For a Supervisor 1 module, align the card with the slot for the CompactFlash reader slot labeled LOG FLASH or EXPANSION FLASH as shown in Figure 3-26. The grooves on the thin side of the card are on the end of the card that goes into the reader first. If the card does not fit easily into the reader, flip the card so that the bottom edge is on top, and try pushing the card into the reader.

Figure 3-26 Aligning a CompactFlash Card to its Reader



- For a Supervisor 2 or 2E module, insert the USB drive in the LOG FLASH or SLOT0 port.

Step 2 Wait for the reader or port LED to turn green and for a message to appear on the console as follows:

- If you are installing a card or USB drive into the log flash reader, the message will end with "logflash:online."
- If you are installing a card or USB drive into the expansion flash reader, the message will end with "slot0:online."
- If you see an "offline" message or do not see a message, either the card or USB drive is not fully inserted or it is improperly formatted.

  Make sure that the card or USB drive is fully inserted inside the reader. If it is fully inserted, either format the card (see the *Cisco Nexus 7000 Series NX-OS Fundamentals Configuration Guide*) or replace the storage media with another that is properly formatted for the reader.

Installing a Cisco Nexus 7010 Chassis

This chapter describes how to install a new or relocated Cisco Nexus 7010 chassis in a rack or cabinet. For information about installing other Cisco Nexus 7000 Series chassis or power supplies, see the following chapters:

- Chapter 2, “Installing a Cisco Nexus 7004 Chassis”
- Chapter 3, “Installing a Cisco Nexus 7009 Chassis.”
- Chapter 5, “Installing a Cisco Nexus 7018 Chassis.”
- Chapter 6, “Installing Power Supplies.”

This chapter includes the following sections:

Preparing to Install the Switch

This section includes the following topics:

Note You must set up one four-post, 19-inch EIA rack or cabinet before you can install the Cisco Nexus 7010 chassis. Make sure that you order the rack or cabinet and have it delivered before installing the chassis.

Required Tools

Before you install the Cisco Nexus 7010 chassis into a rack, make sure that you have the following tools and equipment:

- Mechanical lift capable of lifting 550 pounds (250 kg)
- Number 1 Phillips screwdriver with torque capability
- 3/16-inch flat-blade screwdriver
- Crimping tool
- Wire stripping tool
- Tape measure and level
- Grounding cable

Note These tools and equipment do not ship with the chassis.

Additional tools and equipment, such as an electrostatic discharge (ESD) wrist strap, that you will also need to install the Cisco Nexus 7010 chassis, are included in the Cisco Nexus 7010 accessory kit.

Caution When you handle the Cisco Nexus 7010 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.

Note For a list of tools required to assemble and secure the four-post rack or cabinet, see the documentation that the manufacturer shipped with the rack or cabinet.

Installing a Four-Post Rack or Cabinet

Before you install the Cisco Nexus 7010 chassis, 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 the *Cisco Nexus 7000 Series Site Preparation Guide*. To maximize safety, you should do the following for the rack:

- Bolt the rack to the concrete subfloor before moving the Cisco Nexus 7010 chassis onto it.

Warning **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

- If the rack has bonded construction, connect it to the earth ground to enable you to easily ground the system components that you install and to ground your ESD wrist strap. This step minimizes the chance of electrostatic discharge when you handle ungrounded components before you install them.

Be sure that the rack includes AC power receptacles with the amperage required for the power supply units that you will be installing in the chassis. If you are installing 6-kW power supply units, you must have 20-A circuits. If you are installing 7.5-kW power supply units, you must have 30-A circuits.

Warning **Take care when connecting units to the supply circuit so that wiring is not overloaded.** Statement 1018

For instructions on setting up the rack, see the documentation that the manufacturer shipped with the rack.

Unpacking and Inspecting a New Switch

Before you install a new Cisco Nexus 7010 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.

Tip Do not discard the shipping container when you unpack the Cisco Nexus 7010 system. 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. For repacking instructions, see Appendix E, "Repacking the Cisco Nexus 7000 Series Switch for Shipment."

To inspect the shipment, follow these steps:

Step 1 Compare the shipment to the equipment list 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:
  - 2 supervisor modules
  - 1 to 8 I/O modules
  - 3 to 5 fabric modules
  - 2 system fan trays
  - 2 fabric fan trays
- 2 to 3 power supply units

  The power supply units are shipped with the chassis but are boxed separately.
- Cisco Nexus 7010 system accessory kit

  To see a list of what is in the accessory kit, see the *Cisco Nexus 7010 System Accessory Kit Contents* document, which is included in the kit.
- Mid-chassis doors and frame (optional)
- Air filter (optional)

Step 2 Check the contents of each box or package for damage.

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

- 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 on the Rack

The bottom-support rails hold the Cisco Nexus 7010 chassis on the rack or cabinet. To maximize the stability of the rack, you must attach these rails at the lowest possible rack unit (RU).

The prerequisites, tools, and process for installing the bottom-support rails are included in the following topics:

Prerequisites for Attaching the Bottom-Support Rails

Before you can attach the bottom-support rails, you must fully install the rack or cabinet, and should, for maximum stability, bolt the rack or cabinet to the concrete subfloor. If anything lighter than the Cisco Nexus 7010 system is already installed in the rack, you should make sure that it is positioned above where you will be installing the Cisco Nexus 7010 system. Also, you must have the bottom-support rail kit, which ships with the Cisco Nexus 7010 system accessory kit. The distance between the front and rear mounting brackets on the rack or cabinet must be between 24 and 32 inches (60.96 and 81.28 cm) to fit the bottom-support rails.

Required Tools and Equipment

You need the following tools and equipment to attach the bottom-support rails:

- Number 1 Phillips-head screwdriver with torque capability.
- Rack-mount kit (shipped with the accessory kit). Table 4-1 lists the items in the rack-mount kit.

Table 4-1 Contents for the Rack-Mount Kit

Part Description	Quantity
12-24 x 3/4 in. Phillips screws	20
M6 x 19 mm Phillips screws	20
Adjustable bottom-support rails	2

Attaching the Bottom-Support Rails

To maximize the stability of the rack, you should install the chassis as low as possible on the rack. Install the heaviest system first at the bottom of the rack. If you install a second system in the same rack, install it immediately above the lower system if there is enough vertical space.

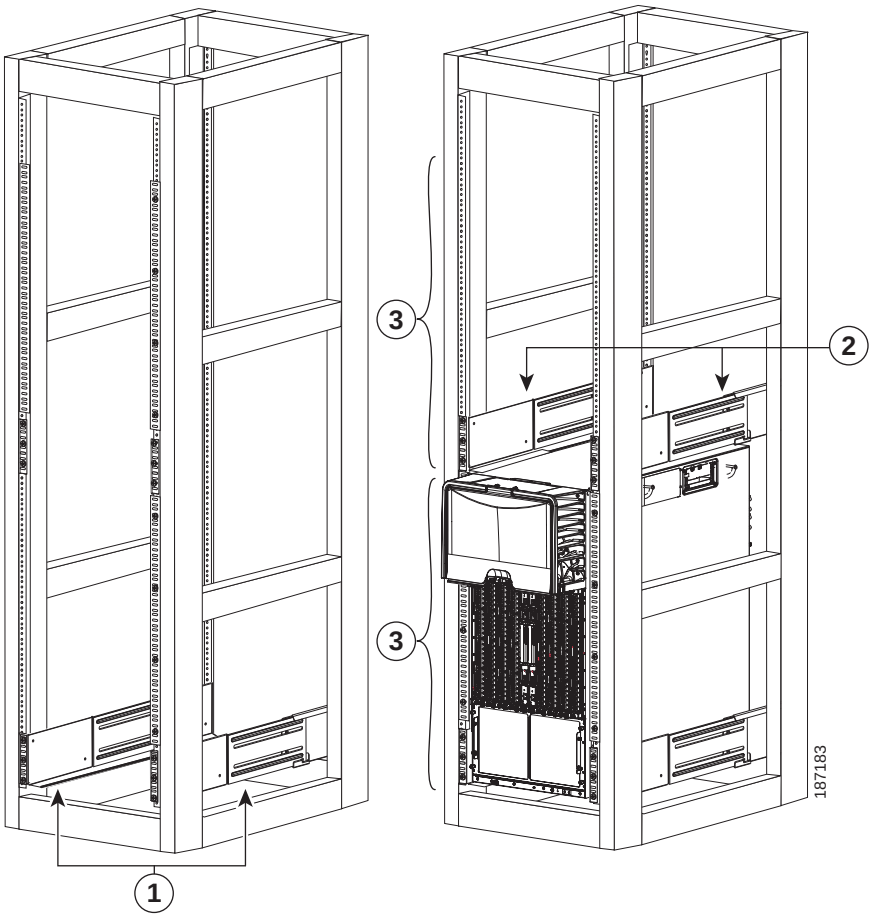
Warning **To prevent bodily injury when mounting or servicing this unit in a rack, you must take special precautions to ensure that the system remains stable. The following guidelines are provided to ensure your safety:**

- **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:

Step 1 Position one of the two adjustable bottom-support rails at the lowest possible RU. If you are installing a chassis above another Cisco Nexus 7010 chassis, position the rail 36.75 inches (93.4 cm) (21 RU) above the bottom-support rails for the lower chassis as shown in Figure 4-1. 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 (60.96 to 81.28 cm).

Figure 4-1 Positioning the Bottom-Support Rails

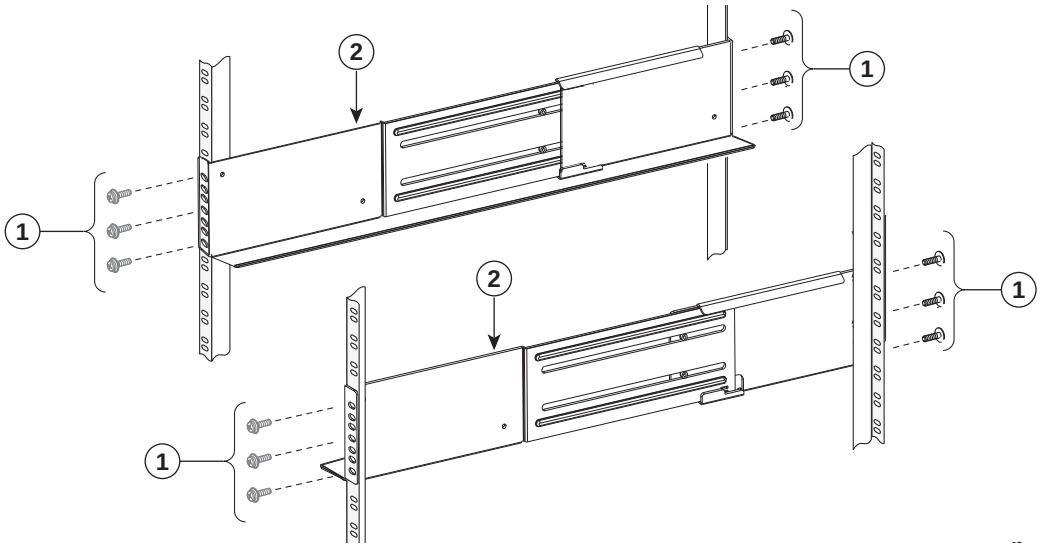


1	For the first and heaviest Cisco Nexus 7010 chassis installed in a rack, position two bottom-support rails at the lowest RU on the rack.	**3**	Allow at least 36.75 inches (93.4 cm) (21 RU) for each Cisco Nexus 7010 system.
2	For the second Cisco Nexus 7010 chassis installed in a rack, position two bottom-support rails immediately above the first installed switch.		

Step 2 Use a Phillips screwdriver to screw in three M6 x 19 mm or 12-24 x 3/4 in. Phillips screws on each end of each rail (using a total of 12 screws for both brackets) as shown in Figure 4-2.

Note Three of the screw holes on each end of the bottom-support rail align to the screw holes in the mounting rail. Use a screw in each of these screw holes.

Figure 4-2 Attaching a Bottom-Support Rail to a Rack



1	Four sets of 3 M6 x 19 mm Phillips screws or four sets of 3 12-24 x 3/4 in. Phillips screws	**2**	Adjustable bottom-support rails (2)

Installing the Chassis

This section describes how to install the Cisco Nexus 7010 chassis in a rack or cabinet. These installation steps include transporting the chassis, elevating the chassis to the rack using a mechanical lift, pushing the chassis onto the rack, and then securing the chassis to the rack.

This section includes the following topics:

Prerequisites for Installing the Chassis

Before you install the chassis, you must make sure that the following items are available for the installation:

- Data center ground is accessible where you are installing the Cisco Nexus 7010 chassis.
- Four-post, 19-inch EIA rack or cabinet that includes such a rack.

  For more information on the rack or cabinet, see the "Installing a Four-Post Rack or Cabinet" section on page 4-2.

Warning **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

- Bottom-support rails installed in the rack or cabinet—You must already have two bottom-support rails attached to the lowest possible rack unit on the chassis.

  For more information, see the "Installing the Bottom-Support Rails on the Rack" section on page 4-4.

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

- Cisco Nexus 7010 chassis and its components are accounted for and undamaged.

  For more information, see the "Unpacking and Inspecting a New Switch" section on page 4-3.

Required Tools and Equipment

You need the following tools and equipment to install the Cisco Nexus 7010 chassis:

- Mechanical lift capable of lifting at least 550 pounds (250 kg)

Caution You must use a mechanical lift whenever lifting a device over 120 pounds (55 kg).

- Number 1 Phillips-head screwdriver with torque capability
- Bottom-support rails kit (shipped with the Cisco Nexus 7010 system accessory kit)

  Part of this kit has already been used to install the bottom-support rails. Table 4-2 lists the items in the rack-mount kit.

Table 4-2 Contents for the Rack-Mount Kit

Part Description	Quantity
12-24 x 3/4 in. Phillips screws	20
M6 x 19 mm Phillips screws	20
Adjustable bottom-support rails	2

Note You should also have at least four persons to push the chassis, which can weigh up to 550 pounds (250 kg), onto and off the mechanical lift and rack.

Installing the Chassis

To install a Cisco Nexus 7010 chassis in a four-post rack or cabinet, follow these steps:

Step 1 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

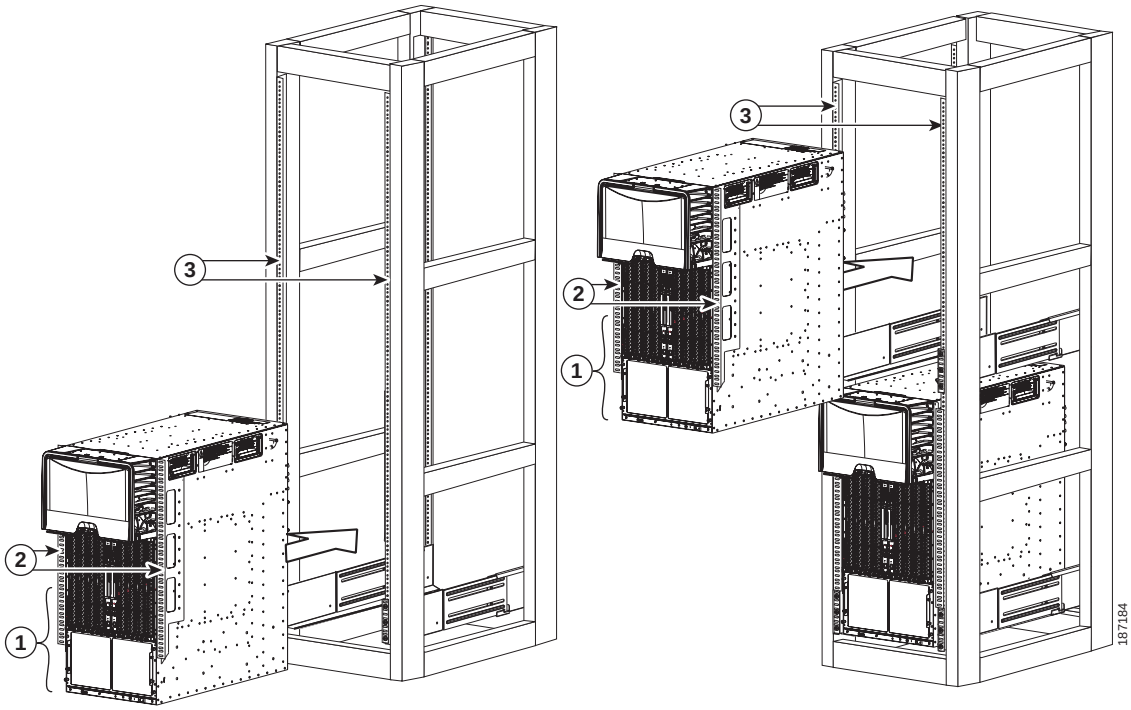
Caution To lift the chassis, use a mechanical lift, not the handles on the side of the chassis (the handles are not rated for lifting over 200 pounds [91 kg]). Use the side handles for only repositioning the chassis after it is already on the mechanical lift or in the rack or cabinet.

Step 2 Use the mechanical lift to move and align the rear of the chassis to the front of the four-post rack or cabinet. Make sure that the bottom of the chassis is elevated to the height of the bottom-support rails or no more than 1/4 inch (0.635 cm) above the bracket.

Step 3 Use at least four persons to push the chassis onto the installed bottom-support rails as shown in Figure 4-3.

Push the lower half of the front side of the chassis so that the back side enters the rack first, and push until the chassis mounting brackets come in contact with the front vertical mounting rails on the rack.

Figure 4-3 Moving a Cisco Nexus 7010 Chassis onto a Rack



1	Push the lower half of the front side of the chassis	**3**	Rack vertical mounting rails
2	Chassis mounting brackets		

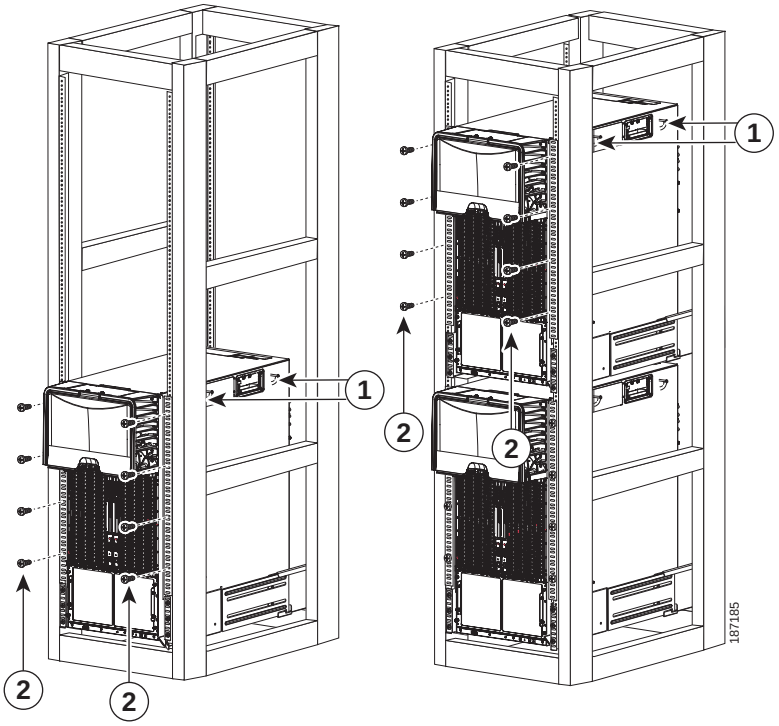
Step 4 Make sure that the screw holes in the chassis mounting brackets align with the screw holes in the vertical mounting rails.

If you need to reposition the chassis to align the screw holes, you can use the handles on the sides of the chassis.

Tip To adjust the placement of the chassis so that the screw holes in the chassis mounting brackets align with the screw holes in the vertical mounting rails, use the chassis handles shown in Figure 4-4.

Step 5 Use a Phillips screwdriver to screw in four M6 x 19-mm or 12-24 x 3/4-inch screws in each of the two chassis mounting brackets (use a total of eight screws for two mounting brackets) as shown in Figure 4-4.

Figure 4-4 Attaching the Cisco Nexus 7010 Chassis to the Rack



1	Handles used to adjust the chassis placement	**2**	Four 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 eight screws)

Grounding the Cisco Nexus 7010 Chassis

The Cisco Nexus 7010 system is grounded through the AC power supply cables and one of two grounding connections on the chassis. The AC power supply cables provide a connection to an earth ground whenever you connect the AC power to the system. 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 power cables are not connected to the system. You establish this ground by connecting one of the two grounding pads on the chassis to the rack (if it is connected to an earth ground) or directly to the earth ground for the data center building.

This section includes the following topics:

- Connecting Your ESD Wrist Strap to the Chassis, page 4-14

Prerequisites for Grounding the Chassis

Before you can ground the chassis, you must have a connection to the earth ground for the data center building. If you installed the Cisco Nexus 7010 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 ports to the rack. Otherwise, you must connect the chassis grounding ports directly to the data center ground.

Required Tools and Equipment

To connect the system 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 Cisco Nexus 7010 system accessory kit.
- Grounding screws—Two M4 x 8 mm (metric) pan-head screws. These screws are shipped with the Cisco Nexus 7010 accessory kit.
- Grounding wire—Not supplied with the Cisco Nexus 7010 system 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 Phillips-head screwdriver with torque capability.
- Crimping tool to crimp the grounding wire to the grounding lug.
- Wire-stripping tool to remove the insulation from the grounding wire.

Connecting the System Ground

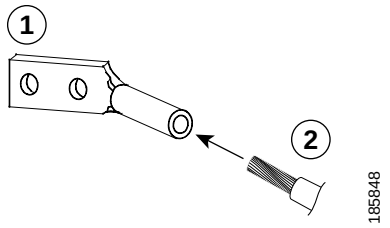
After you have moved the chassis into the rack or cabinet, you are ready to connect the system to the data center earth ground. After you ground the chassis, you can ground your ESD wrist strap by connecting it to the chassis.

To connect the system ground to the data center earth ground, follow these steps:

Step 1 Use a wire-stripping tool to remove approximately 0.75 inch (19 mm) of the covering from the end of the grounding wire.

Step 2 Insert the stripped end of the grounding wire into the open end of the grounding lug as shown in Figure 4-5.

Figure 4-5 Inserting the Grounding Wire in the Grounding Lug

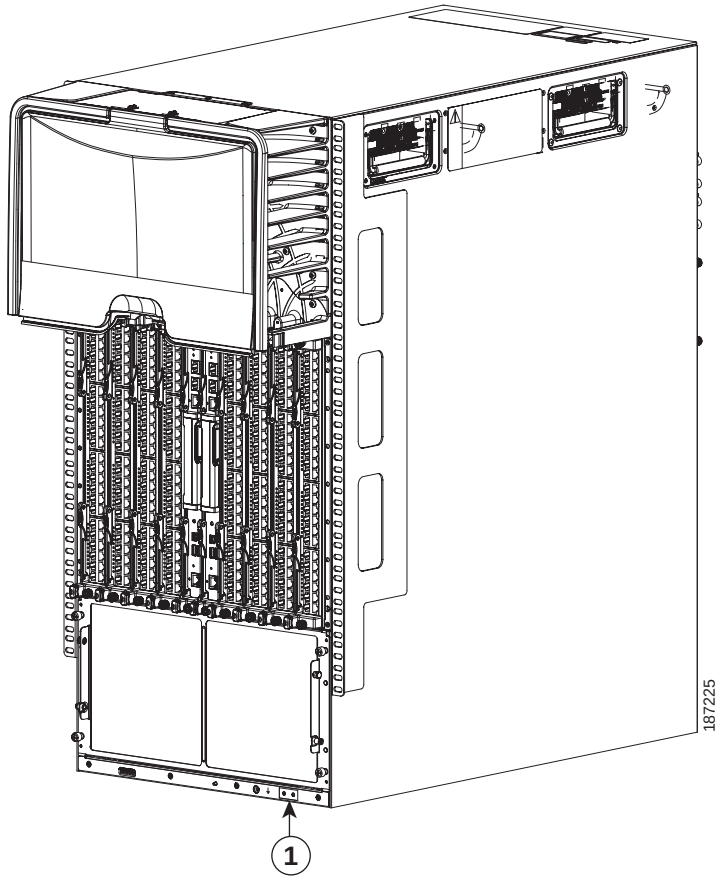


1	NRTL listed 45-degree grounding lug	**2**	Grounding cable with 0.75 in. (19 mm) of insulation stripped from the end

Step 3 Use the crimping tool to crimp the lug to the grounding wire. Verify that the ground wire is securely attached to the ground lug by attempting to pull the wire out of the crimped lug.

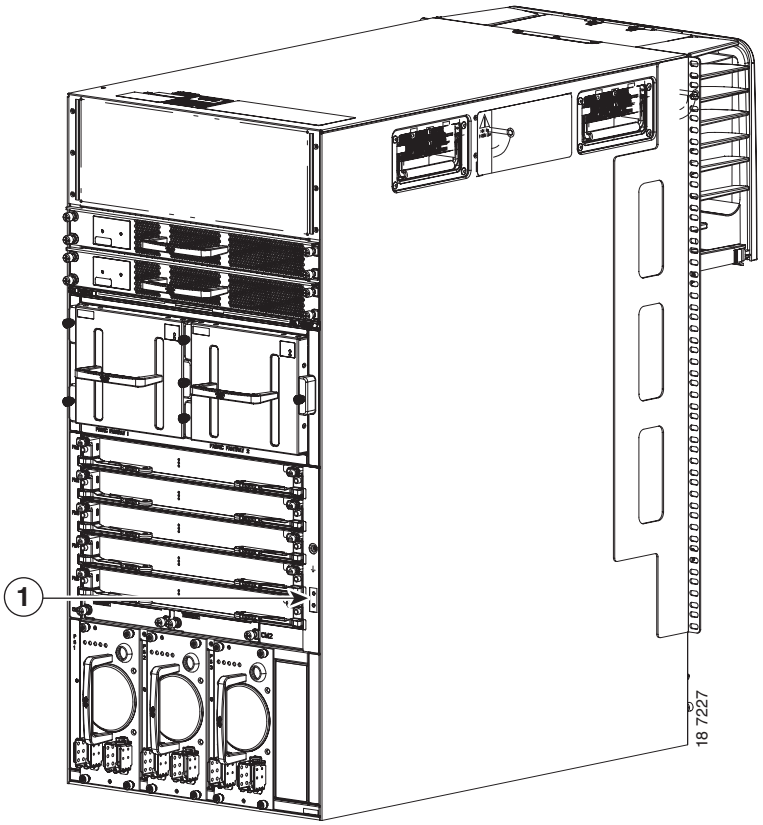
Step 4 Remove the adhesive label from one of the two system grounding pads, and secure the grounding wire lug to the grounding pad with two M4 screws. Figure 4-6 shows the location of the grounding pads on the front side of the chassis. Figure 4-7 shows the location on the rear of the chassis. Ensure that the grounding lug and the grounding wire do not interfere with other switch hardware or rack equipment.

Figure 4-6 Grounding Pad on the Front of the Cisco Nexus 7010 Chassis



1	Grounding pad		

Figure 4-7 Grounding Pad on the Rear of the Cisco Nexus 7010 Chassis



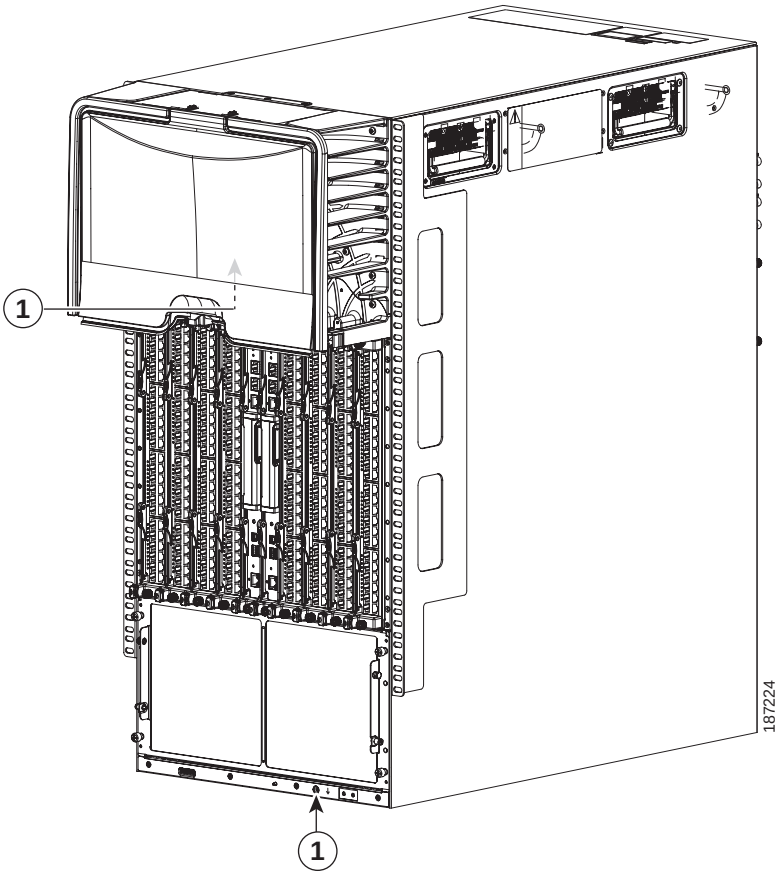
1	Grounding pad		

Step 5 Prepare the other end of the grounding wire and connect it to an appropriate grounding point in your site to ensure an adequate earth ground for the switch. If the rack is grounded, connect the grounding wire as explained in the documentation provided by the vendor for the rack.

Connecting Your ESD Wrist Strap to the Chassis

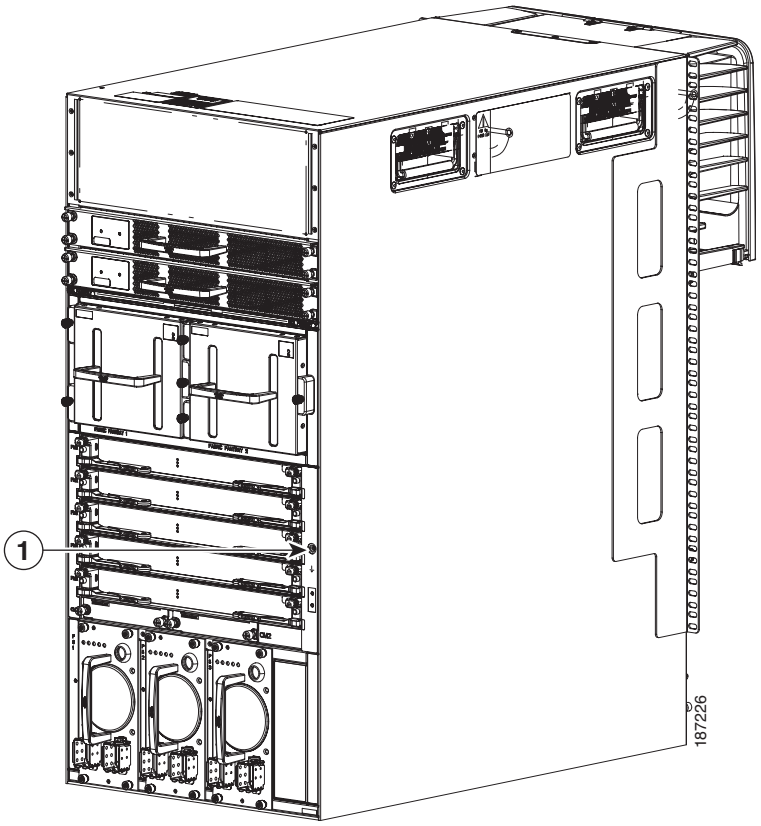
After you connect the chassis to the data center earth ground, you can ground your ESD wrist strap by plugging it into any one of three ESD ports shown in Figure 4-8 (front of the chassis) or Figure 4-9 (rear of the chassis).

Figure 4-8 ESD Grounding Ports on the Front of the Cisco Nexus 7010 Chassis



1	ESD grounding port		

Figure 4-9 ESD Grounding Port on the Rear of the Cisco Nexus 7010 Chassis



1	ESD grounding port		

Installing Storage Media in a Supervisor Module

Each supervisor module on a Cisco Nexus 7000 Series switch is shipped with a CompactFlash card installed in the LOG FLASH reader (Supervisor 1 modules) or a USB drive installed in the LOG FLASH reader (Supervisor 2 and Supervisor 2E modules). The EXPANSION FLASH reader (Supervisor 1) or Slot0 port (Supervisor 2 and 2E) is left empty, but you can optionally install a card in that reader or a USB drive in the USB port. To allow this storage media to function with the reader or port, you must make sure that it is either formatted for the reader before installing it or format it after installing it.

Note The LOG FLASH and EXPANSION FLASH or Slot0 readers require different formats for their storage media.

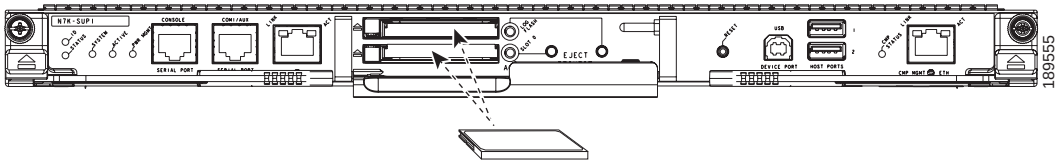
To replace an installed CompactFlash card, see the "Replacing Storage Media for a Supervisor Module" section on page 10-61.

To install storage media in a supervisor module, follow these steps:

Step 1 Align the storage media to its slot or port on the supervisor module as follows:

- For a Supervisor 1 module, align the card with the slot for the CompactFlash reader slot labeled LOG FLASH or EXPANSION FLASH as shown in Figure 4-10. The grooves on the thin side of the card are on the end of the card that goes into the reader first. If the card does not fit easily into the reader, flip the card so that the bottom edge is on top, and try pushing the card into the reader.

Figure 4-10 Aligning a CompactFlash Card to its Reader



- For a Supervisor 2 or 2E module, insert the USB drive in the LOG FLASH or SLOT0 port.

Step 2 Wait for the reader or port LED to turn green and for a message to appear on the console as follows:

- If you are installing a card or USB drive into the log flash reader, the message will end with "logflash:online."
- If you are installing a card or USB drive into the expansion flash reader, the message will end with "slot0:online."
- If you see an "offline" message or do not see a message, either the card or USB drive is not fully inserted or it is improperly formatted.

  Make sure that the card or USB drive is fully inserted inside the reader. If it is fully inserted, either format the card (see the *Cisco Nexus 7000 Series NX-OS Fundamentals Configuration Guide*) or replace the storage media with another that is properly formatted for the reader.

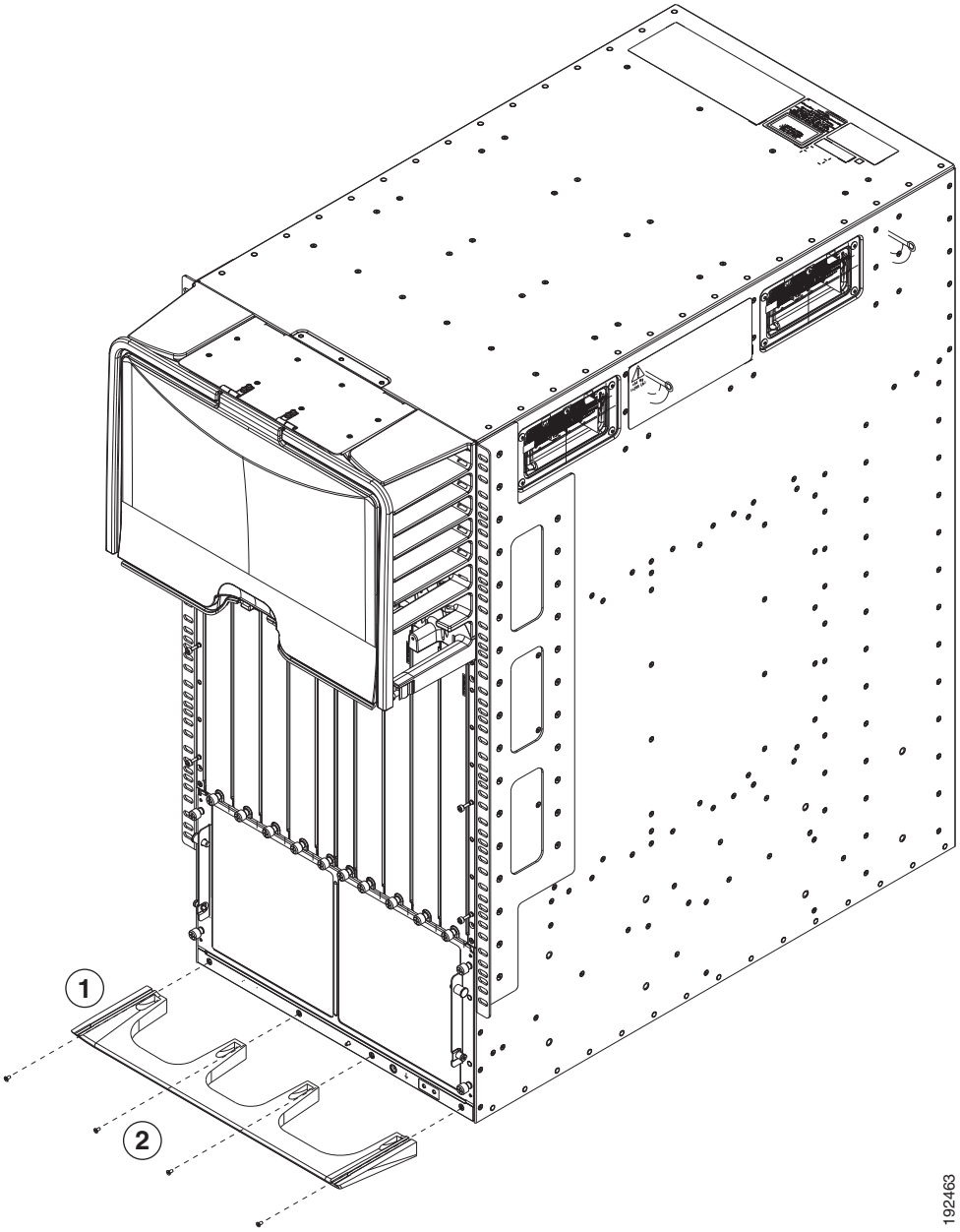
Installing the Front Doors and Frame Assembly

After you have finished moving the chassis to its rack, you can install its optional front doors and frame assemblies.

To install the front doors and frame assemblies, follow these steps:

Step 1 Align the bottom frame assembly so that its four screw holes align to screw holes in the bottom of the chassis, and then screw in four M4 x 6 mm screws to attach the bottom frame to the chassis (see Figure 4-11).

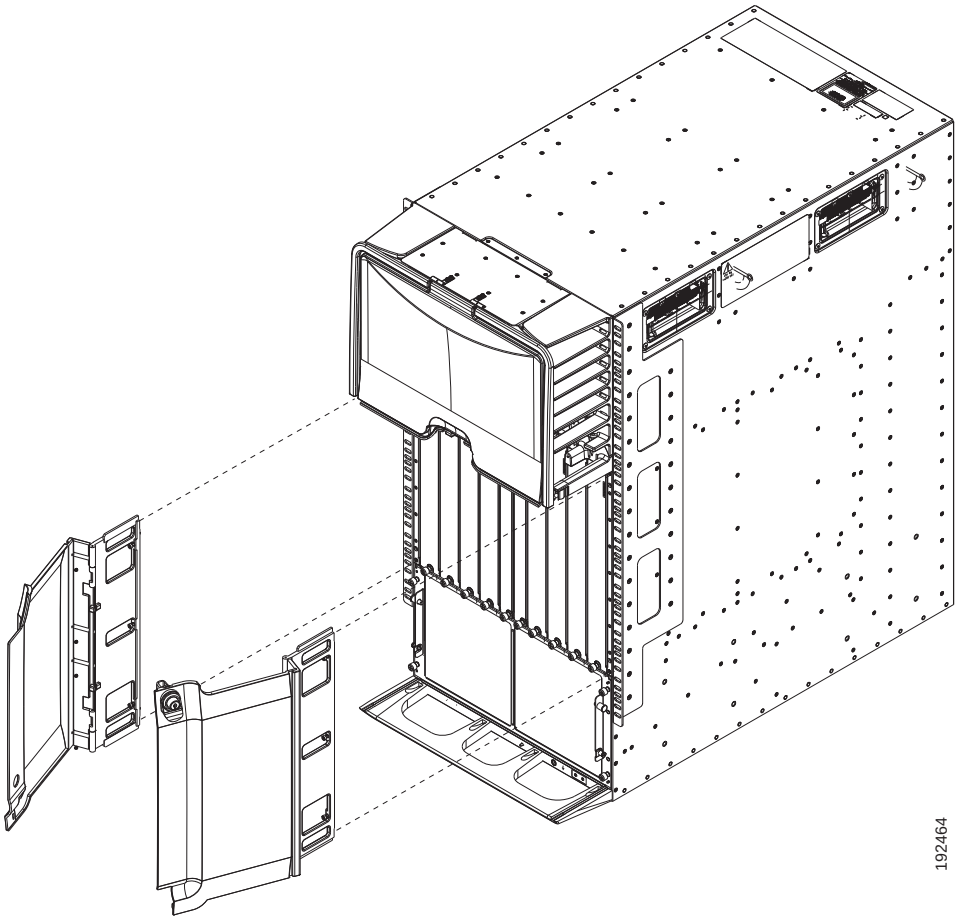
Figure 4-11 Installing the Bottom Frame



1	Bottom frame assembly with screw holes aligned to screw holes in chassis	**2**	Four M4 x 6 mm screws

Step 2 For each of the two front doors, match the two alignment pins on the door frame to the alignment holes on the chassis. Position each door frame immediately under the cable management area (see Figure 4-12).

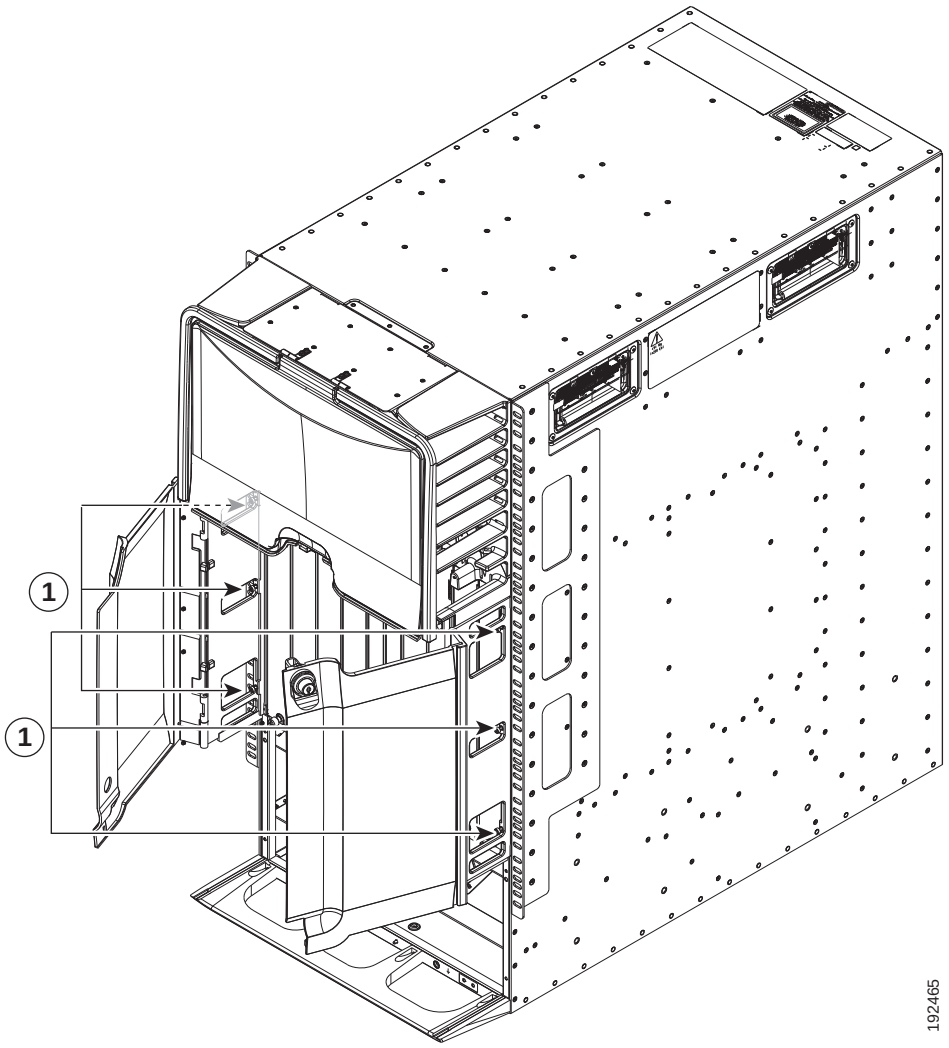
Figure 4-12 Installing the Front Doors



1	Front door frames.	**3**	Place door frame on front edge of chassis and immediately under the cable management area.
2	Cable management area.		

Step 3 Tighten three screws for each door frame (see Figure 4-13).

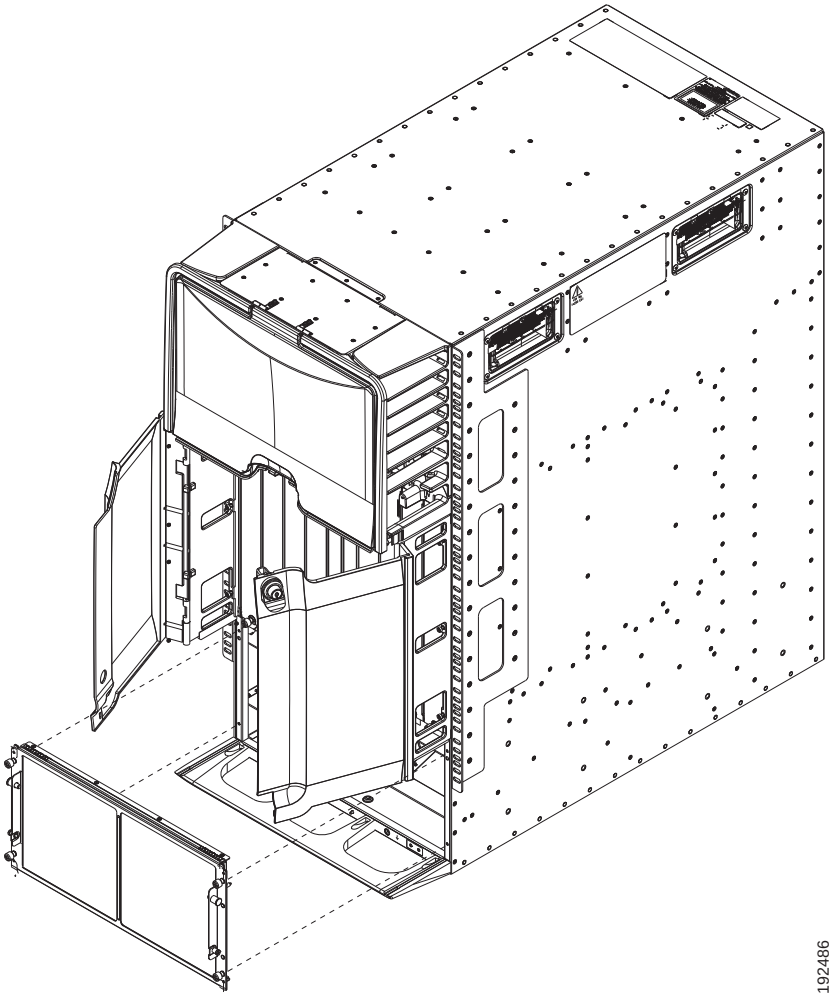
Figure 4-13 Attaching the Door Frames to the Chassis



1	For each of two door frames, tighten three captive screws to secure the frame to the chassis.		

a. Remove the EMI panel by unscrewing its four captive screws until each is free of the chassis (see Figure 4-14).

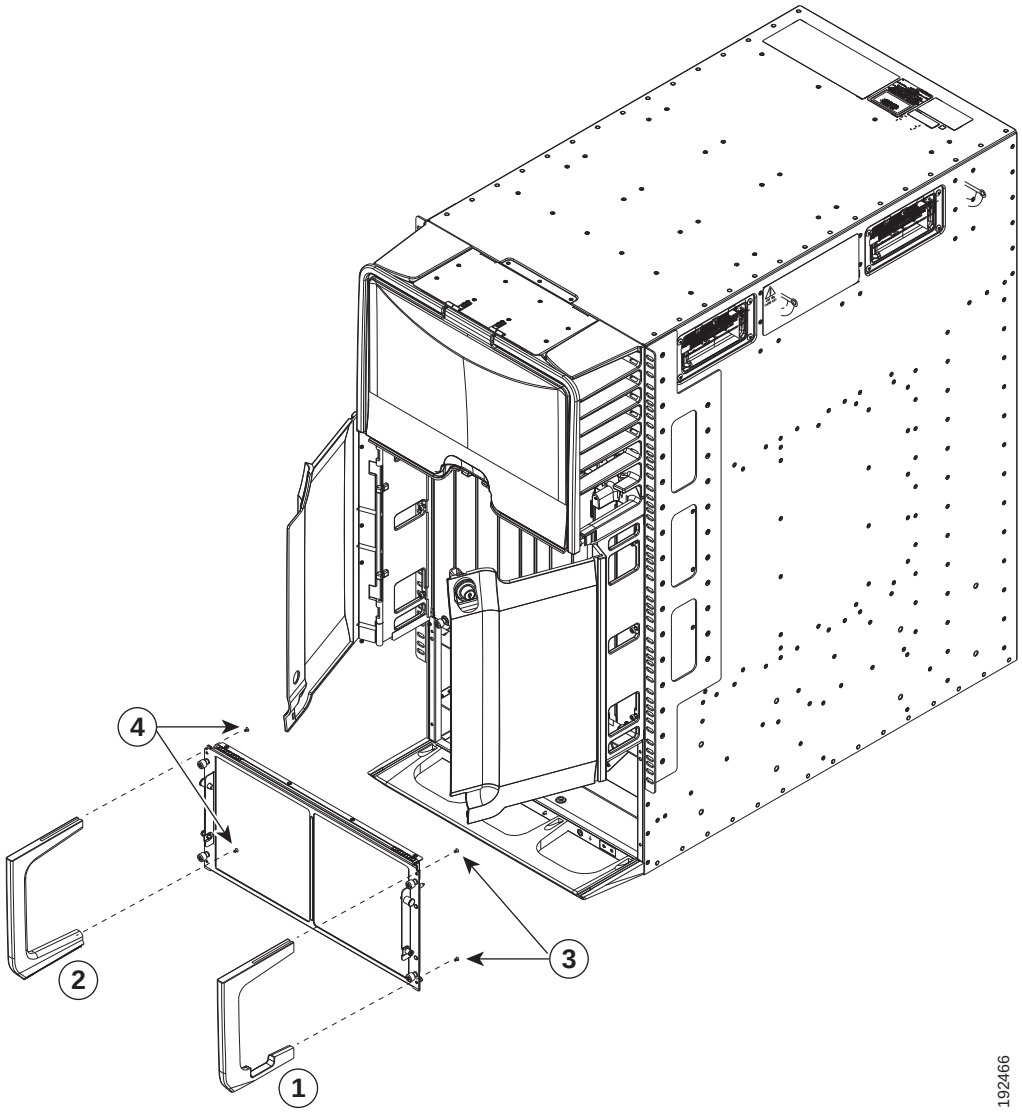
Figure 4-14 Removing the EMI Panel



1	Unscrew four captive screws until they are each clear of the chassis.	**2**	Remove the EMI panel from the chassis.

b. On each side of the EMI panel, align a side frame piece so that its two screw holes align to two screw holes on one side of the EMI panel. Screw in a screw in each of these two screw holes so that the side frame assembly is attached to the EMI panel. Repeat this step for the other side of the EMI panel. See Figure 4-15.

Figure 4-15 Attaching the Side Frame Assemblies to the EMI Panel



1	Right side frame.	**3**	Use two 6-32 x 1/2-inch flat-head screws to attach the right side frame to the right side of the EMI panel. Tighten the screws to 8 in-lb (0.9 N·m).
2	Left side frame.	**4**	Use two 6-32 x 1/2-inch flat-head screws to attach the left side frame to the left side of the EMI panel. Tighten the screws to 8 in-lb (0.9 N·m).

c. Realign the EMI panel to the air intake area on the chassis, screw its four captive screws to the chassis, and tighten the captive screws to 8 in-lb (0.9 N·m).

Installing the Air Filter

You can install the optional air filter while the Cisco Nexus 7000 Series system is operational.

Note Only the Cisco Nexus 7010 switch includes an optional air filter.

To install an air filter, follow these steps:

Step 1 Align the air filter to the EMI panel, which covers the air intake area.

Step 2 Use one hand on the air filter to hold it in place while you use the other hand to pull out the spring pin on one side of the air filter. Adjust the air filter so that the spring pin will be released into its hole in the EMI panel bracket.

Step 3 Switch hands to hold the air filter on the EMI panel and use the free hand to pull out the other spring pin on the other side of the air filter. With the spring pin pulled out, position the air filter so that the pin will be released into its hole on the EMI panel bracket. Release the spring pin and make sure that it holds the air filter on to the EMI panel.

Step 4 Screw in and tighten both captive screws, one on each side of the air filter.

Installing a Cisco Nexus 7018 Chassis

This chapter describes how to install a new or relocated Cisco Nexus 7018 chassis in a rack or cabinet. For information about installing other Cisco Nexus 7000 Series chassis or power supplies, see the following chapters:

- Chapter 2, “Installing a Cisco Nexus 7004 Chassis”
- Chapter 3, “Installing a Cisco Nexus 7009 Chassis”
- Chapter 4, “Installing a Cisco Nexus 7010 Chassis”
- Chapter 6, “Installing Power Supplies”

This chapter includes the following sections:

Preparing to Install the Switch

This section includes the following topics:

Note You must have one four-post, 19-inch EIA rack or cabinet before you can install the Cisco Nexus 7018 chassis. Make sure that you order the rack or cabinet and have it delivered before installing the chassis.

Required Tools

Before you install the Cisco Nexus 7018 chassis into a rack, make sure that you have the following tools and equipment:

- Mechanical lift capable of lifting 700 pounds (318 kg

Note Depending on the number of modules installed in the switch, you can minimize the amount of weight that you need to move. To determine the full weight of the switch switch chassis that you are moving, see Table A-6 on page A-6.

- Number 1 Phillips-head torque screwdriver

Note Although manual torque screwdrivers are recommended, the screwdriver used (whether manual or powered), must be able to be set for the torque settings specified in these instructions.

- Crimping tool
- Wire stripping tool
- Tape measure and level
- Grounding cable

Note These tools and equipment do not ship with the chassis.

Additional tools and equipment, such as an electrostatic discharge (ESD) wrist strap, that you will also need to install the Cisco Nexus 7018 chassis, are included in the Cisco Nexus 7018 accessory kit.

Caution When you handle the Cisco Nexus 7018 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.

Note For a list of tools required to assemble and secure the four-post rack or cabinet, see the documentation that the manufacturer shipped with the rack or cabinet.

Installing a Four-Post Rack or Cabinet

Before you install the switch, you must install a standard four-post, 19-inch EIA data center rack (or in a cabinet that contains such a rack) that meets the requirements listed in the *Cisco Nexus 7000 Series Site Preparation Guide*. To maximize safety, you should do the following for the rack:

- Bolt the rack to the concrete subfloor before moving the Cisco Nexus 7018 chassis onto it.

Warning **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

- If the rack has bonded construction, connect it to the earth ground to enable you to easily ground the system components that you install and to ground your ESD wrist strap. This step minimizes the chance of electrostatic discharge when you handle ungrounded components before you install them.

Be sure that the rack includes AC power receptacles with the amperage required for the power supply units that you will be installing in the chassis. If you are installing 6-kW power supply units, you must have 20-A circuits. If you are installing 7.5-kW power supply units, you must have 30-A circuits.

Warning **Take care when connecting units to the supply circuit so that wiring is not overloaded.** Statement 1018

For instructions on setting up the rack, see the documentation that the manufacturer shipped with the rack.

Unpacking and Inspecting a New Chassis

Before you install a new Cisco Nexus 7018 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.

Tip Do not discard the shipping container when you unpack the Cisco Nexus 7018 system. 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. For repacking instructions, see Appendix E, "Repacking the Cisco Nexus 7000 Series Switch for Shipment."

To inspect the shipment, follow these steps:

Step 1 Compare the shipment to the equipment list 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:
  - 2 supervisor modules
  - 1 to 16 I/O modules
  - 3 to 5 fabric modules
  - 2 fan trays
- 2 to 4 power supply units

  The power supply units are shipped with the chassis but are boxed separately.
- Cisco Nexus 7018 system accessory kit

  To see a list of what is in the accessory kit, see the *Cisco Nexus 7018 System Accessory Kit Contents* document, which is included in the kit.
- Front door (optional)

Step 2 Check the contents of each box or package for damage.

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

- 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 on the Rack

The bottom-support rails hold the Cisco Nexus 7018 chassis on the rack or cabinet. To maximize the stability of the rack, you must attach these rails at the lowest possible rack unit (RU).

The prerequisites, tools, and process for installing the bottom-support rails are included in the following topics:

- Prerequisites for Attaching the Bottom-Support Rails, page 5-4
- Required Tools and Equipment, page 5-4
- Attaching the Bottom-Support Rails, page 5-4

Prerequisites for Attaching the Bottom-Support Rails

Before you can attach the bottom-support rails, you must fully install the rack or cabinet, and should, for maximum stability, bolt the rack or cabinet to the concrete subfloor. If anything lighter than the Cisco Nexus 7018 system is already installed in the rack, you should make sure that it is positioned above where you will be installing the Cisco Nexus 7000 Series system. Also, you must have the bottom-support rail kit, which ships with the Cisco Nexus 7000 Series accessory kit. The distance between the front and rear mounting brackets on the rack or cabinet must be between 24 and 32 inches (61.0 and 81.3 cm).

Required Tools and Equipment

You need the following tools and equipment to attach the bottom-support rails:

- Number 1 Phillips-head screwdriver with torque capability.
- Rack-mount kit (shipped with the accessory kit). Table 5-1 lists the items in the rack-mount kit.

Table 5-1 Contents for the Rack-Mount Kit

Part Description	Quantity
12-24 x 3/4 in. Phillips screws	34
M6 x 19 mm Phillips screws	34
Adjustable bottom-support rails	2

Attaching the Bottom-Support Rails

To maximize the stability of the rack, you should install the chassis as low as possible on the rack. Install the first system at the bottom of the rack. If you install a second system in the same rack, install it immediately above the lower system if there is enough vertical space. If you are planning to install another system in the rack, make sure that the heaviest system is installed first at the bottom of the 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:**

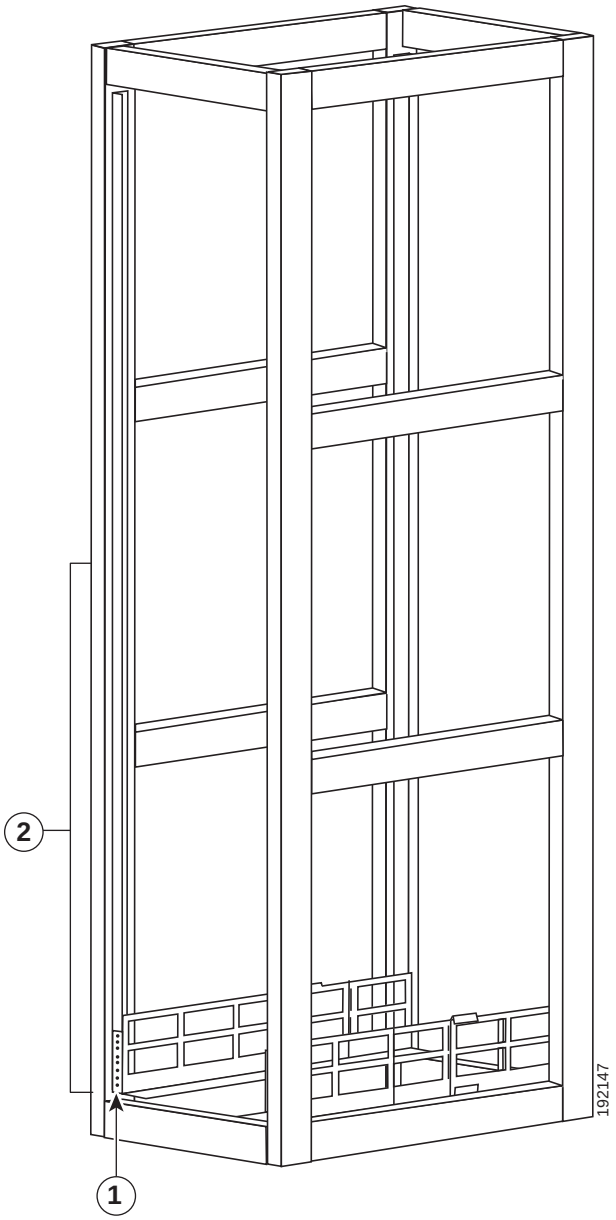
- **This unit should be mounted at the bottom of the rack if it is the only unit in the rack.**
- **When mounting this unit in a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack.**
- **If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the unit in the rack.** Statement 1006

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

Step 1 Position one of the two adjustable bottom-support rails at the lowest possible RU as shown in Figure 5-1. 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).

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.

Figure 5-1 Positioning the Bottom-Support Rails

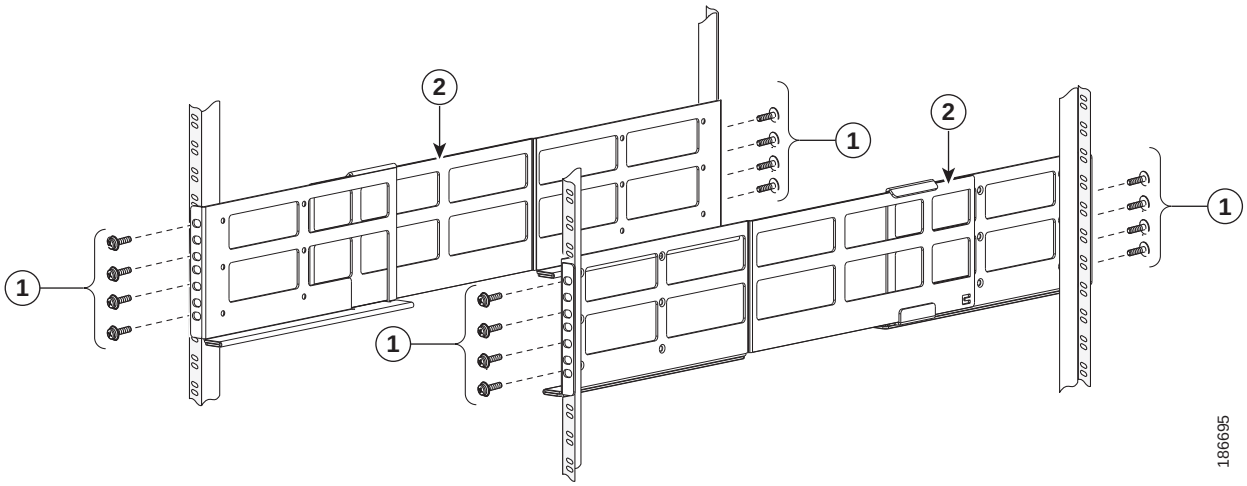


1	For the first and heaviest chassis installed in a rack, position two bottom-support rails at the lowest RU on the rack.	**2**	Allow at least 43.75 inches (111.1 cm) (25 RU) for each Cisco Nexus 7018 system.

Step 2 Use a Phillips torque screwdriver to screw in at least three (four if possible) M6 x 19 mm or 12-24 x 3/4 inch Phillips screws on each end of each rail (using a total of 16 screws for both brackets) as shown in Figure 5-2. Tighten each screw to a maximum of 40 in-lb [4.5 N·m]) of torque.

Note At least three of the screw holes on each end of the bottom-support rail align to the mounting rail. Use at least three screws (four if possible) on each end of each bottom support rail.

Figure 5-2 Attaching a Bottom-Support Rail to a Rack



1	Four sets of four M6 x 19 mm Phillips screws or four sets of four 12-24 x 3/4 in. Phillips screws (tightened to a maximum of 40 in-lb [4.5 N·m])	**2**	Adjustable bottom-support rails (2)

Installing the Chassis

This section describes how to install the chassis (transporting and elevating the chassis to the rack using a mechanical lift, pushing it onto the rack, and then securing it to the rack).

This section includes the following topics:

Prerequisites for Installing the Chassis

Before you install the chassis, you must make sure that the following items are available for the installation:

- Data center ground is accessible where you are installing the Cisco Nexus 7018 chassis.
- Four-post, 19-inch EIA rack or cabinet that includes such a rack.

For more information on the rack or cabinet, see the "Installing a Four-Post Rack or Cabinet" section on page 5-2.

Warning **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

- Bottom-support rails installed in the rack or cabinet—You must already have two bottom-support rails attached to the lowest possible rack unit on the chassis.

  For more information, see the "Installing the Bottom-Support Rails on the Rack" section on page 5-4.

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

- Cisco Nexus 7018 chassis and its components are accounted for and undamaged.

  For more information, see the "Unpacking and Inspecting a New Chassis" section on page 5-3.

Required Tools and Equipment

You need the following tools and equipment to install the Cisco Nexus 7000 Series chassis:

- Mechanical lift capable of lifting 700 pounds (318 kg)

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

Note Depending on the number of modules installed in the switch, you can minimize the amount of weight that you need to move. You can also remove the fan trays before moving the chassis. To determine the full weight of the switch switch chassis that you are moving, see Table A-6 on page A-6.

- Number 1 Phillips-head torque screwdriver

Note Although manual torque screwdrivers are recommended, the screwdriver used (whether manual or powered), must be able to be set for the torque settings specified in these instructions.

Caution Do not use magnetic heads on the screwdriver.

- Bottom-support rails kit (shipped with the Cisco Nexus 7018 accessory kit)

  Part of this kit has already been used to install the bottom-support rails. Table 5-2 lists the items in the rack-mount kit.

Table 5-2 Contents for the Rack-Mount Kit

Part Description	Quantity
12-24 x 3/4 in. Phillips screws	34
M6 x 19 mm Phillips screws	34
Adjustable bottom-support rails	2

Note You should also have at least two persons to push the chassis, which can weigh up to 700 pounds (318 kg) or, if you remove all fan trays and power supplies, it can weigh up to 500 pounds (227 kg), onto and off the mechanical lift and rack. We also recommend that you use a third person for guiding the chassis as it is being pushed.

Installing the Chassis

To install a Cisco Nexus 7018 chassis in a four-post rack or cabinet, follow these steps:

Step 1 To lighten the chassis, we recommend that you remove the fan trays from the chassis. The electronics on these modules are well sealed from damage but you must still be careful not to damage their connectors. To remove a fan tray, follow these steps:

a. Unscrew the four captive screws on the front of the fan tray until they are no longer in contact with the chassis.

b. Grab the fan tray handle and pull the fan tray part way out of the chassis.

c. Place your other hand under the chassis to support its weight and pull the fan tray fully out of the chassis.

d. Place the fan tray on an antistatic surface where nothing touches its connectors on the back of the module.

e. If there are power supplies in the chassis, remove the power supplies to minimize the weight of the chassis. The chassis does not ship with power supplies installed, but if you are moving a previously installed chassis, be sure that the power supplies are removed (for instructions on removing power supplies, see the "Removing a 6-kW or 7.5-kW AC Power Supply Unit During Operations" section on page 10-4).

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 [0.6 cm] below the bottom of the chassis).

c. Use at least two 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. Push only the lower half of the frame of the chassis (never push on the modules installed in the chassis and do not use their handles to guide the chassis).

Tip Use a third person to guide the chassis and to make sure that it does not collide with anything or tip over.

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.

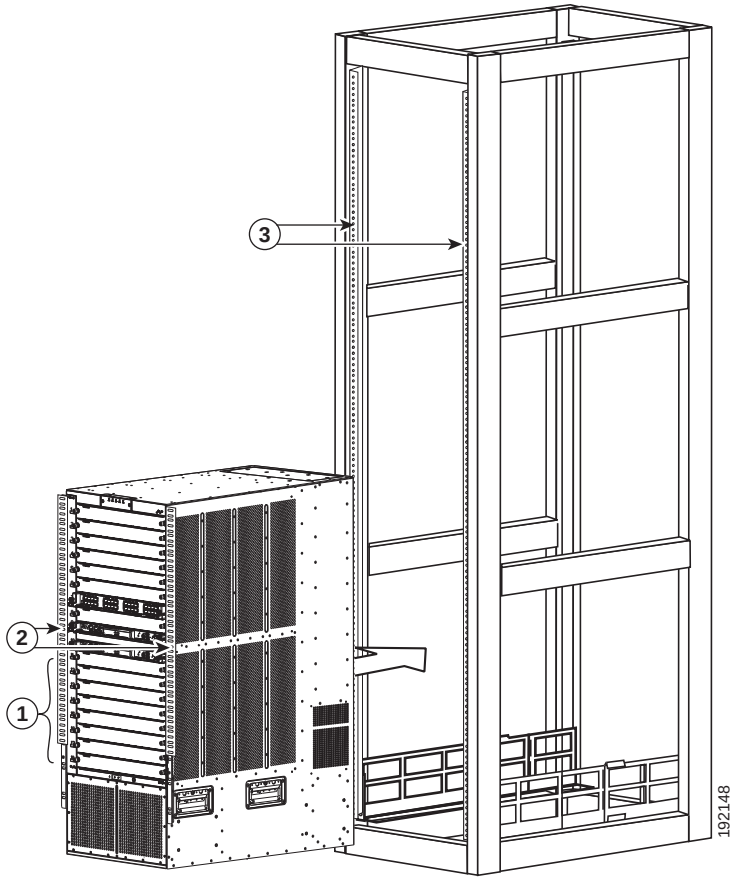
Step 3 Use the mechanical lift to move and align the rear of the chassis to the front of the four-post rack or cabinet. Make sure that the bottom of the chassis is elevated to the height of the bottom-support rails or no more than 1/4 inch (0.6 cm) above the bracket.

Step 4 Use at least two persons to push the chassis half way onto the installed bottom-support rails as shown in Figure 5-3 and a third person to guide the back of the chassis so that it does not get caught on anything as it is pushed into the rack.

Note Push evenly on both sides of the lower half of the front side of the chassis so that the back side enters the rack first. and push until the chassis is half way onto the rack.

Tip Use the third person to be sure that the back end of the chassis does not get caught on the expansion edge of the bottom support rails.

Figure 5-3 Moving a Cisco Nexus 7018 Chassis onto a Rack



1	Push the sides of the lower half of the front side of the chassis.	**3**	Rack vertical mounting rails.
2	Chassis mounting brackets.		

Step 5 Lower the lift until it is no more than 0.25 inches below the bottom support rails. This action ensures that the chassis is not pointing downwards in a way that might get it caught on the expansion edge of the bottom support rails.

Step 6 With the chassis flat on the bottom support rails, use two persons to push evenly on each side of the chassis until it is fully loaded onto the rack (the two mounting brackets on the front of the chassis come into contact with the two vertical mounting rails on the front of the rack). Use a third person to guide the chassis so that the rear of the chassis (the side being pushed into the rack) does not get caught on any edges of the bottom support rails.

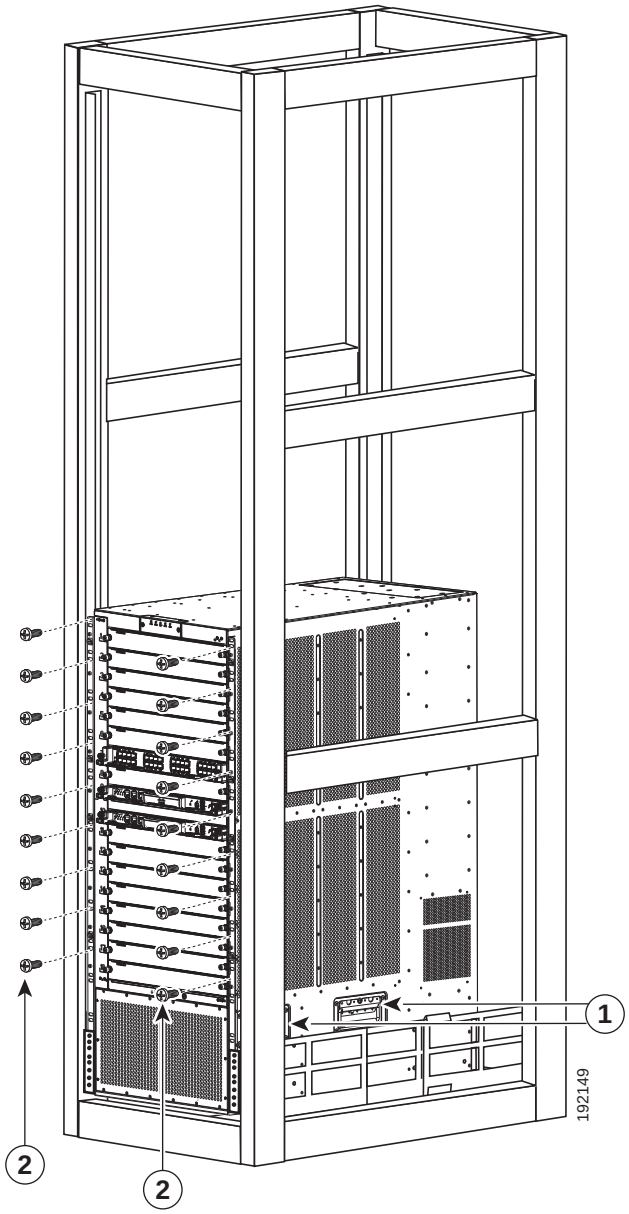
Step 7 Make sure that the screw holes in the chassis mounting brackets align with the screw holes in the vertical mounting rails.

If you need to reposition the chassis to align the screw holes, you can use the handles on the sides of the chassis.

Tip To adjust the placement of the chassis so that the screw holes in the chassis mounting brackets align with the screw holes in the vertical mounting rails, use the chassis handles shown in Figure 5-4.

Step 8 Use a Phillips torque 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) as shown in Figure 5-4. Tighten each screw to a maximum of 40 in-lb [4.5 N·m] of torque.

Figure 5-4 Attaching the Cisco Nexus 7018 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)

Grounding the Cisco Nexus 7018 Chassis

The Cisco Nexus 7018 system is grounded through the AC power supply cables and one of two grounding connections on the chassis. The AC power supply cables provide a connection to an earth ground whenever you connect the AC power to the system. 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 power cables are not connected to the system. You establish this ground by connecting one of the two grounding pads on the chassis to the rack (if it is connected to an earth ground) or directly to the earth ground for the data center building.

This section includes the following topics:

Prerequisites for Grounding the Chassis

Before you can ground the chassis, you must have a connection to the earth ground for the data center building. If you installed the Cisco Nexus 7018 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 ground ports to the rack. Otherwise, you must connect the chassis grounding ports directly to the data center ground.

Required Tools and Equipment

To connect the system 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 Cisco Nexus 7018 system accessory kit.
- Grounding screws—Two M4 x 8 mm (metric) pan-head screws. These screws are shipped with the Cisco Nexus 7018 system accessory kit.
- Grounding wire—Not supplied with the Cisco Nexus 7018 system 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 Phillips-head screwdriver with torque capability.
- Crimping tool to crimp the grounding wire to the grounding lug.
- Wire-stripping tool to remove the insulation from the grounding wire.

Connecting the System Ground

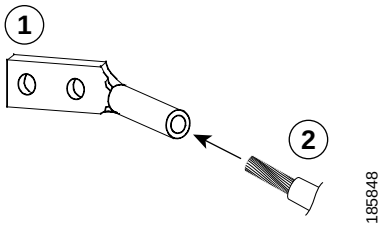
After you have moved the chassis into the rack or cabinet, you are ready to connect the system to the earth ground. After you ground the chassis, you can ground your ESD wrist strap by connecting it to the chassis.

To connect the system ground to the earth ground, follow these steps:

Step 1 Use a wire-stripping tool to remove approximately 0.75 inch (19 mm) of the covering from the end of the grounding wire.

Step 2 Insert the stripped end of the grounding wire into the open end of the grounding lug as shown in Figure 5-5.

Figure 5-5 Inserting the Grounding Wire in the Grounding Lug

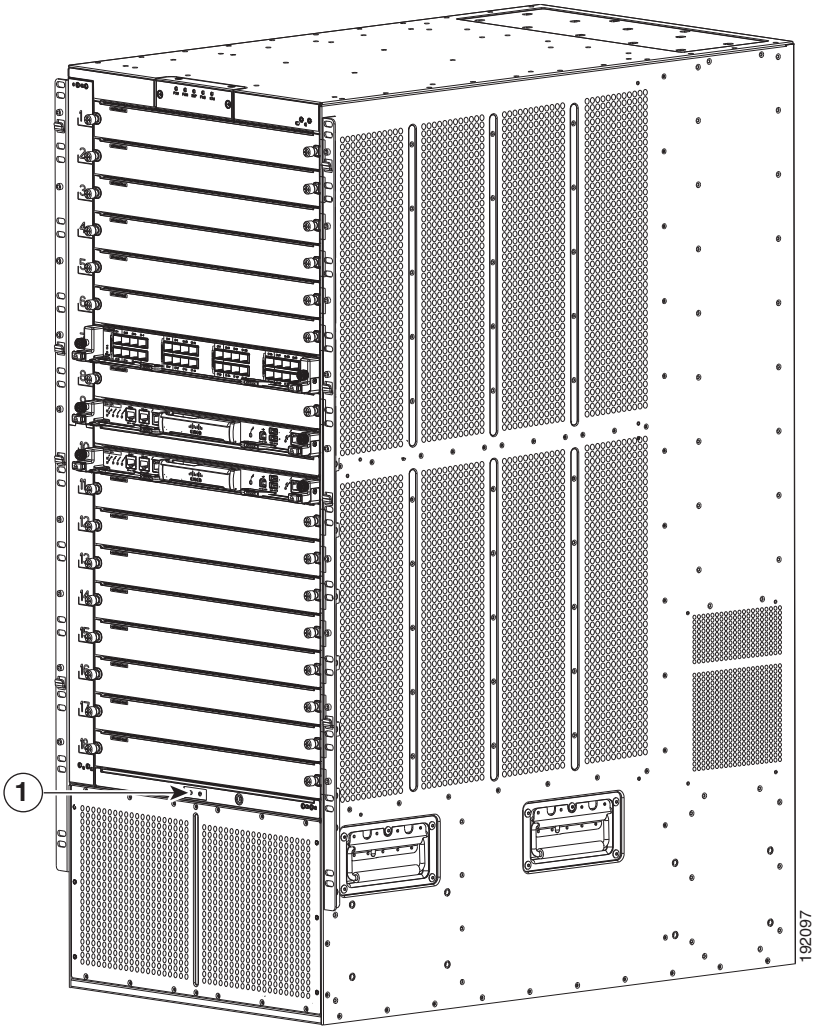


1	NRTL listed 45-degree grounding lug	**2**	Grounding cable with 0.75 in. (19 mm) of insulation stripped from the end

Step 3 Use the crimping tool to crimp the lug to the grounding wire. Verify that the ground wire is securely attached to the ground lug by attempting to pull the wire out of the crimped lug.

Step 4 Remove the adhesive label from one of the two system grounding pads, and secure the grounding wire lug to the grounding pad with two M4 screws. Figure 5-6 shows the location of the grounding pad on the front side of the chassis. Ensure that the grounding lug and the grounding wire do not interfere with other switch hardware or rack equipment.

Figure 5-6 Grounding Pad on the Cisco Nexus 7018 Chassis



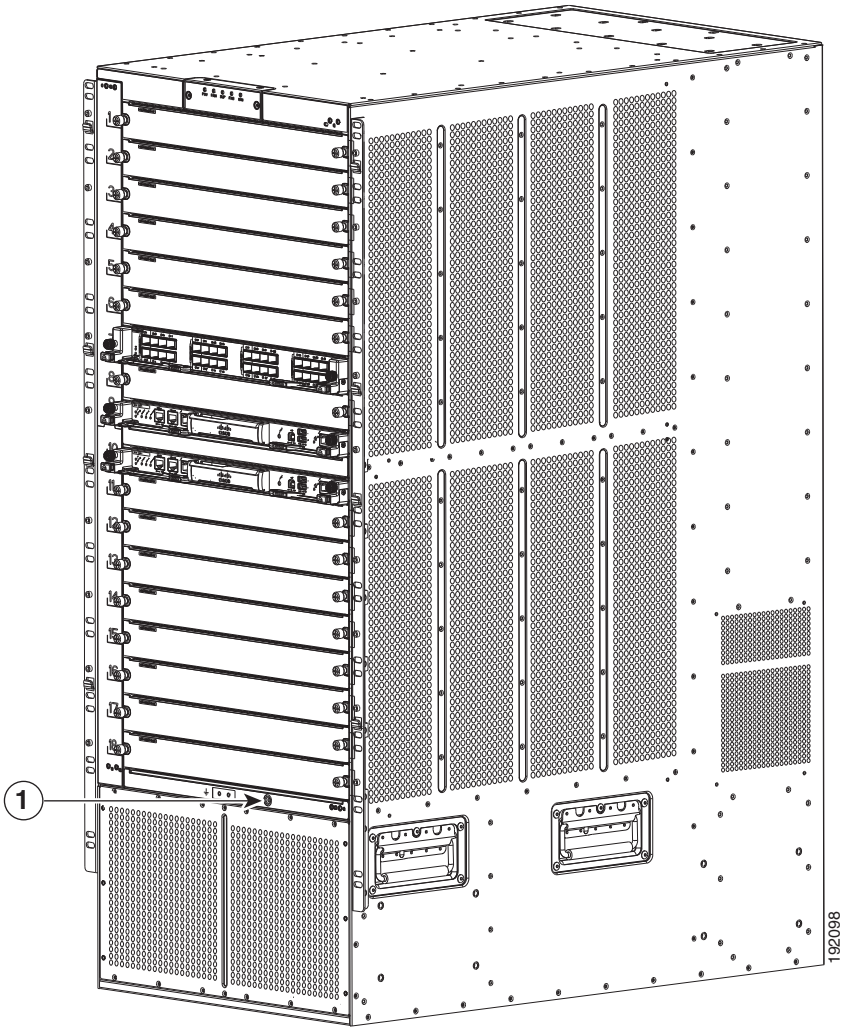
1	Grounding port		

Step 5 Prepare the other end of the grounding wire and connect it to an appropriate grounding point in your site to ensure an adequate earth ground for the switch. If the rack is grounded, connect the grounding wire as explained in the documentation provided by the vendor for the rack.

Connecting Your ESD Wrist Strap to the Chassis

After you connect the chassis to the earth ground, you can ground your ESD wrist strap by plugging it into the ESD port shown in Figure 5-7.

Figure 5-7 ESD Grounding Ports on the Front of the Cisco Nexus 7018 Chassis



1	ESD grounding port		

Installing the Cable Management Frame

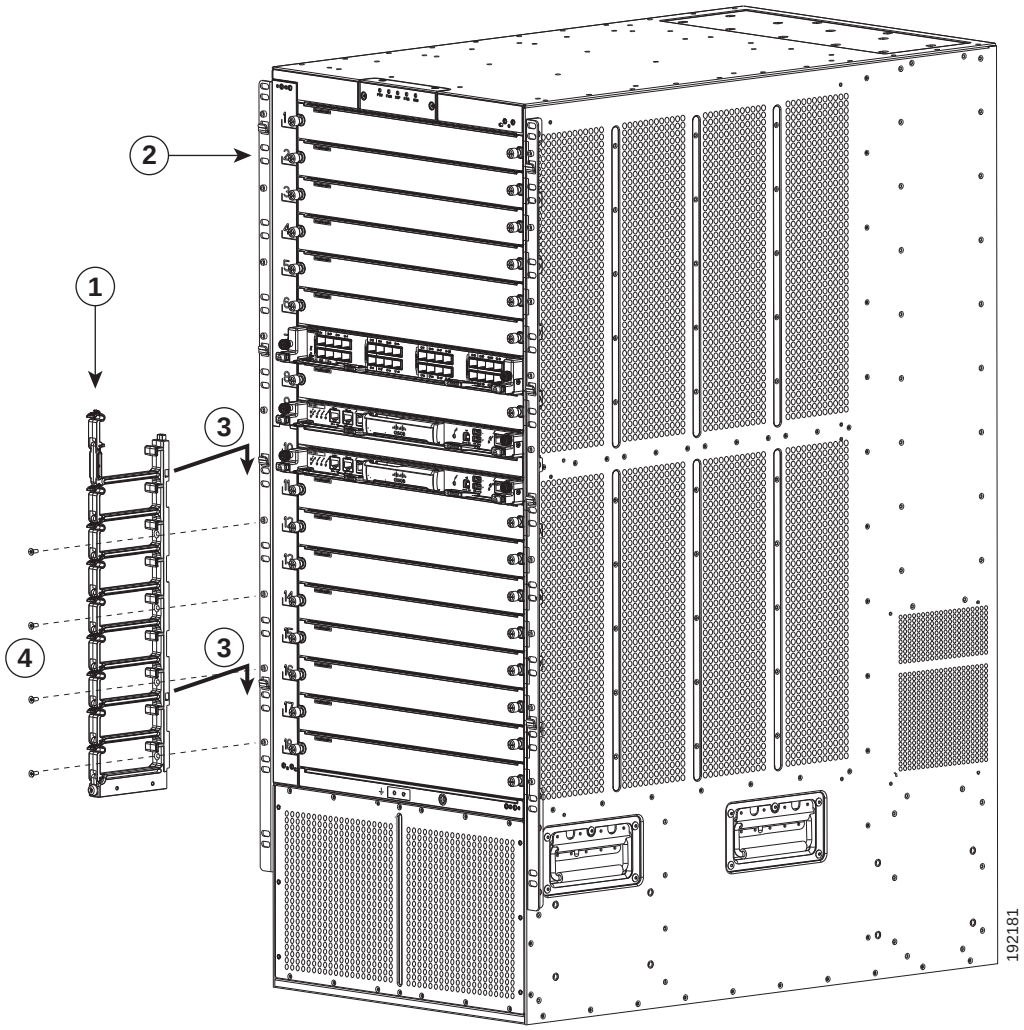
After you have fully installed the Cisco Nexus 7018 switch chassis in the rack or cabinet (see the "Installing the Chassis" section on page 5-7), you can install the cable management frame on the front of the chassis.

When you install the cable management frame, you attach four cable management assemblies to the chassis and then attach a top hood to the top two cable management assemblies and the chassis.

To install the cable management assemblies on the Cisco Nexus 7018 switch chassis, follow these steps:

Step 1 Attach a lower cable management assembly (800-31343-01) onto the two hooks that protrude from the lower half of the left rack-mount bracket that is attached to the Cisco Nexus 7018 switch chassis, and loosely fasten the assembly to the chassis with four flat-head M4x10 screws as shown in Figure 5-8.

Figure 5-8 Attaching a Lower Cable Management Assembly to a Rack-Mount Bracket

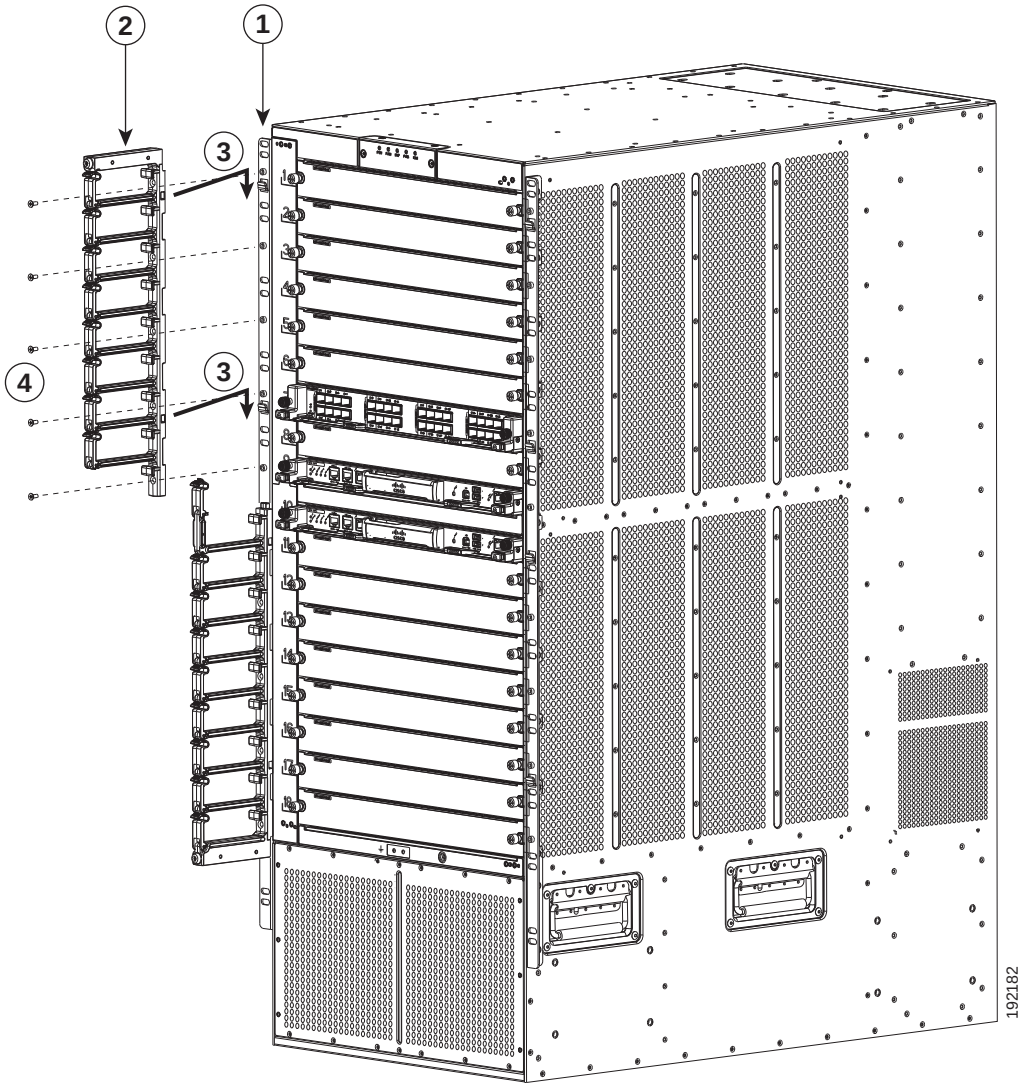


1	Lower cable management assembly.	**3**	Position the assembly so that the two lower hooks on the rack-mount bracket fit inside the two holes on the assembly, and then slide the assembly down so that it is held by the hooks.
2	Rack-mount bracket.	**4**	Loosely fasten the assembly to the rack-mount bracket with four M4x10 screws. Do not tighten these screws.

Step 2 Repeat Step 1 to attach a lower cable management assembly to the right side of the chassis.

Step 3 Attach an upper cable management assembly (800-31342-01) onto the two hooks that protrude from the upper half of the left rack-mount bracket that is attached to the Cisco Nexus 7018 switch chassis, and loosely fasten the assembly to the chassis with four flat-head M4x10 screws as shown in Figure 5-9.

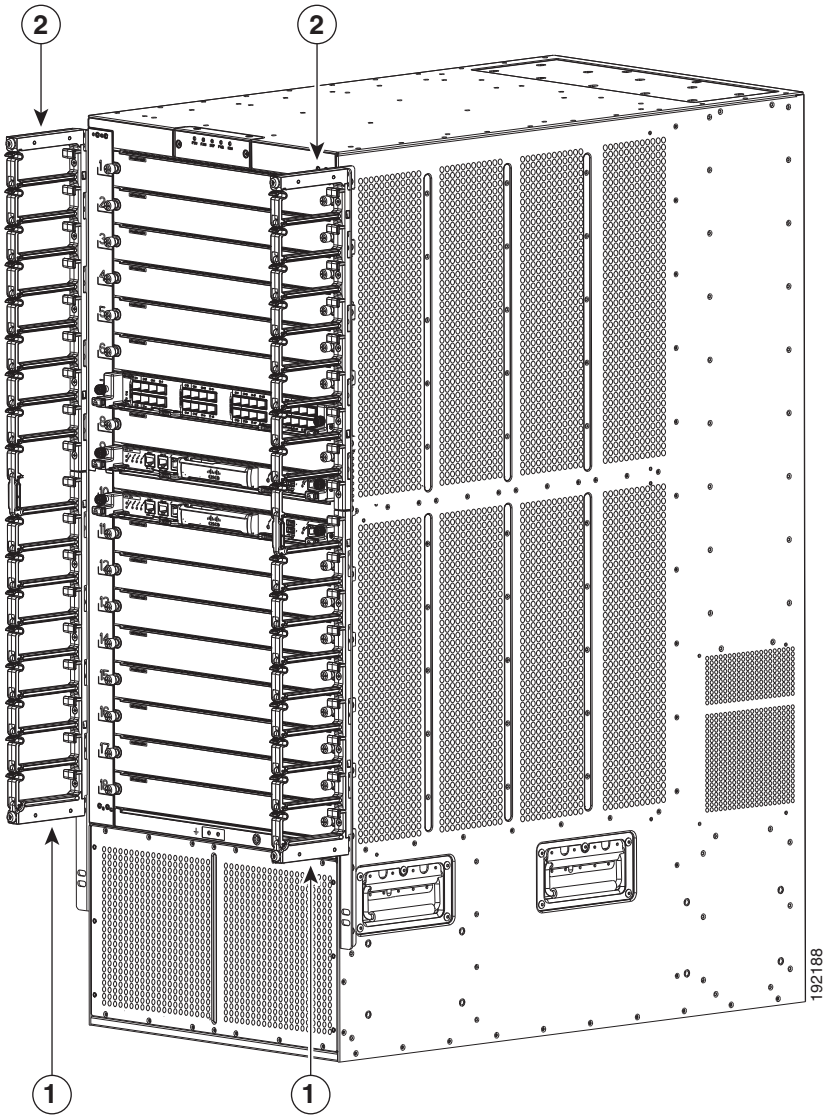
Figure 5-9 Attaching a Left Cable Management Assembly to a Rack-Mount Bracket



1	Rack-mount bracket.	**3**	Position the assembly so that the two upper hooks on the rack-mount bracket fit inside the two holes on the assembly, and then slide the assembly down so that it is held by the hooks.
2	Upper cable management assembly.	**4**	Loosely fasten the assembly to the rack-mount bracket with four M4x10 screws. Do not tighten these screws.

Step 4 Repeat Step 3 to attach an upper cable management assembly to the upper right side of the chassis. When completed, the chassis will appear as shown in Figure 5-10.

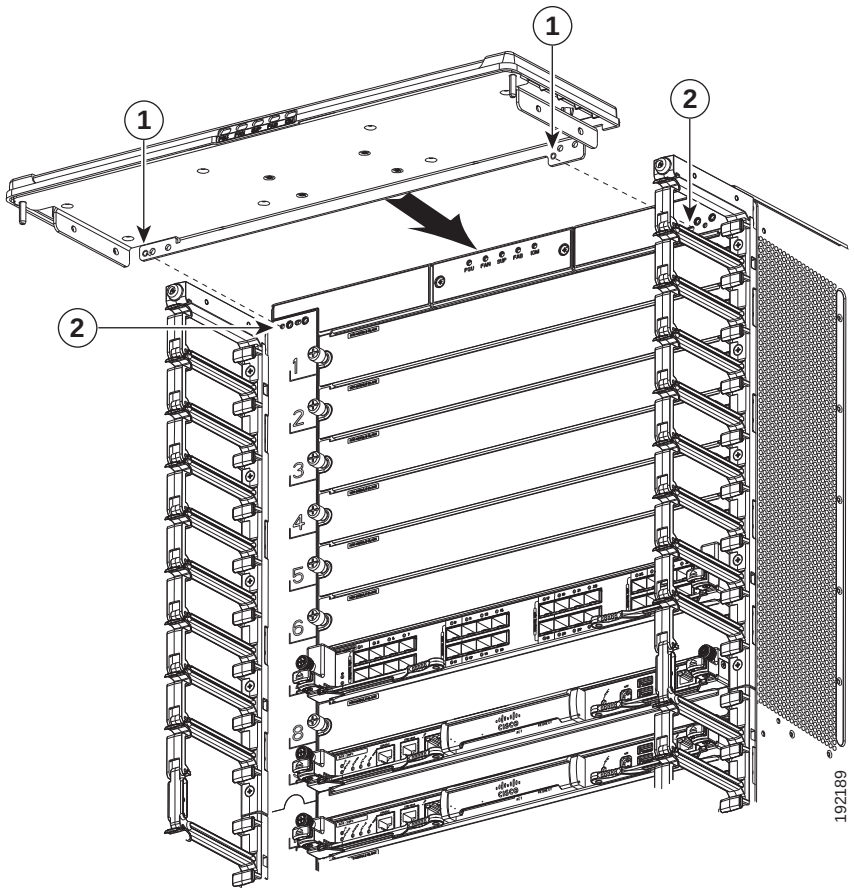
Figure 5-10 Cable Management Assemblies Attached to the Rack-Mount Brackets



1	Lower cable management assembly	**2**	Upper cable management assembly

Step 5 Place the top hood (800-31269-01) on top of the two upper cable management assemblies that are already installed. Make sure that the side of the top hood that is closest to the chassis has two alignment pins that align with the alignment holes in the chassis as shown in Figure 5-11. Push the top hood toward the chassis so that its alignment pins enter the alignment holes and the top hood rests against the chassis.

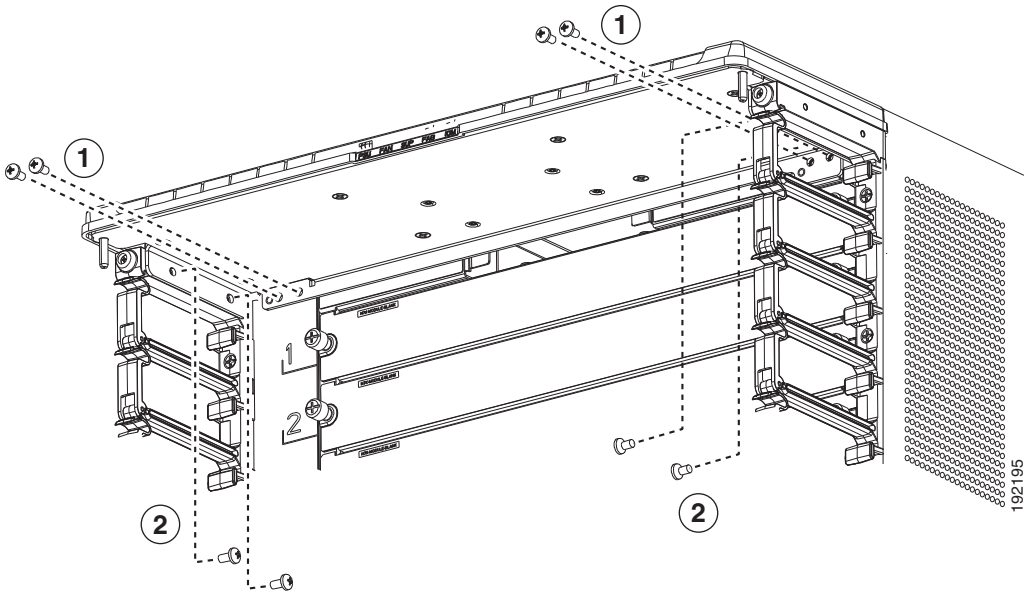
Figure 5-11 Positioning the Top Hood with the Upper Cable Management Assemblies and the Switch Chassis



1	Alignment pins	**2**	Alignment holes

Step 6 Use four M4x8 pan-head screws to loosely fasten the top hood to the chassis as shown in Figure 5-12.

Figure 5-12 Fastening the Top Hood to the Chassis and Cable Management Assemblies



1	Four M4x8 pan-head screws that fasten the top hood to the chassis.	**2**	Four M4x8 pan-head screws that fasten the top hood to the left and right cable management assemblies.

Step 7 Use four M4x8 pan-head screws to loosely fasten the top hood to each of the two upper cable management assemblies as shown in Figure 5-11.

Step 8 Tighten each of the four screws that fasten the top hood to the chassis to 11 to 15 in-lb (1.2 to 1.7 N·m).

Step 9 Tighten each of the four screws that fasten the top hood to the cable management assemblies to 11 to 15 in-lb (1.2 to 1.7 N·m).

Step 10 Tighten each of the 18 screws that fasten the upper and lower cable management assemblies to the rack-mount brackets to 11 to 15 in-lb (1.2 to 1.7 N·m).

Installing the Front Door and Air Intake Frame

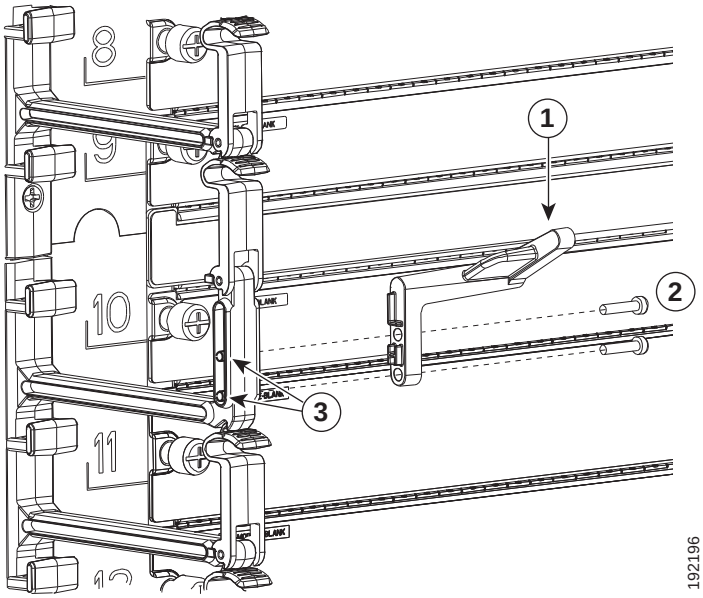
If you need to install the optional double-hinged door and air intake frame, you must install them after installing the cable management frame on the chassis.

Note For the double-hinged door to easily open or close in either direction, make sure that the chassis is level. If necessary, remove the chassis from the rack and adjust the bottom-support rails so that the chassis is level. Also, make sure that the cable management frame is aligned to the vertical sides of the chassis and that the cable management hood is level when you install those components.

To install the front door and air intake frame to the Cisco Nexus 7018 cable management system, follow these steps:

Step 1 Position the left door stopper (700-27454-01) on the middle of the left cable management frame and fasten it with two M3x10 pan-head screws as shown in Figure 5-13. Tighten these two screws to 5 to 7 in-lb (0.6 to 0.8 N·m).

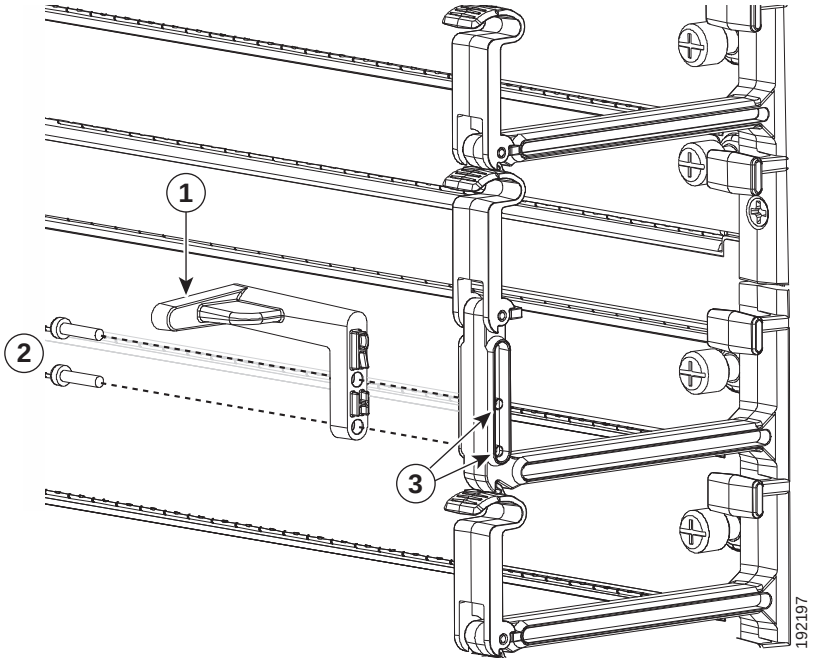
Figure 5-13 Attaching the Left Door Stopper



1	Left door stopper identified with an L on the bottom of the base.	**3**	Screw holes on the cable management frame.
2	Two M3x10 screws that fasten the stopper to the cable management frame.		

Step 2 Position the right door stopper (700-27592-01) on the middle of the right side of the cable management frame and fasten it with two M3x10 pan-head screws as shown in Figure 5-14. Tighten these two screws to 5 to 7 in-lb (0.6 to 0.8 N·m).

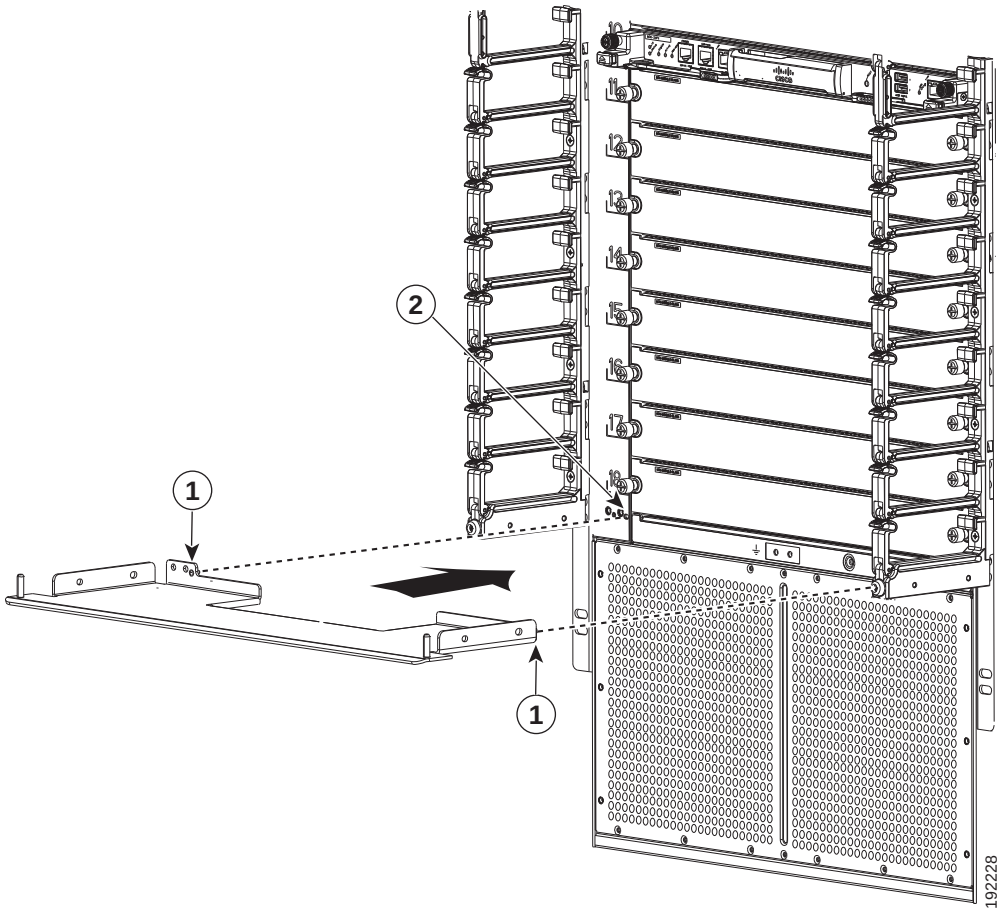
Figure 5-14 Attaching the Right Door Stopper



1	Right door stopper identified with an R on the bottom of the base.	**3**	Screw holes on the right side of the cable management frame.
2	Two M3x10 screws that fasten the stopper to the right side of the cable management frame.		

Step 3 Position the hinge bracket (700-28491-01) at the bottom of the cable management frame and the chassis as shown in Figure 5-15.

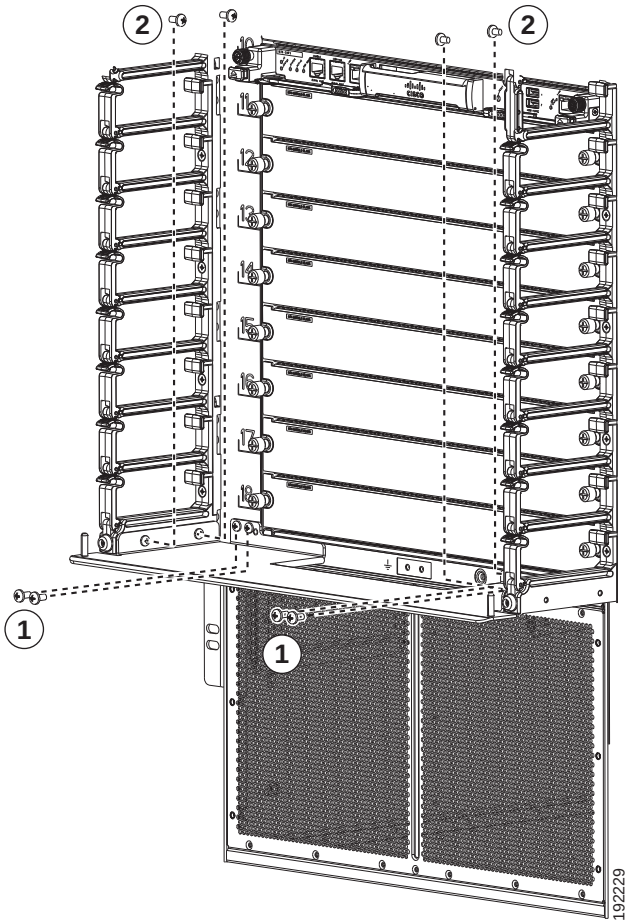
Figure 5-15 Positioning the Hinge Bracket to the Cable Management Frame and Chassis



1	Alignment pins	**2**	Alignment holes

Step 4 Attach the bracket to the chassis with eight loosely fastened M4x8 screws, as shown in Figure 5-16.

Figure 5-16 Attaching the Hinge Bracket to the Cable Management Frame and Chassis



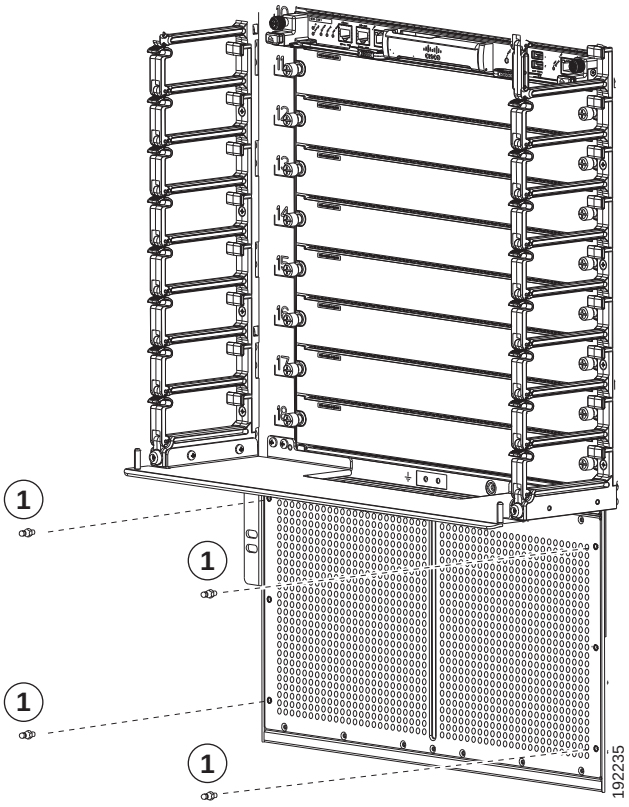
1	Four M4x8 pan-head screws that fasten the hood to the chassis.	**2**	Four M4x8 pan-head screws that fasten the hood to the left and right cable management assemblies.

Step 5 Tighten the four M4x8 screws that fasten the hinge bracket to the chassis to 11 to 15 in-lb (1.2 to 1.7 N·m).

Step 6 Tighten the four M4x8 screws that fasten the hinge bracket to the cable management frame to 11 to 15 in-lb (1.2 to 1.7 N·m).

Step 7 Fasten the four ball-point studs (51-5008-01), each one with a washer (49-0430-01), to the bottom portion of the chassis, one stud by each corner of the air intake area as shown in Figure 5-17.

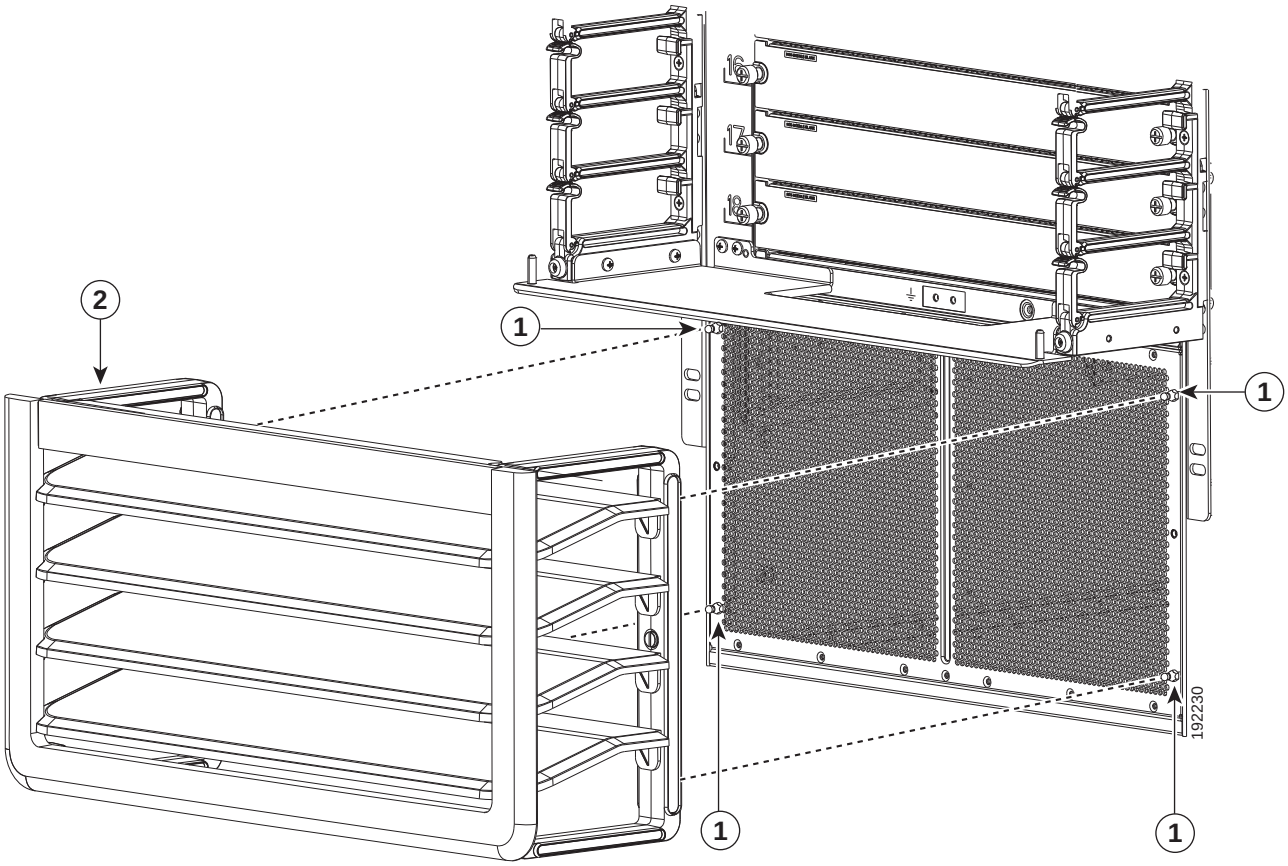
Figure 5-17 Fastening Ball-Point Studs to the Air Intake Area



1	Ball-headed stud		

Step 8 Align the air intake frame to the four ball-point studs and press the frame onto the chassis as shown in Figure 5-18. The captive screws on the air-intake frame should align with their screw holes in the chassis.

Figure 5-18 Positioning the Air Intake Frame on the Chassis



1	Ball-headed studs	**2**	Air-intake frame with holes to be aligned with the ball-headed studs

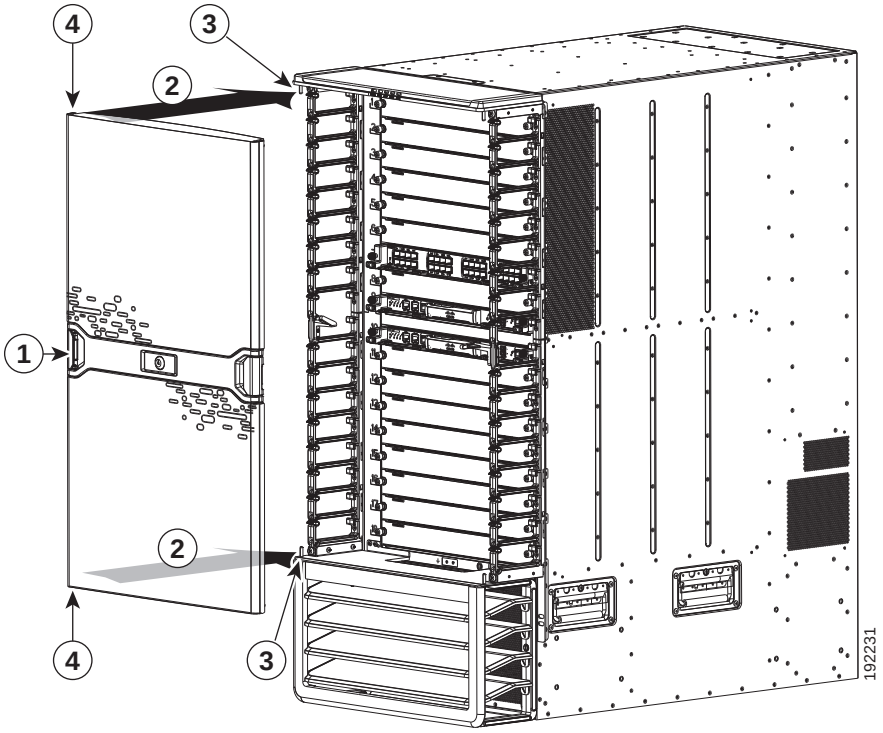
Step 9 Fasten the captive screws on the air-intake frame to the chassis and tighten to 11 to 15 in-lb (95 to 130 N·m).

Step 10 On the chassis door, pull the door handle open on one of the two sides of the door until the handle clicks (the handle clicks when you pull it about 30 degrees).

Step 11 Move the side of the door with the opened handle onto the two hinge pins as shown in Figure 5-19. Make sure that the top and bottom hinge pins on the hood and hinge bracket fit through the slots on the top and bottom of that side of the door. Position the door so that the hinge pins are located at the ends of the slots.

Note The double-hinge door can be installed and opened on either side. The figures in this procedure show how to install the door on the left side first, but you can use the instructions to install it on either side.

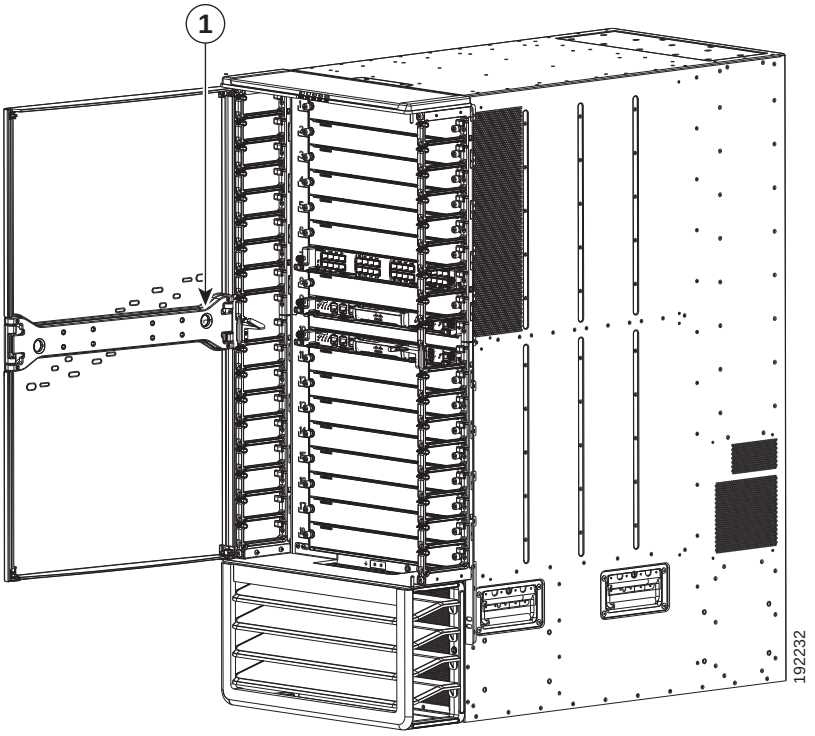
Figure 5-19 Attaching One Side of the Door to the Chassis



1	Double-hinged door	**3**	Hinge pins
2	Move one side to the hinge pins	**4**	Slot for hinge pin

Step 12 While holding the door on the hinge pins with one hand, use your other hand to press the locking button on the interior side of the door. See Figure 5-20. This action locks the latches around the hinge pins so that you no longer need to hold the door onto the chassis.

Figure 5-20 Attaching the Left Side of the Door

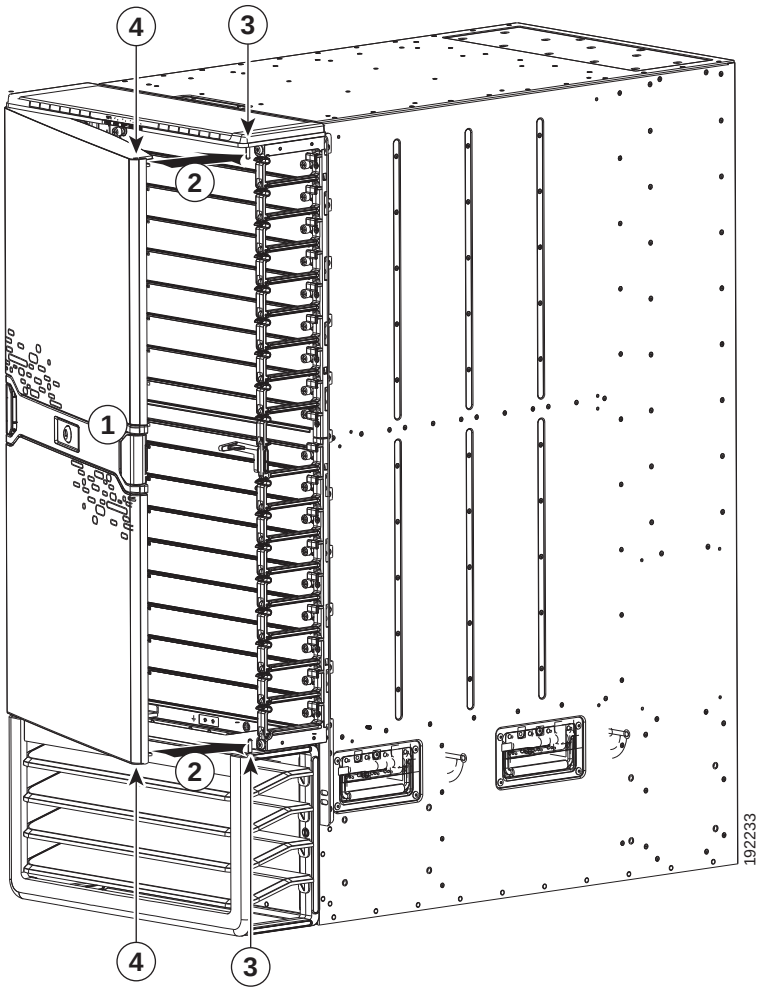


1	Press the locking button to lock the door onto the hinge pins.		

Note Be sure that the door is firmly latched to the two hinge pins. If both of the hinge pins are not secured behind the door latch, hold the door securely with one hand while opening the door handle for the unsecured side until the handle clicks, press that side of the door so that the pins are positioned all the way inside the door slots, press the door latch button on the interior side of the door, and then make sure that the door is firmly secured to both hinge pins.

Step 13 Open the door handle on the open side of the door until it clicks. This action opens the latches on the open side of the door. See Figure 5-21.

Figure 5-21 Attaching the Right Side of the Door



1	Door handle pulled out until it clicks	**3**	Hinge pins
2	Swing the door closed	**4**	Slots for hinge pins

Step 14 Swing the door closed so that the unused hinge pins fit inside the slots on the top and bottom of the door. When you close the door, the door stopper automatically presses the lock button on the inside of the door so that the door is locked on the hinge pins. If the door stopper does not close the latches, press the door closed at the handle until you hear the latches click. Make sure that the door is fully secured to the frames on both sides.

Note If a hinge pin is not secured behind a door latch, open the door handle for that side of the door until it clicks, open that side of the door, and then press the door closed so that the pins are positioned all the way inside the door slots. When you close the door, the door stopper automatically closes the door latches. If you do not hear the latches click, press the door at the handle to fully close it and to activate the latches. Test the door to make sure that it is fully secured to the four hinge pins.

Tip Whenever you need to open the door, pull one of the door handles open until it clicks and then swing that side of the door open.

Note If the double-hinged door and its holders are not level, it is possible that you will have some difficulty opening or closing the door on one or both sides. The door is not defective. Either push in the bottom portion of the door or slightly lift up the door on that side just before closing. If the problem persists, open the door from the other side, which should be free of this problem, or adjust the cable management system and hinge bracket so that they are level.

Installing Storage Media in a Supervisor Module

Each supervisor module on a Cisco Nexus 7000 Series switch is shipped with a CompactFlash card installed in the LOG FLASH reader (Supervisor 1 modules) or a USB drive installed in the LOG FLASH reader (Supervisor 2 and Supervisor 2E modules). The EXPANSION FLASH reader (Supervisor 1) or Slot0 port (Supervisor 2 and 2E) is left empty, but you can optionally install a card in that reader or a USB drive in the USB port. To allow this storage media to function with the reader or port, you must make sure that it is either formatted for the reader before installing it or format it after installing it.

Note The LOG FLASH and EXPANSION FLASH or Slot0 readers require different formats for their storage media.

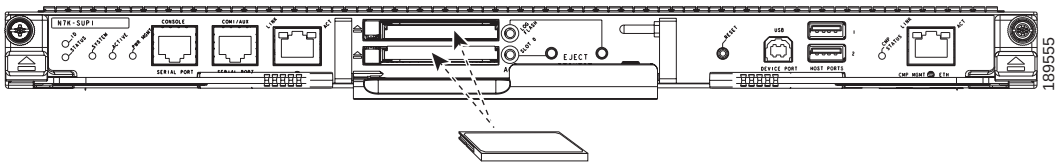
To replace an installed CompactFlash card, see the "Replacing Storage Media for a Supervisor Module" section on page 10-61.

To install storage media in a supervisor module, follow these steps:

Step 1 Align the storage media to its slot or port on the supervisor module as follows:

- For a Supervisor 1 module, align the card with the slot for the CompactFlash reader slot labeled LOG FLASH or EXPANSION FLASH as shown in Figure 5-22. The grooves on the thin side of the card are on the end of the card that goes into the reader first. If the card does not fit easily into the reader, flip the card so that the bottom edge is on top, and try pushing the card into the reader.

Figure 5-22 Aligning a CompactFlash Card to its Reader



- For a Supervisor 2 or 2E module, insert the USB drive in the LOG FLASH or SLOT0 port.

Step 2 Wait for the reader or port LED to turn green and for a message to appear on the console as follows:

- If you are installing a card or USB drive into the log flash reader, the message will end with “logflash:online.”
- If you are installing a card or USB drive into the expansion flash reader, the message will end with “slot0:online.”
- If you see an “offline” message or do not see a message, either the card or USB drive is not fully inserted or it is improperly formatted.

  Make sure that the card or USB drive is fully inserted inside the reader. If it is fully inserted, either format the card (see the *Cisco Nexus 7000 Series NX-OS Fundamentals Configuration Guide*) or replace the storage media with another that is properly formatted for the reader.

Installing Power Supplies

This chapter describes how to install AC and DC power supplies in any Cisco Nexus 7000 Series chassis. You can install the HVAC/HVDC power supplies only on the Cisco Nexus 7004 chassis. The AC power supplies convert the AC power from your facility to DC power for use in the chassis; the DC power supplies take DC power from your facility for use in the chassis. In the same chassis, you can install AC power supplies, DC power supplies, or a combination of AC and DC power supplies, but the power supplies must be the right size for the power supply slots (you cannot mix the smaller power supplies designed for the Cisco Nexus 7004 switch with the larger units designed for the Cisco Nexus 7009, 7010, and 7018 switches). In a Cisco Nexus 7004 chassis, you can install AC power supplies, DC power supplies or HVAC/HVDC power supplies or a combination of AC, DC and HVAC/HVDC power supplies.

For information on managing power modes, see the "Power Supply Configuration Modes" section on page 8-10.

This chapter includes the following sections:

Required Tools and Equipment

Each power supply comes with its own ground lug, ground lug screws, and power cords.

Note Each power supply, except for the 3-kW DC power supply, comes with the required power cords for your country.

To mount and install power supplies, you need the following additional tools and equipment:

- Number 1 Phillips-head screwdriver with torque capability
- Nut driver attachment for screwdriver or ratchet wrench with torque capability (used only for DC power supplies)
- Wire-stripping tool
- 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—This wire should be sized 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.

Installing Power Supplies

You can install two or more power supplies in each Cisco Nexus 7000 Series chassis. If you leave any power supply slots empty, you must install a blank filler plate in those slots to maintain the designed airflow. Table 6-1 lists the quantities and types of power supplies that you can install in each chassis.

Table 6-1 Power Supplies Utilized by the Cisco Nexus 7000 Series Switch Models

	Cisco Nexus 7004	Cisco Nexus 7009	Cisco Nexus 7010	Cisco Nexus 7018
Number of power supply slots	4	2	3	4
3-kW AC power supply (N7K-AC-3KW)	X	—	—	—
6-kW AC power supply (N7K-AC-6.0KW)	—	X	X	X
7.5-kW AC power supply (N7K-AC-7.5KW-INT and N7K-AC-7.5KW-US)	—	X	X	X
3-kW DC power supply (N7K-DC-3KW)	X	—	—	—
6-kW DC power supply (N7K-DC-6KW)	—	X	X	X
3.5-kW HVAC/HVDC power supply (N7K-HV-3.5KW)	X	—	—	—
Blank (N7K-3KPS-BLANK-H)	X	X	—	X
Blank (N7K-PS-BLANK=)	—	—	X	—

Note For the Cisco Nexus 7004 switches, the chassis ships with their power supplies already installed. For the Cisco Nexus 7009, 7010, and 7018 switches, the power supplies ship with the chassis but are boxed separately, so you must install them using the instructions provided in this chapter.

When you install AC and DC power supplies in a Cisco Nexus 7000 Series chassis, you mount them similarly, but you ground them differently. For an AC and HVAC/HVDC power supply, you automatically ground it when you connect it to the AC or HVAC/HVDC power source because the power cable includes a ground connection. For a 6-kW DC power supply, you must connect the power supply to the earth ground before you connect it to the DC power source. For the 3-kW DC power supply, you do not connect it directly to the earth ground because it is grounded through the chassis.

To mount a power supply in a Cisco Nexus 7000 Series chassis, follow these steps:

Step 1 Ensure that the power switch on the front of the power supply is set to standby (labelled as STBY or 0) and that the power supply is not connected to any power sources.

Step 2 Grasp the handle on the power supply with one hand, place the other hand under the power supply, and orient its back end to an open power supply bay.

Step 3 Slide the unit all the way into the power supply bay until one of the following situations occurs:

- For the Cisco Nexus 7004 chassis, 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 the Cisco Nexus 7009, 7010, or 7018 chassis, the front of the power supply is touching the front of the chassis and the four captive screws on the front of the power supply are aligned with four screw holes in the chassis.

Step 4 For the Cisco Nexus 7009, 7010, or 7018 chassis, screw each of the four captive screws into the chassis and tighten them to 8 in-lb (0.9 N·m). This action completes the mounting of the power supply on this chassis.

Note If you do not have enough power supplies to fill all of the power supply bays, cover each empty power supply bay with a blank filler plate and secure it by screwing in its captive screws to 8 in-lb (0.9 N·m).

If you are installing an AC power supply, you must now connect it to an AC power source (see the "Connecting an AC and HVAC/HVDC Power Supply to AC Power Sources" section on page 6-3 and "Connecting a 3.5-kW HVAC/HVDC Power Supply to AC Power Sources" section on page 6-6). The power supply will be automatically grounded through its power cable.

If you are installing a 3-kW DC power supply, you must connect the power supply to the DC power source (see the "Connecting a DC and HVAC/HVDC Power Supply to DC Power Sources" section on page 6-9). You do not need to connect the 3-kW DC power supply directly to an earth ground because it is grounded through the chassis. You are ready to connect the power supply to a DC power source as explained in the "Connecting a 3-kW DC Power Supply Directly to DC Power Sources" section on page 6-17.

If you are installing a 6-kW DC power supply, you must ground the power supply (see the "Grounding a 6-kW DC Power Supply" section on page 6-9) before you connect the power supply to the DC power source.

Connecting an AC and HVAC/HVDC Power Supply to AC Power Sources

If you are powering your Cisco Nexus 7000 Series switch with 3-,3.5-, 6-, or 7.5-kW AC power supplies, you must connect those power supplies to an AC power source. When you connect the power cable to the AC power grid and the power supply, the power supply is automatically grounded through this cable.

Before you connect the power supplies to their power sources, you must have already connected the chassis to the earth ground. If the chassis is not yet grounded, see the following sections:

- To ground a Cisco Nexus 7004 chassis, see the "Grounding the Cisco Nexus 7004 Chassis" section on page 2-9.
- To ground a Cisco Nexus 7009 chassis, see the "Grounding the Cisco Nexus 7009 Chassis" section on page 3-19.

- To ground a Cisco Nexus 7010 chassis, see the "Grounding the Cisco Nexus 7010 Chassis" section on page 4-11.
- To ground a Cisco Nexus 7018 chassis, see the "Grounding the Cisco Nexus 7018 Chassis" section on page 5-13.

Note When you plug in an AC power supply to its power source, you automatically ground the power supply through its power cable. For additional grounding protection for the rest of the chassis and its modules, you must ground the chassis before installing its modules.

You connect the AC power supplies differently as follows:

- For a 3-kW or a 3.5-kW HVAC/HVDC power supply, you connect one power cable to the power supply and one AC power source. For power redundancy, you connect multiple power supplies to one or more power sources in the following ways:
  - For combined power mode or power supply redundancy mode, you connect all of the power supplies in the same chassis to the same power source.
  - For input source redundancy mode or full redundancy mode, you connect half of the power supplies in the chassis to one power source and the other half to another power source.
- For a 6-kW AC power supply, you connect one or two power cables to the power supply and one or two AC power sources. For power redundancy, you connect the power cables for each power supply to power sources in the following ways:
  - For combined power mode, you connect one or both power cables to the same AC power source.
  - For power-supply redundancy mode, you connect both power cables to the same AC power source and you have one more power supply than required to power the modules in the chassis.
  - For input-source redundancy mode, you connect the two power cables to different power sources.
  - For full redundancy mode, you connect the two power cables to different power sources and you have one more power supply than required to power the modules in the chassis.
- For a 7.5-kW AC power supply, you connect the two installed power cables to one or two AC power sources. For power redundancy, you connect the power cables for each power supply in the following ways:
  - For combined power mode, you connect one or both power cables to the same AC power source.
  - For power-supply redundancy mode, you connect both power cables to the same AC power source and you have one more power supply than required to power the modules in the chassis.
  - For input-source redundancy mode, you connect the two power cables to different power sources.
  - For full redundancy mode, you connect the two power cables to different power sources and you have one more power supply than required to power the modules in the chassis.

Note The 3- and 6-kW power supply cables are shipped in the system accessory kit, and the 7.5-kW power supply cables are permanently attached to those power supplies. Check the power cables with the list of available power cables in the accessory kit for the chassis that you ordered (see Appendix C, "Accessory Kits Contents"). If you do not have the correct cables, contact Cisco TAC.

Warning **Read the installation instructions before connecting the system to the power source.** Statement 1004

This section includes the following topics:

Prerequisites for Connecting AC Power Supplies to AC Power Sources

Before you connect the power supplies to AC power sources, you must mount the power supplies in the chassis, and you must make sure that the appropriate AC power source receptacles are located close enough to the power supplies so that the power cords can connect the power supplies to the power sources. For North American installations of 3-kW or 6-kW AC power supplies, you must have one or two 20-A rated, 110V or 220V circuits. For North American installations of 7.5-kW power supplies, you must have one or two 30-A rated, 220-V AC circuits. For international installations, you must size the circuits by local and national codes. If you are using the input source redundancy mode, you must have at least two circuits.

Connecting a 3-kW AC Power Supply to AC Power Sources

The 3-kW AC power supply ships with one power cable that you must attach to the power supply and its AC power source. To configure power supply redundancy mode, input source redundancy mode, or full redundancy mode, you connect at least two power supplies to one or two AC power sources.

To connect a 3-kW AC power supply to one or more power sources, follow these steps:

Step 1 Ensure that the power supply switch located on the front of the power supply is set at standby (labelled 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 **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. 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 labelled 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 Table D-6 on page D-6.

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 (labelled as 0), check the AC power connections on the power supply and the AC power source, and then turn the power switch back on (labelled 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

The 3.5-kW HVAC/HVDC power supply ships with one power cable that you must attach to the power supply and its AC power source.

To connect a 3.5-kW HVAC/HVDC power supply to a power source, follow these steps:

Step 1 Ensure that the power supply switch located on the front of the power supply is set at standby (labelled 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 an 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 **Take care when connecting units to the supply circuit so that wiring is not overloaded.**
Statement 1018

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 Table D-6 on page D-6.

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.

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 cables.

Connecting a 6-kW AC Power Supply to AC Power Sources

The 6-kW AC power supply ships with one or two power cables that you must attach to the power supply and its AC power sources. To configure power supply redundancy mode, input source redundancy mode, or full redundancy mode, you connect the two power supply cables to one or two AC power sources.

To connect a 6-kW AC power supply to one or more power sources, follow these steps:

Step 1 Ensure that the power supply switch located on the front of the power supply is set at standby (labelled as STBY).

Step 2 Plug one or two AC power cables into the power supply, and use a Phillips-head screwdriver to tighten the power cable retainer screws on the cable retention device.

Step 3 Plug the other ends of the power cables into one or two AC power sources supplied by the data center.

Note If you are using the combined power mode or power supply redundancy, connect the power cables to the same 20-A circuit. If you are using the input source redundancy mode or full redundancy mode, connect one power cable to one AC power source and the other cable to another AC power source.

Warning **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. Ensure that the protective device is rated not greater than:**
250V, 20 A
Statement 1005

Step 4 Turn the power supply on by turning the power switch from STBY to ON.

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 Table D-6 on page D-6.

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 STBY, check the AC power connections on the power supply and the AC power source, and then turn the power switch back to ON. The Input and Output LEDs for the connected power supplies should be green and the Fault LED should be off.

Connecting a 7.5-kW AC Power Supply to AC Power Sources

To connect a 7.5-kW AC power supply to one or more AC power sources, follow these steps:

Step 1 Ensure that the power supply switch located on the front of the power supply is set at standby (labelled as STBY).

Step 2 Plug each power cable into one or two AC power sources supplied by the data center.

Note If you are using the combined power mode or power supply redundancy, connect both power cables to the same 30-A circuit. If you are using the input source redundancy mode or full redundancy mode, connect one power cable to one AC power source and the other cable to another AC power source.

Warning **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. Ensure that the protective device is rated not greater than: 250V, 30 A** Statement 1005

Step 3 Turn the power supply switch from STBY to ON.

Step 4 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 Table D-6 on page D-6.

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 STBY, check the AC power connections on the power supply and the AC power source, and then turn the power switch back to ON. The Input and Output LEDs for the connected power supplies should be green and the Fault LED should be off.

Connecting a DC and HVAC/HVDC Power Supply to DC Power Sources

To power your Cisco Nexus 7000 Series switch with DC power supplies, you must first ground the power supplies and then connect the power supplies to a DC power source. You can then connect the power supply directly to DC power sources or indirectly through a power interface unit (PIU), which is connected to a DC power source.

This section includes the following topics:

Grounding a 3-kW and 3.5-kW HVAC/HVDC Power Supply

The 3-kW DC and 3.5-kW HVAC/HVDC power supply is grounded through the power cable.

Grounding a 6-kW DC Power Supply

After you have mounted a 6-kW DC power supply in a Cisco Nexus 7000 Series chassis, you must ground the power supply to the earth ground before connecting it to the DC power source. You ground this power supply by connecting the grounding pad on the lower front side of the power supply to the earth ground.

Caution Although you connect each 6-kW DC power supply to an earth ground before you connect it to the DC power grid, you should also connect the chassis to an earth ground. For information about grounding a Cisco Nexus 7004 chassis, see the "Grounding the Cisco Nexus 7004 Chassis" section on page 2-9. For information about grounding the Cisco Nexus 7009 chassis, see the "Grounding the Cisco Nexus 7009 Chassis" section on page 3-19. For information about grounding the Cisco Nexus 7010 chassis, see the "Grounding the Cisco Nexus 7010 Chassis" section on page 4-11. For information about grounding the Cisco Nexus 7018 chassis, see the "Grounding the Cisco Nexus 7018 Chassis" section on page 5-13.

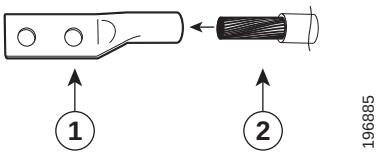
Warning **Installation of the equipment must comply with local and national electrical codes.** Statement 1074

To connect the system ground to the data center earth ground, follow these steps:

Step 1 Use a wire-stripping tool to remove approximately 0.75 inch (19 mm) of the covering from the end of the grounding wire.

Step 2 Insert the stripped end of the grounding wire into the open end of the grounding lug as shown in Figure 6-1.

Figure 6-1 Inserting the Grounding Wire in the Grounding Lug

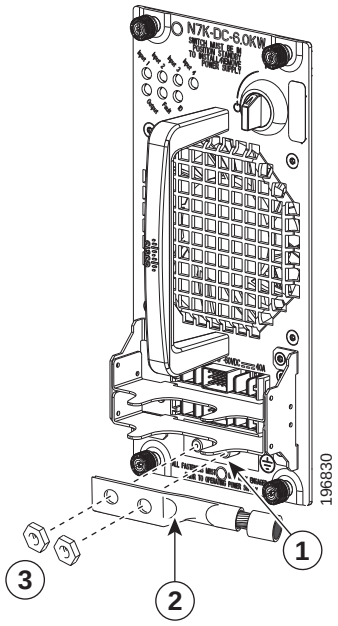


1	Grounding lug for 6 AWG grounding cable	**2**	6 AWG grounding cable with 0.75 in. (19 mm) of insulation stripped from the end

Step 3 Use the crimping tool to crimp the lug to the grounding wire. Verify that the grounding wire is securely attached to the ground lug by attempting to pull the wire out of the crimped lug.

Step 4 Remove the adhesive label from one of the power supply grounding pads, and secure the grounding wire lug to the grounding pad threaded studs with two M6 nuts (tighten to a maximum of 40 in-lb [4.5 N·m]). Figure 6-2 shows the location of the grounding pads on the front side of the power supply. Ensure that the grounding lug and the grounding wire do not interfere with other switch hardware or rack equipment.

Figure 6-2 Grounding Pads on the Front of a DC Power Supply



1	Ground pads	**3**	Two M6 nuts.
2	Grounding lug with 6 AWG cable crimped on place.		

Step 5 Prepare the other end of the grounding wire and connect it to an appropriate grounding point in your site to ensure an adequate earth ground for the power supply.

With the power supply connected to the earth ground, you can connect the power supply to the DC power source (see the "Connecting a DC and HVAC/HVDC Power Supply to DC Power Sources" section on page 6-9).

Connecting a DC Power Supply Directly to DC Power Sources

Warning **Before performing any of the following procedures, ensure that power is removed from the DC circuit.** Statement 1003

Warning **Installation of the equipment must comply with local and national electrical codes.** Statement 1074

Warning **When installing or replacing the unit, the ground connection must always be made first and disconnected last.** Statement 1046

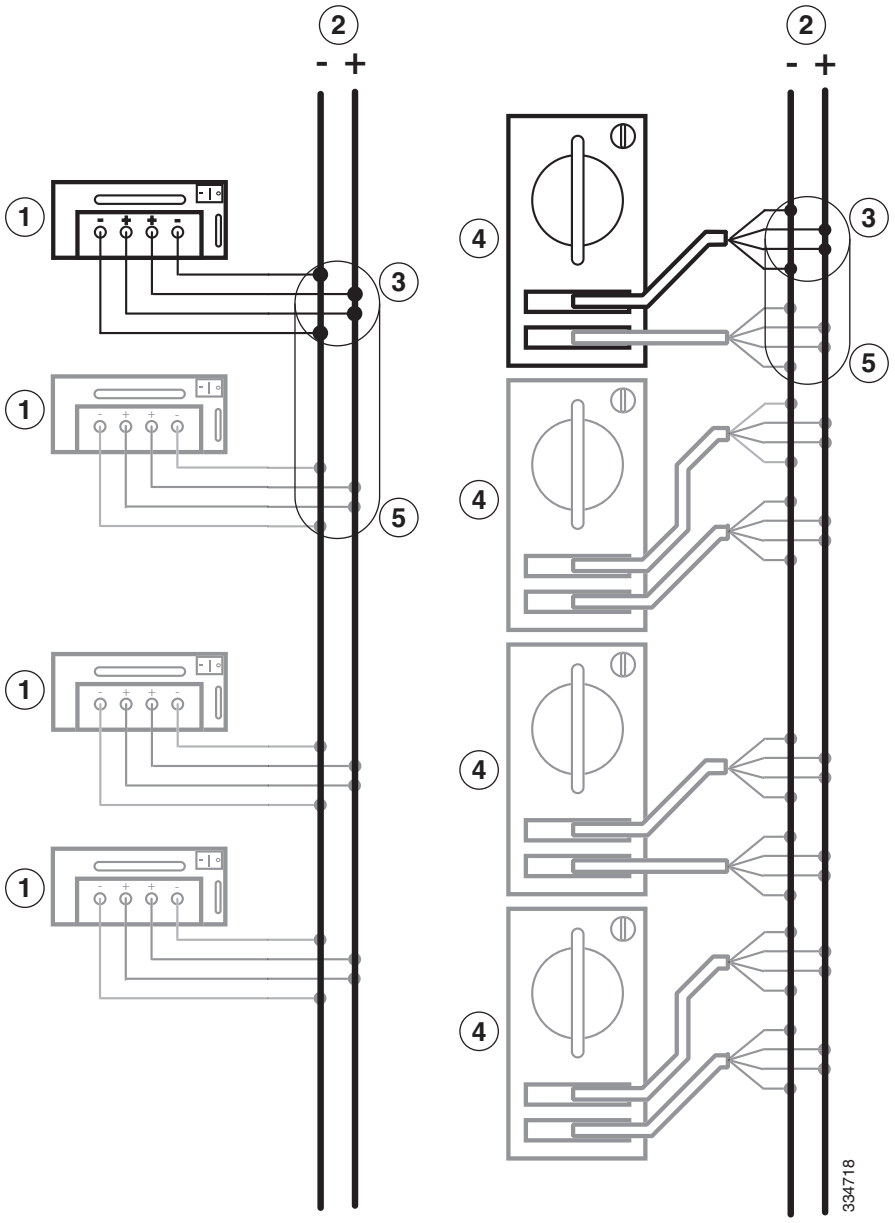
To connect a DC power supply to a DC power source, you must connect two isolated inputs from the DC power grid to the power supply for each 3 kW of output power provided by the power supply. For the 3-kW power supply, you connect the four cables (two isolated inputs) to the power supply (use two 3-kW power supplies to output 6 kW of power). For the 6-kW DC power supplies, the cables for two isolated inputs are bundled into one cable with a plug that connects to the power supply (one cable and plug for 3 kW or two cables and plugs for 6 kW).

You can wire these power supplies for combined power mode, power-supply redundancy mode, input-source redundancy mode, and full redundancy mode as follows:

- Combined power mode uses all of the output from all of the connected power supplies. This mode does not provide any power redundancy. You can connect all of the power supplies to the same DC power grid as shown in Figure 6-3.
- Power supply redundancy uses the required number of power supplies plus one (N+1) power supply for redundancy. This mode enables you to replace a power supply during operations. You can connect all of the power supplies to the same DC power grid as shown in Figure 6-4.
- Input source redundancy uses two power grids. Power supplies with two power cables have each cable connected to a different power grid. Power supplies with one power cable have half of the power supplies connected to one grid and the other half connected to the other grid. To see how these power supplies are connected to two grids, see Figure 6-5.
- Full redundancy provides both the power supply (N+1) redundancy and input source redundancy. You configure an extra power supply and you connect all of the power supplies to two grids, as shown in Figure 6-6.

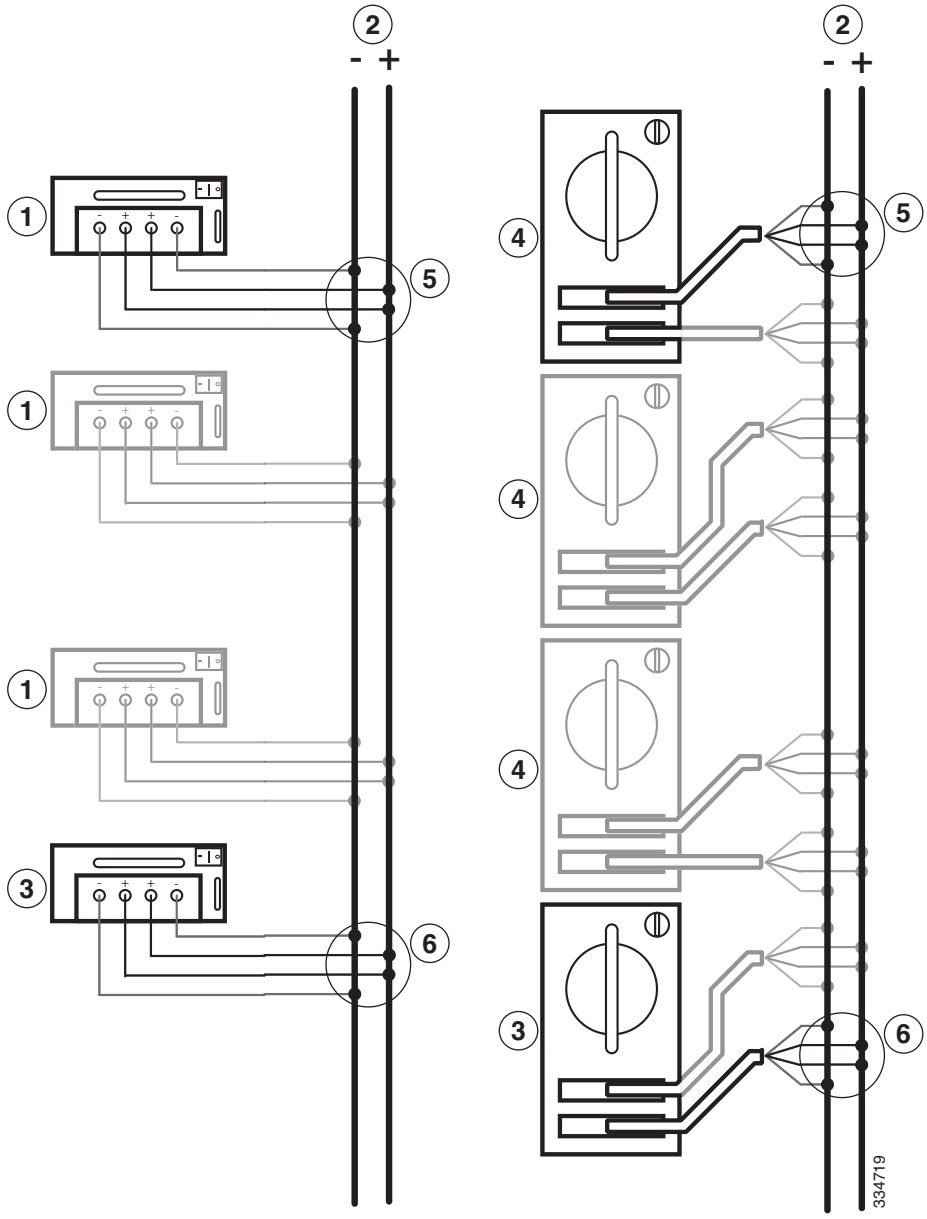
Note Figure 6-3, Figure 6-4, Figure 6-5, and Figure 6-6 show the required power supplies in black and optional power supplies in gray.

Figure 6-3 Connecting Power Supplies to the Grid for Combined Power Mode



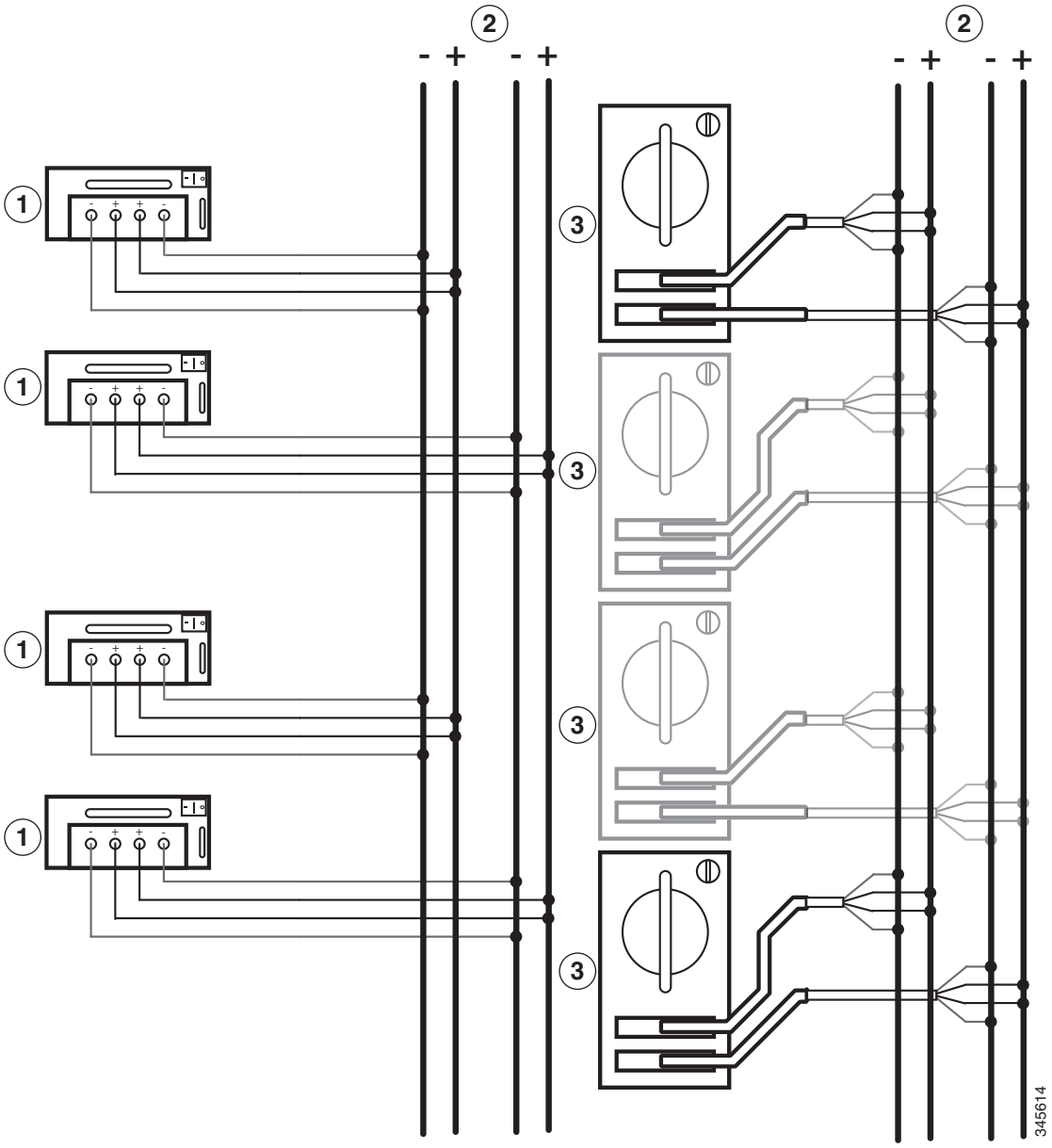
1	3-kW DC power supply. You can use a combination of both power supplies.	**4**	6-kW DC power supply with one or two power cables plugged in (each cable for 3 kW of power)
2	DC power source	**5**	Connections required for 6 kW of available power
3	Connections required for 3 kW of available power		

Figure 6-4 Connecting DC Power Supplies to the Grid for Power Supply [N+1] Redundancy



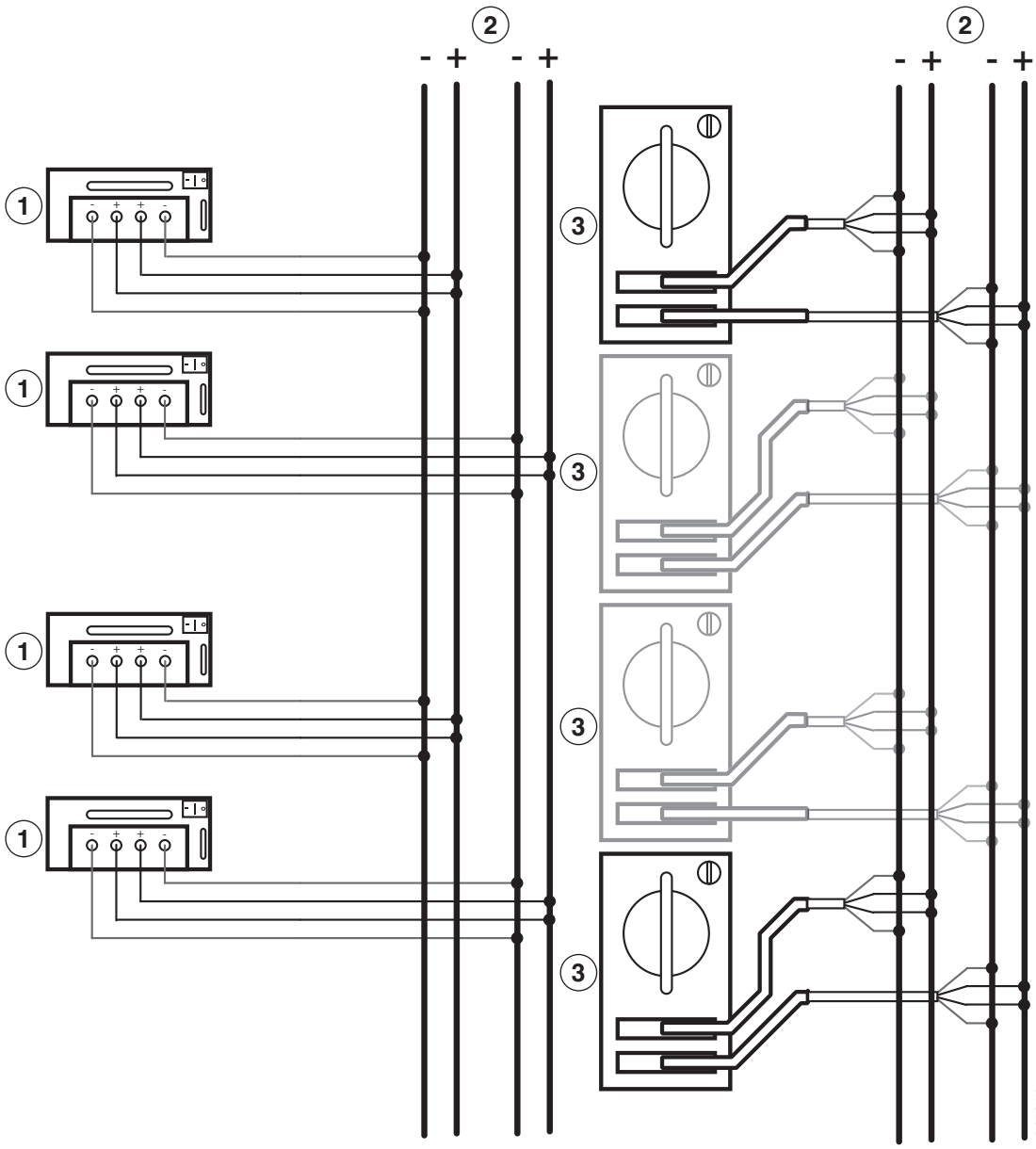
1	3-kW DC power supply . You can use a combination of both power supplies.	**4**	6-kW DC power supply
2	DC power grid	**5**	Connection for available power (for a minimum of 3 kW)
3	Redundant power supply	**6**	Power supply redundancy connection (power connection at least equals the power connection for any power supply providing available power)

Figure 6-5 Connecting DC Power Supplies to Two Grids for Input Source Redundancy Mode



1	3-kW DC power supply (half of the power supplies connected to one DC power grid and the other half connected to another DC power grid).	**3**	6-kW DC power supply (for each power supply, each power cable connects to a separate power grid)
2	Two DC power grids		

Figure 6-6 Connecting DC Power Supplies to Two Grids for Full Redundancy Mode



1	3-kW DC power supply. (half of the power supplies are connected to one power grid and the other half are connected to another power grid and at least one power supply is redundant).	**3**	6-kW DC power supply (each power supply is connected to two power grids and at least one power supply is redundant)
2	Two DC power grids		

If the power supply is too far away for the power cables to reach, you need to install a power interface unit (PIU) in a rack where the power cable can connect it to the power supply (see the "Connecting a Power Supply to DC Power Sources through a Power Interface Unit" section on page 6-21).

Note The power cables required for a 6-kW DC power supply are shipped with the power supply. If you did not receive the correct cables for a 6-kW DC power supply, contact Cisco TAC. You must supply the power cables for a 3-kW DC power supply.

Warning **Read the installation instructions before connecting the system to the power source.** Statement 1004

Connecting a 3-kW DC Power Supply Directly to DC Power Sources

If the DC power supply is within one cable length of the DC power sources, you can connect them directly to one another. Otherwise, if you need additional cables, you can connect the cables using a power interface unit (PIU) as explained in the "Connecting a Power Supply to DC Power Sources through a Power Interface Unit" section on page 6-21.

To connect the 3-kW DC power supply directly to one or two DC power sources, follow these steps:

Step 1 Turn the power switch to standby (labelled 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.

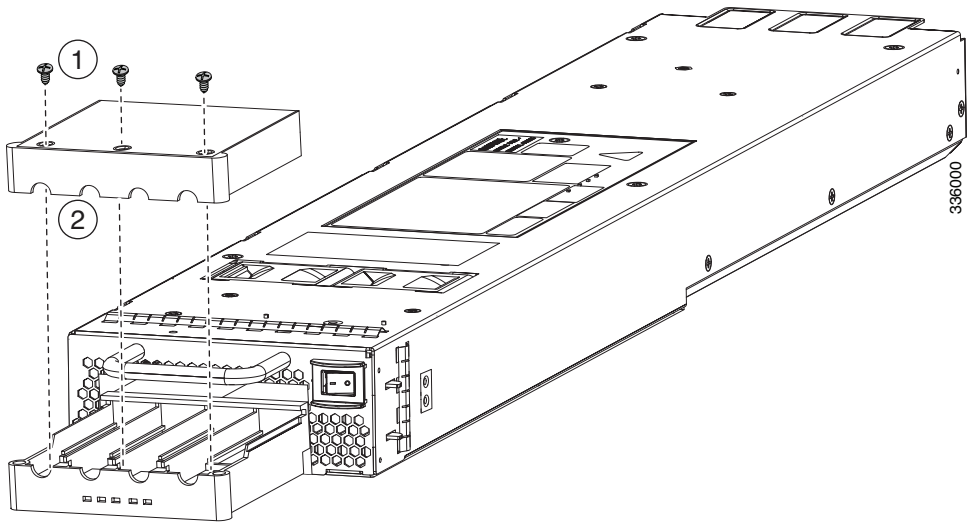
Note For all your power connections, if you are using cables with two different colors, use one color cable for all positive circuits and the other color for all negative circuits.

Warning **Hazardous voltage or energy may be present on DC power terminals. Always replace cover when 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 Figure 6-7).

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 6-7 Removing the Safety Cover for the Terminal Box on the 3-kW DC Power Supply



1	Remove screws from cover.	**2**	Remove the safety 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 the power switch on the connected DC power supplies from standby to on (from 0 to 1 as labelled on the power switch for each power supply). 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.

Connecting a 6-kW DC Power Supply to a DC Power Source

To connect a DC power supply directly to DC power sources, follow these steps:

Step 1 Turn the power switch to standby (labelled as STBY).

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 a cable, cut it at the end that connects to the DC power grid, remove 0.75 inches (19 mm) of insulation from the cut ends, and attach it to the DC power source. Be sure to connect the negative cables to negative terminals and positive cables to positive terminals. To determine which color of cables is positive and which color is negative, see the polarity marked on the plug at the other end of the cable.

Note If the supplied 15-foot (4.6-meter) power cables are too short to connect the 6-kW power supply to the DC power source, you must install a PIU within reach of the power supply (see the "Connecting a Power Supply to DC Power Sources through a Power Interface Unit" section on page 6-21).

Warning **Hazardous voltage or energy may be present on DC power terminals. Always replace cover when terminals are not in service. Be sure uninsulated conductors are not accessible when cover is in place.** Statement 1075

Step 4 Connect one or two power cables (Cisco part number N7K-DC-CAB=) to the DC power supply and the DC power grid. Each cable has one plug that connects two fully isolated 1.5 kW input modules to a DC power supply for 3 kW of power. Depending on your power requirements, connect the cables as follows:

- For 3 kW of output power (combined power mode), use one set of four cables and connect its two fully isolated input modules to the DC power grid (see Figure 6-3 on page 6-13).
- For 6 kW of output power (combined power mode) or 3 kW of output power and 3 kW of redundant power (power supply redundant mode), use two sets of four cables and connect their fully isolated input modules to the same DC power grid (see Figure 6-4 on page 6-14).
- For 3 kW of output power and 3 kW of redundant power (input source redundant mode), use two sets of four cables and connect each set of four cables to separate DC power grids (see Figure 6-5 on page 6-15).

Note For all your power connections, use one color cable for positive circuits and the other color for negative circuits.

Note The cable plugs are keyed to fit one way only in the power supply recepticles. If you cannot insert a plug easily in the receptacle, turn it over and reinsert it. When fully inserted, fasten the plugs to the power supply by tightening their two screws to 8 to 11 in-lb (0.9 to 1.2 N·m).

Step 5 For the powered down circuits connected to the power supplies, turn on the power at the circuit breaker. The Input LEDs turn on as follows:

- For 3 kW of power, either Input 1 and Input 2 LEDs will turn green or the Input 3 and Input 4 LEDs will turn green.
- For 6 kW of power, all four of the Input LEDs will turn green.

Step 6 Turn the power switch on the DC power supply from STBY to ON. 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.

Connecting a 3.5-kW HVAC/HVDC Power Supply to DC Power Sources

To connect a 3.5-kW HVAC/HVDC power supply to a DC power source, follow these steps:

Step 1 Ensure that the power supply switch located on the front of the power supply is set at standby (labelled 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 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.

Warning **Take care when connecting units to the supply circuit so that wiring is not overloaded.** Statement 1018

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 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 Table D-6 on page D-6.

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 DC 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.

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 cables.

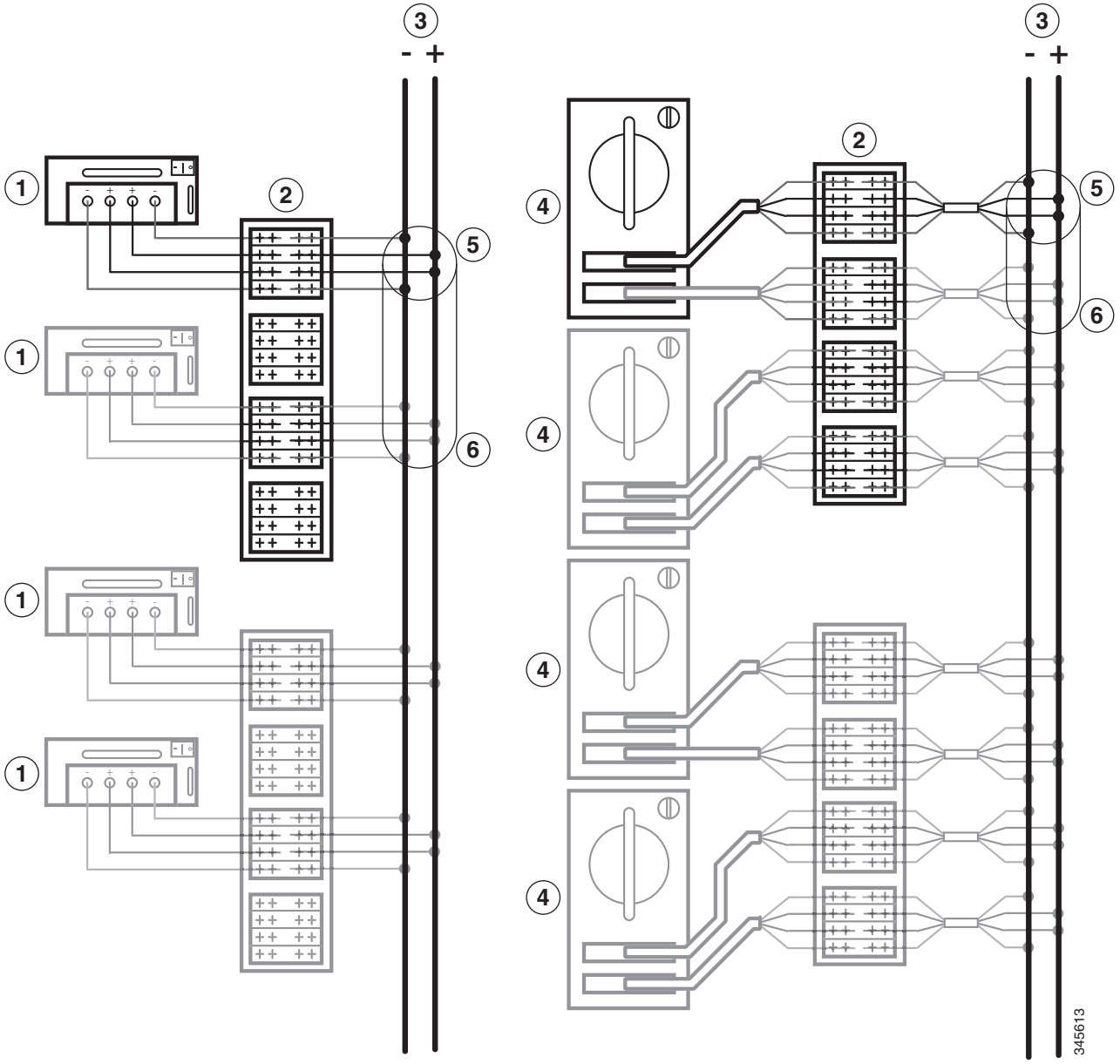
Connecting a Power Supply to DC Power Sources through a Power Interface Unit

If the DC power supplies and the DC power sources are located too far apart for you to connect them with the power cables that you attached to the DC power supplies, you must install a power interface unit (PIU) to connect the power cables to cables that can reach to the DC power sources.

Depending on whether you require the combined power mode, power-supply redundancy, input-source redundancy, or full redundancy, you connect the PIU to one or two power sources as follows:

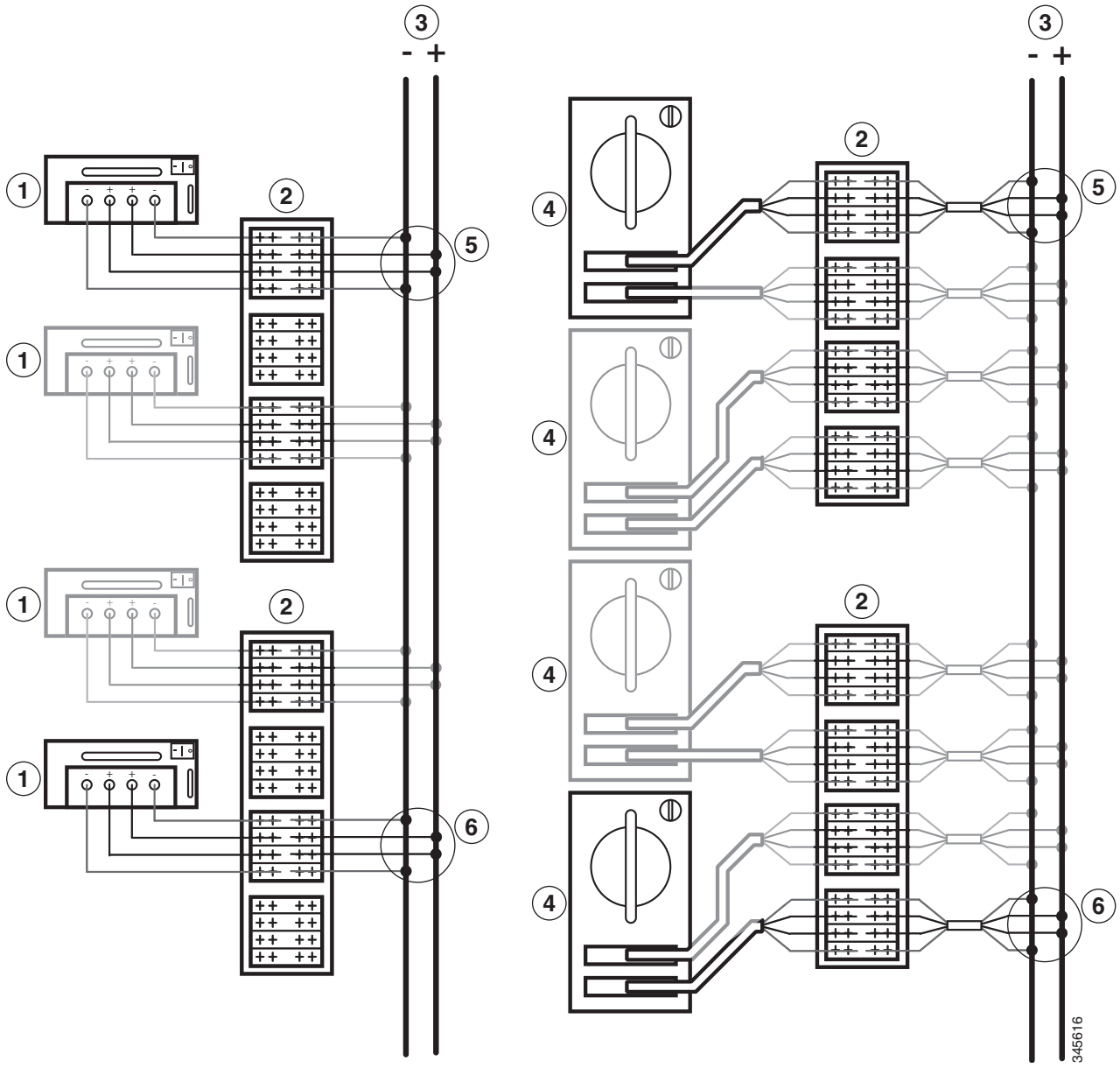
- For combined power, connect each of the isolated inputs to the same DC power source as shown in Figure 6-8.
- For the power-supply redundancy, connect N+1 power supplies to the same DC power source as shown in Figure 6-9.
- For the input-source redundancy, connect the power cables as follows to the DC power source (see Figure 6-10):
  - For 3-kW power supplies, connect the cables from half of the power supplies to one DC power source and the other half to another DC power source.
  - For 6-kW power supplies, connect the cables from one of two plugs on a power supply to one DC power source and the cables from the other plug to another DC power source.
- For the full redundancy, connect the power cables as follows to the DC power source for N+1 power supplies (see Figure 6-11):
  - For 3-kW power supplies, connect the cables from half of the power supplies to one DC power source and the other half to another DC power source.
  - For 6-kW power supplies, connect the cables from one of two plugs on a power supply to one DC power source and the cables from the other plug to another DC power source.

Figure 6-8 Connecting a PIU to a Power Supply and a 3-, 3.5-or 6-kW Power Supply for Combined Power Mode



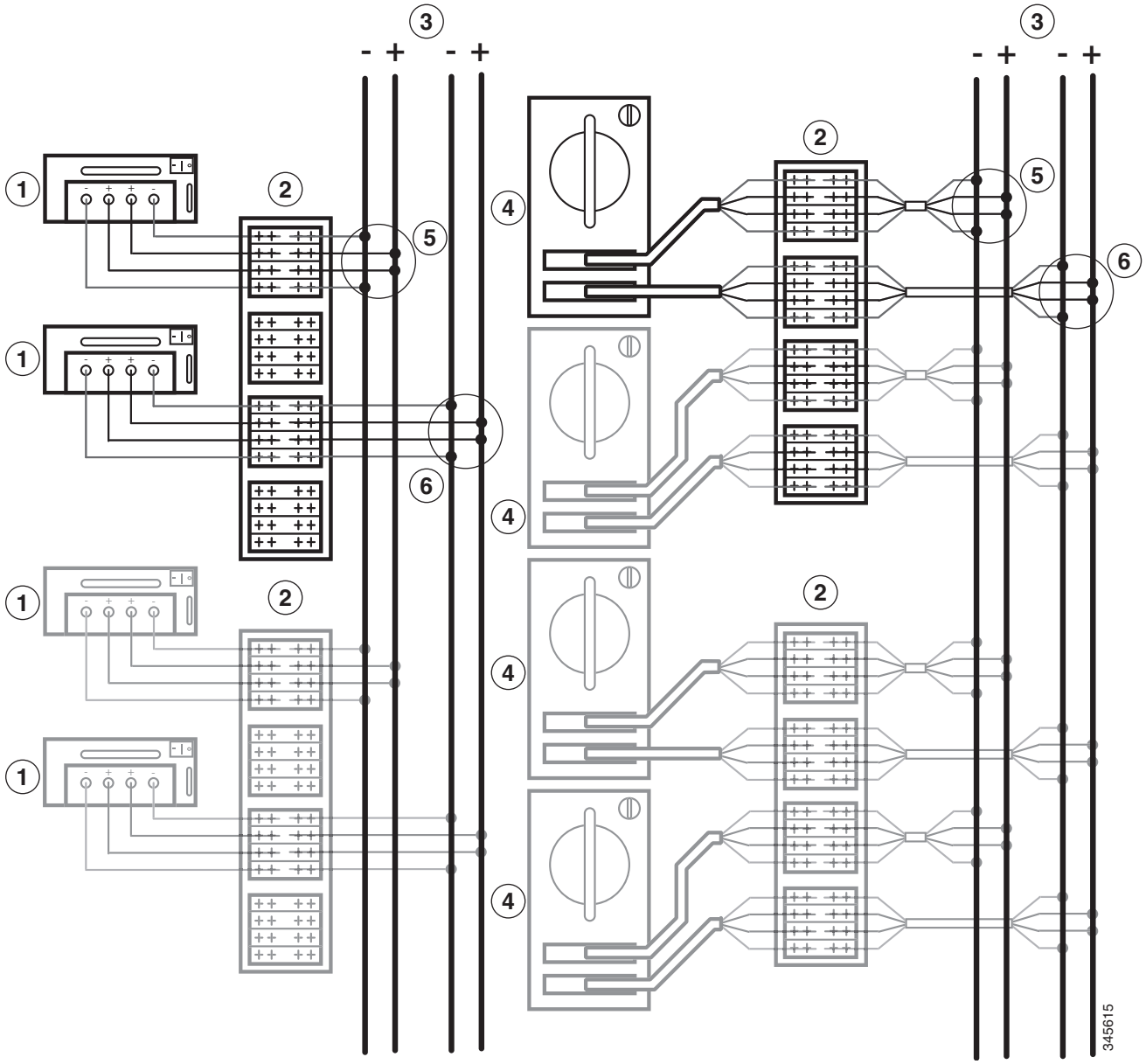
1	3-kW DC power supply(1 to 4)	**4**	6-kW DC power supply (1 to 4)
2	Power Interface Unit (PIU)	**5**	Connections for 3 kW of available power
3	DC power grid	**6**	Connections for 6 kW of available power

Figure 6-9 Connecting a PIU to a Power Supply and a 3-,3.5- or 6-kW Power Supply for Power Supply Redundancy



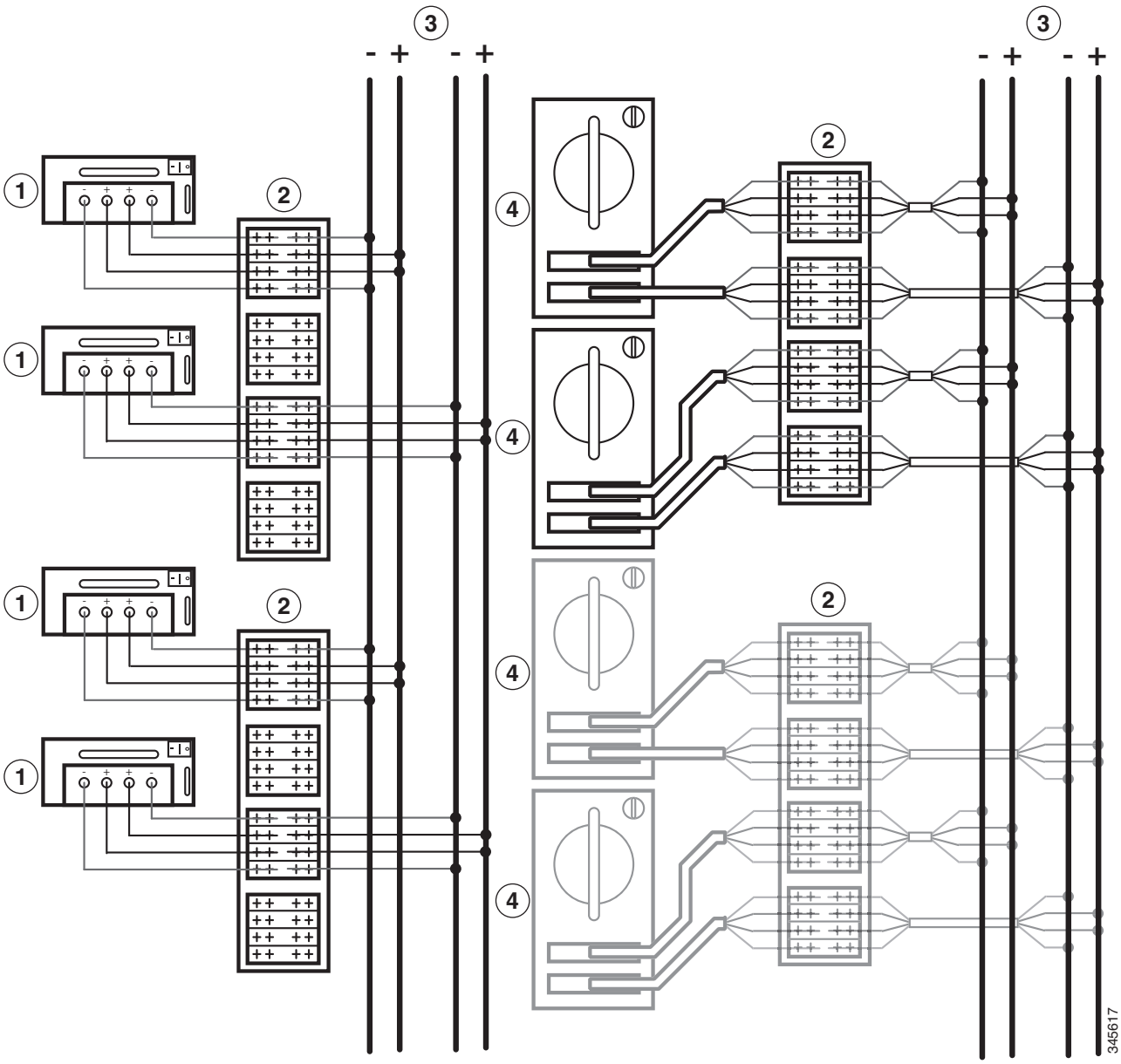
1	3-kW DC power supply(1-4)	**4**	6-kW DC power supply (1-3)
2	Power interface unit (PIU)	**5**	Connections for 3 kW of available power
3	DC power grid	**6**	Connections for 3 kW of reserve power (power supply redundancy at least equals the power provided by the power supply providing the maximum amount of available power)

Figure 6-10 Connecting a PIU to a Power Supply and a 3-, 3.5- or 6-kW Power Supply for Input Source Redundancy



1	3-kW DC power supply(1 to 4)	**4**	6-kW DC power supply (1 to 4)
2	Power interface unit (PIU)	**5**	Connections for 3 kW of available power
3	Two DC power grids	**6**	Connections for 3 kW of reserve power (input source redundancy)

Figure 6-11 Connecting a PIU to Power Sources and a 3-, 3.5-or 6-kW Power Supply for Full Redundancy



1	3-kW DC power supply (up to 4)	**3**	Two DC power grids
2	Power interface unit (PIU)	**4**	6-kW DC power supply (up to 4)

This section includes the following topics:

- Required Tools and Equipment, page 6-26
- Installing the PIU in a Rack, page 6-26
- Grounding the PIU, page 6-28
- Connecting the DC Power Supply to a Power Source Through a PIU, page 6-29

Required Tools and Equipment

To install a power interface unit, you need the following tools and materials:

- PIU (part number N7K-DC-PIU=).
  - Mounting brackets (2)
  - M6 x 19 mm or four 12-24 x 3/4” Phillips screws (4)
  - Grounding lug (standard two-holed barrel lug that supports up to 6 AWG wire)
  - M6 nuts (2)
- Standard lugs (8 required for each 3-kW DC power supply connected to the PIU)
- Grounding wire

Note Size this wire to meet local and national installation requirements. For U.S. installations, you must provide 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. You must supply this wire.

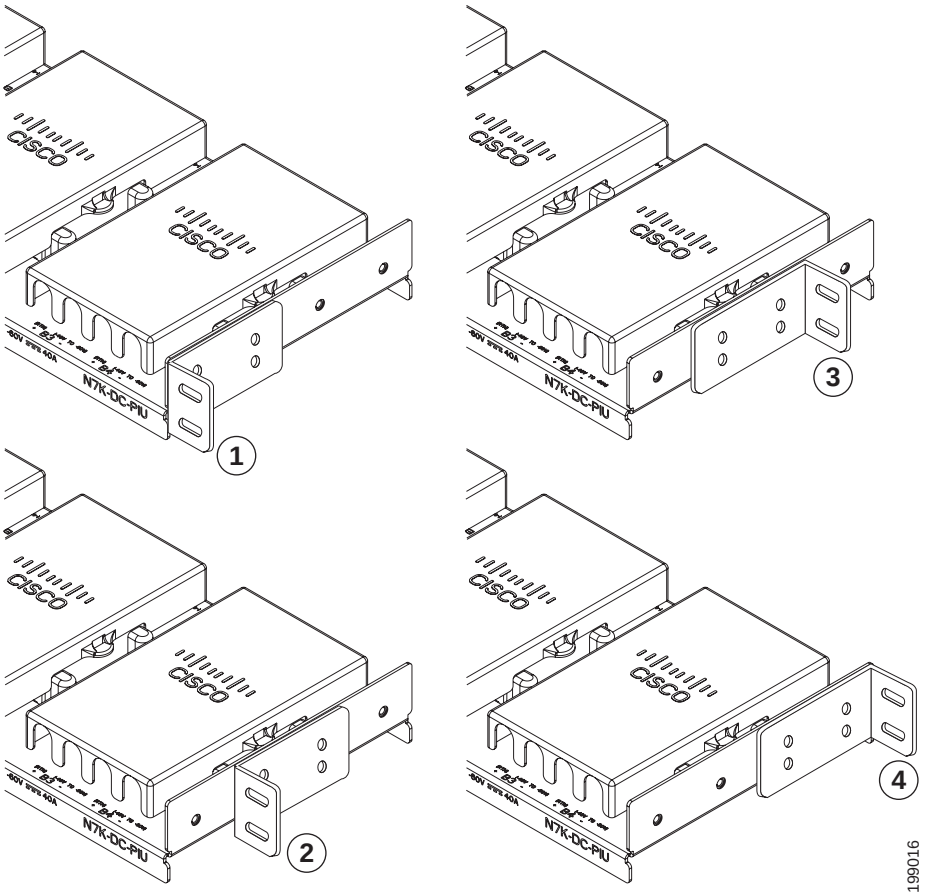
- Wire-stripping tool
- Number 1 Phillips-head screwdriver with torque capability
- Crimping tool
- Power cables
  - Each 3-kW DC power supply requires that you provide four 6-AWG cables for up to 45 A current.
  - Each 6-kW DC power supply comes with a 15-foot (4.6 m) cable with one plug on one end and four wires terminated with lugs.
- Power cables that connect the PIU to the power source. You must size these cables to meet local and national electrical codes.

Installing the PIU in a Rack

To install a PIU in a rack, follow these steps:

Step 1 Position and fasten the two mounting brackets in one of four ways shown in Figure 6-12.

Figure 6-12 Positioning the PIU Mounting Brackets

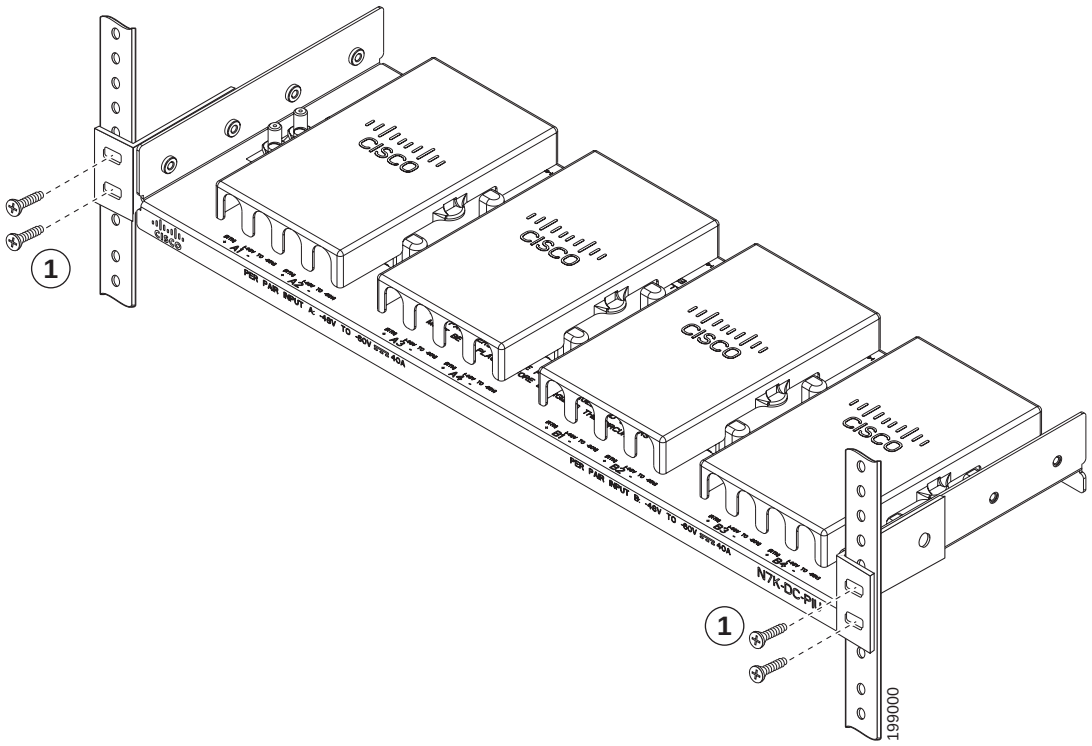


1	Positioned at the front of the PIU	**3**	Positioned offset from the rear of the PIU
2	Positioned offset from the front of the PIU	**4**	Positioned at the rear of the PIU

Step 2 Position the PIU on a rack so that you can connect it to the power supply with the power cables that you are using (user supplied for the 3-kW DC power supply or a 15-foot [4.6 m] cable shipped with the 6-kW DC power supply). Make sure that the PIU is level and its mounting holes align to holes in the mounting rails on the rack.

Step 3 Fasten the PIU to the rack using four M6 x 19 mm screws or four 12-24 x 3/4 inch screws, as shown in Figure 6-13. Tighten each screw to 40 in-lb (4.5 N·m).

Figure 6-13 Fastening the PIU to a Rack



1	On each side, fasten two M6 x 19 mm or two 12-24 x 3/4 inch screws (total of four screws for the PIU) and tighten to 40 in-lb (4.5 N·m).		

Grounding the PIU

To ground the PIU, follow these steps:

Step 1 Unscrew the two M6 nuts that hold the grounding lug to the PIU and remove the grounding lug from the PIU.

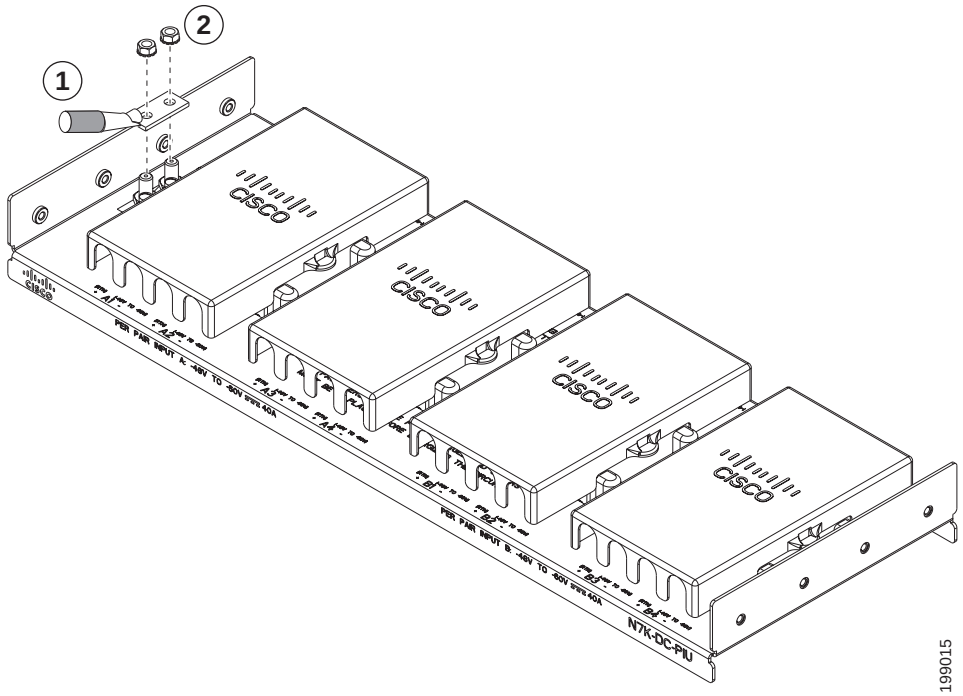
Step 2 Use a wire-stripping tool to remove approximately 0.75 inch (19 mm) of the insulation from the end of the 6 AWG grounding wire that you provide.

Step 3 Insert the stripped end of the grounding wire into the open end of the grounding lug as shown in Figure 6-1 on page 6-10.

Step 4 Use the crimping tool to crimp the lug to the 6 AWG grounding wire. Verify that the grounding wire is securely attached to the grounding lug by attempting to pull the wire out of the crimped lug.

Step 5 Secure the grounding lug to the grounding pad threaded studs with the two M6 nuts and tighten them to 40 in-lb (4.5 N·m). Figure 6-14 shows the location of the grounding pads on the PIU. Ensure that the grounding lug and the grounding wire do not interfere with other PIU equipment.

Figure 6-14 Grounding the PIU



1	Place the grounding lug on grounding posts.	**2**	Fasten the lug to the PIU using two M6 nuts and tighten to 40 in-lb (4.5 N·m).

Step 6 Prepare the other end of the grounding wire and connect it to an appropriate grounding point in your site to ensure an adequate earth ground for the PIU.

Connecting the DC Power Supply to a Power Source Through a PIU

Before you begin connecting the DC power supply, make sure that the power supply and the PIU are located so that you can connect them with the power cable that you are connecting to the power supply. For the 6-kw power supply, this 15-foot (4.6-m) cable ships with the power supply. For the 3-kw power supply, you supply the 6-AWG power cables.

Warning **Read the installation instructions before connecting the system to the power source.** Statement 1004

To connect the DC power supply to DC power sources through a power interface unit, follow these steps:

Step 1 Make sure that the power is turned off for the portion of the DC grid power that you are connecting to.

Step 2 Make sure that the power supply is set to standby (labelled as STBY or 0).

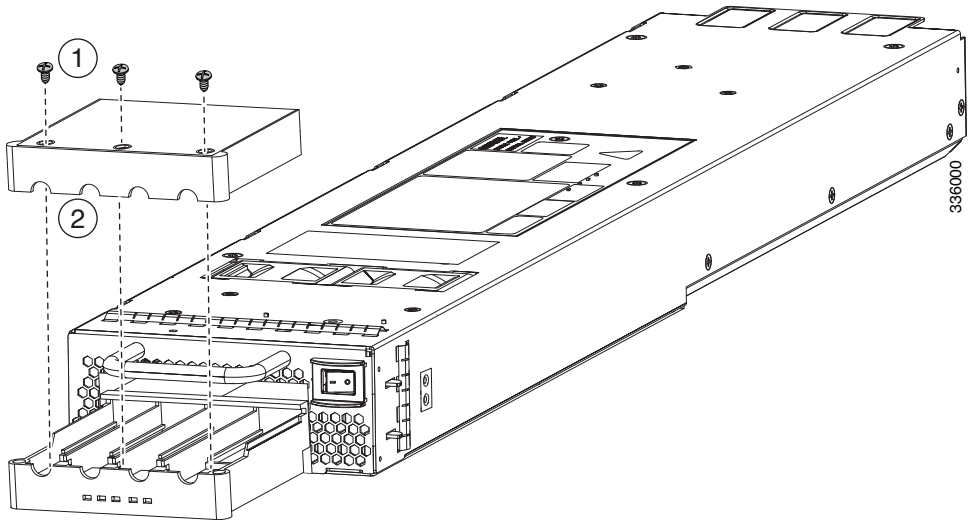
Step 3 Size the power cables to the distance between the power supply and the PIU. If you need to cut the cable, cut it at the ends that connect to the PIU, remove 0.75 in. (19 mm) of insulation from the cut end, and reattach the spade connector to the bare ends.

Warning **Hazardous voltage or energy may be present on DC power terminals. Always replace cover when terminals are not in service. Be sure uninsulated conductors are not accessible when cover is in place.** Statement 1075

Step 4 If you are connecting a 3-kW DC power supply, install four cables (two positive and two negative cables) in the four terminal slots as follows:

a. Unscrew the three screws on the top of the terminal box and lift off the safety cover (see Figure 6-15).

Figure 6-15 Removing the Safety Cover from the Terminal Box



1	Remove the screws from the cover.	**2**	Remove the safety cover.

b. Unscrew the two nuts in each of the four terminal slots inside the terminal box.

c. Remove a lug from each terminal (total of four lugs).

d. For each of the four power cables, carefully crimp a lug on the end of the cable. Be sure not to deform the lug or cable in a way that prevents you from fitting the lug back into one of the terminal slots. Also, ensure that each lug is securely fastened to the cable by attempting to pull the cable out of the lug.

e. Attach each cable lug to a terminal by placing it on two terminal posts and fasten it with two nuts tightened 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 use the other color for all negative circuits.

f. Replace the safety cover on the terminal box and fasten it with three screws.

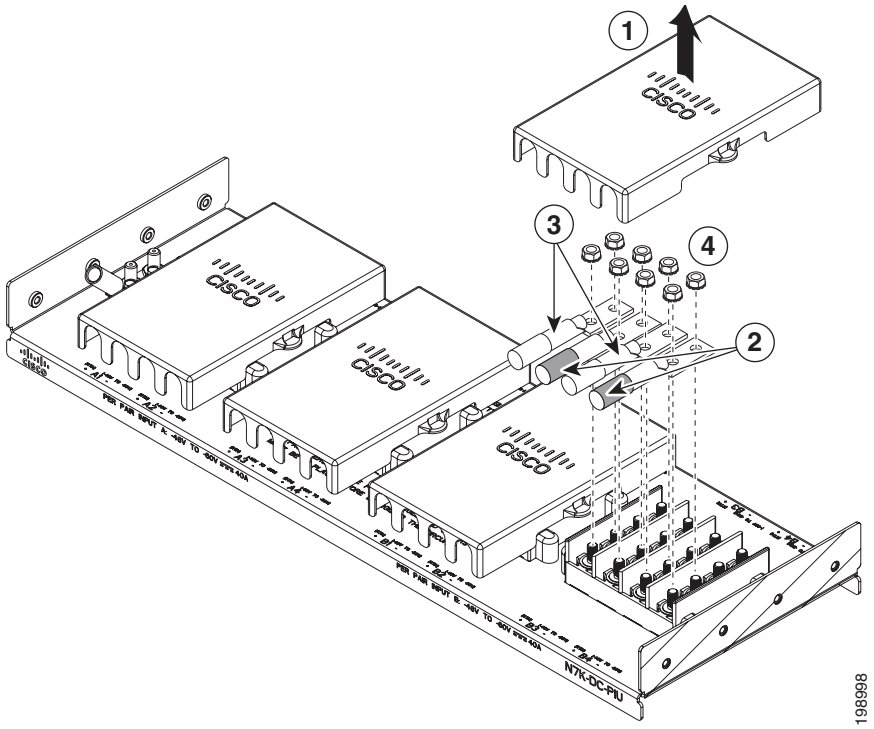
Step 5 If you are connecting a 6-kW DC power supply, insert the plug end of one or two power cables (Cisco part number N7K-DC-CAB=) to the power receptacles on the power supply and tighten its two screws to 11 to 15 in-lb (1.2 to 1.7 N·m).

Note If the plug does not insert easily, turn it over and reinsert it.

Step 6 Attach each set of four power supply and four power source cables to the PIU as follows:

a. Remove the safety cover for a set of four PIU terminals (see Callout 1 in Figure 6-16).

Figure 6-16 Connecting Power Cables to a PIU



1	Remove the cover.	**3**	Place the positive power supply cable lugs (2) on the front positive posts.
2	Place the negative power supply cable lugs (2) on the front negative posts. Use one color for negative cables and another color for positive cables.	**4**	Fasten all four lugs with eight M6 nuts and tighten to 40 in-lb (4.5 N·m).

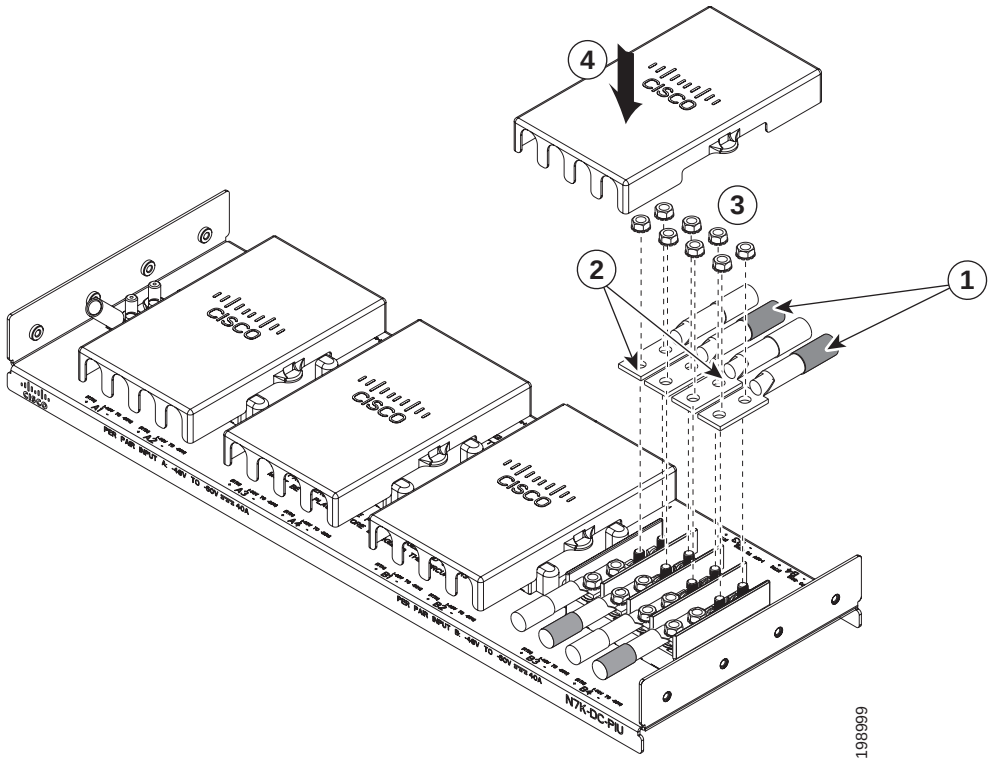
b. In each of the uncovered terminal slots, unscrew and remove two nuts (remove a total of eight nuts) as shown by Callout 4 in Figure 6-16.

c. Attach the lugs for each of the four power supply cables to four terminals and fasten each lug with two nuts. Be sure that each negative cable is attached to a negative terminal and each positive cable is attached to a positive terminal as marked by the PIU slots. See Callouts 2 and 3 in Figure 6-16.

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. In each of the uncovered terminal slots, unscrew and remove two nuts (remove a total of eight nuts) as shown by Callout 3 in Figure 6-17.

Figure 6-17 Connecting the Negative Inputs to the PIU



1	Attach the negative lugs to negative posts.	**3**	Fasten each of the four lugs with two M6 nuts and tighten to 40 in-lb (4.5 N·m).
2	Attach the positive lugs to positive posts.	**4**	Replace the cover on top of the connections.

e. Attach the lugs for each of the four power source cables to four terminals. Be sure that each negative cable is attached to a negative terminal and each positive cable is attached to a positive terminal. See Callouts 1 and 2 in Figure 6-17.

f. Fasten each lug to its terminal poles with two nuts and tighten to 40 in-lb (4.5 N·m). See Callout 3 in Figure 6-17).

g. Replace the safety cover on the PIU as shown by Callout 4 in Figure 6-17.

Step 7 Install the four cables from the PIU to the DC power source as follows:

a. If the wire is not stripped of its insulation for the last 0.75 inches (19 mm), use wire strippers to remove that amount of insulation from the end of the wire.

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 DC power source. Depending on whether you need input source redundancy, connect these cables to one or two power sources as follows:

- For combined power mode or power supply redundancy modes, connect all DC power supply cables to one DC power source.
- For input source redundancy mode or full redundancy mode with a 3-kW DC power supply, connect the power cables for half of the power supplies to one DC power source and connect the power cables for the other half of the power supplies to another DC power source.
- For input source redundancy mode or full redundancy mode with a 6-kW DC power supply, connect the four power cables connected to the top power plug on the power supply to one DC power source and connect the four power cables for the bottom power plug on the power supply to another DC power source.

Step 8 For the powered down circuits connected to the power supplies, turn on the power at the circuit breaker. The Input LEDs turn on each connected power supply.

Step 9 Turn the power switch on the connected DC power supplies from standby (labelled as STBY or 0) to on (labelled as ON or 1). The LEDs should flash and then the Output LEDs should turn on in addition to the Input LEDs.

If the FAULT LED is lit or flashing, call Cisco TAC for assistance.

Connecting the Cisco Nexus 7000 Series Switch to the Network

This chapter describes how to connect the Cisco Nexus 7000 Series switch (configure its IP address through a console, set up its management interface, and connect its Ethernet ports to the network) after it has been installed in its rack or cabinet.

This chapter includes the following sections:

Preparing for Connections

When preparing your site for network connections to the Cisco Nexus 7000 Series switch, consider the following for each type of interface:

- Cabling required for each interface type
- Distance limitations for each signal type
- Additional interface equipment needed

Before installing the switch, have all additional external equipment and cables available.

Required Tools and Equipment

- Console cable connector kit—You can find this kit in the accessory kit, which ships with the Cisco Nexus 7000 Series switch.
- Network cabling—You have already routed the network cables to the location of the installed Cisco Nexus 7000 Series switch.

- If you are creating a management connection to the supervisor module, you need to use a modular, RJ-45, UTP straight-through or crossover cable.

Connecting to the Console

Before you create a network management connection for a Cisco Nexus 7000 Series 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.

This local management connection is made between the asynchronous serial port on each Cisco Nexus 7000 Series supervisor module and a console device capable of asynchronous transmission, such as a computer terminal. On the supervisor modules, you use one of the following two asynchronous serial ports:

- CONSOLE SERIAL PORT

  This port is used for direct connections to the console.
- COM1/AUX SERIAL PORT (Supervisor 1 only)

  This port is used for modem 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.

To connect the Cisco Nexus 7000 Series switch to a computer terminal, follow these steps for each supervisor module installed:

Step 1 Configure the terminal 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 one of the following serial ports on one of the supervisor modules on the Cisco Nexus 7000 Series switch:

- CONSOLE SERIAL PORT—Use this port if you are not using a modem.
- COM1/AUX SERIAL PORT—Use this port if you are using a modem (available with only Supervisor 1).

You can find this cable in the console cable connector kit, which is part of the accessory kit for the Cisco Nexus 7000 Series switch.

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 that can connect to the console. If the console or modem cannot use an RJ-45 connection, use one of the following adapters from the console cable connector kit:

- RJ-45/DSUB F/F adapter
- RJ-45/DSUB R/P adapter
- DB-9F/RJ-45F PC terminal

Creating an Initial Switch Configuration

After you create the local management connection with a console, you must assign an IP address to the switch management interface so that you can then connect the switch to the network.

As soon as you power up the switch, it boots up and asks you a series of questions to configure the switch. This section explains how to configure the IP address that is required to connect the switch to the network. To enable you to connect the switch to the network, you can use the default choices for each configuration except the IP address. You can perform the other configurations at a later time as described in the *Cisco Nexus 7000 Series NX-OS Fundamentals Configuration Guide, Release 6.x*.

Before you perform the initial switch configuration, you must determine the IP address and netmask needed for the following interfaces:

- Management (Mgmt0) interface
- Connectivity management processor (CMP) for the supervisor module in chassis slot 6 (Supervisor 1 modules only)
- CMP for the supervisor module in chassis slot 5 (Supervisor 1 modules only)

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

To define the IP addresses required for an initial switch configuration, follow these steps:

Step 1 Power up the switch by turning the power switch from standby (STBY or 0) to on (ON or 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.

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.

You can now set up the management interface for each supervisor module on the Cisco Nexus 7000 Series switch.

Setting Up the Management Interface

The Cisco Nexus 7000 Series supervisor management port (MGMT ETH) provides out-of-band management, which enables you to use the CLI or the 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 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 the "Creating an Initial Switch Configuration" section on page 7-3.

To connect the supervisor modules to the network, follow these steps for each supervisor module:

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 the network device.

Connecting the Supervisor CMP Port

The CMP, which is included on the Cisco Nexus 7000 Series Supervisor 1 module (the CMP is not included on the Supervisor 2 or Supervisor 2E models), is a secondary, lightweight processor that provides a second network interface to the system for use even when the Control Processor (CP) is not reachable. You can access the CMP to perform operations, such as taking over the CP console, restarting the CP, or restarting a particular I/O module.

Caution To prevent an IP address conflict, do not connect the CMP MGMT 10/100/1000 Ethernet port to the network until the initial configuration is complete. For more information, see the "Connecting to the Console" section on page 7-2.

To connect the CMP to the network, follow these steps for each installed supervisor module:

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

Step 2 Route the cable through the cable management system and to the networking device.

To configure the port, see the *Cisco Nexus 7000 Series Connectivity Management Processor Configuration Guide*.

Connecting an I/O Module

After you set up an IP address for the switch and create an out-of-band management connection for the switch, you can connect the copper (1000BASE-T) and fiber-optic (SFP, SFP+, FET, and X2) I/O modules to the network. Table 7-1 lists the connectors and cables that you can use with each type of I/O module.

Table 7-1 Connectors and Cables Supported by I/O Modules

Module	Port Type	Connector/Transceiver	Fiber and Cable Type
F1 Series 32-port 1- /10-Gigabit Ethernet (N7K-F132XP-15)	SFP+	DWDM-SFP10G-xx.xx	SMF
		SFP-H10GB-ACU7M SFP-H10GB-ACU10M	Twinax cable
		SFP-H10GB-CU1M SFP-H10GB-CU1.5M SFP-H10GB-CU2M SFP-H10GB-CU2.5M SFP-H10GB-CU3M SFP-H10GB-CU5M	Twinax cable
		SFP-10G-AOC1M SFP-10G-AOC2M SFP-10G-AOC3M SFP-10G-AOC5M SFP-10G-AOC7M SFP-10G-AOC10M	Active Optical Cable assembly
		SFP-10G-ER SFP-10G-LR SFP-10G-LRM SFP-10G-ZR[2]	SMF
		SFP-10G-SR SFP-10G-LRM	MMF
	SFP	CWDM-SFP-1xxx DWDM-SFP-xxxx GLC-EX-SMD GLC-LH-SM GLC-LH-SMD GLC-ZX-SM GLC-ZX-SMD SFP-GE-L SFP-GE-Z	SMF
		GLC-LH-SM GLC-LH-SMD GLC-SX-MM GLC-SX-MMD SFP-GE-L SFP-GE-S	MMF
	1000BASE-T	GLC-T SFP-GE-T	Category 5

Table 7-1 Connectors and Cables Supported by I/O Modules (continued)

Module	Port Type	Connector/Transceiver	Fiber and Cable Type
F2 Series 48-port 1-/10-Gigabit Ethernet XL (N7K-F248XP-25 and N7K-F248XP-25E)	SFP+	DWDM-SFP10G-xx.xx	SMF
		FET-10G	MMF(OM2) MMF(OM3 and OM4)
		SFP-H10GB-ACU7M SFP-H10GB-ACU10M	Twinax cable , active
		SFP-H10GB-CU1M SFP-H10GB-CU1.5M SFP-H10GB-CU2M SFP-H10GB-CU2.5M SFP-H10GB-CU3M SFP-H10GB-CU5M	Twinax cable, passive
		SFP-10G-AOC1M SFP-10G-AOC2M SFP-10G-AOC3M SFP-10G-AOC5M SFP-10G-AOC7M SFP-10G-AOC10M	Active Optical Cable assembly
		SFP-10G-ER SFP-10G-ER-S SFP-10G-LR SFP-10G-LR-S SFP-10G-LRM SFP-10G-SR SFP-10G-SR-S SFP-10G-ZR[2] SFP-10G-ZR-S SFP-10G-BXD-I SFP-10G-BXU-I	SMF
	SFP	CWDM-SFP-xxxx DWDM-SFP-xxxx GLC-EX-SMD GLC-LH-SM GLC-LH-SMD GLC-SX-MM GLC-SX-MMD GLC-ZX-SM GLC-ZX-SMD SFP-GE-L SFP-GE-S, SFP-GE-Z GLC-BX-D, GLC-BX-U GLC-T, GLC-TE SFP-GE-T, SFP-GE-S SFP-GE-L,SFP-GE-Z	

Table 7-1 Connectors and Cables Supported by I/O Modules (continued)

Module	Port Type	Connector/Transceiver	Fiber and Cable Type
F3 Series 48-port 1-/10-Gigabit Ethernet (N7K-F348XP-25)	SFP+	DWDM-SFP10G-xx.xx	SMF
		FET-10G	MMF(OM2) MMF(OM3 and OM4)
		SFP-H10GB-ACU7M SFP-H10GB-ACU10M	Twinax cable assembly, active
		SFP-H10GB-CU1M SFP-H10GB-CU3M SFP-H10GB-CU5M	Twinax cable assembly, passive
		SFP-10G-AOC1M SFP-10G-AOC2M SFP-10G-AOC3M SFP-10G-AOC5M SFP-10G-AOC7M SFP-10G-AOC10M	Active optical cable assembly
		SFP-10G-ER SFP-10G-ER-S SFP-10G-LR SFP-10G-LR-S SFP-10G-LRM SFP-10G-ZR SFP-10G-ZR-S	SMF
		SFP-10G-LRM SFP-10G-SR SFP-10G-SR-S	MMF
	SFP	CWDM-SFP-xxxx DWDM-SFP-xxxx GLC-BX-U GLC-BX-D GLC-EX-SMD GLC-LH-SMD GLC-SX-MMD GLC-ZX-SMD	SMF
		GLC-LH-SMD	MMF
		GLC-TE	Category 5

Table 7-1 Connectors and Cables Supported by I/O Modules (continued)

Module	Port Type	Connector/Transceiver	Fiber and Cable Type
F3 Series, 12-port 40-Gigabit Ethernet (N7K-F312FQ-25)	QSFP+	FET-40G	MMF
		QSFP-H40G-ACU7M QSFP-H40G-ACU10M	Direct-attach copper, active
		QSFP-H40G-AOC1M QSFP-H40G-AOC2M QSFP-H40G-AOC3M QSFP-H40G-AOC5M QSFP-H40G-AOC7M QSFP-H40G-AOC10M	Active optical cable assembly
		QSFP-4X10G-AC7M QSFP-4X10G-AC10M	Direct-attach breakout copper, active
		QSFP-4X10G-AOC1M QSFP-4X10G-AOC2M QSFP-4X10G-AOC5M QSFP-4X10G-AOC7M QSFP-4X10G-AOC10M	Active Optical breakout Cable assembly
		QSFP-40G-CSR4 QSFP-40G-SR-BD QSFP-40G-SR4 QSFP-40G-SR4-S	MMF
F3 Series 6-port 100-Gigabit Ethernet (N7K-F306CK-25)	CPAK	CPAK-100G-SR10	MMF (OM3) MMF (OM4)
		CPAK-100G-LR4	SMF
M1 Series, 32-port 10-Gigabit Ethernet (N7K-M132XP-12)	SFP+	FET-10G[1]	MMF
		SFP-10G-ER SFP-10G-LR	SMF
		SFP-10G-SR	MMF
		SFP-10G-ACU7M SFP-10G-ACU10M	Twinax cable, active

Table 7-1 Connectors and Cables Supported by I/O Modules (continued)

Module	Port Type	Connector/Transceiver	Fiber and Cable Type
M1 Series, 32-port 10-Gigabit Ethernet XL (N7K-M132XP-12L)	SFP+	DWDM-SFP10G-xx.xx	SMF
		FET-10G[1]	MMF
		SFP-10G-AOC1M SFP-10G-AOC2M SFP-10G-AOC3M SFP-10G-AOC5M SFP-10G-AOC7M SFP-10G-AOC10M	Active Optical Cable assembly
		SFP-10G-ER SFP-10G-LR SFP-10G-LRM SFP-10G-SR SFP-10G-ZR[2]	SMF
		SFP-10G-LRM	MMF
		SFP-H10GB-CU1M SFP-H10GB-CU1.5M SFP-H10GB-CU2M SFP-H10GB-CU2.5M SFP-H10GB-CU3M SFP-H10GB-CU5M	Twinax cable, passive
		SFP-H10GB-ACU7M SFP-H10GB-ACU10M	Twinax cable, active
M1 Series, 48-port 1-Gigabit Ethernet (N7K-M148GS-11)	SFP	CWDM-SFP-1xxx DWDM-SFP-1xxx GLC-BX-D GLC-BX-U GLC-EX-SMD GLC-LH-SM GLC-LH-SMD GLC-ZX-SM GLC-ZX-SMD SFP-GE-Z	SMF
		GLC-LH-SM GLC-LH-SMD GLC-SX-MM GLC-SX-MMD SFP-GE-L SFP-GE-S	MMF
		GLC-T SFP-GE-T	Category 5

Table 7-1 Connectors and Cables Supported by I/O Modules (continued)

Module	Port Type	Connector/Transceiver	Fiber and Cable Type
M1 Series, 48-port 1-Gigabit Ethernet XL (N7K-M148GS-11L)	SFP	CWDM-SFP-1xxx DWDM-SFP-1xxx GLC-BX-D GLC-BX-U GLC-EX-SMD GLC-LH-SM GLC-LH-SMD GLC-ZX-SM GLC-ZX-SMD SFP-GE-Z	SMF
		GLC-LH-SM GLC-LH-SMD GLC-SX-MM GLC-SX-MMD SFP-GE-L SFP-GE-S	MMF
		GLC-T SFP-GE-T	Category 5
M1 Series, 48-port 10/100/1000 Ethernet (N7K-M148GT-11)	1000BASE-T	RJ-45	
M1 Series, 48-port 10/100/1000 Ethernet (N7K-M148GT-11L)	1000BASE-T	RJ-45	

Table 7-1 Connectors and Cables Supported by I/O Modules (continued)

Module	Port Type	Connector/Transceiver	Fiber and Cable Type
M1 Series, 8-port 10-Gigabit Ethernet (N7K-M108X2-12L)	10GBASE-X2	DWDM-X2-xx.xx	SMF
	10GBASE-X SFP+	SFP-10G-LR[3]	
		SFP=10G-LR-S	
		SFP-10G-LRM[3]	
		SFP-10G-SR[3]	
		SFP-10G-SR-S	MMF
		SFP-10G-LRM[3]	
		SFP-10G-SR[3]	
		SFP-H10GB-CU1M[3]	Twinax cable, passive
		SFP-H10GB-CU3M[3]	
		SFP-H10GB-CU5M[3]	
	10GBASE-X X2	X2-10GB-ER	SMF
		X2-10GB-LR	
		X2-10GB-LRM	
		X2-10GB-ZR	
		X2-10GB-LX4	MMF
		X2-10GB-LRM	
		X2-10GB-SR	
		X2-10GB-CX4	CX4 (Copper)

Table 7-1 Connectors and Cables Supported by I/O Modules (continued)

Module	Port Type	Connector/Transceiver	Fiber and Cable Type
M2 Series, 24-port 10-Gigabit Ethernet (N7K-M224XP-23L)	10GBASE-X SFP+	DWDM-SFP10G-xx.xx	SMF
		FET-10G[1]	MMF
		SFP-H10GB-CU1M SFP-H10GB-CU1.5M SFP-H10GB-CU2M SFP-H10GB-CU2.5M SFP-H10GB-CU3M SFP-H10GB-CU5M	Twinax cable, passive
		SFP-H10GB-ACU7M SFP-H10GB-ACU10M	Twinax cable, active
		SFP-10G-AOC1M SFP-10G-AOC2M SFP-10G-AOC3M SFP-10G-AOC5M SFP-10G-AOC7M SFP-10G-AOC10M	Active Optical Cable assembly
		SFP-10G-ER SFP-10G-ER-S SFP-10G-LR SFP-10G-LR-S SFP-10G-LRM SFP-10G-ZR-S SFP-10G-ZR[2]	SMF
		SFP-10G-LRM SFP-10G-SR SFP-10G-SR-S	MMF

Table 7-1 Connectors and Cables Supported by I/O Modules (continued)

Module	Port Type	Connector/Transceiver	Fiber and Cable Type
M2 Series, 6-Port 40-Gigabit Ethernet (N7K-M206FQ-23L)	QSFP+	FET-40G	MMF
		QSFP-H40G-ACU7M QSFP-H40G-ACU10M	Direct-attache Copper
		QSFP-H40G-AOC1M QSFP-H40G-AOC2M QSFP-H40G-AOC3M QSFP-H40G-AOC5M QSFP-H40G-AOC7M QSFP-H40G-AOC10M	Active Optical Cable Assembly
		QSFP-4X10G-AC7M QSFP-4X10G-AC10M	Direct-attach copper breakout
		QSFP-4X10G-AOC1M QSFP-4X10G-AOC2M QSFP-4X10G-AOC5M QSFP-4X10G-AOC7M QSFP-4X10G-AOC10M	Active Optical Breakout Cable Assembly
		QSFP-40G-CSR4 QSFP-40G-SR-BD QSFP-40G-SR4 QSFP-40G-SR4-S	MMF
M2 Series, 2-Port 100-Gigabit Ethernet (N7K-M202CF-22L)	CFP	CFP-100G-LR4 CFP-40G-LR4	SMF
		CFP-100G-SR10 CFP-40G-SR4	MMF

Table 7-1 Connectors and Cables Supported by I/O Modules (continued)

Module	Port Type	Connector/Transceiver	Fiber and Cable Type
M3 Series 48-Port 1-/10-Gigabit Ethernet (N7K-M348XP-25L)	SFP+	SFP-10G-SR SFP-10G-SR-S	MMF
		SFP-10G-LR SFP-10G-LR-S SFP-10G-LRM SFP-10G-ER SFP-10G-ER-S SFP-10G-ZR SFP-10G-ZR-S	SMF
		SFP-10G-BXD-I SFP-10G-BXU-I CWDM-SFP10G-1xxx DWDM-SFP10G-xx.xx	
		SFP-H10GB-ACU7M SFP-H10GB-ACU10M	Twinax cable, active
		SFP-H10GB-CU1M SFP-H10GB-CU1.5M SFP-H10GB-CU2M SFP-H10GB-CU2.5M SFP-H10GB-CU3M SFP-H10GB-CU5M	Twinax cable, passive
		SFP-10G-AOC1M SFP-10G-AOC2M SFP-10G-AOC3M SFP-10G-AOC5M SFP-10G-AOC7M SFP-10G-AOC10M	Active Optical Cable Assembly
	SFP	CWDM-SFP-xxxx DWDM-SFP-xxxx	SMF
		GLC-TE	Category 5
		GLC-SX-MMD GLC-LH-SMD	MMF
		GLC-EX-SMD GLC-LH-SMD GLC-ZX-SMD GLC-BX-D GLC-BX-U	SMF

Table 7-1 Connectors and Cables Supported by I/O Modules (continued)

Module	Port Type	Connector/Transceiver	Fiber and Cable Type
M3 Series 24-Port 40-Gigabit Ethernet (N7K-M324FQ-25L)	QSFP+	QSFP-40G-SR4 QSFP-40G-SR4-S QSFP-40G-CSR4 QSFP-40G-SR-BD	MMF
		QSFP-40G-LR4 QSFP-40G-LR4-S QSFP-40G-ER4 QSFP-4X10G-LR-S	SMF
		QSFP-H40G-AOC1M QSFP-H40G-AOC2M QSFP-H40G-AOC3M QSFP-H40G-AOC5M QSFP-H40G-AOC7M QSFP-H40G-AOC10M QSFP-H40G-AOC15M	Active Optical Cable Assembly
		QSFP-4X10G-ACUxM	Direct attach breakout copper, active
		QSFP-4X10G-AOC1M QSFP-4X10G-AOC2M QSFP-4X10G-AOC3M QSFP-4X10G-AOC5M QSFP-4X10G-AOC7M QSFP-4X10G-AOC10M	Active Optical Cable Assembly
		QSFP-4X10G-AC7M QSFP-4X10G-AC10M	Direct-attach copper cable assembly
		QSFP-H40G-ACU7M QSFP-H40G-ACU10M	Direct-attach copper, active

1. FETs are used only when connecting this I/O module to a Fabric Extender (FEX).
2. Requires Version 2 or later version.
3. Requires the CVR-X2-SFP10G OneX Converter Module (X2 to SFP+ adapter)

This section includes the following topics:

Connecting or Disconnecting a 1000BASE-T Port

This section includes the following topics:

Connecting a 1000BASE-T Port to the Network

You can connect a copper network interface cable with an RJ-45 connector to a port on a 48-port 10/100/1000 Ethernet I/O module (N7K-M148GT-11 and N7K-M148GT-11L).

To connect a 1000BASE-T Ethernet port to the network, follow these steps:

Step 1 Attach an ESD-preventative wrist strap and follow its instructions for use.

Step 2 Route the interface cable through the cable management slot for the I/O module with the port for this cable.

Step 3 Insert the RJ-45 connector on the interface cable into the appropriate port on the I/O module.

Disconnecting a 1000BASE-T Port from the Network

You can disconnect a copper network interface cable from a 48-port 10/100/1000 Ethernet module by unplugging its RJ-45 connector from its port on the module.

To disconnect a 1000BASE-T Ethernet port from the network, follow these steps:

Step 1 Attach an ESD-preventative wrist strap and follow its instructions for use.

Step 2 Unplug the RJ-45 connector on the interface cable from the appropriate port on the Ethernet I/O module.

Step 3 (Optional) If you need to remove the cable from the switch, pull it out of the cable management slot.

Connecting or Disconnecting an SFP, SFP+, or X2 Port

Depending on the I/O module model that you are using, you can use SFP, SFP+, or X2 transceivers. Some of these transceivers work with fiber-optic cables that you attach to the transceivers and other transceivers work with preattached copper cables. When installing fiber-optic cables for a port, you must install SFP transceivers for 1-Gigabit optical ports or install SFP+ or X2 transceivers or Fabric Extender Transceivers (FETs) for 10-Gigabit optical ports before installing the fiber-optic cable in the transceivers. When removing fiber-optic transceivers, you must remove the fiber-optic cables from a transceiver before removing the transceiver from the port.

Caution Removing and installing a transceiver can shorten its useful life. Do not remove and insert transceivers more often than is absolutely necessary. We recommend that you disconnect cables before installing or removing transceivers to prevent damage to the cable or transceiver.

This section includes the following topics:

Installing a Transceiver

Note Use only the transceivers listed in Table 7-1 on page 7-7. Each Cisco transceiver is encoded with model information that enables the switch to verify that the transceiver meets the requirements for the switch.

To install a transceiver, follow these steps:

Step 1 Attach an ESD-preventative wrist strap and follow its instructions for use.

Step 2 Remove the dust cover from the port cage.

Step 3 Remove the dust cover from the port end of the transceiver.

Step 4 Insert the transceiver into the port.

Caution If the transceiver does not install easily, ensure that it is correctly oriented and the clasp is in the correct position before continuing.

Step 5 If you are installing fiber-optic cables, connect two optical cables to the installed transceiver (see the "Connecting a Fiber-Optic Cable to a Transceiver" section on page 7-20).

Note If you cannot install the cable into the transceiver, insert or leave the dust plug in the cable end of the transceiver.

Removing a Transceiver

To remove a transceiver, follow these steps:

Step 1 Attach an ESD-preventative wrist strap and follow its instructions for use.

Step 2 If a cable is installed in the transceiver, remove the cable as explained in the "Disconnecting a Fiber-Optic Cable from a Transceiver" section on page 7-21.

Step 3 Remove the transceiver from the port in one of the following ways:

- For SFP or SFP+ transceivers, open the clasp on the front of the transceiver and pull the transceiver out of the port.
- For X2 transceivers, pull on the collar on the transceiver to unlock it from the port and pull the transceiver out of the port.

Step 4 Insert a dust cover into the port end of the transceiver and place the transceiver on an antistatic mat or into a static shielding bag if you plan to return it to your Cisco representative.

Step 5 If another transceiver is not being installed, protect the optical port cage by inserting a clean cover.

Connecting a Fiber-Optic Cable to a Transceiver

Caution 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.

To install a cable into a transceiver, follow these steps:

Step 1 Attach an ESD-preventative wrist strap and follow its instructions for use.

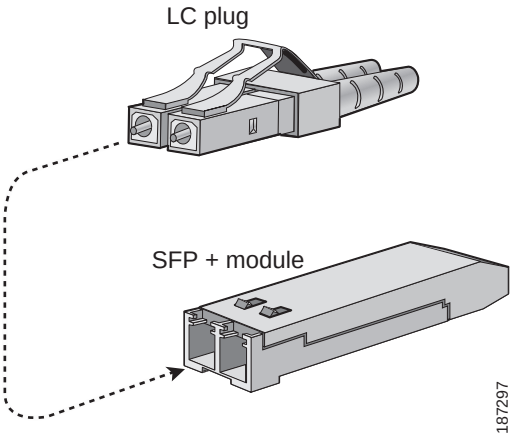
Step 2 Remove the dust cover from the port connector on the cable.

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 Figure 7-1 for SFP or SFP+ transceivers).

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

Figure 7-1 Connecting the LC-Type Cable to an Ethernet SFP or SFP+ Transceiver



Disconnecting a Fiber-Optic Cable from a Transceiver

Caution When disconnecting fiber-optic cables, be sure to cover any exposed fiber-optic openings with dust plugs.

To remove the cable, follow these steps:

Step 1 Attach an ESD-preventative wrist strap and follow its instructions for use.

Step 2 Record the cable and port connections for later reference.

Step 3 Press the release latch on the cable, grasp the connector near the connection point, and gently pull the connector from the transceiver.

Note If the cable does not remove easily, ensure that any latch present on the cable has been released before continuing.

Step 4 Insert a dust plug into the cable end of the transceiver.

Step 5 Insert a dust plug into the end of the cable.

Maintaining Transceivers and Fiber-Optic 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.

Managing the Switch Hardware

This chapter describes how to manage the switch hardware, which includes the fabric and I/O modules, and it provides information on how to monitor system and module states. This chapter includes the following sections:

Displaying the Switch Hardware Inventory

You can display information about the field replaceable units (FRUs), including product IDs, serial numbers, and version IDs by entering the **show inventory** command. See Example 8-1.

Example 8-1 Displaying the Hardware Inventory

```
switch# show inventory
psconfigs# sh inventory
NAME: "Chassis",  DESCR: "Nexus7000 C7009 (9 Slot) Chassis "
PID: N7K-C7009           ,  VID: V01 ,  SN: JAF1437APPD

NAME: "Slot 1",  DESCR: "Supervisor module-1X"
PID: N7K-SUP-1           ,  VID: V09 ,  SN: JAF1414AQFD

NAME: "Slot 2",  DESCR: "Supervisor module-1X"
PID: N7K-SUP-1           ,  VID: V03 ,  SN: JAF1240AHNH

NAME: "Slot 3",  DESCR: "10/100/1000 Mbps Ethernet Module"
PID: N7K-M148GT-11       ,  VID: V01 ,  SN: JAB115000NJ

NAME: "Slot 4",  DESCR: "10 Gbps Ethernet Module"
PID: N7K-M132XP-12       ,  VID: V01 ,  SN: JAB1152010A

NAME: "Slot 5",  DESCR: "10/100/1000 Mbps Ethernet XL Module"
PID: N7K-M148GT-11L      ,  VID: 0   ,  SN: JAF1416ABPM

NAME: "Slot 6",  DESCR: "10 Gbps Ethernet XL Module"
PID: N7K-M108X2-12L      ,  VID: 0   ,  SN: JAF1333AAJR

NAME: "Slot 7",  DESCR: "1000 Mbps Optical Ethernet Module"
PID: N7K-M148GS-11       ,  VID: V02 ,  SN: JAF1409APRB

NAME: "Slot 8",  DESCR: "1/10 Gbps Ethernet Module"
PID: N7K-F132XP-15       ,  VID: V01 ,  SN: JAF1424CFJR

NAME: "Slot 9",  DESCR: "1/10 Gbps Ethernet Module"
PID: N7K-F132XP-15       ,  VID: V01 ,  SN: JAF1321ANHP

NAME: "Slot 10",  DESCR: "Fabric card module"
PID: N7K-C7009-FAB-2     ,  VID: V01 ,  SN: JAF1448ARHJ

NAME: "Slot 11",  DESCR: "Fabric card module"
PID: N7K-C7009-FAB-2     ,  VID: V01 ,  SN: JAF1451BSSF

NAME: "Slot 12",  DESCR: "Fabric card module"
PID: N7K-C7009-FAB-2     ,  VID: V01 ,  SN: JAF1448ARHQ

NAME: "Slot 13",  DESCR: "Fabric card module"
PID: N7K-C7009-FAB-2     ,  VID: V01 ,  SN: JAF1509BHBE

NAME: "Slot 14",  DESCR: "Fabric card module"
PID: N7K-C7009-FAB-2     ,  VID: V01 ,  SN: JAF1509BHCB

NAME: "Slot 33",  DESCR: "Nexus7000 C7009 (9 Slot) Chassis Power Supply"
PID: N7K-AC-6.0KW        ,  VID: V01 ,  SN: DTM141600XT

NAME: "Slot 34",  DESCR: "Nexus7000 C7009 (9 Slot) Chassis Power Supply"
PID: N7K-AC-6.0KW        ,  VID: V01 ,  SN: DTM1414007T

NAME: "Slot 35",  DESCR: "Nexus7000 C7009 (9 Slot) Chassis Fan Module"
PID: N7K-C7009-FAN       ,  VID: V00 ,  SN: JAF1433DDEJ

switch#
```

To display switch hardware inventory details, enter the **show hardware** command. See Example 8-2.

Example 8-2 Displaying Hardware Information

```
switch# show hardware
Cisco Nexus Operating System (NX-OS) Software
TAC support: http://www.cisco.com/tac
Copyright (c) 2002-2010, 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 3.19.0
  loader:    version N/A
  kickstart: version 5.0(2)
  system:    version 5.0(2)
  BIOS compile time:       03/31/09
  kickstart image file is: bootflash:/n7000-s1-kickstart.5.0.2.bin.S19
  kickstart compile time:  12/25/2020 12:00:00 [03/04/2010 19:45:32]
  system image file is:    bootflash:/n7000-s1-dk9.5.0.2.bin.S19
  system compile time:     2/7/2010 3:00:00 [03/04/2010 20:32:24]


Hardware
  cisco Nexus7000 C7010 (10 Slot) Chassis ("Supervisor module-1X")
  Intel(R) Xeon(R) CPU         with 4135780 kB of memory.
  Processor Board ID JAF1309AECN

  Device name: psconfigs
  bootflash:    2000880 kB
  slot0:        2075246 kB (expansion flash)

Kernel uptime is 0 day(s), 1 hour(s), 5 minute(s), 53 second(s)

Last reset at 65404 usecs after  Fri Dec 12 19:34:13 2008

  Reason: Reset Requested by CLI command reload
  System version: 5.0(2)
  Service:

plugin
  Core Plugin, Ethernet Plugin


CMP (Module 5) ok
 Hardware
  Freescale Inc mpc8343 (rev 3.1 (pvr 8083 0031)) CPU with 128 MB of memory
  Model number is N7K-SUP1
  H/W Version is 1.2
  Part Number is 73-10877-11
  Part Revision is A1
  Serial number is JAF1309AECN
  CLEI code is COUCAHLCAA
  MAC address is 00-24-98-e8-20-00

CMP (Module 6) ok
 Hardware
  Freescale Inc mpc8343 (rev 3.1 (pvr 8083 0031)) CPU with 128 MB of memory
  Model number is N7K-SUP1
  H/W Version is 1.2
```

```
  Part Number is 73-10877-11
  Part Revision is A1
  Serial number is JAF1309AEFE
  CLEI code is COUCAHLCAA
  MAC address is 00-24-98-6f-37-92

--------------------------------
Switch hardware ID information
--------------------------------

Switch is booted up
  Switch type is : Nexus7000 C7010 (10 Slot) Chassis
  Model number is N7K-C7010
  H/W version is 1.1
  Part Number is 73-10900-04
  Part Revision is B0
  Manufacture Date is Year 13 Week 10
  Serial number is JAF13100003
  CLEI code is IPMKA00ARA

--------------------------------
Chassis has 10 Module slots and 5 Fabric slots
--------------------------------

Module1  empty

Module2  ok
  Module type is : 10/100/1000 Mbps Ethernet Module
  1 submodules are present
  Model number is N7K-M148GT-11
  H/W version is 1.3
  Part Number is 73-10098-12
  Part Revision is A0
  Manufacture Date is Year 13 Week 6
  Serial number is JAF1306AAFP
  CLEI code is COUIAW3CAA

Module3  ok
  Module type is : 10/100/1000 Mbps Ethernet Module
  1 submodules are present
  Model number is N7K-M148GT-11
  H/W version is 1.3
  Part Number is 73-10098-12
  Part Revision is A0
  Manufacture Date is Year 13 Week 3
  Serial number is JAF1303ACPB
  CLEI code is COUIAW3CAA

Module4  ok
  Module type is : 10/100/1000 Mbps Ethernet Module
  1 submodules are present
  Model number is N7K-M148GT-11
  H/W version is 1.3
  Part Number is 73-10098-12
  Part Revision is A0
  Manufacture Date is Year 13 Week 9
  Serial number is JAF1309ABLE
  CLEI code is COUIAW3CAA

Module5  ok
  Module type is : Supervisor module-1X
  0 submodules are present
  Model number is N7K-SUP1
  H/W version is 1.2
```

```
  Part Number is 73-10877-11
  Part Revision is A1
  Manufacture Date is Year 13 Week 9
  Serial number is JAF1309AECN
  CLEI code is COUCAHLCAA

Module6  ok
  Module type is : Supervisor module-1X
  0 submodules are present
  Model number is N7K-SUP1
  H/W version is 1.2
  Part Number is 73-10877-11
  Part Revision is A1
  Manufacture Date is Year 13 Week 9
  Serial number is JAF1309AEFE
  CLEI code is COUCAHLCAA

Module7  ok
  Module type is : 10 Gbps Ethernet Module
  2 submodules are present
  Model number is N7K-M132XP-12
  H/W version is 1.5
  Part Number is 73-10899-09
  Part Revision is B1
  Manufacture Date is Year 13 Week 7
  Serial number is JAF1307ALCB
  CLEI code is COUIAWGCAA

Module8  empty

Module9  ok
  Module type is : 1000 Mbps Optical Ethernet Module
  1 submodules are present
  Model number is N7K-M148GS-11
  H/W version is 1.2
  Part Number is 73-11584-05
  Part Revision is A0
  Manufacture Date is Year 13 Week 11
  Serial number is JAF1311AEMM
  CLEI code is COUIAV0CAB

Module10  empty

Xbar1  ok
  Module type is : Fabric card module
  0 submodules are present
  Model number is N7K-C7010-FAB-1
  H/W version is 1.0
  Part Number is 73-10624-04
  Part Revision is C0
  Manufacture Date is Year 13 Week 9
  Serial number is JAF1309ACAP
  CLEI code is COUCAGVCAA

Xbar2  ok
  Module type is : Fabric card module
  0 submodules are present
  Model number is N7K-C7010-FAB-1
  H/W version is 1.0
  Part Number is 73-10624-04
  Part Revision is C0
  Manufacture Date is Year 13 Week 9
  Serial number is JAF1309AAHB
  CLEI code is COUCAGVCAA
```

```
Xbar3  ok
  Module type is : Fabric card module
  0 submodules are present
  Model number is N7K-C7010-FAB-1
  H/W version is 1.0
  Part Number is 73-10624-04
  Part Revision is C0
  Manufacture Date is Year 13 Week 6
  Serial number is JAF1306ANJJ
  CLEI code is COUCAGVCAA

Xbar4  ok
  Module type is : Fabric card module
  0 submodules are present
  Model number is N7K-C7010-FAB-1
  H/W version is 1.0
  Part Number is 73-10624-04
  Part Revision is C0
  Manufacture Date is Year 13 Week 9
  Serial number is JAF1309ACAT
  CLEI code is COUCAGVCAA

Xbar5  ok
  Module type is : Fabric card module
  0 submodules are present
  Model number is N7K-C7010-FAB-1
  H/W version is 1.0
  Part Number is 73-10624-04
  Part Revision is C0
  Manufacture Date is Year 13 Week 6
  Serial number is JAF1306ANKF
  CLEI code is COUCAGVCAA

---------------------------------------
Chassis has 3 PowerSupply Slots
---------------------------------------

PS1 ok
  Power supply type is: 6000.00W 220v AC
  Model number is N7K-AC-6.0KW
  H/W version is 1.0
  Part Number is 341-0230-02
  Part Revision is A0
  Manufacture Date is Year 12 Week 16
  Serial number is DTH1216T020
  CLEI code is IPUPADBAAA

PS2 ok
  Power supply type is: 6000.00W 220v AC
  Model number is N7K-AC-6.0KW
  H/W version is 1.0
  Part Number is 341-0230-02
  Part Revision is A0
  Manufacture Date is Year 12 Week 17
  Serial number is DTH1217T029
  CLEI code is IPUPADBAAA

PS3 ok
  Power supply type is: 6000.00W 220v AC
  Model number is N7K-AC-6.0KW
  H/W version is 1.0
  Part Number is 341-0230-02
  Part Revision is A0
```

```
  Manufacture Date is Year 12 Week 15
  Serial number is DTH1215T139
  CLEI code is IPUPADBAAA

---------------------------------
Chassis has 4 Fan slots
---------------------------------

Fan1(sys_fan1) ok
  Model number is N7K-C7010-FAN-S
  H/W version is 1.1
  Part Number is 73-10741-04
  Part Revision is B0
  Manufacture Date is Year 13 Week 3
  Serial number is FOX1303XABC
  CLEI code is COM8210ARA

Fan2(sys_fan2) ok
  Model number is N7K-C7010-FAN-S
  H/W version is 1.1
  Part Number is 73-10741-04
  Part Revision is B0
  Manufacture Date is Year 13 Week 6
  Serial number is FOX1306X03U
  CLEI code is COM8210ARA

Fan3(fab_fan1) ok
  Model number is N7K-C7010-FAN-F
  H/W version is 1.1
  Part Number is 73-10967-02
  Part Revision is B0
  Manufacture Date is Year 12 Week 41
  Serial number is FOX1241XA6Q
  CLEI code is IPEQABAEAA

Fan4(fab_fan2) ok
  Model number is N7K-C7010-FAN-F
  H/W version is 1.1
  Part Number is 73-10967-02
  Part Revision is B0
  Manufacture Date is Year 12 Week 41
  Serial number is FOX1241XA7U
  CLEI code is IPEQABAEAA

switch#
```

Displaying the Switch Serial Number

The serial number of your Cisco Nexus 7000 Series switch can be obtained by looking at the serial number label on the back of the switch (next to the power supply), or by entering the **show sprom backplane 1** command. See Example 8-3.

Example 8-3 Displaying the Switch Serial Number

```
switch# show sprom backplane 1
DISPLAY backplane sprom contents:
Common block:
 Block Signature : 0xabab
 Block Version   : 3
 Block Length    : 160
```

```
 Block Checksum  : 0x13bd
 EEPROM Size     : 65535
 Block Count     : 5
 FRU Major Type  : 0x6001
 FRU Minor Type  : 0x0
 OEM String      : Cisco Systems, Inc.
 Product Number  : N7K-C7010
 Serial Number   : TBM11493268
 Part Number     : 73-10900-04
 Part Revision   : 06
 Mfg Deviation   : 0
 H/W Version     : 0.406
 Mfg Bits        : 0
 Engineer Use    : 0
 snmpOID         : 0.0.0.0.0.0.0.0
 Power Consump   : 0
 RMA Code        : 0-0-0-0
 CLEI Code       : 0
 VID             : V01
Chassis specific block:
 Block Signature : 0x6001
 Block Version   : 3
 Block Length    : 39
 Block Checksum  : 0x268
 Feature Bits    : 0x0
 HW Changes Bits : 0x0
 Stackmib OID    : 0
 MAC Addresses   : 00-1b-54-c2-1e-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
wwn 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
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 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  : 0x77
lic usage bits:
 00 00 00 00 00 00 00 00
Second Serial number specific block:
 Block Signature : 0x6007
 Block Version   : 1
 Block Length    : 28
 Block Checksum  : 0x312
 Serial Number   : TBM11476798
switch#
```

Displaying Power Usage Information

To display the actual power usage information for the entire switch, use the **show environment power** command (see Example 8-4 for power allocations displayed for a Cisco Nexus 7018 switch). This command shows the power usage for many of the modules 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 In a Cisco Nexus 7000 Series switch, power usage is reserved for both supervisor modules regardless of whether one or both supervisor modules are present.

Example 8-4 Power Management Information Displayed for a Cisco Nexus 7018 Switch

```
switch# show environment power
Power Supply:
Voltage: 50 Volts
Power                                  Actual        Total
Supply    Model                        Output     Capacity    Status
                                      (Watts )     (Watts )
-------  ------------------  -----------  -----------  --------------
1        N7K-AC-6.0KW            1272 W       6000 W     Ok
2        N7K-AC-6.0KW             584 W       3000 W     Ok
3        -                          0 W          0 W     Shutdown
4        -                          0 W          0 W     Shutdown


                                    Actual        Power
Module    Model                       Draw    Allocated    Status
                                    (Watts )     (Watts )
-------  ------------------  -----------  -----------  --------------
4        N7K-F248XP-24            292 W        400 W    Powered-Up
5        N7K-F132XP-15            302 W        425 W    Powered-Up
6        N7K-M108X2-12L           464 W        850 W    Powered-Up
8        N7K-M148GS-11L           248 W        400 W    Powered-Up
9        N7K-SUP1                 N/A          210 W    Powered-Up
10       supervisor               N/A          210 W    Absent
Xb1      N7K-C7018-FAB-1          N/A          150 W    Powered-Up
Xb2      xbar                     N/A          150 W    Absent
```

```
Xb3      xbar                      N/A          150 W    Absent
Xb4      xbar                      N/A          150 W    Absent
Xb5      xbar                      N/A          150 W    Absent
fan1     N7K-C7018-FAN             213 W        578 W    Powered-Up
fan2     N7K-C7018-FAN             148 W        422 W    Powered-Up

N/A - Per module power not available


Power Usage Summary:
--------------------
Power Supply redundancy mode (configured)                PS-Redundant
Power Supply redundancy mode (operational)               Non-Redundant

Total Power Capacity (based on configured mode)               9000 W
Total Power of all Inputs (cumulative)                        9000 W
Total Power Output (actual draw)                              1856 W
Total Power Allocated (budget)                                4245 W
Total Power Available for additional modules                  4755 W

switch#
```

Power Supply Configuration Modes

This section includes the following topics:

Power Supply Configuration Overview

You can configure one of the following power modes to either use the combined power provided by the installed power supply units or to provide power redundancy when there is a power loss:

- Combined mode—Provides the maximum amount of available power by utilizing the combined power output from all installed power supply units for switch operations. This mode does not provide redundancy.
- Power-supply redundancy mode—Allows you to replace a power supply during switch operations. All power supplies are active. The available power is calculated as the least amount of power available from all but one of the power supply units (N+1). The reserve power is the amount of power output by the power supply unit that can output the most power. For example, if three power supply units output 3 kW, 6 kW, and 6 kW, the available power is 9 kW (3 kW + 6 kW) and the reserve power is 6 kW.
- Input source redundancy mode—Takes power from two electrical grids so that if one grid goes down, the other grid can provide the power needed by the switch. For the Cisco Nexus 7004 chassis, each grid powers half of the power supplies. For the Cisco Nexus 7009, 7010, and 7018 chassis, each grid powers half of each power supply unit (grid A is connected to the Input 1 receptacle on each power supply unit and grid B is connected to the Input 2 receptacle on each power supply unit). The available power is the amount of power output by the portions of the power supply units that are connected to the same grid. For example, if three power supply units are connected to a 110-V grid and a 220-V grid, each power supply outputs 1.2 kW for the 110-V grid and 3.0 kW for the 220-V grid. The available power would be 3.6 kW (1.2 kW + 1.2 kW + 1.2 kW) and the reserve power would be 9.0 kW (3.0 kW + 3.0 kW + 3.0 kW).

- Full redundancy mode—Provides both power-supply redundancy and input-source redundancy. This mode allows you to replace a power supply unit without interrupting switch operations or continue powering the switch if one of two grids goes down. The available power is the lesser amount of output power for power supply redundancy or input source redundancy.

The amount of power available for use with your Cisco Nexus 7000 Series switch depends on the number of power supply units, input voltage used, and the power mode used. To determine the amount of available power for the power supply units, see the following tables:

- For the 3-kW AC power supply units, see Table A-11 on page A-13
- For the 6-kW AC power supply units, see Table A-13 on page A-16
- For the 7.5-kW AC power supply units, see Table A-14 on page A-17
- For the 3-kW DC power supply units, see Table A-15 on page A-18
- For the 6-kW DC power supply units, see Table A-17 on page A-19
- For the 3.5-kW HVAC/HVDC power supplies, see Table A-12 on page A-15 and Table A-16 on page A-18

Configuring the Power Supply Mode

You can configure the power supply mode.

SUMMARY STEPS

1. **config t**
2. **power redundancy-mode** *mode*

DETAILED STEPS

	Command	Purpose

Step 1	`config t`
	
	Example:
	`switch# config t`
	`switch(config)#`
		Starts the global configuration mode.

Step 2	`power redundancy-mode` *mode*
	
	Example:
	`switch(config)# power redundancy-mode redundant`
	`switch(config)#`
		Configures one of the following power supply modes:
		• For combined mode, use the **combined** keyword.
		• For power supply redundancy, use the **ps-redundant** keyword.
		• For input source redundancy, use the **insrc-redundant** keyword.
		• For full redundancy, use the **redundant** keyword.

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

Power Supply Configuration Guidelines

Follow these guidelines when configuring power supply units:

- When power supply units with different capacities are installed in the switch, the amount of available power differs based on one of the following configuration modes:
  - Combined mode—To activate this mode, use the **power redundancy-mode combined** command. If the combined power provided by all of the installed power supply units meets the power requirements of all of the switch modules, then this mode is sufficient for running your switch.

    For example, suppose your system has the following setup:

    Power supply unit 1 outputs 6 kW.
    The switch power requirement is 8.784 kW.

    The following two scenarios explain what happens for different numbers of power supply units that you install:

    Scenario 1: If you do not add a power supply unit, the available power (6 kW) is insufficient for the switch power requirement, 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 might not be powered).

    Scenario 2: If you install an additional power supply unit that can output 3 kW, the available power becomes 9.0 kW. The increased amount of available power exceeds the switch power requirement, so all of the modules and fan trays in the switch can power up.

    Table 8-1 shows the results for each scenario.

Table 8-1 Combined Power Mode Scenarios

Scenario	Power Supply 1 (kW)	Power Supply 2 (kW)	System Usage (kW)	Available Power (kW)	Result
1	6.0	—	8.784	6.0	Available power is less than system usage, so you cannot power the entire system with this mode.
2	6.0	3.0	8.784	9.0	Available power exceeds the system usage, so you can use this mode to power your entire system.

  - Power supply redundancy mode—To activate this power mode, use the **power redundancy-mode ps-redundant** command. The power supply unit that outputs the most power provides the reserve power, and the combined output for the other power supply units becomes the available power.

    For example, suppose your system has the following setup:

    Power supply unit 1 outputs 3.0 kW.
    Power supply unit 2 outputs 6.0 kW.
    The switch power requirement is 8.784 kW.

The following three scenarios explain what happens depending on what you install for the third power supply unit:

Scenario 1: If you do not add a third power supply unit, the reserve power is 6 kW and the available power is 3 kW. The available power is insufficient for the switch power requirement, so you cannot power the entire switch.

Scenario 2: If you add a power supply unit that outputs 3 kW, the reserve power remains 6 kW and available power becomes 6 kW. The available power is still insufficient because it does not meet the switch power requirement, so you can power more modules than you could with Scenario 1, but you still cannot power the entire switch.

Scenario 3: If you add a power supply unit that outputs 7.5 kW, the reserve power becomes 7.5 kW and the available power becomes 9 kW. The available power exceeds the switch power requirement, so you can power up all of the modules and fan trays in the switch.

Table 8-2 shows the results for each scenario.

Table 8-2 Power Supply Redundancy Mode Scenarios

Scenario	Power Supply 1 (kW)	Power Supply 2 (kW)	Power Supply 3 (kW)	System Usage (kW)	Available Power (kW)	Reserve Power (kW)	Result
1	3.0	6.0	—	8.784	6.0	—	The available power does not meet the system usage requirement, so you cannot power the entire system with this power supply configuration and mode.
2	3.0	6.0	3.0	8.784	6.0	6.0	The available power does not meet the system usage, so you cannot power the entire system with this power supply configuration and mode.
3	3.0	6.0	7.5	8.784	9.0	7.5	The available power exceeds the system usage, so you can power the entire system with this power supply configuration and mode.

– Input source redundancy mode—To activate this power mode, use the **power redundancy-mode insrc_redundant** command. The reserve power is the greater of power outputs for the two grids, and the available power becomes the lesser of power outputs for the two grids.

For example, suppose your system has the following setup:

Grids 1 and 2 each input 220 V to the power supply units.
Power supply units 1 and 2 each output 6 kW.
Current usage requirement is 8.784 kW.

The following three scenarios explain what happens for different numbers of power supply units that you install:

Scenario 1: If you do not add a power supply unit, the reserve power is 6 kW (3 kW for one power supply unit and 3 kW for the other power supply unit), and the available power is 6 kW (3 kW for one power supply unit plus 3 kW for the other power supply unit). The available power does not meet the switch usage requirement, so you cannot power the entire switch.

Scenario 2: If you add a power supply that outputs 3 kW, the reserve power is 9 kW (3 kW for three power supply units), and the available power is 6 kW (3 kW for each of two power supply units). The available power does not meet the system usage requirement, so you cannot power the entire switch.

Scenario 3: If you add a power supply unit that outputs 7.5 kW, the reserve power is 9.75 kW (3 kW for two power supply units and 3.75 kW for the new power supply unit), and the available power is 9.75 kW (3 kW for two power supply units and 3.75 kW for the new power supply unit). The available power exceeds the switch usage requirement, so you can power up all of the modules and fan trays in the switch.

Table 8-3 shows the results for each scenario.

Table 8-3 Input Source Redundancy Mode Scenarios

Scenario	Power Supply 1 (kW)	Power Supply 2 (kW)	Power Supply 3 (kW)	System Usage (kW)	Available Power (kW)	Reserve Power (kW)	Result
1	6.0	6.0	-	8.784	6.0	6.0	Available power (the power supply output for either grid) does not meet the system usage requirement.
2	6.0	6.0	3.0	8.784	9.0	6.0	The power supply output for one grid meets the system usage requirement, but the power supply output for the other grid does not meet the system usage requirement.
3	6.0	6.0	7.5	8.784	9.75	9.75	The power supply output for both grids meet the meet the system usage requirement.

– Full redundancy mode—To activate this power mode, use the **power redundancy-mode redundant** command. The reserve power is the greater amount of reserve power for power supply redundancy and input source redundancy, and the available power is the lesser amount of available power for the same two redundancy modes.

For example, suppose your system has the following setup:

Grids A and B each provide 220 V.
Power supply units 1 and 2 each output 6.0 kW.
Switch usage requirement is 8.784 kW.

The following three scenarios explain what happens for different numbers of power supply units that you install:

Scenario 1: If you do not add a power supply unit, the reserve power is 6 kW and the available power is 6 kW. The available power does not meet the switch usage requirement, so you cannot power up the entire switch.

Scenario 2: If you add a 3-kW power supply unit, the reserve power is 9 kW (3 kW for three power supply units on one grid), and the available power is 6 kW (3 kW for two power supply units on a second grid). The available power does not meet the switch usage requirement, so you cannot power up the entire switch.

Scenario 3: If you add a 6-kW power supply unit, the reserve power is 9 kW (3 kW for three power supply units on the same grid), and the available power is 9 kW (3 kW for three power supply units on a second grid). The available power meets the switch usage requirements, so you can power up the entire switch.

Table 8-4 shows the results for each scenario.

Table 8-4 Full Redundancy Mode Scenarios

Scenario	Power Supply 1 (kW)	Power Supply 2 (kW)	Power Supply 3 (kW)	System Usage (kW)	Input Source Mode		Power Supply Mode		Result
					Available Power (kW)	Reserve Power (kW)	Available Power (kW)	Reserve Power (kW)	
1	6.0	6.0	—	8.784	6.0	6.0	6.0	6.0	Available power does not meet the switch usage requirement.
2	6.0	6.0	3.0	8.784	6.0	9.0	9.0	6.0	Available power for the power supply mode is sufficient but the available power for the input source mode is insufficient, so the available power does not meet the switch usage requirement.
3	6.0	6.0	6.0	8.784	9.0	9.0	12.0	6.0	Available power for both modes meets the switch usage requirement, so you can power up the entire switch.

Information About Modules

The following sections explain how you can manage operations for the switch modules:

- Supervisor Modules, page 8-15
- I/O Modules, page 8-17
- Fabric Modules, page 8-18

Supervisor Modules

The Cisco Nexus 7000 Series switch has one or two supervisor modules. The switch can use the following supervisor module types:

- Supervisor 1 (N7K-SUP1)
- Supervisor 2 (N7K-SUP2)
- Supervisor 2 Enhanced (N7K-SUP2E)

Note Supervisor 1 modules are supported by the Cisco 7009, 7010, and 7018 switches, but it is not supported by the Cisco Nexus 7004 switch. Supervisor 2 and 2E modules are supported by all Cisco Nexus 7000 Series switches.

Note If a switch has two supervisor modules, both must be the same type and have the same amount of memory in case the supervisor functions must switch over from one supervisor module to the other supervisor module.

When it 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 of the same type and amount of memory, 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 you need to shutdown the switch to replace a supervisor module (for example, when there is only one supervisor installed in the switch or when the replacement supervisor is of another type or has a different amount of memory) you must follow the migration process explained in the "Replacing a Supervisor Module" section on page 10-18.

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

To understand the terms used for the supervisors, see Table 8-5.

Table 8-5 Supervisor Module Terms and Usage in Console Displays

Module Terms	Fixed or Relative	Usage
`module-1 and module-2`	Fixed usage	Cisco Nexus 7004 and 7009 • Module-1 refers to the supervisor module in slot 1. • Module-2 refers to the supervisor module in slot 2.
`module-5 and module-6`		Cisco Nexus 7010 • Module-5 refers to the supervisor module in slot 5. • Module-6 refers to the supervisor module in slot 6.
`module-9 and module-10`		Cisco Nexus 7018 • Module-9 refers to the supervisor module in slot 9. • Module-10 refers to the supervisor module in slot 10.

Table 8-5 Supervisor Module Terms and Usage in Console Displays (continued)

Module Terms	Fixed or Relative	Usage
`sup-1 and sup-2`	Fixed usage	Cisco Nexus 7004 and 7009 • sup-1 refers to the supervisor module in slot 1. • sup-2 refers to the supervisor module in slot 2. Cisco Nexus 7010 • sup-1 refers to the supervisor module in slot 5. • sub-2 refers to the supervisor module in slot 6. Cisco Nexus 7018 • 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 usage	Cisco Nexus 7004, 7009, 7010, and Cisco Nexus 7018 • 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 usage	If you are logged into the active supervisor (in any Cisco Nexus 7000 Series chassis), the following applies: • sup-local refers to the active supervisor module. • sup-remote refers to the standby supervisor module. If you are logged into the standby supervisor (in any Cisco Nexus 7000 Series chassis), the following applies: • 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).

I/O Modules

Cisco Nexus 7000 Series switches support the following I/O modules:

- F1-Series 32-port 1- and 10-Gigabit Ethernet I/O modules (N7K-F132XP-15)[1]
- F2-Series 48-port 1-/10-Gigabit Ethernet I/O modules with XL (N7K-F248XP-25)
- F2-Series 48-port 1-/10-Gigabit Ethernet I/O modules with XL and enhancements (N7K-F248XP-25E)
- F3-Series 48-Port 1-/10-Gigabit Ethernet I/O modules (N7K-F348XP-25)
- F3-Series 12-Port 40-Gigabit Ethernet I/O modules (N7K-F312FQ-25)
- F3-Series 6-Port 100-Gigabit Ethernet I/O modules (N7K-F306CK-25)
- M1-Series 48-port 10/100/1000 I/O modules (N7K-M148GT-11)[1]
- M1-Series 48-port 10/100/1000 I/O modules with XL option (N7K-M148GT-11L)

1. Not supported by the Cisco Nexus 7004 switch.

- M1-Series 48-port 1-Gigabit Ethernet I/O modules (N7K-M148GS-11)[1]
- M1-Series 48-port 1-Gigabit Ethernet I/O modules with XL option (N7K-M148GS-11L)
- M1-Series 32-port 10-Gigabit Ethernet I/O modules (N7K-M132XP-12)[1]
- M1-Series 32-port 10-Gigabit Ethernet I/O modules with XL option (N7K-M132XP-12L)
- M1-Series 8-port 10-Gigabit Ethernet I/O modules with XL option(N7K-M108X2-12L)
- M2-Series 24-port 10-Gigabit Ethernet I/O modules with XL option (N7K-M224XP-23L)
- M2-Series 6-port 40-Gigabit Ethernet I/O modules with XL option (N7K-M206XP-23L)
- M2-Series 2-port 100-Gigabit Ethernet I/O modules with XL option (N7K-M202XP-23L)
- M3-Series 48-port 1- and 10-Gigabit Ethernet SFP+ I/O modules with XL option (N7K-M348XP-25L)
- M3-Series 24-port 40-Gigabit Ethernet QSFP+ I/O modules with XL option (N7K-M324FQ-25L)

Note
- M3-Series I/O modules are not compatible with Sup-1 and Fab-1 modules.
- M3-Series and F2e-Series modules cannot be in the same VDC.
- M3-Series modules cannot be combined with M1-,F1- or F2-Series modules in the same Cisco Nexus 7000 Series switch.
- Starting with Cisco NX-OS Release 8.0(1), F2-Series I/O modules and M1-Series with XL option I/O modules are not compatible with Cisco Nexus 7000 Series switches. For more information on unsupported I/O modules, refer Cisco Nexus 7000 Series Release Notes.

Fabric Modules

Cisco Nexus 7000 Series switches support up to five fabric modules in the chassis. Each chassis has its own type of fabric module as follows:

- Cisco Nexus 7009 chassis uses the Fabric 2 (N7K-C7009-FAB-2) modules.
- Cisco Nexus 7010 chassis uses the Fabric 1 (N7K-C7010-FAB-1) or Fabric 2 (N7K-C7010-FAB-2) modules.
- Cisco Nexus 7018 chassis uses the Fabric 1 (N7K-C7018-FAB-1) or Fabric 2 (N7K-C7018-FAB-2) modules.

Note The Cisco Nexus 7004 switch does not include fabric modules.

Note You can replace a Fabric 1 module with a Fabric 2 module in the Cisco Nexus 7010 and 7018 switches during operations, but while there is a mix of fabric module types, all of the fabric modules perform as Fabric 1 modules. If you power up a switch with both types of fabric modules installed, only the Fabric 2 modules will power up. To utilize the Fabric 2 module capabilities, all of the installed fabric modules must be Fabric 2 modules.

Verifying the Status of a Module

Before you begin configuring the switch, you need to ensure that the modules in the chassis are functioning as designed. To verify the status of all modules, enter the **show module** command. To verify the status of a supervisor or I/O module, enter the **show module** *slot_number* command. To verify the status of a fabric module, enter the **show module xbar** *slot_number* command. The interfaces in each module are ready to be configured when the ok status is displayed in the **show module** command output. See Example 8-5.

Example 8-5 Displaying Module Information

```
switch# show module
Mod  Ports  Module-Type                       Model               Status
---  -----  --------------------------------  ------------------  ------------
2    48     10/100/1000 Mbps Ethernet Module  N7K-M148GT-11       ok
3    48     10/100/1000 Mbps Ethernet Module  N7K-M148GT-11       ok
4    48     10/100/1000 Mbps Ethernet Module  N7K-M148GT-11       ok
5    0      Supervisor module-1X              N7K-SUP1            active *
6    0      Supervisor module-1X              N7K-SUP1            ha-standby
7    32     10 Gbps Ethernet Module           N7K-M132XP-12       ok
9    48     1000 Mbps Optical Ethernet Modul  N7K-M148GS-11       ok

Mod  Sw              Hw
---  --------------  ------
2    5.0(2)          1.3
3    5.0(2)          1.3
4    5.0(2)          1.3
5    5.0(2)          1.2
6    5.0(2)          1.2
7    5.0(2)          1.5
9    5.0(2)          1.2

Mod  MAC-Address(es)                         Serial-Num
---  --------------------------------------  ----------
2    00-24-98-e9-14-58 to 00-24-98-e9-14-8c  JAF1306AAFP
3    00-24-98-e8-28-84 to 00-24-98-e8-28-b8  JAF1303ACPB
4    00-24-f7-1c-85-b0 to 00-24-f7-1c-85-e4  JAF1309ABLE
5    00-24-98-6f-95-00 to 00-24-98-6f-95-08  JAF1309AECN
6    00-24-f7-18-92-88 to 00-24-f7-18-92-90  JAF1309AEFE
7    00-24-98-e9-29-60 to 00-24-98-e9-29-84  JAF1307ALCB
9    00-24-f7-1c-d5-50 to 00-24-f7-1c-d5-84  JAF1311AEMM

Mod  Online Diag Status
---  ------------------
2    Pass
3    Pass
4    Pass
5    Pass
6    Pass
7    Pass
9    Pass
…
switch#
```

The Status column in the output should display an ok status for switching modules and an active or standby (or HA-standby) status for supervisor modules. If the status is either ok or active, you can continue with your configuration.

Note A standby supervisor module reflects the HA-standby status if the HA switchover mechanism is enabled. If the warm switchover mechanism is enabled, the standby supervisor module reflects the standby status.

For information about the states through which a switching module progresses, see the "Checking the State of a Module" section on page 8-20.

Checking the State of a Module

If your chassis has more than one I/O module, you can check the progress by repeatedly using the **show module** command and viewing the Status column each time.

The I/O module goes through a testing and an initializing stage before displaying an ok status. Table 8-6 describes the possible states in which a module can exist.

Table 8-6 Module States

show module Command Status Output	**Description**
`powered up`	The hardware has electrical power. When the hardware is powered up, the software begins booting.
`testing`	The switching module has established connection with the supervisor and the switching module is performing bootup diagnostics.
`initializing`	The diagnostics have completed successfully and the configuration is being downloaded.
`failure`	The switch detects a switching 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 a switching 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.

Specifying the Boot Up Order for I/O Modules

By default, the NAM and I/O modules in the I/O module slots boot up in the order of their chassis slot numbers (that is, modules in the lower numbered slots boot up before the modules in the higher numbered slots). To reverse that boot up sequence, use the **hardware module boot-order reverse** command. To use the default boot up sequence, use the **no hardware module boot-order reverse** command.

SUMMARY STEPS

1. **config t**
2. **[no] hardware module boot-order reverse**

DETAILED STEPS

	Command	Purpose
Step 1	**config t** **Example:** switch# config t switch(config)#	Starts the global configuration mode
Step 2	**[no] hardware module boot-order reverse** **Example:** switch(config)# hardware module boot-order reverse switch(config)#	Switches the boot-up order for the modules from a default low-to-high slot numbered order to high-to-low slot numbered order. **Tip** To use the defalut low-to-high order, use the **no hardware module boot-order reverse** command.

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.

SUMMARY STEPS

1. **attach module** *slot_number*
2. **dir bootflash**

DETAILED STEPS

	Command	Purpose

Step 1	**attach module** *slot_number*
	
	Example:
	`switch# attach module 6`
	`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# dir bootflash:`
	`80667580 Feb 21 22:04:59 2008 is855.S7`
	`22168064 Feb 21 22:04:19 2008 ks855.S7`
	`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 Use the **exit** command to exit the module-specific prompt.
		Tip If you are not accessing the switch from a console terminal, this step is the only way to access the standby supervisor module.

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.

Accessing an I/O Module Through the 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. You can specify a slot number of 1 to 8 or 11 to 18.

SUMMARY STEPS

1. **attach console module** *slot_number*

DETAILED STEPS

	Command	Purpose

Step 1	**attach console module** *slot_number*
	
	Example:
	`switch# attach console module 9`
	`Connected`
	`Escape character is '~,' (tilde comma]`
		Attaches the console port for the I/O module slot number specified.

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

Shutting Down Modules

This section includes the following topics:

Shutting Down a Supervisor

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

```
switch# out-of-service module slot
```

Shutting Down 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** command, the slot remains in that state until you use the **no poweroff** command. If you use the **out-of-service** 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 (see the "Changing the Amount of Power Reserved for Fabric Modules" section on page 8-31), 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.

Note If you are powering on more fabric modules than allowed by the current maximum number of fabric modules, then make sure that the fabric modules that you are powering on 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 the "Changing the Amount of Power Reserved for Fabric Modules" section on page 8-31).

SUMMARY STEPS

1. **config t**
2. [**no**] **poweroff xbar** *slot_number*

Note Alternatively, you can use the **out-of-service xbar** *slot_number* command.

DETAILED STEPS

	Command	Purpose
Step 1	**config t** **Example:** switch# config t switch(config)#	Starts the global configuration mode.
Step 2	**poweroff xbar** *slot_number* **Example:** switch(config)# poweroff xbar 1 switch(config)#	Powers off the specified fabric module in the switch.
	no poweroff xbar *slot_number* **Example:** switch(config)# no poweroff xbar 1 switch(config)#	Powers on the specified fabric module in the switch.

Shutting Down an I/O Module

To shut down an I/O module, use the **poweroff module** command to specify the slot with that module as follows:

```
switch# poweroff module slot
```

When you are ready to power up the module, use the **no poweroff module** command.

SUMMARY STEPS

1. **config t**
2. [**no**] **poweroff module** *slot_number*

DETAILED STEPS

	Command	Purpose
Step 1	**config t** **Example:** switch# config t switch(config)#	Starts the global configuration mode.
Step 2	**poweroff module** *slot_number* **Example:** switch(config)# poweroff module 1 switch(config)#	Powers off the specified I/O module in the switch.
	no poweroff module *slot_number* **Example:** switch(config)# no poweroff module 1 switch(config)#	Powers up the specified I/O module in the switch.

Information About Module Temperature

This section includes the following topics:

Overview of Module Temperatures

Built-in, automatic sensors are provided in all switches in the Cisco Nexus 7000 Series to monitor your switch at all times.

Each module (supervisor, I/O, and fabric) 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:
  - System messages are displayed.
  - Call Home alerts are sent (if configured).
  - SNMP notifications are sent (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:

    System messages are displayed.

    Call Home alerts are sent (if configured).

    SNMP notifications are sent (if configured).
  - 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 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 Cisco Nexus 7000 Series 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.

Displaying the Module Temperature

You can display temperature readings for module temperature sensors by using the **show environment temperature** command. See Example 8-6.

Example 8-6 Displaying Temperature Information for Hardware

```
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#
```

Displaying Environment Information

You can display all of the environment-related switch information by using the **show environment** command. See Example 8-7.

Example 8-7 Displaying All Environmental Information

```
switch# show environment
Clock:
----------------------------------------------------------
Clock           Model                Hw       Status
----------------------------------------------------------
A               Clock Module          --       NotSupported/None
B               Clock Module          --       NotSupported/None


Fan:
-----------------------------------------------------
Fan             Model                Hw         Status
-----------------------------------------------------
Fan1(sys_fan1)  N7K-C7010-FAN-S      1.1        Ok
Fan2(sys_fan2)  N7K-C7010-FAN-S      1.1        Ok
Fan3(fab_fan1)  N7K-C7010-FAN-F      1.1        Ok
Fan4(fab_fan2)  N7K-C7010-FAN-F      1.1        Ok
Fan_in_PS1      --                   --         Ok
Fan_in_PS2      --                   --         Ok
Fan_in_PS3      --                   --         Ok
Fan Air Filter : Absent
Temperature:
---------------------------------------------------------------------
Module   Sensor        MajorThresh   MinorThres    CurTemp    Status
                       (Celsius)     (Celsius)     (Celsius)
---------------------------------------------------------------------
2        Crossbar(s5)    105             95           43        Ok
2        CTSdev4 (s9)    115             105          58        Ok
2        CTSdev5 (s10)   115             105          56        Ok
2        CTSdev7 (s12)   115             105          53        Ok
2        CTSdev9 (s14)   115             105          51        Ok
2        CTSdev10(s15)   115             105          50        Ok
2        CTSdev11(s16)   115             105          48        Ok
2        CTSdev12(s17)   115             105          47        Ok
2        QEng1Sn1(s18)   115             105          49        Ok
2        QEng1Sn2(s19)   115             105          46        Ok
2        QEng1Sn3(s20)   115             105          44        Ok
2        QEng1Sn4(s21)   115             105          45        Ok
2        L2Lookup(s22)   120             110          44        Ok
2        L3Lookup(s23)   120             110          52        Ok
3        Crossbar(s5)    105             95           43        Ok
3        CTSdev4 (s9)    115             105          56        Ok
3        CTSdev5 (s10)   115             105          54        Ok
3        CTSdev7 (s12)   115             105          53        Ok
3        CTSdev9 (s14)   115             105          50        Ok
3        CTSdev10(s15)   115             105          49        Ok
3        CTSdev11(s16)   115             105          47        Ok
3        CTSdev12(s17)   115             105          46        Ok
3        QEng1Sn1(s18)   115             105          47        Ok
3        QEng1Sn2(s19)   115             105          45        Ok
3        QEng1Sn3(s20)   115             105          44        Ok
3        QEng1Sn4(s21)   115             105          43        Ok
3        L2Lookup(s22)   120             110          44        Ok
3        L3Lookup(s23)   120             110          50        Ok
4        Crossbar(s5)    105             95           44        Ok
4        CTSdev4 (s9)    115             105          56        Ok
4        CTSdev5 (s10)   115             105          54        Ok
4        CTSdev7 (s12)   115             105          54        Ok
4        CTSdev9 (s14)   115             105          51        Ok
4        CTSdev10(s15)   115             105          51        Ok
4        CTSdev11(s16)   115             105          48        Ok
4        CTSdev12(s17)   115             105          47        Ok
```

4	QEng1Sn1(s18)	115	105	49	Ok
4	QEng1Sn2(s19)	115	105	48	Ok
4	QEng1Sn3(s20)	115	105	47	Ok
4	QEng1Sn4(s21)	115	105	46	Ok
4	L2Lookup(s22)	120	110	45	Ok
4	L3Lookup(s23)	120	110	52	Ok
5	Intake (s3)	60	42	23	Ok
5	EOBC_MAC(s4)	105	95	44	Ok
5	CPU (s5)	105	95	36	Ok
5	Crossbar(s6)	105	95	47	Ok
5	Arbiter (s7)	110	100	54	Ok
5	CTSdev1 (s8)	115	105	46	Ok
5	InbFPGA (s9)	105	95	41	Ok
5	QEng1Sn1(s10)	115	105	48	Ok
5	QEng1Sn2(s11)	115	105	47	Ok
5	QEng1Sn3(s12)	115	105	44	Ok
5	QEng1Sn4(s13)	115	105	45	Ok
6	Intake (s3)	60	42	24	Ok
6	EOBC_MAC(s4)	105	95	47	Ok
6	CPU (s5)	105	95	37	Ok
6	Crossbar(s6)	105	95	48	Ok
6	Arbiter (s7)	110	100	54	Ok
6	CTSdev1 (s8)	115	105	47	Ok
6	InbFPGA (s9)	105	95	44	Ok
6	QEng1Sn1(s10)	115	105	50	Ok
6	QEng1Sn2(s11)	115	105	48	Ok
6	QEng1Sn3(s12)	115	105	46	Ok
6	QEng1Sn4(s13)	115	105	49	Ok
7	Crossbar(s5)	105	95	58	Ok
7	QEng1Sn1(s12)	115	110	66	Ok
7	QEng1Sn2(s13)	115	110	63	Ok
7	QEng1Sn3(s14)	115	110	62	Ok
7	QEng1Sn4(s15)	115	110	62	Ok
7	QEng2Sn1(s16)	115	110	66	Ok
7	QEng2Sn2(s17)	115	110	63	Ok
7	QEng2Sn3(s18)	115	110	63	Ok
7	QEng2Sn4(s19)	115	110	63	Ok
7	L2Lookup(s27)	115	105	51	Ok
7	L3Lookup(s28)	120	110	61	Ok
9	Crossbar(s5)	105	95	43	Ok
9	CTSdev1 (s6)	115	105	53	Ok
9	CTSdev3 (s8)	115	105	53	Ok
9	CTSdev4 (s9)	115	105	56	Ok
9	CTSdev5 (s10)	115	105	53	Ok
9	CTSdev6 (s11)	115	105	57	Ok
9	CTSdev7 (s12)	115	105	52	Ok
9	CTSdev9 (s14)	115	105	50	Ok
9	CTSdev10(s15)	115	105	53	Ok
9	CTSdev11(s16)	115	105	50	Ok
9	CTSdev12(s17)	115	105	53	Ok
9	QEng1Sn1(s18)	115	105	55	Ok
9	QEng1Sn2(s19)	115	105	54	Ok
9	QEng1Sn3(s20)	115	105	52	Ok
9	QEng1Sn4(s21)	115	105	51	Ok
9	L2Lookup(s22)	120	110	52	Ok
9	L3Lookup(s23)	120	110	60	Ok
xbar-1	Intake (s2)	60	42	27	Ok
xbar-1	Crossbar(s3)	105	95	59	Ok
xbar-2	Intake (s2)	60	42	26	Ok
xbar-2	Crossbar(s3)	105	95	50	Ok
xbar-3	Intake (s2)	60	42	26	Ok
xbar-3	Crossbar(s3)	105	95	54	Ok
xbar-4	Intake (s2)	60	42	26	Ok
xbar-4	Crossbar(s3)	105	95	53	Ok

```
xbar-5   Intake (s2)     60              42           26        Ok
xbar-5   Crossbar(s3)    105             95           55        Ok


Power Supply:
Voltage: 50 Volts
Power                                  Actual       Total
Supply    Model                        Output     Capacity    Status
                                      (Watts )    (Watts )
-------  ------------------  -----------  -----------  --------------
1        N7K-AC-6.0KW              816 W       6000 W     Ok
2        N7K-AC-6.0KW              713 W       6000 W     Ok
3        N7K-AC-6.0KW              730 W       6000 W     Ok


                                  Actual       Power
Module    Model                     Draw   Allocated     Status
                                   (Watts )    (Watts )
-------  ------------------ -----------  -----------   --------------
2        N7K-M148GT-11             N/A         400 W     Powered-Up
3        N7K-M148GT-11             N/A         400 W     Powered-Up
4        N7K-M148GT-11             N/A         400 W     Powered-Up
5        N7K-SUP1                  N/A         210 W     Powered-Up
6        N7K-SUP1                  N/A         210 W     Powered-Up
7        N7K-M132XP-12             N/A         750 W     Powered-Up
9        N7K-M148GS-11             283 W       400 W     Powered-Up
Xb1      N7K-C7010-FAB-1           N/A          60 W     Powered-Up
Xb2      N7K-C7010-FAB-1           N/A          60 W     Powered-Up
Xb3      N7K-C7010-FAB-1           N/A          60 W     Powered-Up
Xb4      N7K-C7010-FAB-1           N/A          60 W     Powered-Up
Xb5      N7K-C7010-FAB-1           N/A          60 W     Powered-Up
fan1     N7K-C7010-FAN-S            88 W       720 W     Powered-Up
fan2     N7K-C7010-FAN-S            88 W       720 W     Powered-Up
fan3     N7K-C7010-FAN-F             9 W       120 W     Powered-Up
fan4     N7K-C7010-FAN-F             9 W       120 W     Powered-Up

N/A - Per module power not available


Power Usage Summary:
--------------------
Power Supply redundancy mode (configured)             Redundant
Power Supply redundancy mode (operational)            Redundant
Total Power Capacity (based on configured mode)              9000 W
Total Power of all Inputs (cumulative)                      18000 W
Total Power Output (actual draw)                             2259 W
Total Power Allocated (budget)                               4750 W
Total Power Available for additional modules                 4250 W

switch#
```

Reloading Modules

You can reload the entire switch, reset specific modules in the switch, or reload the image on specific modules in the switch.

This section includes the following topics:

Reloading the Switch

To 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** command beforehand.

Power Cycling Modules

To power cycle any module, follow these steps:

Step 1 Identify the module that needs to be reset.

Step 2 Reset the identified module by entering the **reload module** command. This command power cycles the selected module.

```
switch# reload module number
```

The *number* indicates the slot in which the identified module resides.

Caution Reloading a module disrupts traffic through the module.

Saving the Module Configuration

To save the new configuration to nonvolatile storage, use the **copy running-config startup-config** command from EXEC mode. Once you enter this command, the running and the startup copies of the configuration are identical.

Table 8-7 displays various scenarios when module configurations are preserved or lost.

Table 8-7 Switching Module Configuration Status

Scenario	Consequence
A particular switching module is removed and you used the **copy running-config startup-config** 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 **copy running-config startup-config** command again.	The configured module information is preserved.
A particular switching module is removed and replaced with the same type switching module, and you entered the **reload module** *number* command.	The configured module information is preserved.
A particular switching module is reloaded when you enter the **reload module** *number* command.	The configured module information is preserved.

Purging the Module Configuration

To delete the configuration in an empty slot or in a slot with a powered-down I/O module, use the **purge module** *slot* **running-config** command from EXEC mode. This command clears the running configuration for the specified slot. This command does not work on supervisor modules or on any slot that currently has a powered-up module. This command only works on an empty slot (where the specified module once resided) or on a slot with a powered-down I/O module.

The **purge module** command clears the configuration for any module that previously existed in a slot and has since been removed or powered down. While the module was in that slot, some parts of the configuration may have been stored in the running configuration and cannot be reused (for example, IP addresses), unless you clear that from the running configuration.

For example, suppose you create an IP storage configuration with a 48-port 10/100/1000 Ethernet I/O module in slot 3 in 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.

Changing the Amount of Power Reserved for Fabric Modules

By default, each Cisco Nexus 7000 Series system reserves enough power for the maximum quantity (five) of fabric modules that can be installed in its chassis. If you have installed fewer than five 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 fabric modules.

Before you can change the maximum number of fabric modules, you must do all of the following:

- 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 those slots with fabric modules, but the fabric modules that you will be using must be in those slots. 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. Also, make sure that any empty fabric module slots have blank modules installed in them.
- Make sure that each of the installed fabric modules is powered up by using the **no poweroff xbar** *slot_number* command (see the "Shutting Down a Fabric Module" section on page 8-23).
- Power down the unused slots by using the **poweroff xbar** *slot_number* command (see the "Shutting Down a Fabric Module" section on page 8-23).

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 (see the "Verifying the Status of a Module" section on page 8-19). To verify the amount of reserved power, use the **show environment power** command (see the "Displaying Power Usage Information" section on page 8-9).

Note Power allocations differ for fabric modules depending on the type of fabric module (for example, fabric-1 versus fabric-2) and for the switch model (for example, Cisco Nexus 7004 versus Cisco Nexus 7018).

SUMMARY STEPS

1. **config t**
2. **hardware fabrics max** *number*

DETAILED STEPS

	Command	Purpose

Step 1	`config t`
	
	Example:
	`switch# config t`
	`switch(config)#`
		Starts the global configuration mode.

Step 2	`hardware fabrics max` *number*
	
	Example:
	`switch(config)# hardware fabrics max 4`
	`switch(config)#`
		Powers off the specified fabric module in the switch. For the number, use a digit between 1 and 5, inclusive.

Information About Fan Trays

Hot-swappable fan trays are provided in all switches in the Cisco Nexus 7000 Series to manage airflow and cooling for the entire switch. 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 Cisco Nexus 7000 Series 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.
- The fan tray is removed for replacement—The fan tray is designed to be removed and replaced while the system is operating without presenting an electrical hazard or damage to the system. Depending on the type of fan tray that you remove, one of the following will occur:
  - Cisco Nexus 7004 or 7009 Series fan tray—The switch can function without a fan tray for up to two minutes by which time you must replace the missing fan tray.
  - Cisco Nexus 7010 Series system fan tray—The fans in the remaining system fan tray increase their speeds as needed for the current temperature until you replace the missing fan tray.
  - Cisco Nexus 7010 Series fabric fan tray—The fan in the remaining fabric fan tray increases its speed to the maximum speed until you replace the missing fabric fan tray.
  - Cisco Nexus 7018 Series fan tray—If you do not replace the fan tray within three minutes, the system shuts down the modules cooled by the removed fan tray. For the top fan tray, that means that the system would shut down the supervisor in slot 9, the I/O modules in slots 1 through 8, and the fabric modules. For the bottom fan tray, that means that the system would shut down the supervisor in slot 10 and the I/O modules in slots 11 through 18.

Note When replacing a failed fan tray in a running system, be sure to promptly replace the fan tray.

Tip 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).
- SNMP notifications are sent (if configured).

To display the fan module statuses, use the **show environment fan** command as shown in Example 8-8 (Cisco Nexus 7004 switch), Example 8-9 (Cisco Nexus 7009 switch), Example 8-10 (Cisco Nexus 7010 switch), or Example 8-11 (Cisco Nexus 7018 switch).

Example 8-8 Displaying Fan Information for a Cisco Nexus 7004 Series Chassis

```
switch# show environment fan
Fan:
-----------------------------------------------------
Fan             Model                Hw         Status
-----------------------------------------------------
Fan1(sys_fan1)  N7K-C7004-FAN        0.110      Ok
Fan_in_PS1      --                   --         Ok
Fan_in_PS2      --                   --         Ok
Fan_in_PS3      --                   --         Absent
Fan_in_PS4      --                   --         Absent
Fan Zone Speed: Zone 1: 0x7f
Fan Air Filter : Absent
```

Example 8-9 Displaying Fan Information for a Cisco Nexus 7009 Series Chassis

```
switch# show environment fan
Fan:
-----------------------------------------------
Fan            Model          Hw     Status
-----------------------------------------------
Fan1(sys_fan1) N7K-C700-FAN   0.31   Ok
Fan_in_PS1     --             --     Ok
Fan_in_PS2     --             --     Ok
Fan Air Filter:Absent
switch#
```

Example 8-10 Displaying Fan Information for a Cisco Nexus 7010 Series Chassis

```
switch# show environment fan

Fan:
-----------------------------------------------------
Fan             Model                Hw         Status
-----------------------------------------------------
ChassisFan1     N7K-C7010-FAN-S      0.410      Ok
ChassisFan2     N7K-C7010-FAN-S      0.410      Ok
ChassisFan3     N7K-C7010-FAN-F      0.209      Ok
ChassisFan4     N7K-C7010-FAN-F      0.209      Ok
Fan_in_PS1      --                   --         Ok
Fan_in_PS2      --                   --         Ok
Fan_in_PS3      --                   --         Ok
Fan Air Filter : Absent

switch#
```

Example 8-11 Displaying Fan Information for a Cisco Nexus 7018 Series Chassis

```
switch# show environment fan
Fan:
----------------------------------------------------
Fan             Model                Hw         Status
----------------------------------------------------
Fan1(sys_fan1)  N7K-C7018-FAN        0.204      Ok
Fan2(sys_fan2)  N7K-C7018-FAN        0.204      Ok
Fan_in_PS1      --                   --         Ok
Fan_in_PS2      --                   --         Ok
Fan_in_PS3      --                   --         Absent
Fan_in_PS4      --                   --         Absent
Fan Air Filter : Absent
switch#
```

The possible Status field values are as follows:

- If the fan module is operating properly, the status is Ok.
- If the fan is physically absent, the status is Absent.
- If the fan is physically present but not working properly, the status is Failure.

If the status for one of the fan trays is "Failure," the status field also displays the numbers of the failing fans. For the Cisco Nexus 7010 system, each system fan tray has six fans to cool the supervisor and I/O modules and each fabric fan tray has one fan to cool the fabric modules. For the Cisco Nexus 7018 system, each fan tray has 14 fans to cool the supervisor, I/O modules, and fabric modules as follows:

- Top fan tray
  - Fans 1 through 12 cool the I/O modules in slots 1 through 8 and the supervisor module in slot 9.
  - Fans 13 and 14 cool the fabric modules
- Bottom fan tray
  - Fans 1 through 12 cool the I/O modules in slots 11 through 18 and the supervisor module in slot 10
  - Fans 13 and 14 are not used

Configuring EPLDs

The Cisco Nexus 7000 Series switches, which include the Cisco Nexus 70*xx* and 77*xx* switches, contain several programmable logical devices (PLDs) that provide hardware functionalities in all modules. Cisco provides electronic programmable logical device (EPLD) image upgrades to enhance hardware functionality or to resolve known issues. PLDs include electronic programmable logical devices (EPLDs), field programmable gate arrays (FPGAs), and complex programmable logic devices (CPLDs), but they do not include ASICs. In this document, the term EPLD is used for FPGA and CPLDs.

The advantage of having EPLDs for some module functions is that when you need to upgrade those functions, you just upgrade their software images instead of replacing their hardware.

Note EPLD image upgrades for an I/O module disrupt the traffic going through the module because the module must power down briefly during the upgrade. The system performs EPLD upgrades on one module at a time, so at any one time the upgrade disrupts only the traffic going through one module.

Cisco does not provide upgrade EPLD images very frequently, and you do not have to upgrade your EPLD images unless they fix the functions for the hardware that you are using in your Cisco Nexus 7000 Series switch. The EPLD image upgrades are independent from the Cisco NX-OS In-Service Software Upgrade (ISSU) process, which upgrades the system and kickstart images with no impact on the network environment.

When Cisco makes an EPLD image upgrade available, the *Cisco Nexus 7000 Series FPGA/EPLD Upgrade Release Notes* announce its availability, and you can download it from http://www.cisco.com.

This section includes the following topics:

Deciding When to Upgrade EPLDs

You do not always need to upgrade EPLD images but the following circumstances do require that you upgrade these images:

- If you are upgrading Supervisor 1 modules with Supervisor 2 or Supervisor 2E modules and the switch has Fabric 2 modules (For the Cisco Nexus 7009 switch, make sure that you are using image 1.003 or later image for the fabric 2 modules. For Cisco Nexus 7010 and 7018 switches, make sure that you are using image 0.007 or later image.)

Note Supervisor 1 modules are not supported by the Cisco Nexus 7004 switches.

- If you are enabling software features (LIST, VPCs, and so on) that require EPLDs
- If you are using M2 Series 100-Gbps Ethernet I/O modules that remain powered down after booting up the switch

When new EPLD images are available, the upgrades are always recommended if your network environment allows for a maintenance period in which some level of traffic disruption is acceptable. If such a disruption is not acceptable at this time, you might consider postponing the upgrade until a better time.

Note The EPLD upgrade operation is a disruptive operation. You should execute this operation only at a programmed maintenance time. The system/kickstart ISSU upgrade is a nondisruptive upgrade.

Note Do not perform an EPLD upgrade during an ISSU system/kickstart upgrade.

Table 8-8 provides high-level guidelines to help network administrators determine whether an EPLD upgrade is necessary when upgrading Cisco NX-OS Release 5.0(1) or a later release. If you are upgrading an earlier release, see one of the following earlier versions of the release notes:

- *Cisco Nexus 7000 Series FPGA/EPLD Upgrade Release Notes, Release 4.0*
- *Cisco Nexus 7000 Series FPGA/EPLD Upgrade Release Notes, Release 4.1*

Table 8-8 Conditions For Upgrading EPLD Images

Condition	Modules Targeted for Upgrades[1]
M2 Series I/O modules remain powered down after booting up the switch for Cisco NX-OS Release 6.1(1) or 6.1(2).	Download one of the following EPLD images and use the **no poweroff module** command for each powered down M2 Series I/O module: • For Release 6.1(1) and supervisor 1 modules download n7000-s1-epld.6.1.1a.img. • For Release 6.1(1) and supervisor 2 modules download n7000-s2-epld.6.1.1a.img. • For Release 6.1(2) and supervisor 1 modules download n7000-s1-epld.6.1.2a.img. • For Release 6.1(2) and supervisor 2 modules download n7000-s2-epld.6.1.2a.img.
Upgrading the Cisco NX-OS operating system from Release 4.x to Release 5.0 or later releases.	Update all supervisor, I/O, and fabric modules with the latest EPLD images.
Moving 32-port 10-Gigabit Ethernet I/O modules from a Cisco Nexus 7010 switch to a Cisco Nexus 7018 switch	32-port 10-Gigabit Ethernet I/O modules (N7K-M132XP-12)
Moving 48-port 10/100/1000 Ethernet I/O modules from a Cisco Nexus 7010 switch to a Cisco Nexus 7018 switch	48-port 10/100/1000 Ethernet I/O modules (N7K-M148GT-11)
Moving the supervisor (N7K-SUP1) modules from a Cisco Nexus 7010 switch to a Cisco Nexus 7018 switch	Supervisor (N7K-SUP1) modules

1. We recommend (not mandatory) that you upgrade the EPLD images for the supervisor, I/O, and fabric modules.

Switch Requirements

The Cisco Nexus 7000 Series switch must be running the Cisco NX-OS operating system and include the following hardware:

- One or two supervisor modules, each with at least 120 MB of available bootflash or slot0 memory

- One or more I/O modules
- One or more fabric modules
- One fan tray module (Cisco Nexus 7009)
- Two fabric fan tray modules (Cisco Nexus 7010)
- Two system fan tray modules (Cisco Nexus 7010)
- Two fan tray modules (Cisco Nexus 7018)

You must be able to access the system through a console, SSH, or Telnet.

You must have administrator privileges to work with the Cisco Nexus 7000 Series switches.

Determining Whether to Upgrade EPLDs

As shown in Table 8-9, you can use various show commands to determine whether the EPLDs can be upgraded for all the modules or for specific modules on a switch. These commands indicate the current EPLD images, new EPLD images, and whether the upgrades would be disruptive to switch operations.

Table 8-9 Displaying the EPLD Upgrade Status for the Switch and its Modules

Modules to Verify EPLD Status	Command
All modules on the switch	**show install all impact epld bootflash:***filename*
I/O and supervisor modules	**show install module** *slot_number* **impact epld bootflash:***filename*
Fabric modules	**show install xbar-module** *slot_number* **impact epld bootflash:***filename*
Fan-tray modules	**show install fan-module** *slot_number* **impact epld bootflash:***filename*

If there are different EPLD images to use depending on the version ID (VID) of a hardware module (see Table 9 on page 8-37), then you must determine the version number of the module by using the **show sprom module** *number* command as shown in Example 8-12.

Example 8-12 Determining the Version Number of a Supervisor or I/O Module

```
switch# show sprom module 8 1
DISPLAY linecard sprom contents of module 8:
Common block:
 Block Signature : 0xabab
 Block Version   : 3
 Block Length    : 160
 Block Checksum  : 0x198b
 EEPROM Size     : 65535
 Block Count     : 3
 ...
 H/W Version     : 0.102
 Mfg Bits        : 0
 Engineer Use    : 0
 snmpOID         : 9.12.3.1.9.66.5.0
 Power Consump   : -600
 RMA Code        : 0-0-0-0
 CLEI Code       : COUIAY6CAA
```

```
VID             : V01           <------Version ID
...
```

Downloading the EPLD Images

Before you can prepare the EPLD images for installation, you must download them to the FTP or management server.

To download the EPLD images, follow these steps:

Step 1 From a browser, go to the following URL:

http://www.cisco.com

The browser will display the Cisco website.

Step 2 From the Products & Services tab, choose **Switches**.

The Switches page opens.

Step 3 In the Data Center area, click the arrow next to View Products.

The page lists the Data Center products.

Step 4 Click **Nexus 7000**.

The Cisco Nexus 7000 Series Switches page opens.

Step 5 In the Support area, click **Download Software**.

The Downloads page opens and lists the Data Center switches.

Step 6 Choose a Cisco Nexus 7000 Series switch from the list under **Data Center Switches > Cisco Nexus 7000 Series Switches**.

The Log In page opens.

Step 7 If you are an existing user, enter your username in the **User Name** field and your password in the **Password** field. If you are a new user, click Register Now and provide the required information before returning to the Log In page and logging in with your new username.

The Downloads page lists the software types that can be downloaded for the switch that you specified.

Step 8 Click **NX-OS EPLD Updates**.

The Downloads page lists software releases that you can download.

Step 9 Choose **Latest Releases > 6.2(8)**.

The Downloads page displays image information, including a link to the downloadable Tar file, to the right of the releases.

Note For Releases 6.1(1) or 6.1(2), you must download EPLD image files for 6.1(1a) or 6.1(2a).

Step 10 Click the link for the Tar file.

The Downloads page displays a Download button and lists information for the Tar file.

Step 11 Click **Download**.

The Supporting Documents page opens to display the rules for downloading the software.

Step 12 Read the rules and click **Agree**.

A File Download dialog box opens to ask if you want to open or save the images file.

Step 13 Click **Save**.

The Save As dialog box appears.

Step 14 Indicate where to save the Tar file and click **Save**.

The Tar file saves to the location that you specified.

You are ready to prepare the EPLD images for Installation (see the "Preparing the EPLD Images for Installation" section on page 8-41).

EPLD Images Needed for vPCs

The virtual port channel (vPC) feature is available beginning with Cisco NX-OS Release 4.1(3). When you enable vPC on the chassis, you must have EPLD image 186.3 (or later image) on the 32-port 10-Gigabit Ethernet types of I/O modules (N7K-M132XP-12 and N7K-M132XP-12L).

Note The EPLD upgrade operation is a disruptive operation. You should execute this operation only at a programmed maintenance time. The system/kickstart ISSU upgrade is a nondisruptive upgrade.

Most of the N7K-M132XP-12 modules in the chassis already meet this minimum EPLD requirement, but if you are working with an N7K-M132XP-12 module that was shipped before June 2008, you might need to upgrade the EPLD version.

To determine the EPLD version for all N7K-M132XP-12 modules, enter the **show version module** *slot_number* **epld** command. If the line FE Bridge(x) version displays a version earlier than 186.7, you should schedule an EPLD upgrade to a version that is compatible with the target Cisco NX-OS release. For example, if you want to run Cisco NX-OS Release 6.1(1), you should choose Release 6.1(1) EPLDs.

The following example shows Release 186.008 on the FE Bridge line, which is the correct EPLD version:

```
Nexus-7k(config)# show version module 7 epld

EPLD Device                          Version
---------------------------------------
Power Manager                          4.008
IO                                     1.016
Forwarding Engine                      1.006
FE Bridge(1)                         186.008 << OK!
FE Bridge(2)                         186.008 << OK!
Linksec Engine(1)                      2.007
Linksec Engine(2)                      2.007
Linksec Engine(3)                      2.007
Linksec Engine(4)                      2.007
Linksec Engine(5)                      2.007
Linksec Engine(6)                      2.007
Linksec Engine(7)                      2.007
Linksec Engine(8)                      2.007
```

EPLD Images Needed for LISP

The Locator/ID Separator Protocol (LISP) feature is available beginning with Cisco NX-OS Release 5.2(1). When you enable LISP on the chassis, you must have EPLD image 186.8 or 186.008 (or later image) on the 32-port 10-Gigabit Ethernet types of I/O modules (N7K-M132XP-12 and N7K-M132XP-12L).

Note The EPLD upgrade operation is a disruptive operation. You should execute this operation only at a programmed maintenance time. The system/kickstart ISSU upgrade is a nondisruptive upgrade.

If you are working with an N7K-M132XP-12 module that was shipped before July 2011, you might need to upgrade the EPLD version.

To determine the EPLD version for all N7K-M132XP-12 and N7K-M132XP-12L modules, enter the **show version module** *slot_number* **epld**. If the line FE Bridge(x) version displays a version earlier than 186.8 or 186.008, you should schedule an EPLD upgrade to a version that is compatible with the target Cisco NX-OS release. For example, if you want to run Cisco NX-OS Release 5.2(1), you should choose Release 5.2(1) EPLDs.

The following example shows Release 186.008 on the FE Bridge line, which is the correct EPLD version:

```
Nexus-7k(config)# show version module 7 epld

EPLD Device                          Version
---------------------------------------
Power Manager                          4.008
IO                                     1.016
Forwarding Engine                      1.006
FE Bridge(1)                         186.008 << OK!
FE Bridge(2)                         186.008 << OK!
Linksec Engine(1)                      2.007
Linksec Engine(2)                      2.007
Linksec Engine(3)                      2.007
Linksec Engine(4)                      2.007
Linksec Engine(5)                      2.007
Linksec Engine(6)                      2.007
Linksec Engine(7)                      2.007
Linksec Engine(8)                      2.007
```

Installation Guidelines

You can upgrade (or downgrade) EPLDs using CLI commands on the Cisco Nexus 7000 Series switch. Follow these guidelines when you upgrade or downgrade EPLDs:

- Before you upgrade any EPLD images, be sure that you have updated the Cisco NX-OS operating system to the level required for the images and be sure that you have one of the following EPLD image files:
  - n7000-s1-epld.6.2.8.img (for Cisco Nexus 7004, 7009, 7010, and 7018 switches with Supervisor 1 modules)
  - n7000-s2-epld.6.2.8.img (for Cisco Nexus 7004, 7009, 7010, and 7018 switches with Supervisor 2 or Supervisor 2E modules)
  - n7700-s2-epld.6.2.8.img (for Cisco Nexus 7710 and 7718 switches)

Note EPLD and software images for a chassis with Supervisor 1 modules include “s1” in the image name and images for Supervisor 2 and Supervisor 2E have “s2” in the image name.

- You can execute an upgrade from the active supervisor module only. This upgrade is for one or all of the modules as follows:
  - You can upgrade a module individually.
  - You can upgrade all modules sequentially.
  - You can upgrade all modules in parallel.
- You can update the images for one or all modules whether the switch is online or offline as follows:
  - If the modules are online, only the EPLD images with version numbers that differ from the new EPLD images are upgraded.
  - If the modules are offline, all of the EPLD images are upgraded.
- On a system that has two supervisor modules, upgrade the EPLDs for the standby supervisor and then switch the active supervisor to the standby mode to upgrade its EPLDs (the supervisor switchover is not disruptive to traffic on Cisco Nexus 7000 Series switches). On a switch that has only one supervisor module, you can upgrade the active supervisor, but this will disrupt its operations during the upgrade.
- If you interrupt an upgrade, you must upgrade the module that is being upgraded again.
- The upgrade process disrupts traffic on the targeted module.
- Do not insert or remove any modules while an EPLD upgrade is in progress.

Preparing the EPLD Images for Installation

Before you can update the EPLD images for each of your switch modules, you must determine the Cisco NX-OS version that your switch is using, make sure that there is space for the new EPLD images, and download the images.

To prepare the EPLD images for installation, follow these steps:

Step 1 Log in to the switch through the console port, an SSH session, or a Telnet session.

Step 2 Verify that the switch is using the expected version of the Cisco NX-OS operating system. The kickstart and system lines indicate the Cisco NX-OS version. This step determines the versions of EPLD images that you must download.

```
switch# show version
..Software
  BIOS:      version 3.22.0
  kickstart: version 6.2(8)
  system:    version 6.2(8)
  BIOS compile time:       02/20/10
  kickstart image file is: bootflash:/n7000-s2-kickstart.6.2.8.bin
  kickstart compile time:  4/06/2014 12:00:00 [04/06/2014 18:37:07]
  system image file is:    bootflash:/n7000-s2-dk9.6.2.8.bin
  system compile time:     4/06/2014 13:00:00 [04/06/2014 19:21:22]
```

Step 3 Verify that you have 120 MB of free space on the active or standby supervisor memory devices for the EPLD images that you will be downloading by using the **dir bootflash:** or **dir slot0:** commands.

By default, these commands display the used and free memory for the active supervisor. If your switch has an additional supervisor (a standby supervisor), use the **show module** command to find the module number for the other supervisor, use the **attach module** command to attach to the module number, and then use the **dir bootflash:** or **dir slot0:** command to determine the amount of used and free memory. See Example 8-13 to determine the amount of available bootflash memory, and see Example 8-14 to determine the amount of available slot0 memory.

Example 8-13 Determining the Amount of Available Bootflash Memory

```
switch# dir bootflash:
...
       4096    Apr 06 01:19:53 2014 lost+found/
    3020665    Jan 02 07:47:36 2014  n7000-s1-debug-sh-bash.6.2.6.gbin
  207429135    Jan 02 07:35:03 2014  n7000-s1-dk9.6.2.6.gbin
  207558132    Apr 06 07:11:31 2014  n7000-s2-dk9.6.2.8.gbin
   29479424    Jan 02 12:03:47 2014  n7000-s2-kickstart.6.2.6.gbin
   29467136    Apr 06 10:35:18 2014  n7000-s2-kickstart.6.2.8.gbin
...

Usage for bootflash://sup-local
  978673664 bytes used
  860184576 bytes free
 1838858240 bytes total
switch# show module
Mod  Ports  Module-Type                       Model              Status
---  -----  -------------------------------- ------------------ ------------
6    8      10 Gbps Ethernet XL Module       N7K-M108X2-12L     ok
7    48     1/10 Gbps Ethernet Modul         N7K-F248XP-24      ok
8    48     1000 Mbps Optical Ethernet XL Mo N7K-M148GS-11L     ok
9    0      Supervisor module-1X             N7K-SUP1           ha-standby
10   0      Supervisor module-1X             N7K-SUP1           active *
...
switch# attach module 9
Attaching to module 9 ...
To exit type 'exit', to abort type '$.'
Cisco Nexus Operating System (NX-OS) Software
TAC support: http://www.cisco.com/tac
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
switch#
```

Example 8-14 Determining the Amount of Available Slot0 Memory

```
switch# dir slot0:
...

Usage for slot0://sup-local
       4096 bytes used
 2044850176 bytes free
 2044854272 bytes total
```

```
switch# show module
Mod  Ports  Module-Type                        Model              Status
---  -----  --------------------------------- ------------------ ------------
2    48     10/100/1000 Mbps Ethernet Module N7K-M148GT-11      ok
3    48     10/100/1000 Mbps Ethernet Module N7K-M148GT-11      ok
4    48     10/100/1000 Mbps Ethernet Module N7K-M148GT-11      ok
5    0      Supervisor module-1X             N7K-SUP1           ha-standby
6    0      Supervisor module-1X             N7K-SUP1           active *
7    48     1/10 Gbps Ethernet Modul         N7K-F248XP-24      ok
9    48     1000 Mbps Optical Ethernet Modul N7K-M148GS-11      ok
...
switch(standby)# dir slot0://sup-standby/
...
Usage for slot0://sup-standby
    1376256 bytes used
 2073870336 bytes free
 2075246592 bytes total
```

Step 4 If there is not at least 120 MB of memory free for the EPLD files, delete some unneeded files, such as earlier images, so there is enough free memory.

```
switch# delete bootflash:n7000-s1-kickstart.5.2.0.bin
```

Step 5 Copy the EPLD image file from the FTP or management server to the bootflash or slot0 memory in the active supervisor module. The following example shows how to copy from the FTP server to the bootflash memory:

```
switch# copy ftp://10.1.7.2/n7000-s1-epld.6.2.8.img bootflash:n7000-s1-epld.6.2.8.img
```

Note For NX-OS Release 6.1(1) , you must copy the n7000-s1-epld.6.1.1a.img (for supervisor 1 modules) or n7000-s2-epld.6.1.1a.img (for supervisor 2 modules) files. For NX-OS Release 6.1(2), you must copy the n7000-s1-epld.6.1.2a.img (for supervisor 1 modules) or n7000-s1-epld.6.1.2a.img (for supervisor 2 modules) files.

Step 6 Copy the EPLD image to the standby supervisor.

```
switch# copy bootflash:n7000-s1-epld.6.2.8.img
bootflash://sup-standby/n7000-s1-epld.6.2.8.img
```

You are ready to upgrade the EPLD images (see the "Manual Upgrading of EPLD Images" section on page 8-43).

Manual Upgrading of EPLD Images

You can manually upgrade the EPLD images for all of the modules installed in your switch or specific modules installed in your switch. When you request an upgrade, the Cisco NX-OS software lists the current and new versions for each EPLD image with the following results:

- If a module is installed and online, the software lists the installed and new versions for each EPLD. Where there is a difference in versions, the software indicates an upgrade or downgrade to occur when you confirm the process.
- If a module is installed and offline, the software cannot list its current EPLD versions so all EPLDs will be updated when you confirm the upgrade.
- If a module is not installed, the software displays an error message and does not upgrade the EPLDs.

If you need to know which modules can be updated and which upgrades are disruptive to switch operations, see the "Determining Whether to Upgrade EPLDs" section on page 8-37.

To upgrade the EPLD images for a Cisco Nexus 7000 Series switch, you use one of the **install** commands listed in Table 8-10. These commands enable you to upgrade the EPLD images for all of the modules on the switch, multiple modules of one or two types, or single modules. When specifying a *slot_number*, use one number. When specifying *slot_numbers*, you can specify **all** for all slots, multiple slots separated by commas (*x*,*y*,*z*) or a range of slot numbers (*x*-*y*).

Table 8-10 EPLD Upgrade Commands

Modules Upgraded	Command
All installed modules with one module upgraded at a time	**install all epld** *epld_image*
All installed modules with the I/O modules upgraded in parallel	**install all epld** *epld_image* **parallel**
One or more I/O and supervisor modules with the I/O modules upgraded in parallel	**install all epld** *epld_image* **parallel module {all |** *slot_numbers***}**
One or more I/O and supervisor modules with the I/O modules upgraded in parallel and one or more fan-tray modules	**install all epld** *epld_image* **parallel module {all |** *slot_numbers***}** **fan-module {all |** *slot_numbers***}**
One or more I/O and supervisor modules with the I/O modules upgraded in parallel and one or more fabric (xbar) modules	**install all epld** *epld_image* **parallel module {all |** *slot_numbers***}** **xbar-module {all |** *slot_numbers***}**
One or more fan-tray modules and one or more fabric (xbar) modules	**install all epld** *epld_image* **parallel fan-module {all |** *slot_numbers***}** **xbar-module {all |** *slot_numbers***}**
One I/O or supervisor module	**install module** *slot_number* **epld** *epld_image*
One fan module	**install fan-module** *slot_number* **epld** *epld_image*
One fabric module	**install xbar-module** *slot_number* **epld** *epld_image*

When you upgrade both supervisor modules in a switch, Cisco NX-OS upgrades the EPLD images for the standby supervisor module and then upgrades the active supervisor module. This action enables the upgrade of supervisor modules to be nondisruptive to switch operations.

Note When upgrading EPLD images for Supervisor 2 or Supervisor 2E modules in a two-supervisor switch, the standby supervisor will reset twice towards the end of that upgrade but the upgrade continues to completion and the console displays the upgrade status.

When you upgrade supervisor module in a single-supervisor switch, the operation is disruptive to switch operations if the switch is active.

To start the installation of all new EPLD images for all modules in a switch, use the **install all epld** command as shown in either Example 8-15 (switches with Supervisor 1 modules) or Example 8-16 (switches with Supervisor 2 or Supervisor 2E modules).

Example 8-15 Installing EPLD Images in Parallel for Switches with Supervisor 1 Modules

```
switch# install all epld bootflash:n7000-s1-epld.6.2.8.img parallel
```

Example 8-16 Installing EPLD Images in Parallel for Switches with Supervisor 2 or Supervisor 2E Modules

```
switch# install all epld bootflash:n7000-s2-epld.6.2.8.img parallel
```

Example 8-17 shows how to start the installation of all new EPLD images for all of the I/O and supervisor modules and the fan-tray module in fan-tray slot 1 (in this case for a switch with Supervisor 1 modules).

Example 8-17 Installing Supervisor and I/O Modules Plus Other Specific Modules (for Switches with Supervisor 1 Modules)

```
switch# install all epld bootflash:n7000-s1-epld.6.2.8.img parallel module all fan-module
1
```

Note For Releases 6.1(1) and 6.1(2), if there are any powered down M2 Series I/O modules, use the **no poweroff module** command to power up that module**.**

switch# **no poweroff module** *slot_number*

Note For Release 4.0(2) or earlier releases, if you updated the power management EPLD image, you must reset the power for the module so that EPLD can take effect (this is not required for release 4.0(3) or later). You can reset the power in one of the following two ways: reset the power for the module (physically remove the module and reinstall it--a module reload or just pressing the ejector buttons is not sufficient for this reset requirement), or reset the entire switch (power cycle the switch).

Caution Resetting the power disrupts any data traffic going through the affected modules. If you power cycle the entire switch, all data traffic going through the switch at the time of the power cycling is disrupted. This is not necessary for Release 4.0(3) or later releases.

Note For Release 4.0(3) and later releases, the switch automatically loads the new power management EPLD after an upgrade, so it is no longer necessary to reset the power for the module or switch.

To confirm the EPLD upgrades, see the "Verifying the EPLD Upgrades" section on page 8-47.

Automatic Upgrading of EPLD Images for I/O Modules

You can enable, disable, and verify automatic upgrading of EPLD images for I/O modules installed in the Cisco Nexus 7004, 7009, 7010, and 7018 switches. Also, if the upgrade is canceled because it exceeds a maximum number of programmed attempts, you can reset the process to enable the upgrades.

Note You can set automatic upgrading of EPLD images for only I/O modules, not for other modules such as the supervisor modules, fabric modules, or fan trays.

This section includes the following topics:

Enabling or Disabling Automatic Upgrades of EPLD Images

You can enable or disable automatic upgrades of EPLD images for I/O modules. When enabled, the switch checks the EPLD image versions on newly installed or powered up I/O modules to see if they are older than the images that were installed with the current version of Ciscon NX-OS software on the switch. If the images on the I/O modules are older, the switch automatically upgrades the images to the newer versions.

SUMMARY STEPS

1. **configure terminal**
2. **system auto-upgrade epld**
3. **show running-config | inc epld**

Note Alternatively, to prevent automatic upgrades of EPLD images for I/O modules, use the **no system auto-upgrade epld** command.

DETAILED STEPS

	Command	Purpose

Step 1	**configure terminal**
	Example:
	`switch# configure terminal`
	`switch(config)#`
		Starts the global configuration mode.

Step 2	**system auto-update epld**
	Example:
	`switch(config)# system auto-update epld`
	`Auto upgrade enabled`
	`switch(config)#`
		Enables automatic updates.

	no system auto-update epld
	Example:
	`switch(config)# no system auto-update epld`
	`Auto upgrade disabled`
	`switch(config)#`
		Disables automatic updates.

Step 3	**show running-config | inc epld**
	Example:
	`switch(config)# sh running-config | inc epld`
	`system auto-upgrade epld`
	`switch(config)#`
		Verifies whether auto upgrades are part of the running configuration.

Verifying Automatic Upgrades of EPLD Images

To check on the automatic upgrade status while the upgrades occur or after the upgrades, use the commands listed in Table 8-11.

Table 8-11 Automatic EPLD Upgrade Verification Commands

Command	Action
show system auto epld status	Displays the status of the ongoing automatic upgrades.
show install auto-upgrade epld status	Displays the current and old EPLD versions after an upgrade.

Resetting Automatic Upgrades of EPLD Images

If the automatic upgrade function has stopped because it has exceeded the maximum number of allowed update attempts, you will see the following message:

```
switch# 2013 May 21 13:30:21 switch %$ VDC-1 %$_ %USER-2-SYSTEM_MSG:
<<%EPLD_AUTO-2-AUTO_UPGRADE_CHECK>> Automatic EPLD upgrade check for module 15: Max
retries reached. Use 'clear auto-upgrade epld flags all' to upgrade. - epld_auto
```

You can reset the automatic upgrade process in one of the following ways:

- Clearing the auto-upgrade epld flags for all of the I/O modules by using the **clear auto-upgrade epld flags all** command.
- Clearing the auto-upgrade epld flags for a specific I/O module by using the **clear auto epld flags** *module_number* command.
- Restarting the switch.

Verifying the EPLD Upgrades

You can verify the EPLD upgrades for each slot in the switch by using the commands listed in Table 8-12.

Table 8-12 Commands Used to Display EPLD Information for Modules

Command	Modules Verified
show version module *slot_number* **epld**	I/O and supervisor modules
show version fan *slot_number* **epld**	Fan-tray modules
show version xbar *slot_number* **epld**	Fabric modules

This example shows how to verify the EPLD images for the Cisco Nexus 7018 supervisor module in slot 9:

```
switch# show version module 9 epld
```

This example shows how to verify the EPLD images for the fan-tray module in fan-tray module slot 2:

```
switch# show version fan 2 epld
```

This example shows how to verify the EPLD images for the fabric module in fabric module slot 4:

```
switch# show version xbar 4 epld
```

Displaying the Available EPLD Versions

To view the available EPLD versions, use the **show version epld** *url* command as shown in Example 8-18.

Example 8-18 Displaying the Available EPLD Versions

```
switch# show version epld bootflash:n7000-s1-epld.6.2.8.img

...
Module Type                          EPLD Device          Version
------------------------------------------------------------------
Supervisor-1X                        Power Manager          3.009
Supervisor-1X                        IO                     3.029
Supervisor-1X                        Inband                 1.008
Supervisor-1X                        Local Bus CPLD         3.000
Supervisor-1X                        CMP CPLD               6.000
...
10/100/1000 Mbps Eth Module          Power Manager          5.006
10/100/1000 Mbps Eth Module          IO                     2.014
10/100/1000 Mbps Eth Module          Forwarding Engine      1.006

10 Gbps Ethernet Module              Power Manager          4.008
10 Gbps Ethernet Module              IO                     1.016
10 Gbps Ethernet Module              Forwarding Engine      1.006
10 Gbps Ethernet Module              FE Bridge            186.008
10 Gbps Ethernet Module              Linksec Engine         2.007

1000 Mbps Optical Ethernet Module    Power Manager          4.008
1000 Mbps Optical Ethernet Module    IO                     1.006
1000 Mbps Optical Ethernet Module    Forwarding Engine      1.006
1000 Mbps Optical Ethernet Module    SFP                    1.004
...
Fabric Module 2                      Power Manager          1.003

Fabric Module 2                      Power Manager          1.003
...
Fan<Cisco Nexus 7009>                Fan Controller         0.009
Fan<Cisco Nexus 7009>                Fan Controller         0.009
```

Displaying the Status of EPLD Upgrades

To display the status of EPLD upgrades on the switch, use the **show install epld status** command as shown in Example 8-19.

Example 8-19 Displaying EPLD Upgrades

```
switch# show install epld status

1) Xbar Module 4 upgraded on Wed Oct 26 16:36:27 2011 (524778 us)
Status: EPLD Upgrade was Successful
```

```
EPLD                                 Curr Ver    Old Ver
-----------------------------------------------------
Power Manager                         1.003         1.003

2) Module 14 upgraded on Mon May 23 19:45:55 2011 (835895 us)
Status: EPLD Upgrade was Successful

...
```

Default Settings

Table 8-13 lists the default hardware settings.

Table 8-13 Default Hardware Parameters

Parameters	Default
Power supply mode	Power supply redundancy mode

Troubleshooting

This chapter describes how to troubleshoot Cisco Nexus 7000 Series hardware problems.

This chapter includes the following sections:

If your system has problems related to the Cisco NX-OS operating system, see the *Cisco NX-OS Troubleshooting Guide*. If you cannot isolate a system problem, contact the Cisco Technical Assistance Center (TAC).

Getting Started

Start the Cisco Nexus 7000 Series switch by turning on the power at the power supply units to send power to the system fans, supervisor module, fabric modules, and I/O modules. During the startup phase, the STATUS LEDs on the supervisor and I/O modules are amber to indicate that the initialization process is in progress. When the system is operational, the component LEDs indicate that either the system is operational or you need to troubleshoot for system problems.

The key to troubleshooting the system is to isolate a problem to a specific system component. First, you compare what the system is doing with what it should be doing. Look at the chassis LEDs to see if there are any critical problems detected with the system components. Green chassis LEDs indicate that all components of a type are operational while amber LEDs indicate that at least one component of a type has a critical problem that requires troubleshooting.

For a listing of the system LEDs and the conditions that they indicate, see Table D-1 on page D-1.

Less critical problems, such as minor overtemperature conditions, are not indicated by the chassis LEDs. To find those problems, you must look for amber STATUS LEDs on the system modules.

Depending on the type of component that needs troubleshooting, see one of the following topics:

- For an amber PSU LED, see the "Troubleshooting the Fan Trays" section on page 9-2.
- For an amber FAN LED, see the "Troubleshooting the Fan Trays" section on page 9-2.
- For an amber SUP LED, see the "Troubleshooting the Supervisor Modules" section on page 9-6.
- For an amber FAB LED, see the "Troubleshooting the Fabric Modules" section on page 9-7.
- For an amber IOM LED, see the "Troubleshooting the I/O Modules" section on page 9-8.

Troubleshooting the Fan Trays

The following conditions indicate that there is a problem with one or more fan tray modules:

- The FAN LED on the chassis is amber.
- The STATUS LED on the fan tray is flashing red.

While the system is running, each fan tray module should be exhausting air and its STATUS LED should be green, which indicates that all of the fans in that tray are running above the threshold speed.

For a listing of the fan tray LEDs and the conditions that they indicate, see Table D-7 on page D-7.

To troubleshoot a fan tray problem, follow these steps until the problem is resolved:

Step 1 Check if the STATUS LED is flashing red or is not lit on each fan tray. If the LED is flashing red, at least one fan in the tray is running at a slow speed or not running. If the LED is not lit, no power is going to the fan tray.

Step 2 Check if the power supply units are providing power to the chassis components. The Output LED on each power supply unit should be lit and green.

Step 3 Make sure that the fan tray is properly seated in the chassis by following these steps:

a. Loosen the captive screws on the fan tray until they are no longer in the chassis.

b. Place one hand on the handle for the fan tray and pull the fan tray part way out of the chassis.

c. Push the fan tray back into the chassis until it is fully seated on the midplane and make sure that each captive screw on the fan tray is aligned with its hole in the chassis.

d. Securely tighten each captive screw (to 8 in-lb [0.90 N·m]) to the chassis.

Step 4 Call Cisco TAC and describe the conditions that you are seeing with the fan tray. See the "Contacting Customer Service" section on page 9-9.

Troubleshooting an AC Power Supply Unit

The following conditions indicate that you need to troubleshoot one or more AC power supply units:

- The PSU LED on the chassis is amber.
- The Input 1, Input 2, or Output LED on a power supply unit is not green.
- The Fault LED on a power supply unit is flashing red.

Also, when there are power problems with other modules or the supervisor module PWR MGMT LED is amber, you need to troubleshoot the power supply units or check the seating of the modules that are not receiving power.

For a listing of the power supply unit LEDs and the conditions that they indicate, see Table D-6 on page D-6.

To troubleshoot a power supply problem, follow these steps:

Step 1 Determine which power supply unit has a problem. Check to see which power supply unit does not have its Input and Output LEDs lit.

Step 2 If one of the required Input LEDs is not lit, perform each of the following checks on the power cord used for that half of the power supply unit:

- Make sure that the power cord is securely connected to the AC source.
- For a 6-kW power supply unit, make sure that the power cord is securely connected to the power supply unit. Verify that the cable retention device on the power supply unit is securely holding the power cord.
- Turn the power supply switch to standby (STBY or 0) and then disconnect the power cord from the AC source and reconnect with another AC source. After you connect to the AC source, turn the power switch on (ON or 1).

Step 3 If the Output LED is not lit, verify that the power switch is turned on (ON or 1).

Step 4 Make sure that the power supply unit is properly seated in the power supply bay by performing the following steps:

a. Turn the power switch to standby (STBY or 0).

b. Loosen the four captive screws on the power supply unit so that they are no longer in contact with the chassis.

c. Pull the power supply unit part way out of the chassis and then push it back into the power supply bay. Make sure that the captive screws on the power supply unit align with their holes in the chassis.

d. Tighten the four captive screws to 8 in-lb (0.90 N·m).

e. Turn the power switch on (ON or 1).

Step 5 Verify that the power supply unit is functional by replacing it with another power supply (see the "Replacing an AC Power Supply Unit During Operations" section on page 10-2) and plugging its power cords into the same AC source. If the Input and Output LEDs turn green on the replacement power supply unit, contact Cisco TAC (see the "Contacting Customer Service" section on page 9-9) to replace the defective power supply unit.

If you cannot determine the problem with the power supply or determine which power supply unit has the problem, contact TAC.

Troubleshooting a DC Power Supply Unit

The following conditions indicate that you need to troubleshoot one or more DC power supply units:

- The PSU LED on the chassis is amber.
- The Input LEDs or Output LED on a power supply unit is not green.
- The Fault LED on a power supply unit is flashing red.

Also, when there are power problems with other modules or the supervisor module PWR MGMT LED is amber, you need to troubleshoot the power supply units or check the seating of the modules that are not receiving power.

For a listing of the power supply unit LEDs and the conditions that they indicate, see Table D-6 on page D-6.

To troubleshoot a power supply problem, follow these steps:

Step 1 Determine which power supply unit has a problem. Check to see which power supply unit does not have its Input and Output LEDs lit.

Note If a power supply unit has only one power cord attached to a DC source, only the Input LEDs (Input 1 and Input 2 or Input 3 and Input 4) for the connected half of the power supply unit should be lit.

Step 2 If the Output LED is not lit, verify that the power switch on the power supply unit is turned to ON. If not, turn it to ON and verify that the Output LED turns on.

Step 3 If the required Input LEDs are not lit, test the power connections as follows:

a. Turn the power switch on the power supply unit to standby (STBY or 0).

b. Turn off the DC circuit by manually shutting it down at the circuit breaker.

Warning **Before performing any of the following procedures, ensure that power is removed from the DC circuit.** Statement 1003

c. Verify that the power cord is securely connected to the DC source or the DC power interface unit (PIU).

Warning **Hazardous voltage or energy may be present on DC power terminals. Always replace cover when terminals are not in service. Be sure uninsulated conductors are not accessible when cover is in place.** Statement 1075

d. Verify that the power cord is securely connected to the power supply unit. Verify that the cable retention device on the power supply unit is securely holding the power cord.

e. Turn on the power at the circuit breaker.

f. Turn the power switch on the power supply unit to ON (or 1).

g. Check the Input LEDs to see if they are on yet.

Step 4 If the required Input LEDs are still not lit, test the power source as follows:

a. Turn the power switch on the power supply unit to standby (STBY or 0).

b. Turn off the DC circuit by manually shutting it down at the circuit breaker.

Warning **Before performing any of the following procedures, ensure that power is removed from the DC circuit.** Statement 1003

c. Disconnect the power cord from the DC source, and reconnect with another powered down DC source.

Warning **Hazardous voltage or energy may be present on DC power terminals. Always replace cover when terminals are not in service. Be sure uninsulated conductors are not accessible when cover is in place.** Statement 1075

d. Turn on the newly connected DC power source at the circuit breaker.

e. Turn the power switch on the power supply unit to ON (or 1).

f. Check the Input LEDs to see if they are on yet.

g. If the Input LEDs are not on, call TAC.

Step 5 If the Output LED is not lit, verify that the power switch on the power supply unit is turned to ON (or 1). If not, turn it to ON (or 1) and see if the LED turns on.

Step 6 If the Output LED is not lit, verify that the power supply unit is properly seated in the power supply bay by performing the following steps:

a. Turn the power switch on the power supply unit to standby (STBY or 0).

b. Turn off the DC circuit by manually shutting it down at the circuit breaker.

Warning **Before performing any of the following procedures, ensure that power is removed from the DC circuit.** Statement 1003

c. Pull the power supply unit part way out of the chassis and then push it back into the power supply bay. To remove a 6-kW power supply, you must first fully loosen its four captive screws. To remove a 3-kW, you must press and hold its release latch to the left. When you reinstall a 6-kW power supply, tighten its four captive screws to 8 in-lb (0.90 N·m).

d. Turn on the DC power source at the circuit breaker.

e. Turn the power switch to ON (or 1).

f. Verify that the Output LED turns on.

Step 7 If the Output LED is still not on, verify that the power supply unit is functional by replacing it with another power supply (see the "Replacing a DC Power Supply Unit During Operations" section on page 10-9) and plugging its power cords into the same DC source. If the Input and Output LEDs turn green on the replacement power supply unit, contact TAC (see the "Contacting Customer Service" section on page 9-9) to replace the defective power supply unit.

If you cannot determine the problem with the power supply or determine which power supply unit has the problem, contact TAC.

Troubleshooting an HVAC/HVDC Power Supply Unit

The following conditions indicate that you need to troubleshoot an HVAC/HVDC power supply unit:

- The PSU LED on the chassis is amber.
- The Input or Output LED on the power supply unit is not green.
- The Fault LED on the power supply unit is flashing red.

Also, when there are power problems with other modules or the supervisor module PWR MGMT LED is amber, you need to troubleshoot the power supply unit or check the seating of the modules that are not receiving power.

For a listing of the power supply unit LEDs and the conditions that they indicate, see Table D-6 on page D-6.

To troubleshoot a power supply problem, follow these steps:

Step 1 Check to see if the Input and Output LEDs are lit.

Step 2 If the Input LED is not lit, perform each of the following checks on the power cord used for the power supply unit:

- Make sure that the power cord is securely connected to the power source.
- Turn the power supply switch to standby to 0 and then disconnect the power cord from the power source and reconnect with another power source. After you connect to the power source, turn the power switch on (1).

Step 3 If the Output LED is not lit, verify that the power switch is turned on (1).

Step 4 Make sure that the power supply unit is properly seated in the power supply bay.

Step 5 Verify that the power supply unit is functional by replacing it with another power supply and plugging its power cords into the same power source.

If you cannot determine the problem with the power supply or determine which power supply unit has the problem, contact TAC.

Troubleshooting the Supervisor Modules

The following conditions indicate a problem with one or more supervisor modules:

- The SUP LED on the chassis is amber.
- The STATUS LED on a supervisor module is amber, red, or not lit.
- The CMP STATUS LED on a supervisor 1 module is amber or red.
- An ACT LED on a supervisor module is not lit.

The SYSTEM and PWR MGMT LEDs on the supervisor modules indicate that there could be problems with the supervisor module or any of the other switch modules.

When you start up the switch, the supervisor module STATUS and CMP STATUS LEDs are amber while the module runs diagnostic tests. When the module passes the diagnostic tests and becomes operational, the STATUS and CMP STATUS LEDs become green. For switches that have two supervisor modules, the ACTIVE LED is green for the active supervisor module or amber for the standby supervisor module. When the SYSTEM and PWR MGMT LEDs are green, the switch does not detect any critical system problems. Amber, red, or unlit LEDs indicate system problems that you need to resolve, possibly with other system modules.

For a listing of supervisor module LEDs and the conditions that they indicate, see Table D-2 on page D-2.

To troubleshoot for a hardware problem with the supervisor module, follow these steps until the problem is resolved:

Step 1 Check if the STATUS LED (all supervisors modules) or CMP STATUS LED (Supervisor 1 modules only) is amber, red, or unlit on each supervisor module as follows:

- If either the STATUS or CMP STATUS LED is amber or flashing red, a minor (amber) or critical (flashing red) overtemperature condition exists. Contact TAC for assistance (see the "Contacting Customer Service" section on page 9-9).
- If the STATUS LED is red, the initialization process detected a parity error condition. Contact TAC for assistance (see the "Contacting Customer Service" section on page 9-9).

Step 2 If the STATUS LED (all supervisors modules) and CMP STATUS LED (Supervisor 1 modules only) are unlit, check the module seating and power connections as follows:

a. Loosen the captive screws on the module so that they are no longer in contact with the chassis.

b. Unseat the module by pressing the ejector buttons on each end of the module and swinging out each ejector lever.

c. Place one hand on the handle for the module and pull the module part way out of the chassis.

d. Push the module back into the chassis until it is seated on the midplane.

e. Rotate both ejector levers until they both touch the front of the module. Make sure that each captive screw on the fan tray is aligned with its hole in the chassis.

f. Securely tighten each captive screw (to 8 in-lb [0.9 N·m]) to the chassis.

g. Verify that the Output LED on each power supply is lit. If the Output LED is not lit, troubleshoot the AC power supply units (see the "Troubleshooting an AC Power Supply Unit" section on page 9-2) or DC power supply units (see the "Troubleshooting a DC Power Supply Unit" section on page 9-3).

Step 3 If the LOG FLASH or EXPANSION FLASH (Supervisor 1) or SLOT0 (Supervisor 2 or 2E) LED is not lit, a compact flash slot (Supervisor 1) or USB port (Supervisor 2 or Supervisor 2E) is empty. If you need to load storage media in the slot or port, make sure that the media is formatted correctly for the slot.

Step 4 Contact TAC for assistance (see the "Contacting Customer Service" section on page 9-9).

Troubleshooting the Fabric Modules

The following conditions indicate problems with one or more fabric modules:

- The FAB LED on the chassis is amber.
- The STATUS LED on the fabric module is red.

Note Fabric modules are included with the Cisco Nexus 7009, 7010, and 7018 chassis but not with the Cisco Nexus 7004 chassis.

When you start up the switch or install a new fabric module, the STATUS LED on the module is amber while the module initializes. When the module becomes operational, the STATUS LED becomes green. If an overtemperature condition occurs, the STATUS LED flashes red.

For a listing of the fabric module LEDs and the conditions that they indicate, see Table D-5 on page D-6.

To troubleshoot a fabric module hardware problem, follow these steps until the problem is resolved:

Step 1 Check if a STATUS LED is flashing red or is unlit on each fabric module.

Step 2 Check if the power supply units are providing power to the chassis components.

- For information on troubleshooting AC power supply units, see the "Troubleshooting an AC Power Supply Unit" section on page 9-2.
- For information on troubleshooting DC power supply units, see the "Troubleshooting a DC Power Supply Unit" section on page 9-3.

Step 3 Make sure that the fabric module is properly seated in the chassis as follows:

a. Loosen the captive screws on the fabric module until they are no longer in the chassis.

b. Press the eject buttons on either end of the module and simultaneously rotate out both ejector levers until the module is unseated from the midplane.

c. Place one hand on the module handle and pull the module part way out of the chassis.

d. Push the module back into the chassis until it is seated on the midplane.

e. Simultaneously rotate both ejector levers until they both touch the front of the module. This action fully seats the module on the midplane.

f. Make sure that each of the captive screws on the module is aligned with its holes in the chassis.

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

Step 4 Contact TAC for assistance (see the "Contacting Customer Service" section on page 9-9).

Troubleshooting the I/O Modules

The following conditions indicate that there are problems with one or more I/O modules:

- The IOM LED on the chassis is amber.
- The STATUS LED on an I/O module is red.

During initialization, the STATUS LED is amber while the I/O module powers up and performs diagnostic tests. When the diagnostic tests are complete, the STATUS LED becomes green. If an overtemperature condition occurs, the STATUS LED becomes amber. If the module is resetting, ejectors are out, or if there is a major overtemperature condition, the LED flashes red.

For a listing of the I/O module LEDs and the conditions that they indicate, see Table D-3 on page D-4.

To troubleshoot an I/O module hardware problem, follow these steps until the problem is resolved:

Step 1 Determine which I/O module has a problem. Check if a STATUS LED that is flashing red or is not lit on a module.

Step 2 Check if the power supply units are providing power to the chassis components. See the "Troubleshooting the Fan Trays" section on page 9-2.

Step 3 Make sure that the I/O module is properly seated in the chassis by following these steps:

a. Loosen the captive screws on the I/O module until they are no longer in the chassis.

b. Press the eject buttons on either end of the module.

c. Simultaneously rotate out both ejector levers until the module is unseated from the midplane.

d. Place one hand on the module handle and pull the module part way out of the chassis.

e. Push the module back into the chassis until it is seated on the midplane.

f. Simultaneously rotate both ejector levers to the front of the module to fully seat the module.

g. Make sure that each of the captive screws on the module is aligned with its holes in the chassis.

h. Securely tighten each captive screw (to 8 in-lb [0.9 N·m]) to the chassis.

Step 4 Contact TAC for assistance (see the "Contacting Customer Service" section on page 9-9).

Contacting Customer Service

If you cannot solve a startup problem after using the troubleshooting suggestions in this chapter, contact the Technical Assistance Center (TAC) for assistance and additional instructions. Provide the following information to help your TAC representative address your problem as quickly as possible:

- Date that you received the switch
- Chassis serial number (located on a label on the right of the rear panel of the chassis)
- Type of software and release number
- Maintenance agreement or warranty information
- Brief description of the problem
- Brief explanation of the steps that you have already taken to isolate and resolve the problem

Note If you have CLI access, enter the **show sprom all** command to display the backplane contents.

To contact TAC, go to http://tools.cisco.com/ServiceRequestTool/create/launch.do.

Installing or Replacing Components

This chapter describes the replacement and other maintenance procedures for the Cisco Nexus 7000 Series switch components. You can also use these procedures for installing modules and other features purchased after you receive the switch.

A Cisco Nexus 7000 Series switch is designed for redundancy, which means that you can replace its modules, fan trays, and power supply units if there is at least one other of the same type operating during the replacement process.

This chapter includes the following sections:

Replacing an AC Power Supply Unit During Operations

The Cisco Nexus 7000 Series switches use a load-balanced power supply that uses up to four AC, DC or HVAC/HVDC power supply units. The AC power supply units convert up to 1.2 kW, 1.4 kW, 3 kW, 3.5 kW, 6 kW, or 7.5 kW of AC power to DC power for system operations. If you can set one power supply unit in standby mode and have the required power load balanced by the remaining online power supply units, you can replace the standby power supply unit with another power supply unit without interrupting system operations.

Warning **Blank faceplates and cover panels serve three important functions: they prevent exposure to hazardous voltages and currents inside the chassis; they contain electromagnetic interference (EMI) that might disrupt other equipment; and they direct the flow of cooling air through the chassis. Do not operate the system unless all cards, faceplates, front covers, and rear covers are in place.** Statement 1029

Note If a replacement power supply unit is not available and you do not have a blank plate to cover the empty power supply bay, you should leave the original power supply in the bay until you have the replacement unit.

This section describes how to replace an AC power supply unit and includes the following topics:

Required Tools

Before you replace an AC power supply unit, make sure that you have the following tools and equipment:

- Number 1 Phillips screwdriver with torque capability
- Shipping materials
- Antistatic mat
- Replacement AC power supply unit

Caution When you handle the Cisco Nexus 7000 Series 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.

Removing a 3-kW AC Power Supply Unit During Operations

Warning **Hazardous voltage or energy is present on the backplane when the system is operating. Use caution when servicing.** Statement 1034

To replace an AC power supply unit while a Cisco Nexus 7000 Series switch is operating, follow these steps:

Step 1 Make sure that the power supply units not being replaced have their power turned on (labelled as 1 on the power switch).

Step 2 Turn the power switch on the power supply that you are removing to standby (labelled as 0).

The Output LED turns off.

Step 3 Unplug the power cord from the AC power source. Release the retention clip over the plug.

Step 4 Press the release latch on the front right side of the power supply to the left and pull the power supply part way out of the chassis.

Step 5 Release the latch, place your other hand under the power supply, pull the module fully out of the chassis, and set it on the antistatic mat or pack it in a box for shipping.

Step 6 Either replace the power supply unit or cover the empty power supply bay as follows:

- If you are ready to replace the power supply unit, see the "Installing a 3-kW AC Power Supply Unit During Operations" section on page 10-3.
- If the power supply bay is to remain empty, install a blank power supply filler plate (Cisco part number 800-28658-01) over the opening, and secure it with the captive screws.

Installing a 3-kW AC Power Supply Unit During Operations

After you remove an AC power supply, you can replace it with another power supply or replace it with a blank plate until another power supply is available.

Warning **Hazardous voltage or energy is present on the backplane when the system is operating. Use caution when servicing.** Statement 1034

To install an AC power supply unit while a Cisco Nexus 7000 Series switch is operating, follow these steps:

Step 1 Unpack the replacement power supply unit and place it on an antistatic mat. You must also unpack a power cord to be used with the power supply.

Step 2 Ensure that the power switch on the power supply unit is set to standby (labelled as 0) and that the AC and power cords are not plugged into the AC power supply.

Step 3 Holding the AC power supply unit with one hand on its handle and the other hand under the bottom (longest side), align the back of the power supply unit with the power supply bay and slide the power supply fully into the power supply bay until the release latch clicks.

Step 4 Plug the power cable into the power jack on the front of the power supply unit. Pull down the retention clip over the plug on the power cable.

Step 5 Plug the other end of the power cable into the AC power source. The Input LEDs light up.

Step 6 Turn the Power switch from standby to on (from 0 to 1 as labelled on the power switch). The Output LED lights up.

If one or more of these LEDs is red, turn the power switch to standby (0), check the AC power connection, and then turn the power switch back on (1). The Input and Output LEDs for the connected power supply units should be green.

For more information about the power supply unit LED states, see Appendix D, "Chassis and Module LEDs."

Removing a 6-kW or 7.5-kW AC Power Supply Unit During Operations

Warning **Hazardous voltage or energy is present on the backplane when the system is operating. Use caution when servicing.** Statement 1034

To replace an AC power supply unit while a Cisco Nexus 7000 Series switch is operating, follow these steps:

Step 1 Make sure that the power supply units not being replaced have their power switches turned to ON.

Step 2 Turn the power switch on the power supply that you are removing to standby (STBY).

The Output LED turns off.

Step 3 Unplug the power cords from the AC power source. If the power supply unit has only one AC power cable, unplug just that cable. Otherwise, unplug both AC power cables.

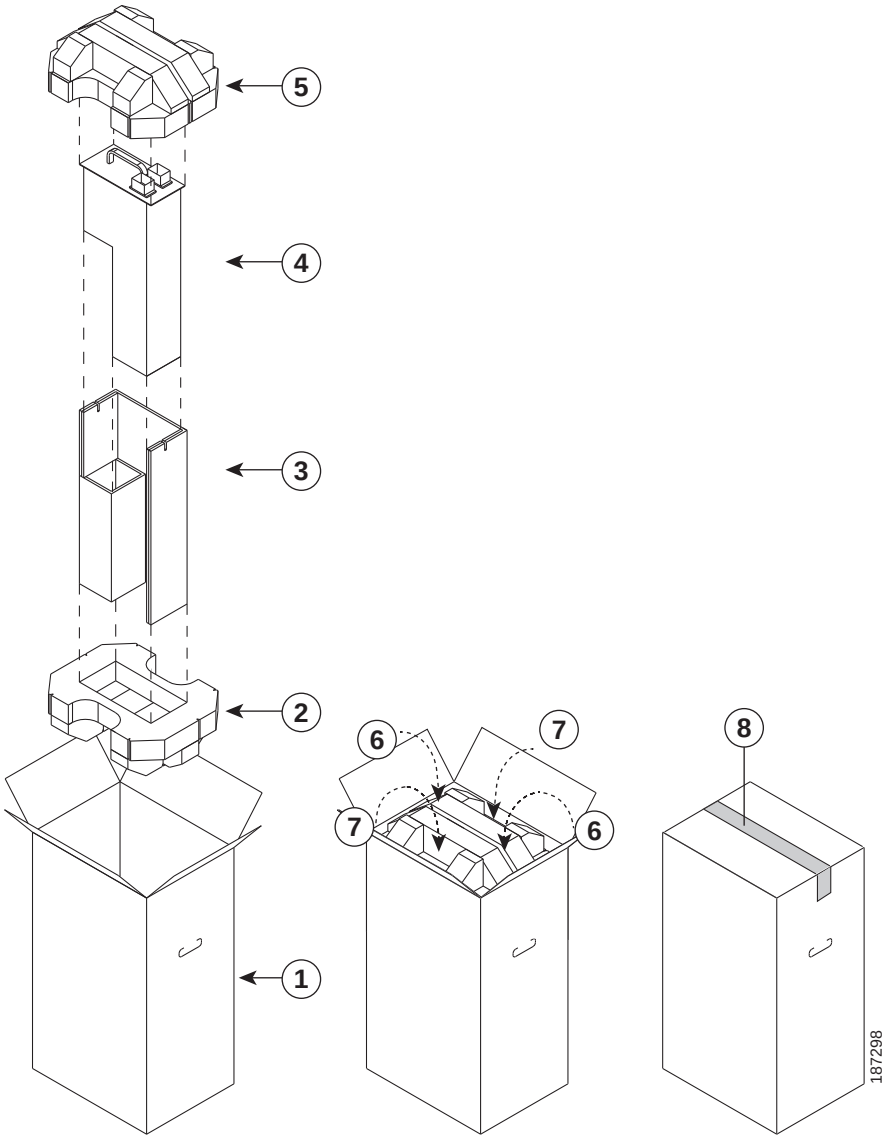
Step 4 Unscrew the four captive screws on the power supply unit so that they are no longer in contact with the chassis.

Step 5 With one hand on the handle of the power supply unit, pull the unit part way out of the chassis.

Step 6 Place your other hand underneath the power supply unit to support its weight and then pull the unit fully out of the chassis.

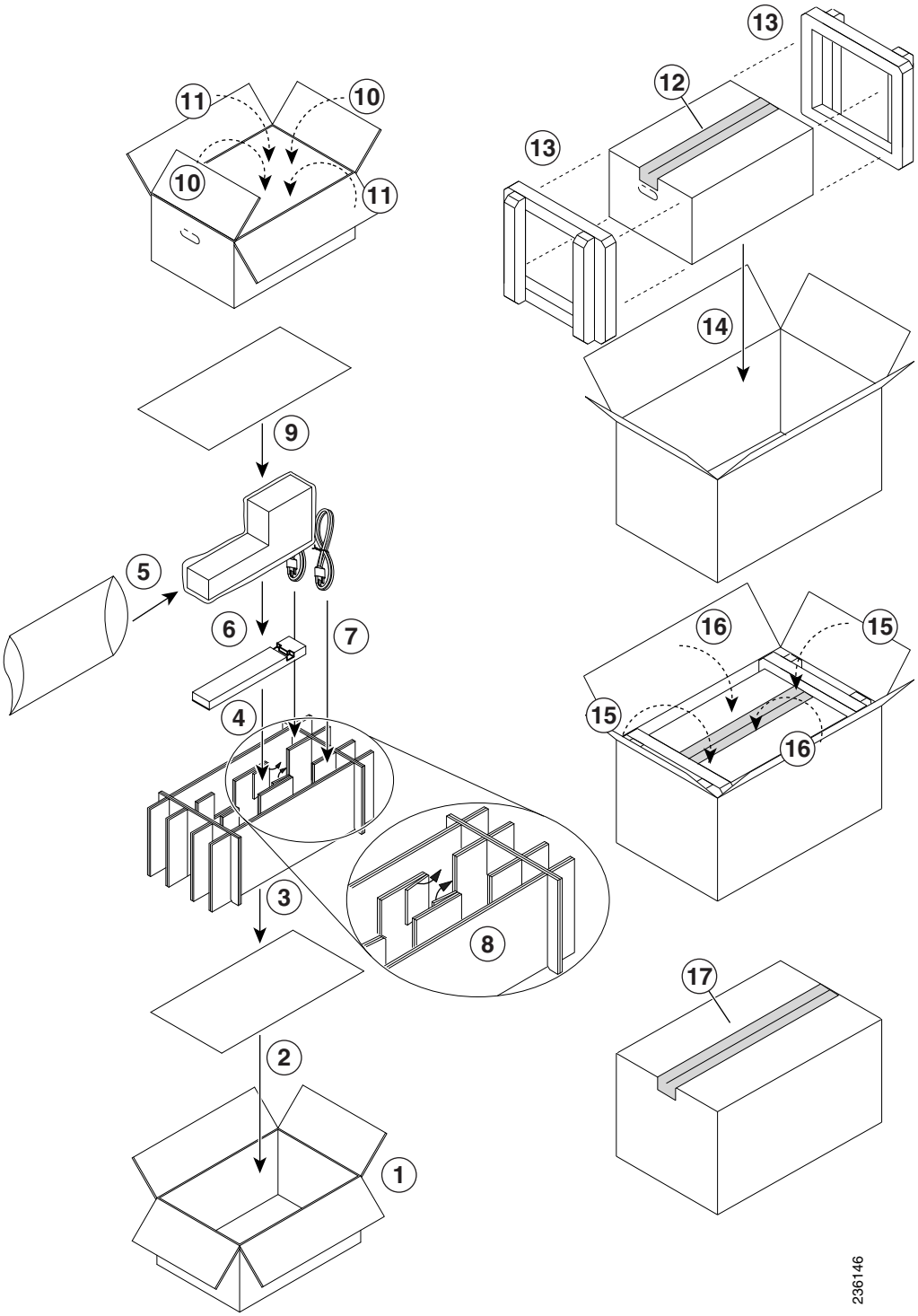
Step 7 Place the power supply unit on an antistatic mat or repack it in its original shipping materials. To repack a 6-kW AC power supply unit, see Figure 10-1. To repack a 7.5 kW AC power supply unit, see Figure 10-2.

Figure 10-1 Repacking a 6-kW AC Power Supply Unit



1	Open the box.	**5**	Insert a foam cushion onto the top of the power supply unit.
2	Insert a foam cushion.	**6**	Fold the two narrow flaps over the top cushion.
3	Insert the cardboard holder with the U-shaped end facing upwards.	**7**	Fold the two wide flaps over the top of the box.
4	Insert the power supply unit with the small end going in the box first.	**8**	Tape the wide flaps together and to the box.

Figure 10-2 Repacking a 7.5 kW Power Supply Unit



1	Open the smaller of two boxes.	**10**	Fold the two narrow box flaps over the padding.
2	Place a padding sheet on the bottom of the box.	**11**	Fold the two wide box flaps over the narrow flaps.
3	Place the partitions on top of the padding. Make sure that the cutout sections are on top.	**12**	Tape the two wide flaps together using packing tape.
4	Place thicker padding piece in the central slot, with the groove side up.	**13**	Insert each end of the smaller box into a padding block.
5	Place the power supply unit in an ESD bag.	**14**	Place the box and its padding blocks in the larger box.
6	Place the bagged power supply unit in the central partition slot. Make sure that the extension of the front side fits into the padding groove.	**15**	Fold the two narrow box flaps over the padding blocks.
7	Coil each of the two power cables and place each cable in a slot next to the power supply unit.	**16**	Fold the two wide box flaps over the narrow flaps.
8	Rotate both foldouts over the power supply unit.	**17**	Tape the two wide flaps together using packing tape.
9	Place a padding sheet on top of the partitions.		

Step 8 Either replace the power supply unit or cover the empty power supply bay as follows:

- If you are ready to replace the power supply unit, see the "Installing a 6-kW or 7.5-kW AC Power Supply Unit During Operations" section on page 10-7.
- If the power supply bay is to remain empty, install a blank power supply filler plate (Cisco part number 800-28658-01) over the opening, and secure it with the captive screws.

Installing a 6-kW or 7.5-kW AC Power Supply Unit During Operations

After you remove an AC power supply, you can replace it with another power supply or replace it with a blank plate until another power supply is available. If you need to install a DC power supply unit, see the "Installing a 6-kW DC Power Supply Unit During Operations" section on page 10-14.

Warning **Hazardous voltage or energy is present on the backplane when the system is operating. Use caution when servicing.** Statement 1034

To install an AC power supply unit while a Cisco Nexus 7000 Series switch is operating, follow these steps:

Step 1 Unpack the replacement power supply unit and place it on an antistatic mat. If you are unpacking a 6-kW power supply unit, you must also unpack one or two power cords. If you are unpacking a 7.5-kW power supply unit, two power cords are already attached to the power supply unit.

Step 2 Ensure that the power switch on the power supply unit is in the standby (STBY) position and that the AC power cords are not plugged into the AC power supply.

Step 3 Holding the AC power supply unit with one hand on its handle and the other hand under the bottom (longest side), align the back of the power supply unit with the power supply bay and slide the power supply into the power supply bay. Make sure the power supply unit is fully seated in the power supply bay and that its four captive screws are aligned with their holes in the chassis.

Note The 6-kW AC power supply unit weighs 22 pounds (10 kg), and the 7.5-kW AC power supply unit weighs 26.4 pounds (12 kg). Use two hands to safely hold and move a power supply unit.

If you cannot push the power supply unit all the way into its bay, make sure that the power switch is turned to STBY before pushing the power supply unit all of the way into the bay.

Step 4 Screw in the four captive screws and tighten to 8 in-lb (0.9 N·m).

Step 5 Plug the power cables into the power jacks on the front of the power supply unit.

- For 6-kW of power, plug two power cables into the two power jacks.
- For 3-kW of power, plug one power cable into one of the two power jacks.

Note The 6-kW AC power supply unit does not ship with power cables attached to it, so you must attach one or two of those cables. If necessary, you can remove the cables from the AC power supply unit that you removed. The 7.5-kW AC power supply ships with permanently attached power cables, so you do not need to attach power cables to that power supply unit.

Step 6 Plug the power cables that are already attached to the power supply unit into the AC power source.

Tip For power redundancy, plug each power cable into a separate AC power supply circuit.

Step 7 Turn the Power switch from STBY to ON.

Step 8 Verify the power supply operation by checking that the power supply LEDs are in the following states:

- Input 1 LED is green.
- If a second AC power cord was connected, the Input 2 LED is green.
- Output LED is green.
- Fault LED is not on or flashing.

If one or more of these LEDs is red, turn the power switch to standby (STBY), check the AC power connections for the line in standby (STBY), and then turn the power switch back to ON. The Input and Output LEDs for the connected power supply units should be green.

For more information on the power supply unit LED states, see Appendix D, “Chassis and Module LEDs.”

Replacing a DC Power Supply Unit During Operations

The Cisco Nexus 7000 Series switches use a load-balanced power supply that uses up to three or four AC or DC power supply units. If you can set one power supply unit in standby mode and have the required power load balanced by the remaining online power supply units, then you can replace the standby power supply unit with another power supply unit without interrupting system operations.

Note If a replacement power supply unit is not available and you do not have a blank plate to cover the empty power supply bay, you should leave the original power supply in the bay until you have the replacement unit.

Warning **Blank faceplates and cover panels serve three important functions: they prevent exposure to hazardous voltages and currents inside the chassis; they contain electromagnetic interference (EMI) that might disrupt other equipment; and they direct the flow of cooling air through the chassis. Do not operate the system unless all cards, faceplates, front covers, and rear covers are in place.** Statement 1029

This section describes how to replace a DC power supply unit and includes the following topics:

Removing a 3-kW DC Power Supply Unit During Operations

You can remove a DC power supply during operations if the power supply is redundant and you can shut off the power from the grid without shutting off power to the other needed power supplies.

Warning **Hazardous voltage or energy is present on the backplane when the system is operating. Use caution when servicing.** Statement 1034

To replace a DC power supply unit while a Cisco Nexus 7000 Series switch is operating, follow these steps:

Step 1 Unpack the new power supply and keep its shipping materials so that you can use them to pack the old power supply.

Step 2 Make sure that the power supply units not being replaced have their power switches turned on (labelled as 1).

Step 3 For the power supply unit that you are replacing, turn its power switch to standby (labelled as 0). The Output LED turns off.

Step 4 Turn off the DC input power by manually turning off the input circuit at the circuit breaker for this power supply.

Step 5 Verify that the input power is completely off by making sure that all of the LEDs on the DC power supply unit are off.

Warning **Before performing any of the following procedures, ensure that power is removed from the DC circuit.** Statement 1003

Step 6 Detach each set of four DC power cables from the DC power source or DC power interface unit (PIU) as follows:

Warning **Hazardous voltage or energy may be present on DC power terminals. Always replace cover when terminals are not in service. Be sure uninsulated conductors are not accessible when cover is in place.** Statement 1075

a. Unscrew the three screws on top of the terminal box located on the front of the power supply, and remove the safety cover.

b. Unscrew the two nuts holding each cable lug, remove the lug, and refasten the two nuts. This action releases four cables from the power supply.

c. Place the safety cover on the terminal box and fasten with three screws.

Step 7 Press and hold the release latch on the front of the power supply and then pull the power supply part way out of the chassis by its handle.

Step 8 Place your other hand under the power supply, fully pull it out of the chassis, and place it in its shipping materials.

Step 9 Either replace the power supply unit or cover the empty power supply bay as follows:

- If you are ready to replace the power supply unit, see the "Installing a 3-kW DC Power Supply Unit During Operations" section on page 10-10.
- If the power supply bay is to remain empty, install a blank power supply filler plate (Cisco part number 800-37248-01) over the opening, and secure it with its captive screws.

Installing a 3-kW DC Power Supply Unit During Operations

After you remove a 3-kW DC power supply, you can replace it with another AC or DC power supply or replace it with a blank plate until another power supply is available. To install an AC power supply unit, see the "Installing a 3-kW AC Power Supply Unit During Operations" section on page 10-3.

Warning **Hazardous voltage or energy is present on the backplane when the system is operating. Use caution when servicing.** Statement 1034

To install a 3-kW DC power supply unit while a Cisco Nexus 7000 Series switch is operating, follow these steps:

Step 1 If you have not already done so, unpack the replacement DC power supply unit and place it on an antistatic mat.

Step 2 Ensure that the power switch on the replacement DC power supply unit is in the standby (0) position.

Step 3 Ensure that the DC power source for the new power supply unit is turned off at the circuit breaker.

Warning **Before performing any of the following procedures, ensure that power is removed from the DC circuit.** Statement 1003

Step 4 Grasp the power supply unit handle with one hand, and place your other hand underneath the power supply unit to support its weight. Align the back of the power supply unit with the power supply bay and slide the power supply all the way into the power supply bay until the release lever clicks. Make sure that the power supply unit does not pull out of the power supply bay without pressing the release lever.

Step 5 If the power cables are not already connected to the DC power source, connect them as follows:

a. Unscrew the three screws on top of the terminal box located in front of the power supply, and remove the safety cover.

b. Unscrew two nuts from each of the four terminal slots in the terminal box.

c. In each of two negative slots (labelled as -), place the lug on the end of a negative power cable, and fasten with two nuts. Tighten the nuts to 40 in-lb (4.5 N·m).

d. In each of two positive slots (labelled as +), place the lug on the end of a positive power cable, and fasten with two nuts. Tighten the nuts to 40 in-lb (4.5 N·m).

e. Place the safety cover on the terminal box and fasten with three screws.

Step 6 Turn on the power at the DC power source circuit breaker. The input LEDs turn on when the circuit turns on.

Step 7 Turn the power switch on the DC power supply from standby (0) to on (1). The output LED turns on when power is being output to the switch.

For information about how to connect the power supply unit to DC power sources for input source redundancy, see the "Connecting a DC Power Supply Directly to DC Power Sources" section on page 6-11).

Note If the power source is not within reach of the power cables, connect the power cables to a DC power interface unit (PIU). To connect the PIU, see the "Connecting a Power Supply to DC Power Sources through a Power Interface Unit" section on page 6-21.

Warning **Hazardous voltage or energy may be present on DC power terminals. Always replace cover when terminals are not in service. Be sure uninsulated conductors are not accessible when cover is in place.** Statement 1075

If one or more of the Input or Output LEDs is not green or the Fault LED is lit or flashing, see the "Troubleshooting a DC Power Supply Unit" section on page 9-3.

For more information on the power supply unit LED states, see Appendix D, "Chassis and Module LEDs."

Removing a 6-kW DC Power Supply Unit During Operations

Warning **Hazardous voltage or energy is present on the backplane when the system is operating. Use caution when servicing.** Statement 1034

To replace a DC power supply unit while a Cisco Nexus 7000 Series switch is operating, follow these steps:

Step 1 Make sure that the power supply units not being replaced have their power switches turned to ON.

Step 2 For the power supply unit that you are replacing, turn its power switch to STBY. The Output LED turns off.

Step 3 Turn off the DC input power by manually turning off each input circuit at its circuit breaker.

Step 4 Verify that the input power is completely off by making sure that all of the LEDs on the DC power supply unit are off.

Warning **Before performing any of the following procedures, ensure that power is removed from the DC circuit.** Statement 1003

Step 5 Detach each set of four DC power cables from the DC power source or DC power interface unit (PIU) as follows:

Warning **Hazardous voltage or energy may be present on DC power terminals. Always replace cover when terminals are not in service. Be sure uninsulated conductors are not accessible when cover is in place.** Statement 1075

Step 6 For each of the power plugs attached to the DC power supply unit, completely unscrew the two screws that hold it to the power supply unit, and then remove the plug from the power supply unit.

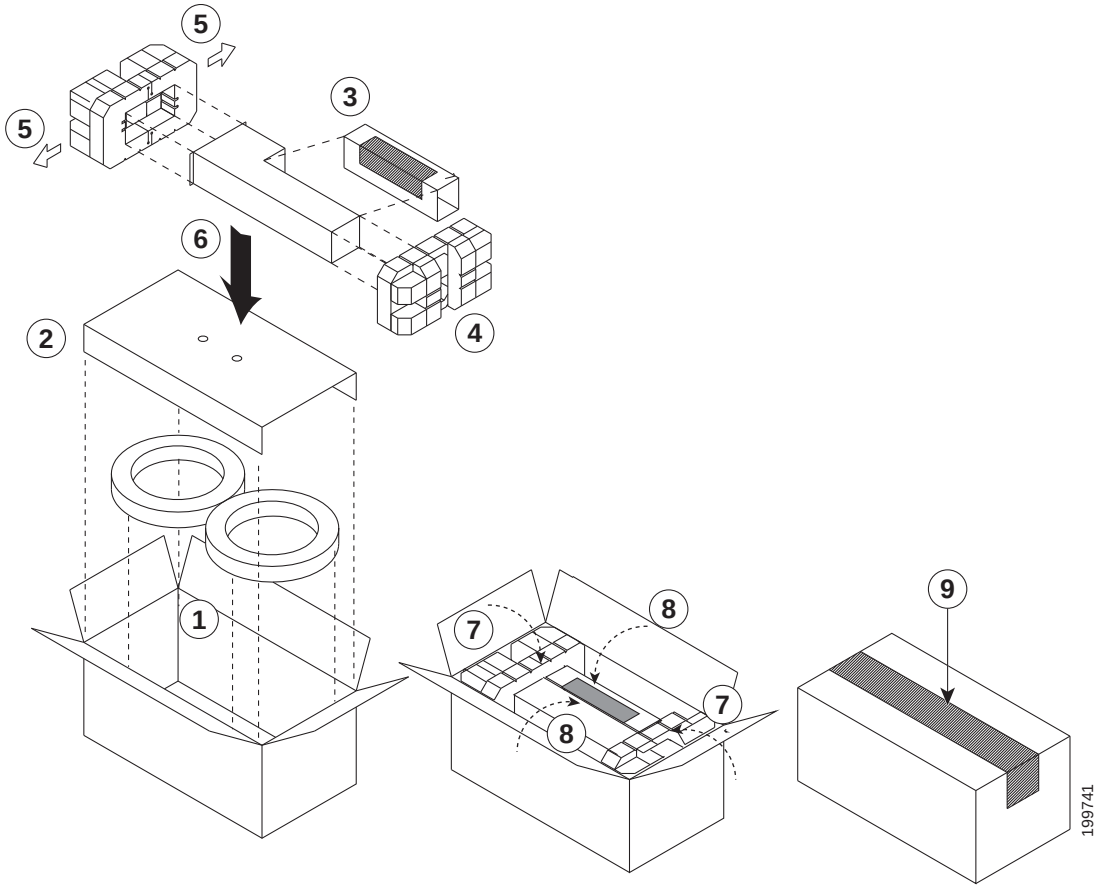
Step 7 Disconnect the grounding lug from the lower front side of the power supply unit by unscrewing the two M6 nuts and removing the lug from the power supply unit. For the location of the grounding pad on the DC power supply unit, see Figure 6-2 on page 6-11.

Warning **When installing or replacing the unit, the ground connection must always be made first and disconnected last.** Statement 1046

Step 8 Holding the power supply handle with one hand, slide the power supply part of the way out of the chassis. Place your other hand underneath the power supply unit to support its weight and slide the power supply unit completely out of the chassis.

Step 9 Place the power supply unit on an antistatic mat or repack it in the box for its replacement unit as shown in Figure 10-3.

Figure 10-3 Packing a DC Power Supply Unit



1	Coil the power cables and place them on the bottom of the box.	**6**	Place the padded power supply unit inside the box and on top of the trifold.
2	Place the trifold cover over the coiled cables.	**7**	Fold the narrow flaps over the power supply unit pads.
3	Put the power supply unit in its ESD bag and hold the filler box outside the bag in the notched portion of the power supply unit.	**8**	Fold the wide flaps over the power supply unit.
4	Place the nonexpanding end pad over the back end of the power supply unit and filler box.	**9**	Tape the wide flaps together and to the box with packing tape.
5	Pull the two sides of the expandable end pad apart, fit the end pad over the front end of the power supply unit, and press the two sides together snuggly over the front end of the power supply unit.		

Step 10 Either replace the power supply unit or cover the empty power supply bay as follows:

- If you are ready to replace the power supply unit, see the "Installing a 6-kW DC Power Supply Unit During Operations" section on page 10-14.

- If the power supply bay is to remain empty, install a blank power supply filler plate (Cisco part number 800-28658-01) over the opening, and secure it with its captive screws.

Installing a 6-kW DC Power Supply Unit During Operations

After you remove a 6-kW DC power supply, you can replace it with another AC or DC power supply or replace it with a blank plate until another power supply is available. To install an AC power supply unit, see the "Installing a 6-kW or 7.5-kW AC Power Supply Unit During Operations" section on page 10-7.

Warning **Hazardous voltage or energy is present on the backplane when the system is operating. Use caution when servicing.** Statement 1034

To install a 6-kW DC power supply unit while a Cisco Nexus 7000 Series switch is operating, follow these steps:

Step 1 Unpack the replacement DC power supply unit and place it on an antistatic mat. Also, unpack the power cables.

Step 2 Ensure that the power switch on the replacement DC power supply unit is in the standby (STBY) position.

Step 3 Ensure that the DC power source for the new power supply unit is turned off at the circuit breaker.

Warning **Before performing any of the following procedures, ensure that power is removed from the DC circuit.** Statement 1003

Step 4 Grasp the power supply unit handle with one hand, and place your other hand underneath the power supply unit to support its weight. Align the back of the power supply unit with the power supply bay and slide the power supply into the power supply bay. Make sure the power supply unit is fully seated in the power supply bay and that its four captive screws are aligned with their holes in the chassis.

Note The 6-kW power supply unit weighs 21 lb (9.5 kg). Use two hands to safely hold and move a power supply unit.

Step 5 Screw in each of the four captive screws and tighten to 8 in-lb (0.9 N·m).

Step 6 Attach the Earth ground to the power supply unit (see the "Grounding a 6-kW DC Power Supply" section on page 6-9).

Warning **When installing or replacing the unit, the ground connection must always be made first and disconnected last.** Statement 1046

Step 7 If the power cables are not already connected to the DC power source, connect them as follows:

- For 3 kW of power, connect one set of power cables (two sets of positive and negative cables attached to one plug) to the DC power circuit.
- For 6 kW of power, connect two sets of power cables (four sets of positive and negative cables attached to two plugs) to the DC power circuit.

For information on how to connect the power supply unit to DC power sources for input source redundancy, see the "Connecting a DC Power Supply Directly to DC Power Sources" section on page 6-11).

Note If the power source is not within reach of the power cables, connect the power cables to a DC power interface unit (PIU). To connect the PIU, see the "Connecting a Power Supply to DC Power Sources through a Power Interface Unit" section on page 6-21.

Warning **Hazardous voltage or energy may be present on DC power terminals. Always replace cover when terminals are not in service. Be sure uninsulated conductors are not accessible when cover is in place.** Statement 1075

Tip For power redundancy, connect each set of power cables (each set with a common plug for the power supply unit) to a separate DC power circuit.

Step 8 Attach the DC power cable plugs to the power supply unit and fasten them by tightening the captive screw on each end of the plug to 8 to 11 in-lb (0.9 to 1.2 N·m).

Step 9 Turn on the circuit breaker for the DC circuits that you connected.

Step 10 Turn the Power switch on the power supply unit from STBY to ON.

Step 11 Verify the power supply operation by checking that the power supply LEDs are in the following states:

- For 3 kW of output power, make sure that two Input LEDs are green.
- For 6 kW of output power, make sure that four Input LEDs are green.
- Output LED is green.
- Fault LED is not on or flashing.

If one or more of the Input or Output LEDs is not green or the Fault LED is lit or flashing, see the "Troubleshooting a DC Power Supply Unit" section on page 9-3.

For more information on the power supply unit LED states, see Appendix D, "Chassis and Module LEDs."

Replacing an HVAC/HVDC Power Supply Unit During Operations

The Cisco Nexus 7000 Series switches use a load-balanced power supply that uses up to four AC, DC or HVAC/HVDC power supply units. If you can set one power supply unit in standby mode and have the required power load balanced by the remaining online power supply units, you can replace the standby power supply unit with another power supply unit without interrupting system operations.

Warning **Blank faceplates and cover panels serve three important functions: they prevent exposure to hazardous voltages and currents inside the chassis; they contain electromagnetic interference (EMI) that might disrupt other equipment; and they direct the flow of cooling air through the chassis. Do not operate the system unless all cards, faceplates, front covers, and rear covers are in place.** Statement 1029

Note If a replacement power supply unit is not available and you do not have a blank plate to cover the empty power supply bay, you should leave the original power supply in the bay until you have the replacement unit.

This section describes how to replace an AC power supply unit and includes the following topics:

Required Tools

Before you replace an HVAC/HVDC power supply unit, make sure that you have the following tools and equipment:

- Number 1 Phillips screwdriver with torque capability
- Shipping materials
- Antistatic mat
- Replacement power supply unit

Caution When you handle the Cisco Nexus 7000 Series 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.

Removing a 3.5-kW HVAC/HVDC Power Supply Unit During Operations

Warning **Hazardous voltage or energy is present on the backplane when the system is operating. Use caution when servicing.** Statement 1034

To replace an HVAC/HVDC power supply unit while a Cisco Nexus 7000 Series switch is operating, follow these steps:

Step 1 Make sure that the power supply units not being replaced have their power turned on (labelled as 1 on the power switch).

Step 2 Turn the power switch on the power supply that you are removing to standby (labelled as 0).

The Output LED turns off.

Step 3 Unplug the power cord from the power source. Release the built-in latch on the plug.

Step 4 Press the release latch on the front right side of the power supply to the left and pull the power supply part way out of the chassis.

Step 5 Release the latch, place your other hand under the power supply, pull the module fully out of the chassis, and set it on the antistatic mat or pack it in a box for shipping.

Step 6 Either replace the power supply unit or cover the empty power supply bay as follows:

- If you are ready to replace the power supply unit, see the "Installing a 3.5-kW HVAC/HVDC Power Supply Unit During Operations" section on page 10-17.
- If the power supply bay is to remain empty, install a blank power supply filler plate (Cisco part number 800-28658-01) over the opening, and secure it with the captive screws.

Installing a 3.5-kW HVAC/HVDC Power Supply Unit During Operations

After you remove a 3.5-kW HVAC/HVDC power supply, you can replace it with another power supply or replace it with a blank plate until another power supply is available.

Warning **Hazardous voltage or energy is present on the backplane when the system is operating. Use caution when servicing.** Statement 1034

To install an HVAC/HVDC power supply unit while a Cisco Nexus 7000 Series switch is operating, follow these steps:

Step 1 Unpack the replacement power supply unit and place it on an antistatic mat. You must also unpack a power cord to be used with the power supply.

Step 2 Ensure that the power switch on the power supply unit is set to standby (labelled as 0) and that the HVAC/HVDC power cords are not plugged into the HVAC/HVDC power supply.

Step 3 Holding the HVAC/HVDC power supply unit with one hand on its handle and the other hand under the bottom (longest side), align the back of the power supply unit with the power supply bay and slide the power supply fully into the power supply bay until the release latch clicks.

Step 4 Plug the power cable into the power jack on the front of the power supply unit. The built-in latch secures the power cable to the power supply.

Step 5 Plug the other end of the power cable into the HVAC/HVDC power source. The Input LEDs light up.

Step 6 Turn the Power switch from standby to on (from 0 to 1 as labelled on the power switch). The Output LED lights up.

If one or more of these LEDs is red, turn the power switch to standby (0), check the HVAC/HVDC power connection, and then turn the power switch back on (1). The Input and Output LEDs for the connected power supply units should be green.

For more information about the power supply unit LED states, see Appendix D, "Chassis and Module LEDs."

Replacing a Supervisor Module

The Cisco Nexus 7000 Series switches can be configured with one or two supervisor modules. If the system has two supervisor modules, you can replace one of the supervisors while the other one manages system operations. If the system has only one supervisor, you must bring the system down to replace the supervisor module because the supervisor module is required for managing operations.

Note If you need to bring down the switch to change supervisors, you must also copy the running configuration, system messages, VDC configurations, and licenses onto a USB drive before removing the supervisor module as explained in the "Replacing a Supervisor Module" section on page 10-18.

Caution Make sure that you do not accidentally press one or more of the ejector release buttons on the I/O, supervisor, and fabric modules. These buttons and their mechanical levers are designed so that you can easily power down and remove these modules when you need to replace them. If you press one of these buttons, the lever for that button releases from the front of the module, but the module remains operational and connected to the system. If you press the other ejector button on the same module at the same time as you press the first button or while the lever for the first button is released, the lever for the second button releases, and the module powers down and disconnects from the system.

To minimize the chance of accidentally disconnecting a module with a released lever, press the lever back toward the module until it clicks. If both levers are released, the system has disconnected and powered down the module, and the STATUS LED will be unlit. To reconnect and power up the module, either remove and reinsert the module in the chassis or use system commands to power it on.

This section describes how to replace supervisor modules and includes the following topics:

Required Tools

You need a flat-blade or number 2 Phillips-head screwdriver to loosen or tighten the captive screws on the supervisor module.

Replacing a Redundant Supervisor Module During System Operations

During operations, one supervisor is active while the other (redundant) supervisor is in standby mode. You can replace either of these two supervisors. If you need to replace the active supervisor, it becomes the standby supervisor as soon as you press its ejector buttons.

Note A replacement supervisor module comes with one DIMM (4 GB of memory) or, if your switch is running Cisco NX-OS 5.1 (or later release), two DIMMs (8 GB of memory). If the switch not running a version of Cisco NX-OS that is compatible with using 8 GB of memory, then you must use only one DIMM (do not install an additional DIMM).

Caution If you cannot immediately replace a supervisor, either leave the supervisor in its slot until it can be replaced or replace it with a blank module so the system airflow is not disrupted. If the system airflow is disrupted for more than a couple of minutes, the system could overheat and shut down.

Warning **Hazardous voltage or energy is present on the backplane when the system is operating. Use caution when servicing.** Statement 1034

Caution Handle each supervisor or I/O module carefully using an ESD wrist strap, holding the module only on its carrier edges without touching any electronic circuitry, and placing the module on antistatic mats or repacking it in its original packing materials when it is not installed in the Cisco Nexus 7000 Series chassis.

To replace a supervisor module, follow these steps:

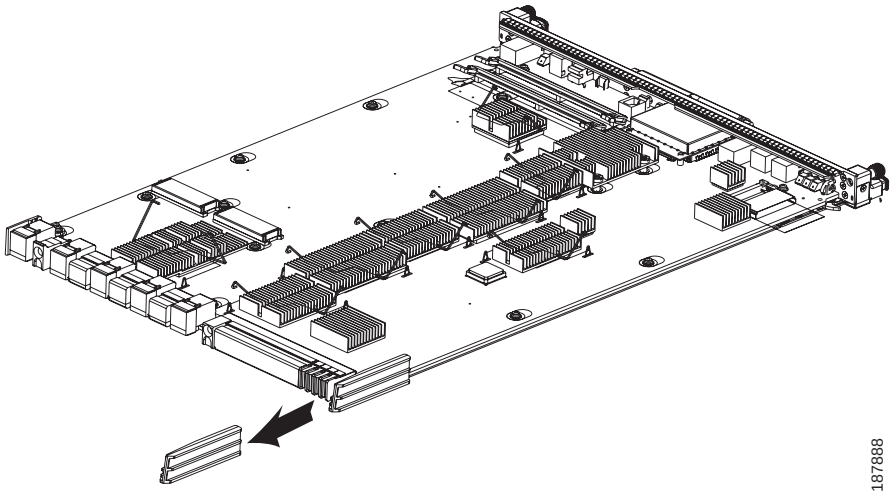
Step 1 Place an antistatic mat or antistatic foam where you can place the new and old supervisor modules.

Step 2 If the replacement supervisor is in a shipping box, prepare the module for installation by following these steps:

a. Open the shipping box for the module and remove the module from its antistatic wrapping.

b. If the plastic protector shown in Figure 10-4 is included with the module, remove it by pulling it past the back of the module. Keep the plastic protector and the other packing materials so that you can easily ship the module at a later time.

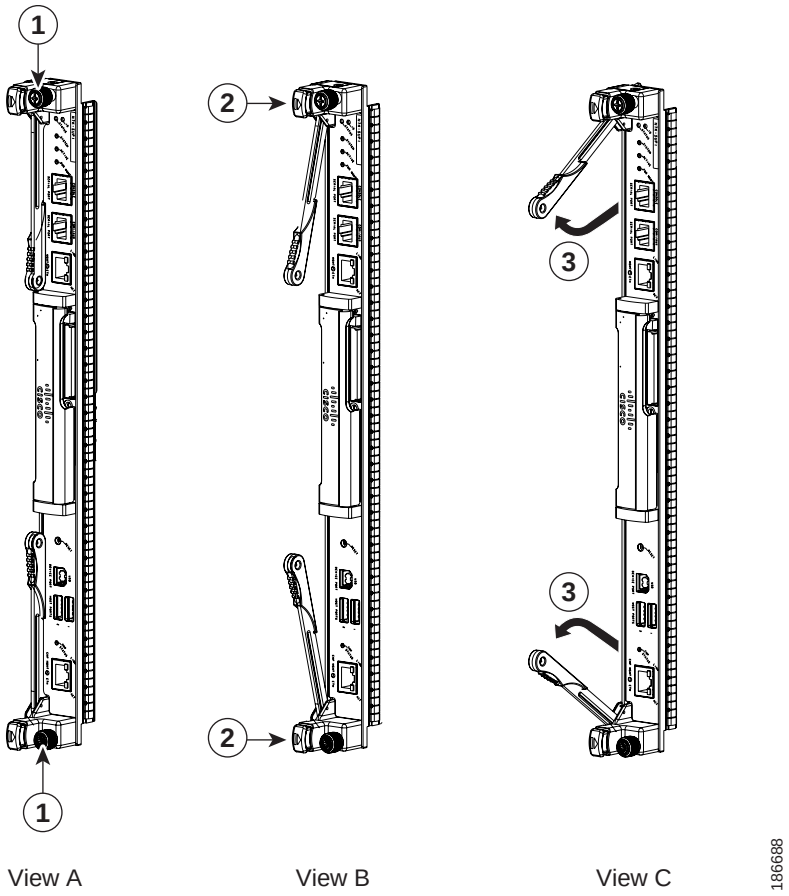
Figure 10-4 Removing the Plastic Protector from the Supervisor Module



Caution To prevent ESD damage, avoid touching the electronic circuitry and prevent anything else from coming in contact with the circuitry.

Step 3 On the currently installed supervisor module (the module that you are going to remove), loosen the two captive screws identified in View A of Figure 10-5.

Figure 10-5 Unseating a Supervisor Module



1	Unscrew two captive screws.	**3**	Simultaneously swing open both ejector levers to unseat the module.
2	Simultaneously press both ejector buttons.		

Step 4 Press the ejector release buttons on the ends of the module (see View B of Figure 10-5) to push out the ejector levers and to disconnect the module.

If the chassis has two supervisor modules and you disconnect the active supervisor module, that supervisor goes into standby mode and the other supervisor automatically becomes the active supervisor.

Step 5 Disconnect the cables attached to the front of the module to be removed. Make sure that each cable is labelled for its port on the module.

Step 6 Simultaneously rotate the two ejector levers outward to unseat the module from the midplane connector (see View C of Figure 10-5).

Step 7 With a hand on each ejector, pull the module part way out of its slot in the chassis.

Step 8 Grasp the front edge of the module with your left hand and place your right hand under the lower side of the module to support its weight. Pull the module out of its slot.

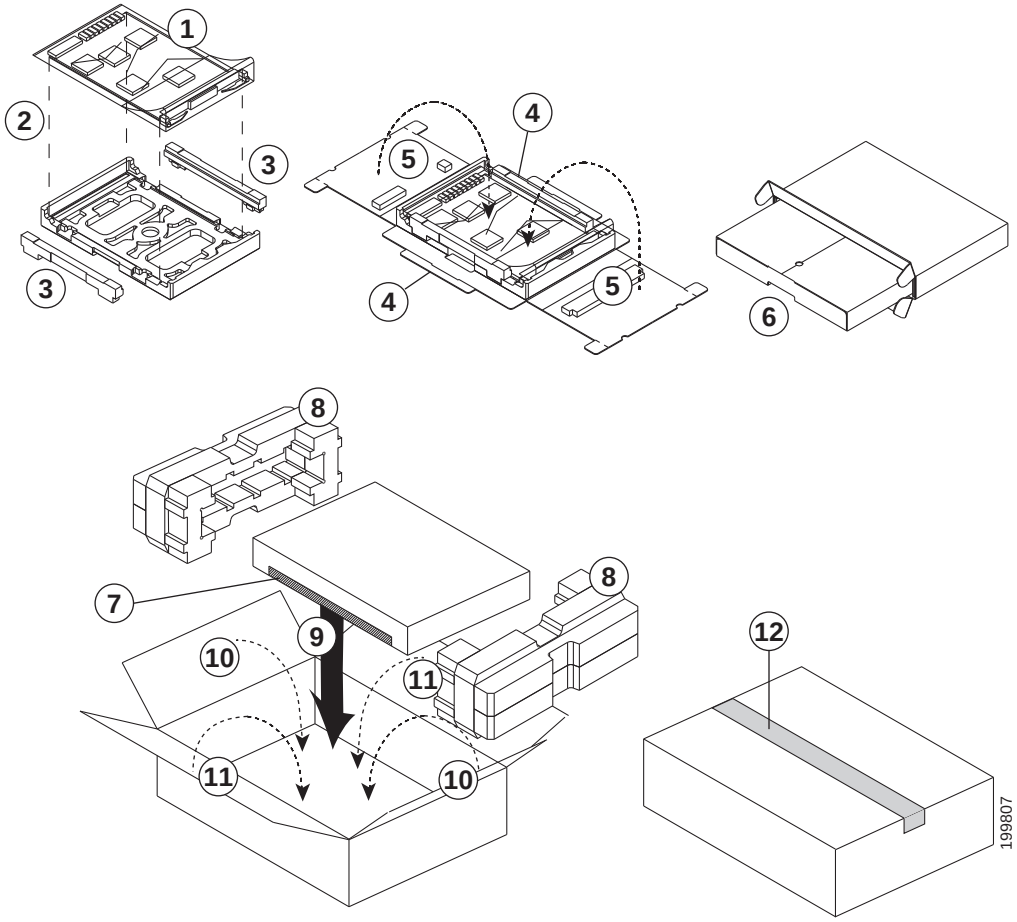
Caution To prevent ESD damage, avoid touching the electronic circuitry and prevent anything else from coming in contact with the circuitry.

Step 9 If you are removing the module from a Cisco Nexus 7010 chassis, rotate the module 90 degrees counterclockwise so that it is horizontal and you can see its circuitry from above.

Step 10 Place the removed module in an antistatic bag.

Step 11 Repack the bagged I/O module in its original packing materials as shown in Figure 10-6.

Figure 10-6 Repacking a Supervisor Module



1	Put the module in an ESD bag.	**7**	Tape the flap to the box.
2	Place the bagged module on the foam pad.	**8**	Insert the two box sides into foam blocks.
3	Attach a side pad to each of the long sides of the module.	**9**	Place the box and its foam blocks into the larger box.
4	Fold the side flaps up along the side pads.	**10**	Fold the narrow flaps over the smaller box and foam blocks.
5	Fold the long flaps up along the ends of the module and then over the top of the module. Insert the two tabs on each flap into the side flaps.	**11**	Fold the wide flaps over the box.
6	Insert the folded box into the slightly larger box.	**12**	Tape the wide flaps together and to the box.

Step 12 On the replacement module, rotate both of the ejector levers away from the front of the module.

Step 13 If you are inserting the module into a Cisco Nexus 7010 chassis, rotate the module 90 degrees clockwise.

Step 14 Align the module to the chassis guides for the vacated slot (slot 5 or 6 on the Cisco Nexus 7010 chassis or slot 9 or 10 on the Cisco Nexus 7018 chassis), and slide the module part way into the slot.

Step 15 With one or both hands on the front of the module, push the module all the way into the slot until it seats on the midplane connector.

Step 16 Simultaneously push both ejector levers inward until they come in contact with the face of the module.

The module should be fully seated in the slot and the captive screws should be aligned with their holes in the chassis. The EMI gasket should close the gap between the new module and the module in the next slot to the right.

Step 17 Screw in the two captive screws to the chassis and tighten them to 8 in-lb (0.9 N·m).

Step 18 Reconnect the console cable to the CONSOLE SERIAL PORT as explained in the "Connecting to the Console" section on page 7-2.

Step 19 If the previous supervisor module was connected to an asynchronous device through a modem, connect the modem cable to the COM1/AUX SERIAL PORT as explained in the "Connecting to the Console" section on page 7-2.

Step 20 Reconnect the network management cable to the MGMT ETH port as explained in "Setting Up the Management Interface" section on page 7-4.

Step 21 Reconnect the CMP cable to the CMP MGMT ETH port as explained in "Connecting the Supervisor CMP Port" section on page 7-5.

Step 22 Copy the license file from the active supervisor to the standby supervisor. Use the **copy bootflash:license-filename.lic bootflash://supervisor-standby/license-filename.lic.lic** command to copy the license file.

Step 23 Verify that both supervisors have the same amount of memory by following these steps:

a. Use the show **system resources command** to see how much memory is installed in the active supervisor.

b. Use the **system switchover** command to make the other supervisor module active.

c. Use the **show system resources** command to see how much memory is installed in the other supervisor.

If one of the supervisor modules has more memory than the other supervisor module, you must either remove 4 GB from the module with 8 GB (see the "Removing 4 GB of Memory from a Supervisor Module" section on page 10-36) or add 4 GB to the module with 4 GB (see the"Adding 4 GB of Memory to a Supervisor Module" section on page 10-33).

Replacing a Supervisor Module in a Single-Supervisor System

If you need to replace the supervisor in a single-supervisor Cisco Nexus 7000 Series system, you must shut down the system before replacing the supervisor.

Note A replacement supervisor module comes with one DIMM (4 GB of memory) or, if your switch is running Cisco NX-OS 5.1 (or later release), two DIMMs (8 GB of memory). If the switch not running a version of Cisco NX-OS that is compatible with using 8 GB of memory, you must use only one DIMM (do not install an additional DIMM).

Warning **Hazardous voltage or energy is present on the backplane when the system is operating. Use caution when servicing.** Statement 1034

Caution Handle the supervisor module carefully using an ESD wrist strap, holding the module only on its carrier edges without touching any electronic circuitry, and placing the module on antistatic mats or antistatic foam when it is not installed in the Cisco Nexus 7000 Series chassis.

To replace a supervisor module in a single-supervisor system, follow these steps:

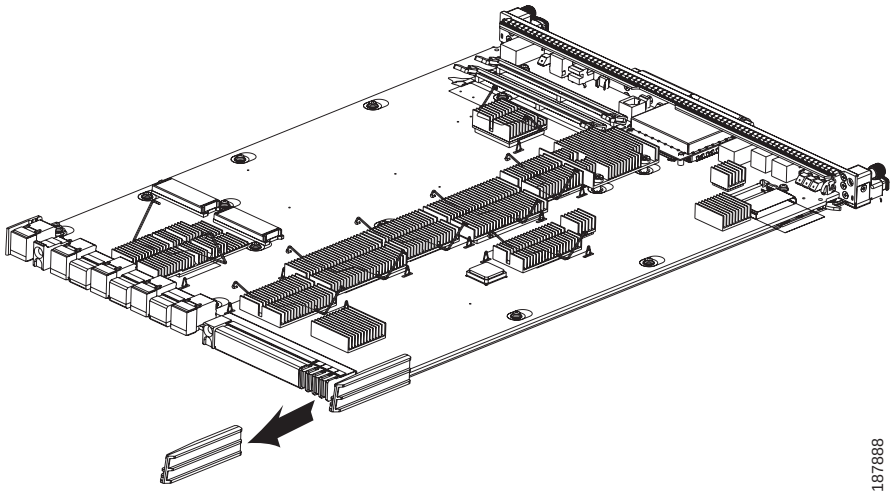
Step 1 Place an antistatic mat or antistatic foam where you can place the new and old supervisor modules.

Step 2 If the replacement supervisor is in a shipping box, prepare the module for installation by following these steps:

a. Open the shipping box for the module and remove the module from its antistatic wrapping.

b. If the plastic protector shown in Figure 10-7 is included with the module, remove it by pulling it past the back of the module. Keep the plastic protector and the other packing materials so that you can easily ship the module at a later time.

Figure 10-7 Removing the Plastic Protector from the Supervisor Module



Caution To prevent ESD damage, avoid touching the electronic circuitry and prevent anything else from coming in contact with the circuitry.

Step 3 Turn off the power on each of the power supply unit by turning its power switch to standby (STBY).

Step 4 Disconnect all of the cables attached to the front of the module to be removed.

Step 5 Loosen the two captive screws identified in View A of Figure 10-5 on page 10-21.

Step 6 Press the ejector release buttons on the top and bottom ends of the module (see View B of Figure 10-5 on page 10-21) to push out the ejector levers and to disconnect the module.

Step 7 Simultaneously rotate the two ejector levers outward to unseat the module from the midplane connector (see View C of Figure 10-5 on page 10-21).

Step 8 With a hand on each ejector, pull the module part way out of its slot in the chassis.

Step 9 Grasp the front edge of the module with your left hand and place your right hand under the lower side of the module to support its weight. Pull the module out of its slot.

Caution To prevent ESD damage, avoid touching the electronic circuitry and prevent anything else from coming in contact with the circuitry.

Step 10 If you are removing a module from a Cisco Nexus 7010 chassis, rotate the module 90 degrees counterclockwise so that it is horizontal and you can see its circuitry from above.

Step 11 Place the removed module on the antistatic mat or repack it in its original packing materials as shown in Figure 10-6 on page 10-22.

Step 12 On the replacement supervisor module, rotate both of the ejector levers away from the front of the module.

Caution To prevent ESD damage, avoid touching the electronic circuitry and prevent anything else from coming in contact with the circuitry.

Step 13 If you are inserting the module into a Cisco Nexus 7010 chassis, rotate the module 90 degrees clockwise.

Step 14 Align the module to the chassis guides for the vacated slot (slot 5 or 6 on a Cisco Nexus 7010 chassis or slot 9 or 10 on a Cisco Nexus 7018 chassis), and slide the module part way into the slot.

Step 15 With one or both hands on the front of the module, push the module all the way into the slot until it seats on the midplane connector.

Step 16 Slide the module into the slot until it seats on the midplane.

Step 17 Simultaneously push both ejector levers inward until they come in contact with the face of the module.

The module should be fully seated in the slot and the captive screws should be aligned with their holes in the chassis. The EMI gasket should close the gap between the replacement module and the module in the next slot.

Step 18 Screw in the two captive screws to the chassis and tighten them to 8 in-lb (0.9 N·m).

Step 19 Reconnect the console cable to the CONSOLE SERIAL PORT as explained in the "Connecting to the Console" section on page 7-2.

Step 20 (For Supervisor 1 modules only) If the previous supervisor module was connected to an asynchronous device through a modem, connect the modem cable to the COM1/AUX SERIAL PORT as explained in the "Connecting to the Console" section on page 7-2.

Step 21 Reconnect the network management cable to the MGMT ETH port as explained in the "Setting Up the Management Interface" section on page 7-4.

Step 22 (For Supervisor 1 modules only) Reconnect the CMP cable to the CMP MGMT ETH port as explained in the "Connecting the Supervisor CMP Port" section on page 7-5.

Replacing Supervisor 1 Modules with Supervisor 2 or Supervisor 2E Modules

Before migrating from Supervisor 1 modules to Supervisor 2 or Supervisor 2E modules, note the following guidelines:

- This migration process is disruptive for switches with one or two supervisor modules because the power must be turned off for the switch.
- Backward migration procedure (migrating from Supervisor 2 or Supervisor 2E modules to Supervisor 1 modules) is not provided.
- We recommend that you use Cisco NX-OS Release 5.2 (or later release) on the Supervisor 1 module while performing the migration.
- You cannot mix Supervisor 2 and Supervisor 2E modules in a production environment (this mix of modules is supported only while you are migrating from using Supervisor 2 modules to Supervisor 2E modules as explained in the "Replacing Supervisor 2 Modules with Supervisor 2E Modules" section on page 10-30). You must replace redundant Supervisor 1 modules with either two Supervisor 2 modules or two Supervisor 2E modules.
- If you plan to enable the admin VDC feature on the Supervisor 2 or Supervisor 2E modules, be sure to complete the entire migration procedure before enabling this feature (see the *Cisco Nexus 7000 Series NX-OS Virtual Device Context Configuration Guide*).
- The default-gateway command needs to be removed and replaced with ip route under the cmp-mgmt interface when SUP1 is upgraded to SUP-2/SUP-2E.

- If you are migrating Supervisor 1 Modules with Supervisor 2 or Supervisor 2E Modules, then replace ip default-gateway x.x.x.x' with ip route 0/0 x.x.x.x in the config.

To migrate from using Supervisor 1 modules to Supervisor 2 or Supervisor 2E modules, follow these steps:

Step 1 Insert a USB drive in the top USB port (usb1) in the active supervisor 1 module. If the Supervisor 2 or Supervisor 2E module shipped with an extra USB drive, you can insert that USB drive in the usb1 drive on the Supervisor 1 module.

Note Do not use the USB drive that is in the LOG FLASH port.

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 1 module.

Step 5 Determine the Cisco NX-OS software release to use on the Supervisor 2 or Supervisor 2E modules. We support Cisco NX-OS Release 6.1(1) (or later release) on those modules but another one might be recommended. Additionally, the most recommended maintenance release might not be the one that ships with the Supervisor 2 or Supervisor 2E modules. We recommend that you check with the following documents for the recommended software release:

- *Minimum Recommended Cisco NX-OS Releases for Cisco Nexus 7000 Series Switches*
- *Cisco Nexus 7000 Series NX-OS Release Notes, Release 6.1*

Step 6 Copy the Supervisor 2 or Supervisor 2E version of the kickstart, system, and EPLD (optional) images to the USB drive by using the **copy** command.

```
switch(config)# copy scp://path/n7000-s2-kickstart.6.1.1.bin usb1:
switch(config)# copy scp://path/n7000-s2-dk9.6.1.1.bin usb1:
switch(config)# copy scp://path/n7000-s2-epld.6.1.1.img usb1:
```

Note This example specifies the NX-OS Release 6.1(1) images. For a later release, use the later release number in the .bin or .img file name.

Caution Use -s2- images with Supervisor 2 or Supervisor 2E modules. If you use an -s1- image with a Supervisor 2 or Supervisor 2E module, the supervisor will not boot up.

Note Although the Supervisor 2 and Supervisor 2E ship with updated EPLD images, you might need to update the EPLD images on the other modules on the switch. For example, migrating from Supervisor 1 modules to Supervisor 2 or Supervisor 2E modules on switches that use Fabric 2 modules requires EPLD updates for the fabric modules. For more information, see the *Cisco Nexus 7000 Series FPGA/EPLD Upgrade Release Notes, Release 6.1* or later release.

Step 7 Turn off the power to the switch by turning the power switch on each power supply from ON to STBY (Standby). 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 8 For each Supervisor 1 module installed in the switch, remove the module and replace it with a Supervisor 2 or Supervisor 2E module as explained one of the following sections:

- If you are replacing both supervisors in a switch, see the "Replacing a Redundant Supervisor Module During System Operations" section on page 10-18.
- If you are replacing a supervisor module in a switch with one supervisor, see the "Replacing a Supervisor Module in a Single-Supervisor System" section on page 10-24.

Caution If the switch has two supervisor modules, be sure that both supervisors are the same type. Do not mix Supervisor 1 modules with Supervisor 2 or Supervisor 2E modules and do not mix Supervisor 2 modules with Supervisor 2E modules.

Step 9 Power up the switch by turning the power switch on each of its power supplies from STBY (standby) to ON. 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 10 Remove the USB drive from the Supervisor 1 module (this drive has copies of the Supervisor 1 configuration, license, and software images) and insert it in the Slot0: USB port on the active Supervisor 2 or Supervisor 2E module (ACTIVE LED is green).

Step 11 Connect a console to the active supervisor module as explained in "Connecting to the Console" section on page 7-2.

Step 12 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 13 When you are asked to enable admin VDCs, enter **no**.

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

Step 14 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 15 When asked to log in, enter the login and password that you specified in step 12.

```
User Access Verification
switch login:
Password:
```

Step 16 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 SLOT 0 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 17 Copy the TAR archive containing the license files from the USB SLOT 0 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 slot0:licenses_archive_file_name.tar bootflash:
switch(config)# tar extract bootflash:licenses_archive_file_name.tar to bootflash:
switch(config)# install license bootflash:license_file_name.lic
```

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

Step 18 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
Mod  Ports  Module-Type                        Model              Status
---  -----  ---------------------------------- ------------------ ---------------
2    0      Supervisor module-2                N7K-SUP2E          active *
6    0      Supervisor module-2                N7K-SUP2E          ha-standby
7    48     1/10 Gbps Ethernet Module          N7K-F248XP-25      ok
...
```

Step 19 If there are Fabric 2 modules in the switch, upgrade the Fabric 2 EPLDs (see the "Configuring EPLDs" section on page 8-34).

Step 20 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 slot0:configuration_file_name running-config
```

Note While the configuration is applied on the Supervisor 2 or Supervisor 2E module you will see an error that indicates a problem with the cmp-mgmt interface or AUX port. The Supervisor 2 and Supervisor 2E modules do not have the CMP utility nor the AUX port, so you can disregard this error message.

```
switch(config)# interface cmp-mgmt module 5
                           ^
Invalid interface format at '^' marker.
...
switch(config)# line com1
                        ^
% Invalid command at '^' marker.
```

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.

Note When upgrading from Supervisor 1 to Supervisor 2, any configuration that is a part of the CMP module may be erroneously applied to the interface above it.

Step 21 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
```

Replacing Supervisor 2 Modules with Supervisor 2E Modules

Before migrating from Supervisor 2 modules to Supervisor 2E modules, note that non disruptive backward migration (migrating from Supervisor 2E modules to Supervisor 2 modules during switch operations) is not supported—in a switch with two supervisor modules and an active Supervisor 2E module, a Supervisor 2 will not boot up nor synchronize with the active Supervisor 2E module.

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

Step 1 Replace one of the Supervisor 2 modules by following the steps in the "Replacing a Redundant Supervisor Module During System Operations" section on page 10-18.

Step 2 Verify that the Supervisor 2E module has 2 CPUs and 32 GB of DRAM by looking at the bootup output (see the highlighted portions in the following example).

```
CPU - 2 : Cores - 4 : HTEn - 1 : HT - 2 : Features - 0xbfebfbff
```

```
FSB Clk - 532 Mhz :  Freq - 2144 Mhz - 2128 Mh
MicroCode Version : 0xffff0002
Memory - 32768 MB : Frequency - 1067 MHZ
```

Step 3 Monitor the console output for the active Supervisor 2. When the standby Supervisor 2E fully boots up, note that the console displays a SYSLOG message similar to the following:

```
2012 Jul 26 14:28:23 switch %SYSMGR-2-CTIVE_LOWER_MEM_THAN_STANDBY: Active Supervisor in
slot 1 is running with less memory than standby supervisor in slot 2.
```

This message states that the Supervisor 2E module has more memory than the Supervisor 2 module (as expected).

Step 4 Verify that both supervisor modules have synchronized their states by using the **show mod** and **show system redundancy ha status** commands.

```
switch# show mod
Mod  Ports  Module-Type              Model           Status
---  -----  -----------------------  --------------  ---------
1    0      Supervisor module-2      N7K-SUP2        active
2    0      Supervisor module-2      N7K-SUP2E       ha-standby

switch# show system redundancy ha status
VDC No This supervisor Other supervisor
------ --------------- ----------------
vdc 1 Active with HA standby HA standby
vdc 2 Active with HA standby HA standby
vdc 3 Active with HA standby HA standby
vdc 4 Active with HA standby HA standby
```

Step 5 Make the Supervisor 2E module active by using the **system switchover** command.

```
switch# system switchover
```

When the Supervisor 2E becomes active, the Supervisor 2 powers down and will not come up as a standby supervisor.

```
2012 Jul 26 14:50:19 switch %$ VDC-1 %$ %SYSMGR-2-SUP_POWERDOWN; Supervisor in slot 1 is
running with less memory than active supervisor in slot 2
2012 Jul 26 14:50:19 switch %$ VDC-1 %$ %SYSMGR-2-CONVERT_STARTUP_ABORTED: Conversion of
startup-config failed.
2012 Jul 26 14:50:19 switch %$ VDC-1 %$ %PLATFORM-2-MOD_PWRDN: Module 1 powered down
```

Step 6 Verify that the Supervisor 2E module is active and that the Supervisor 2 is powered down by using the show module command.

```
switch# show mod
Mod  Ports  Module-Type              Model           Status
---  -----  -----------------------  --------------  ---------
1    0      Supervisor module-2      N7K-SUP2        powered-dn
2    0      Supervisor module-2      N7K-SUP2E       active *
...

Mod  Power-Status  Reason
---  ------------  ----------------------------
1    powered-dn    Policy trigger initiated reset: Stdby has lower mem than active
```

Step 7 Remove the Supervisor 2 module, which is powered down (LEDs are off).

Note If you intend to use a single Supervisor 2e module, the procedure is complete. If you intend to use redundant Supervisor 2e modules, continue with the following steps.

Step 8 Install a Supervisor 2E module in the open slot and connect it to the console (see the "Replacing a Redundant Supervisor Module During System Operations" section on page 10-18).

Step 9 Verify that both supervisor modules have synchronized their states by using the **show mod** and **show system redundancy ha status** commands.

```
switch# show mod
Mod  Ports  Module-Type              Model           Status
---  -----  ----------------------  --------------  ---------
1    0      Supervisor module-2     N7K-SUP2E       active
2    0      Supervisor module-2     N7K-SUP2E       ha-standby

switch# show system redundancy ha status
VDC No This supervisor Other supervisor
------ --------------- ----------------
vdc 1 Active with HA standby HA standby
vdc 2 Active with HA standby HA standby
vdc 3 Active with HA standby HA standby
vdc 4 Active with HA standby HA standby
```

Upgrading Memory for Supervisor 1 Modules

The Cisco Nexus 7000 Series Supervisor 1 modules use either 4 GB or 8 GB of memory. For switches that have two supervisor modules, each module must have the same amount of memory so that it can provide redundant services for the other. In order to use 8 GB of memory, a switch must be running Cisco NX-OS Release 5.1 or later release. If the switch is running an earlier release of Cisco NX-OS, the supervisor modules must have only 4 GB of memory installed.

Note The Cisco NX-OS software may require 8 GB of memory, depending on the software version you use and the software features that you enable. If your switch has Supervisor 1 modules with only 4 GB of memory, then you might need to upgrade the modules to 8 GB of memory by using the 8 GB supervisor upgrade kit (N7K-SUP1-8GBUPG=). This upgrade is not needed for switches that have at least 8 GB of memory (which includes Supervisor 1 modules with 8 GB and all Supervisor 2 and Supervisor 2E modules).

To determine the amount of memory installed in the active supervisor, use the **show system resources** command as shown in Example 10-1. To determine the amount of memory used by the standby supervisor module, use the **system switchover** command to make that module active and then use the **show system resources** command. This example shows the output for the **show system resources** command, which shows 4115768K (4 GB) of memory usage.

Example 10-1 Determining the Amount of Memory used by the active supervisor module.

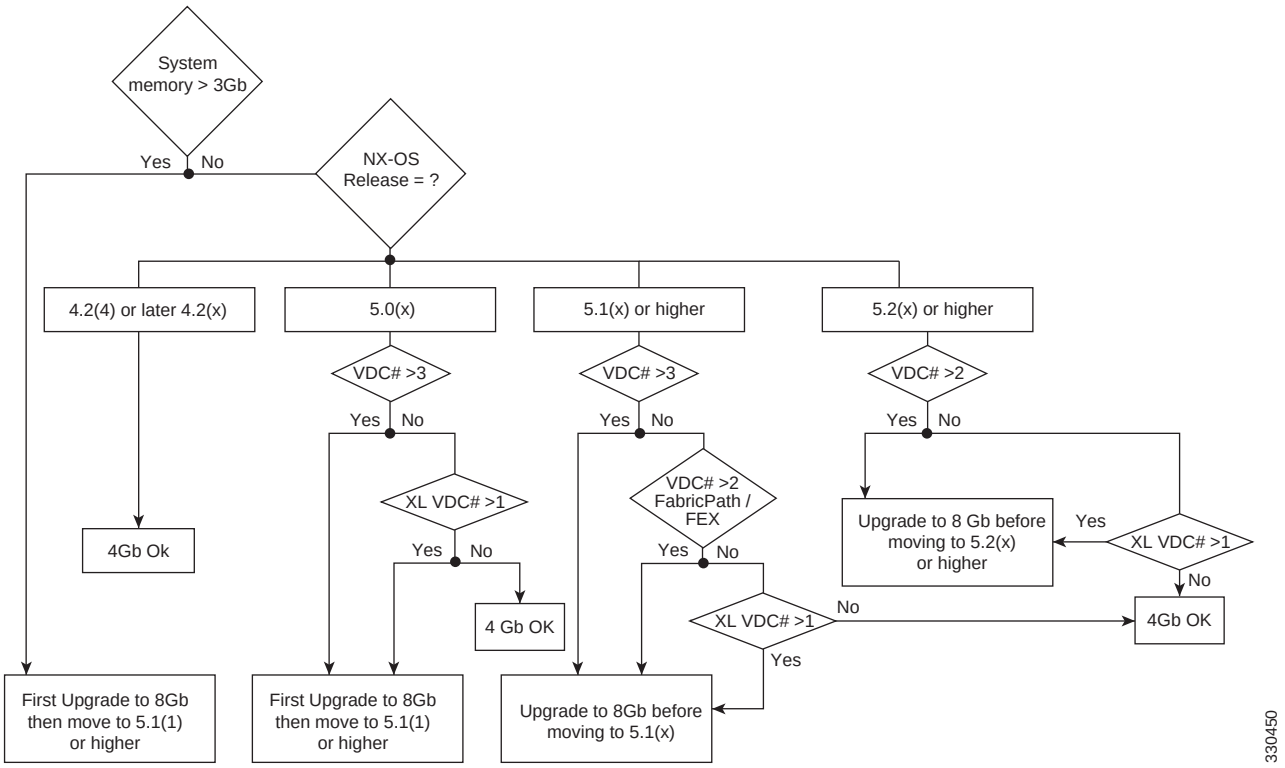
```
switch# show system resources
Load average:   1 minute: 0.22   5 minutes: 0.25   15 minutes:0.15
Processes   :   860 total, 3 running
CPU states  :   0.0% user,   6.5% kernel,   93.5% idle
Memory usage:   4115768K total,   2747512K used,   1368256K free

switch#
```

The following guidelines can help you determine whether or not to upgrade an existing Supervisor 1 module:

- When the switch memory usage exceeds 3 GB (75 percent of total memory), we recommend that you upgrade the memory to 8 GB.
- If you create more than one VDC with XL mode enabled, or if you have more than two VDCs, 8 GB is required.

For additional guidance about whether or not to upgrade a supervisor module to 8 GB of memory, see Figure 10-8.

Figure 10-8 Supervisor Memory Upgrade Decision Flowchart



To determine which version of Cisco NX-OS that the switch is running, use the **show version** command.

This section includes the following topics:

- Adding 4 GB of Memory to a Supervisor Module, page 10-33
- Removing 4 GB of Memory from a Supervisor Module, page 10-36

Adding 4 GB of Memory to a Supervisor Module

If you need to add 4 GB of memory to the supervisor modules on your switch so that they have 8 GB of memory, the switch must be running NX-OS Release 5.1(1) or later release.

Note If the switch has two supervisor modules, both must have the same amount of memory. If you upgrade the standby supervisor module to 8 GB of memory, you must then switch the active supervisor to standby and upgrade the new standby supervisor to 8 GB of memory.

Note If you are using an earlier version of Cisco NX-OS, the supervisor modules can have only 4 GB of memory. If you need to remove 4 GB of memory to have only 4 GB of memory in a supervisor, see the "Removing 4 GB of Memory from a Supervisor Module" section on page 10-36.

To add 4 GB of memory to the supervisor modules, follow these steps:

Step 1 Follow ESD procedures, which include wearing an ESD wrist strap and placing antistatic foam or antistatic padding where you will place the supervisor module while working with it.

Step 2 Disconnect the cables attached to the front of the module to be removed. If there are two supervisors in the switch, disconnect the cables from the standby supervisor.

Note If the chassis has two supervisor modules and you disconnect the active supervisor module, that supervisor goes into standby mode and the other supervisor becomes the active supervisor.

Step 3 Loosen and fully unscrew both captive screws on the module.

Step 4 Press both ejector release buttons on the ends of the module (see Callout 2 in Figure 10-5 on page 10-21) to push out the ejector levers and to disconnect the module.

Note If you stop this procedure at this point without removing the module and need to power it up, simultaneously press both ejector levers back to the face of the module until they click, secure both of the module captive screws to the chassis, and then use the **no poweroff module** *slot_number* command to power up the module.

Step 5 Simultaneously rotate the two ejector levers outward to unseat the module from the midplane connector (see Callout 3 in Figure 10-5 on page 10-21).

Step 6 With a hand on each ejector lever, pull the module part way out of its slot in the chassis.

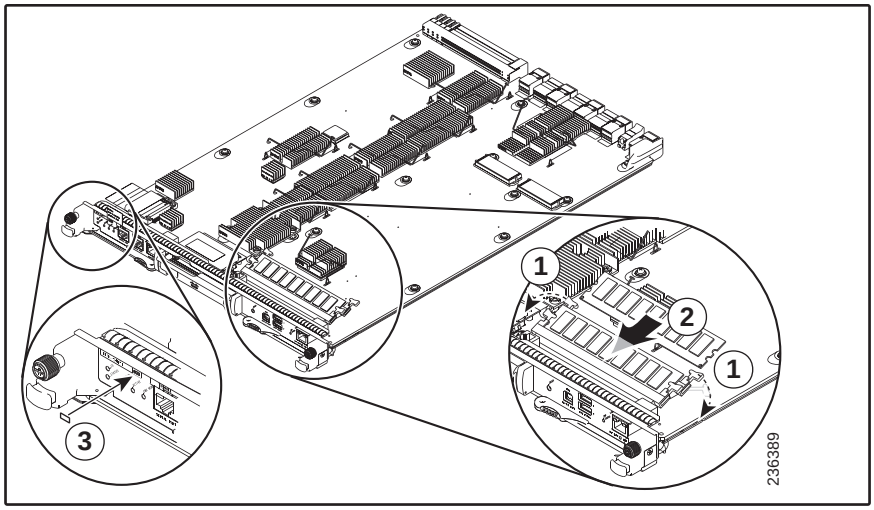
Step 7 Grasp the front edge of the module with one hand and place your other hand under the lower side of the module to support its weight. Pull the module out of its slot.

Caution To prevent ESD damage, avoid touching the electronic circuitry and prevent anything else from coming in contact with its circuitry.

Step 8 If you are removing the module from a Cisco 7010 chassis, rotate the module 90 degrees counterclockwise so that it is horizontal and you can see the circuitry from above.

Step 9 On the second memory slot from the front of the module, rotate both spring clips away from the slot (see Callout 1 in Figure 10-9).

Figure 10-9 Adding a 4-GB DIMM



1	On the second memory slot from the front of the supervisor module, rotate both spring clips out.	**3**	Add an 8 GB label to the right of the N7K-SUP-1 identifier on the front of the module.
2	Holding the DIMM by its edges, align it to the second memory slot and push it into place until the spring clips click into the DIMM.		

Step 10 Holding the edges of the 4-GB memory board with one hand, slide it into the second memory slot from the front of the module until the two spring clips click into the DIMM (see Callout 2 in Figure 10-9).

Step 11 Place an 8-GB label on the front of the module and to the right of the N7K-SUP-1 identifier.

Step 12 Rotate both ejector levers away from the front of the supervisor module.

Step 13 Grasp the front of the supervisor module with one hand and place your other hand under the module to support its weight.

Step 14 Align the module to the open supervisor slot in the chassis and push the module into the slot until it makes contact with the midplane.

Step 15 Simultaneously push both ejector levers inward until they come in contact with the face of the module.

The module should be fully seated in the slot and the captive screws should be aligned with their holes in the chassis. The EMI gasket should close the gap between this module and the next module.

Step 16 Screw in the two captive screws to the chassis and tighten them to 8 in-lb (0.9 N·m).

Step 17 Reconnect the console cable to the CONSOLE SERIAL PORT as explained in the "Connecting to the Console" section on page 7-2.

Step 18 If the previous supervisor module was connected to an asynchronous device through a modem, connect the modem cable to the COM1/AUX SERIAL PORT as explained in the "Connecting to the Console" section on page 7-2.

Step 19 Reconnect the network management cable to the MGMT ETH port as explained in the "Setting Up the Management Interface" section on page 7-4.

Step 20 Reconnect the CMP cable to the CMP MGMT ETH port as explained in the "Connecting the Supervisor CMP Port" section on page 7-5.

Step 21 If you need to upgrade the other supervisor module to 8 GB (both modules must have the same amount of memory), repeat Steps 2 through 19.

Step 22 Verify that the upgraded module has 8 GB of memory. If there are two supervisor modules installed in the switch, use the **system switchover** command to make that module active, and then use the **show system resources** command. If there is just one supervisor module installed in the switch, use the **show system resources** command.

Step 23 If you need to upgrade another supervisor module to 8 GB (both supervisor modules in a switch with two supervisors must have the same amount of memory), repeat Steps 2 through 22.

Removing 4 GB of Memory from a Supervisor Module

If you need to remove 4 GB of memory from the supervisor modules so that they each have only 4 GB of memory, you must remove the DIMM from the second memory slot from the front of each installed supervisor module.

Note If the switch has two supervisor modules, both must have the same amount of memory. If you downgrade one supervisor module to 4 GB of memory, you must also downgrade the other supervisor module to 4 GB of memory.

To remove 4 GB of memory from a supervisor module, follow these steps:

Step 1 Follow ESD procedures, which include wearing an ESD wrist strap and placing antistatic foam or antistatic padding where you will place the supervisor module while working with it.

Step 2 Disconnect the cables attached to the front of the module to be removed. If there are two supervisor modules installed in the switch, disconnect the cables from the standby supervisor.

Note If the chassis has two supervisor modules and you disconnect the active supervisor module, that supervisor goes into standby mode and the other supervisor becomes the active supervisor.

Step 3 Loosen and fully unscrew both captive screws on the installed supervisor module that you need to upgrade.

Step 4 Press both ejector release buttons on the ends of the module (see Callout 2 in Figure 10-5 on page 10-21) to push out the ejector levers and to disconnect the module.

Note If you stop this procedure at this point without removing the module and need to power it up, simultaneously press both ejector levers back to the face of the module until they click, secure both of the module captive screws to the chassis, and then use the **no poweroff module** *slot_number* command to power up the module.

Step 5 Simultaneously rotate the two ejector levers outward to unseat the module from the midplane connector (see Callout 3 in Figure 10-5 on page 10-21).

Step 6 With a hand on each ejector lever, pull the module part way out of its slot in the chassis.

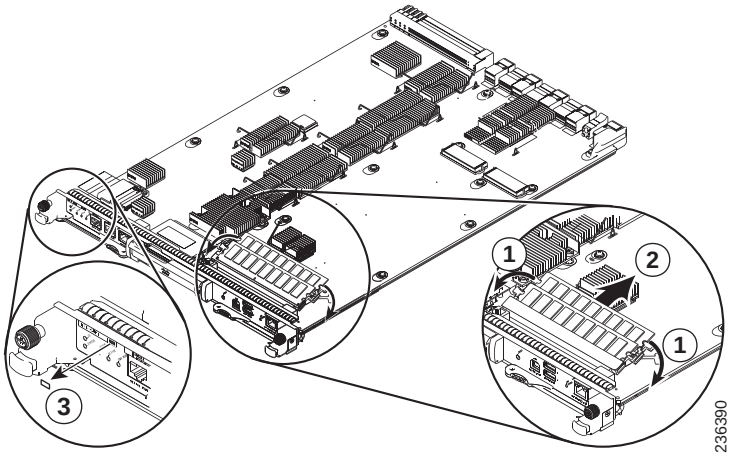
Step 7 Grasp the front edge of the module with one hand and place your other hand under the lower side of the module to support its weight. Pull the module out of its slot.

Caution To prevent ESD damage, avoid touching the electronic circuitry and prevent anything else from coming in contact with its circuitry.

Step 8 If you are removing the module from a Cisco 7010 chassis, rotate the module 90 degrees counterclockwise so that it is horizontal and you can see the circuitry from above.

Step 9 For the DIMM in the second memory slot from the front of the supervisor module, rotate the two spring clips away from the DIMM (see Callout 1 in Figure 10-10).

Figure 10-10 Removing a 4-GB DIMM



1	On the second socket from the front of the module, rotate both spring clips away from the DIMM.	**3**	Remove the “8 GB” label on the front of the module.
2	Hold the DIMM by its edges and pull it out of the memory slot.		

Step 10 Holding the edges of the 4-GB DIMM with your fingers, slide it out of its memory slot (see Callout 2 in Figure 10-10) and place it in an antistatic bag.

Step 11 Remove the 8-GB label from the front of the module.

Step 12 Rotate both ejector levers away from the front of the supervisor module.

Step 13 Grasp the front of the module with one hand and place your other hand under the module to support its weight.

Step 14 Align the module to the open supervisor slot in the chassis and push the module into the slot until it makes contact with the midplane.

Step 15 Simultaneously push both ejector levers inward until they come in contact with the face of the module.

Step 16 The module should be fully seated in the slot and the captive screws should be aligned with their holes in the chassis. The EMI gasket should close the gap between this module and the next module.

Step 17 Screw in the two captive screws to the chassis and tighten them to 8 in-lb (0.9 N·m).

Step 18 Reconnect the console cable to the CONSOLE SERIAL PORT as explained in the "Connecting to the Console" section on page 7-2.

Step 19 If the previous supervisor module was connected to an asynchronous device through a modem, connect the modem cable to the COM1/AUX SERIAL PORT as explained in the "Connecting to the Console" section on page 7-2.

Step 20 Reconnect the network management cable to the MGMT ETH port as explained in the "Setting Up the Management Interface" section on page 7-4.

Step 21 Reconnect the CMP cable to the CMP MGMT ETH port as explained in the "Connecting the Supervisor CMP Port" section on page 7-5.

Step 22 Verify that the module has 4 GB of memory by using the **system switchover** command to make the downgraded module active and using the **show system resources** command.

Step 23 If you need to downgrade the other supervisor module to 4 GB (both modules must have the same amount of memory), repeat Steps 2 through 21.

Step 24 Verify that the downgraded module has 4 GB of memory. If there are two supervisor modules installed in the switch, use the **system switchover** command to make the downgraded module active, and then use the **show system resources** command. If there is just one supervisor module installed in the switch, use the **show system resources** command.

Step 25 If you need to downgrade another supervisor module to 4 GB (both supervisor modules in a switch with two supervisors must have the same amount of memory), repeat Steps 2 through 24.

Installing an I/O Module

A Cisco Nexus 7004 switch has up to two I/O modules, a Cisco Nexus 7009 switch has up to seven I/O modules, a Cisco Nexus 7010 switch has up to eight I/O modules, and a Cisco Nexus 7018 has up to 16 I/O modules. These modules are located on the front of the chassis. You can replace one of these modules at a time while the switch is operating.

Note If you are installing F2 I/O modules, all of the fabric modules in the switch must be Series 2 fabric modules.

This section describes how to replace I/O modules and includes the following topics:

Required Tools

You need a flat-blade or number 2 Phillips-head screwdriver to loosen or tighten the captive screws on the I/O module.

Installing a New I/O Module

A Cisco Nexus 7000 Series switch includes one or more of the following types of I/O modules:

- 48-port 10/100/1000 Ethernet module (N7K-M148GT-11)
- 48-port 10/100/1000 Ethernet module with XL option (N7K-M148GT-11L)
- 48-port 1-Gigabit Ethernet I/O module (N7K-M148GS-11)
- 48-port 1-Gigabit Ethernet I/O module with XL option (N7K-M148GS-11L)
- 48-port 1-/10-Gigabit Ethernet I/O modules with XL (N7K-F248XP-25 and N7K-F248XP-25E)
- 48-port 1-/10-Gigabit Ethernet I/O module (N7K-F348XP-25)
- 48-port 1-/10-Gigabit Ethernet I/O modules with XL option(N7K-M348XP-25L)
- 24-port 10-Gigabit Ethernet I/O modules with XL option (N7K-M224XP-23L)
- 24-port 40-Gigabit Ethernet I/O modules with XL option(N7K-M324FQ-25L)
- 32-port 10-Gigabit Ethernet I/O module (N7K-M132XP-12)
- 32-port 10-Gigabit Ethernet I/O module with XL option (N7K-M132XP-12L)
- 32-port 1- and 10-Gigabit Ethernet I/O module (N7K-F132XP-15)
- 8-port 10-Gigabit Ethernet I/O module with XL option (N7K-M108X2-12L)
- 12-port 40-Gigabit Ethernet I/O module (N7K-F312FQ-25)
- 6-port 100-Gigabit Ethernet I/O module (N7K-F306CK-25)

You can replace each of these I/O modules with another module of the same type while the Cisco Nexus 7000 Series 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.

Note M3-Series I/O modules are not supported on the Cisco Nexus 7004 switch.

Note On a Cisco Nexus 7000 Series switch, when a transceiver is removed or inserted on an interface in a VDC (for example VDC-1), a trap is sent to all the VDCs in the switch (including the VDC-1). This behavior is applicable for module removal or insertion and to other physical entity events.

Warning **Hazardous voltage or energy is present on the backplane when the system is operating. Use caution when servicing.** Statement 1034

Caution Make sure that you wear an ESD wrist strap while you handle each I/O module. Hold the module only on its carrier edges without touching any electronic circuitry, and place it on antistatic mats or repack it in its original packing material when it is not installed in the chassis.

Caution If you cannot immediately replace an I/O module, either leave the I/O module in its slot or replace it with a blank module so the system airflow is not disrupted. Leaving an I/O module slot open for more than a couple of minutes can disrupt the system airflow causing the system to overheat and shut down.

To replace an I/O module, follow these steps:

Step 1 Place antistatic mats or antistatic foam where you can place the old and new I/O modules. Choose a place that prevents damage to the module while it is outside the chassis.

Step 2 Unpack and place the replacement I/O module on an antistatic mat or antistatic foam.

Step 3 Disconnect each I/O cable from the front of the module by doing the following:

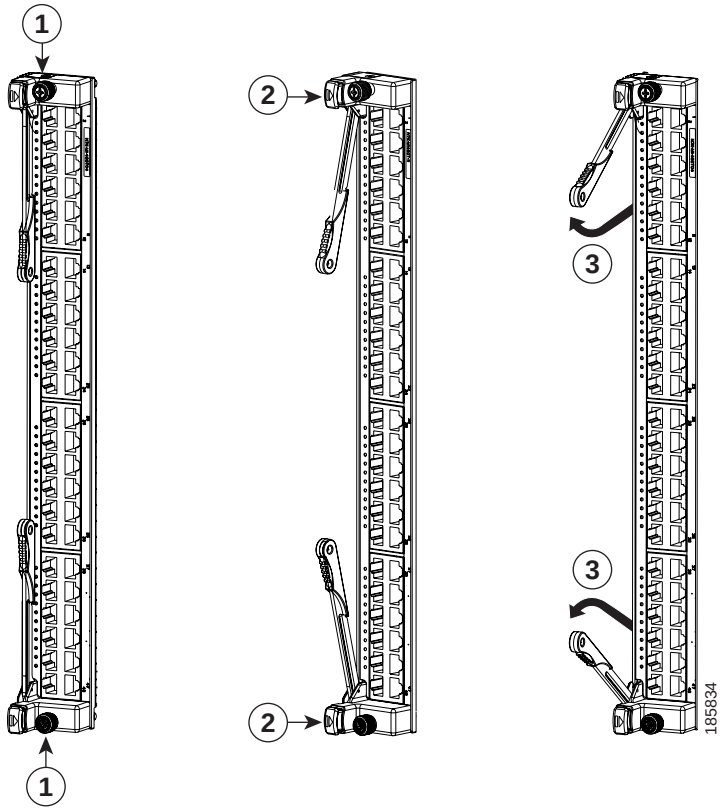
- For the 48-port 10/100/1000 Ethernet I/O module (N7K-M148GT-11 and N7K-M148GT-11L), unplug each cable.
- For the 48-port 1-Gigabit Ethernet types of I/O modules (N7K-M148GS-11 and N7K-M148GS-11L) and the 48-port 1- and 10-Gigabit Ethernet I/O module (N7K-F248XP-25), remove the fiber-optic cables and then remove the SFP transceivers.
- For the 48-port 1- and 10-Gigabit Ethernet I/O module (N7K-F348XP-25), remove the fiber-optic cables and then remove the SFP/SFP+ transceivers.
- For the 48-port 1- and 10-Gigabit Ethernet types of I/O module (N7K-M348XP-25L), remove the fiber-optic cables and then remove the SFP+ transceivers.
- For the 32-port 10-Gigabit Ethernet types of I/O modules (N7K-M132XP-12, N7K-M132XP-12L, and N7K-F132XP-15), remove the fiber-optic cables and then remove the SFP+ transceivers.
- For the 24-port 40-Gigabit Ethernet types of I/O modules (N7K-M324FQ-25L), remove the fiber-optic cables and then remove the QSFP transceivers.
- For the 12-port 40-Gigabit Ethernet I/O modules (N7K-F312FQ-25), remove the fiber-optic cables and then remove the QSFP+ transceivers.
- For the 8-port 10-Gigabit Ethernet I/O module (N7K-M108X2-12L), remove the fiber-optic cables and then remove the X2 transceivers.
- For the 6-port 100-Gigabit Ethernet I/O module (N7K-F306CK-25), remove the fiber-optic cables and then remove the CPAK transceivers.

Note To prevent contaminants from entering the fiber-optic lines or transceivers, cover the fiber-optic openings with a plug.

Warning **Invisible laser radiation may be omitted from disconnected fibers or connectors. Do not stare into beams or view directly with optical instruments.** Statement 1051

Step 4 Loosen the two captive screws identified in View A of Figure 10-11.

Figure 10-11 Unseating an I/O Module



1	Unscrew two captive screws.	**3**	Simultaneously swing open both ejector levers to unseat the module.
2	Simultaneously press both ejector buttons.		

Step 5 Press ejector release buttons on the top and bottom ends of the module (see View B in Figure 10-11) to push out the ejector levers and to disconnect the module.

Step 6 Simultaneously rotate the two ejector levers outward to unseat the module from the midplane connector (see View C in Figure 10-11).

Step 7 With a hand on each ejector, pull the module part way out of its slot in the chassis.

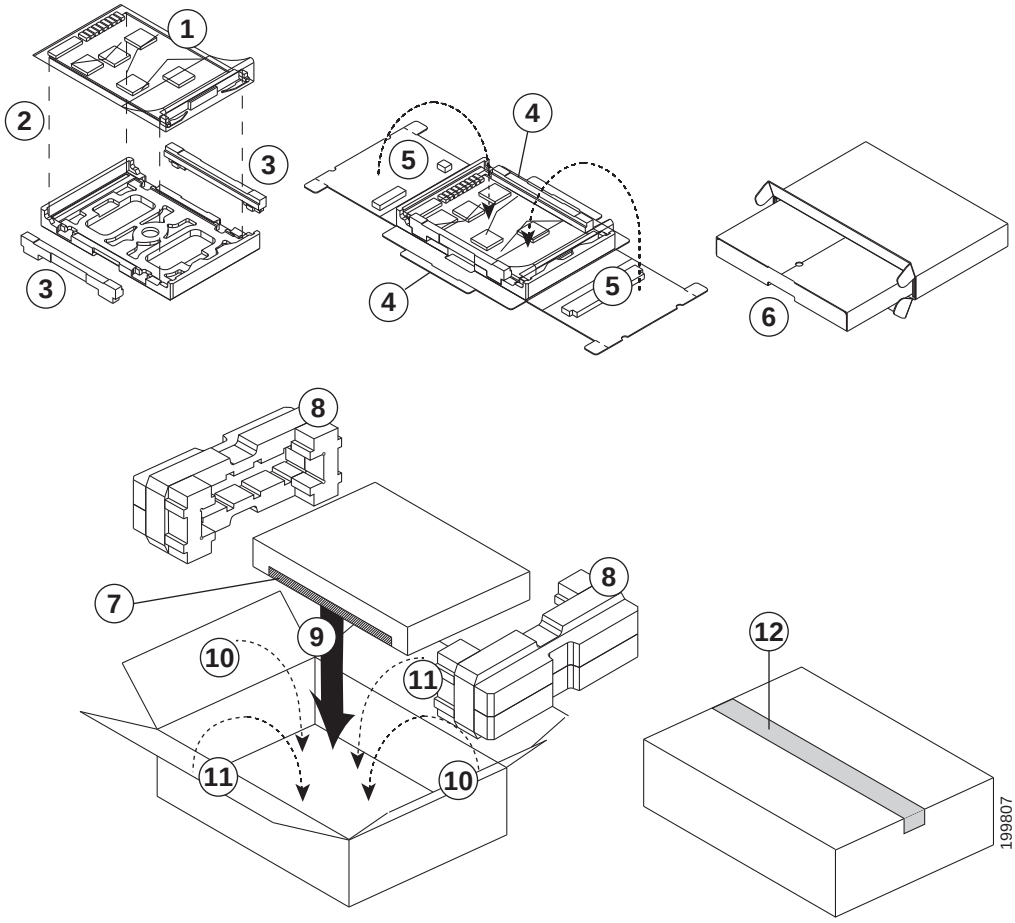
Step 8 Grasp the front edge of the module and place your other hand under the module to support its weight. Pull the module out of its slot. Do not touch the module circuitry.

Caution To prevent ESD damage, avoid touching the electronic circuitry and prevent anything else from coming in contact with the circuitry.

Step 9 If you are removing the module from a Cisco Nexus 7010 chassis, rotate the module 90 degrees counterclockwise so that it is horizontal (with the circuitry seen from above).

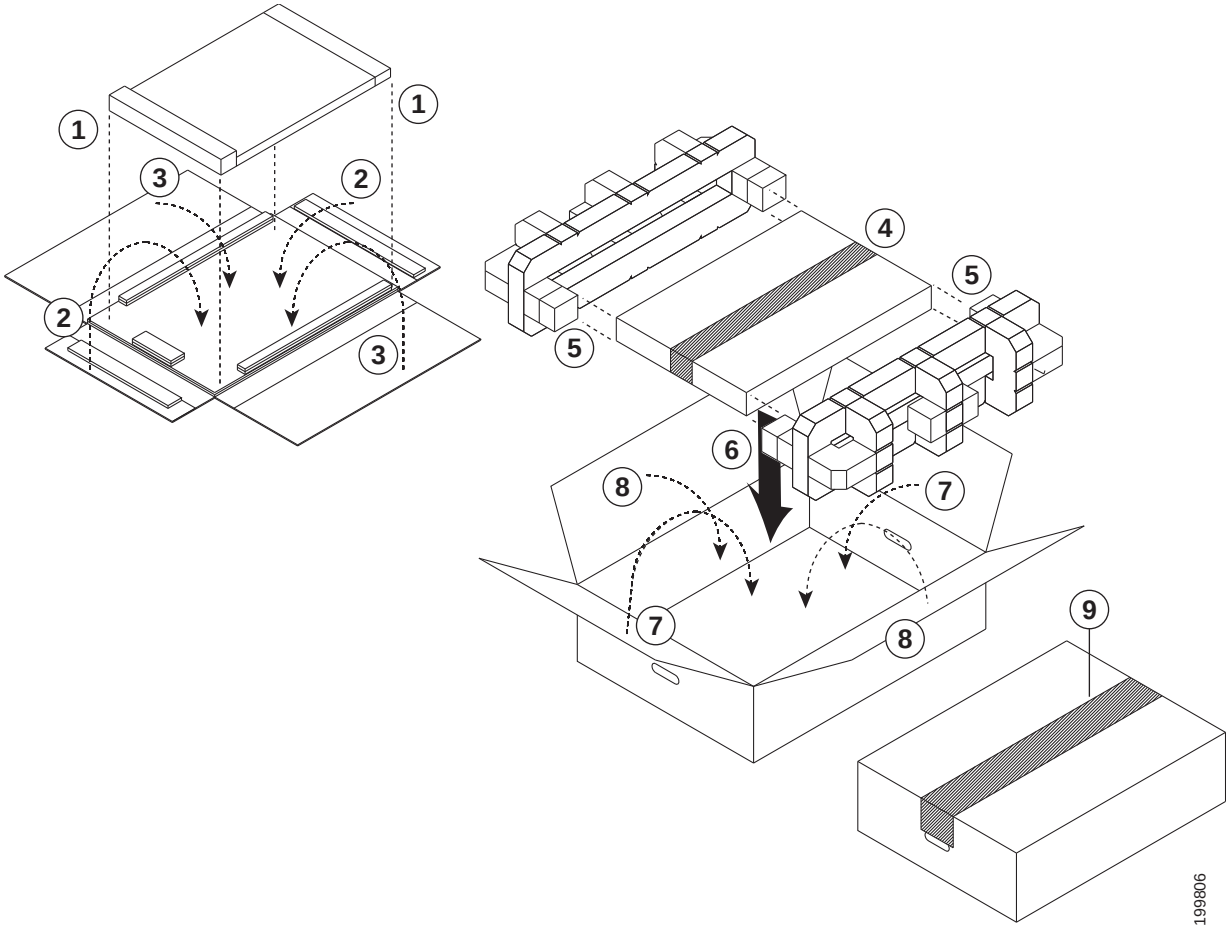
Step 10 Place the module on an antistatic mat or repack it in its original packing materials as shown in Figure 10-12 (8- and 48-port types of I/O modules) or Figure 10-13 (32-port types of I/O modules).

Figure 10-12 Repacking an 8- or 48-Port I/O Module (N7K-M108X2-12L, N7K-M148GT-11, N7K-M148GT-11L, N7K-M148GS-11, or N7K-M148GS-11L)



1	Put the module in an ESD bag.	**7**	Tape the flap to the box.
2	Place the bagged module on the foam pad.	**8**	Insert the two box sides into foam blocks.
3	Attach a side pad to each of the long sides of the module.	**9**	Place the box and its foam blocks into the larger box.
4	Fold the side flaps up along the side pads.	**10**	Fold the narrow flaps over the smaller box and foam blocks.
5	Fold the long flaps up along the ends of the module and then over the top of the module. Insert the two tabs on each flap into the side flaps.	**11**	Fold the wide flaps over the box.
6	Insert the folded box into the slightly larger box.	**12**	Tape the wide flaps together and to the box.

Figure 10-13 Repacking a 32-port Type of I/O Module (N7K-F132XP-15, N7K-M132XP-12, or N7K-M132XP-12L)



1	Put the I/O module in an ESD bag (not shown) and then place it between the raised portions of the flattened box.	**6**	Place the box and foam blocks into the larger box.
2	Fold the shorter flaps along the front and back of the module and then fold them over the module.	**7**	Fold the narrow flaps over the box.
3	Fold the longer flaps along the sides of the module and then over the top of the module.	**8**	Fold the wide flaps over the box.
4	Tape the longer flaps together and to the box.	**9**	Tape the wide flaps together and to the box.
5	Insert each of the two sides of the box into one of the foam blocks.		

Step 11 On the replacement I/O module, rotate both ejector levers fully away from the front of the module.

Step 12 If you are inserting the module into a Cisco Nexus 7010 chassis, rotate the module 90 degrees clockwise.

Step 13 Align the module to the chassis guides for the vacated slot, and slide the module part way into the slot.

Step 14 With one or both hands on the front of the module, push the module all the way into the slot until it seats on the midplane connector.

Step 15 Simultaneously push both ejector levers inward until they come in contact with the face of the module.

Note Verify that the ejector levers are fully closed before tightening the captive screws. Failure to fully seat the module in the backplane connector can result in error messages.

Step 16 Tighten the two captive screws on the I/O module to 8 in-lb (0.9 N·m).

Step 17 Reconnect the I/O cables to the ports or the transceivers on the fiber-optic cables to the ports on the module.

Installing a NAM Module

The Network Analysis Module (NAM) can be installed in an I/O module slot on the Cisco Nexus 7004, 7009, 7010, or 7018 switch chassis. You can either replace a NAM or install a new one in an empty I/O module slot. If you install a new module, you must also install and configure the latest NAM software on the module.

Note If the switch shipped with one or more NAM modules already installed, then the modules are already configured with the Prime NAM software and are ready to be used. If you are installing a new NAM module and the module does not automatically boot up, then you must install and configure the Prime NAM software in order to use the module.

This section describes how to install NAM modules and includes the following topics:

Required Tools for Installing a NAM

You need a flat-blade or number 2 Phillips-head screwdriver to loosen or tighten the captive screws on the I/O module.

Installing or Replacing a NAM

A Cisco Nexus 7004, 7009, 7010, or 7018 switch can have one or more NAMs installed in it. You can either install a new one in an empty I/O module slot or replace an existing NAM or I/O module. If you are replacing an existing NAM, you must first shut down the module with the **out-of-service module**

command before removing the original module. If you are replacing an I/O module, you can either use the out-of-service module command to shut the module down or just remove the module and a graceful shutdown will automatically occur.

Warning **Hazardous voltage or energy is present on the backplane when the system is operating. Use caution when servicing.** Statement 1034

Caution To prevent ESD damage, wear an ESD wrist strap while you handle each module. Hold the module only on its carrier edges without touching any electronic circuitry, and place it on antistatic mats or repack it in its original packing material when it is not installed in the chassis.

Caution If you cannot immediately replace a NAM, either leave the module in its slot or replace it with a blank module so the system airflow is not disrupted. Leaving an I/O module slot open for more than a couple of minutes can disrupt the system airflow causing the system to overheat and shut down.

To install or replace a NAM, follow these steps:

Step 1 Place antistatic mats or antistatic foam where you can place the old and new I/O modules. Choose a place that prevents damage to the module while it is outside the chassis.

Step 2 Unpack and place the new I/O module on an antistatic mat or antistatic foam.

Step 3 If you are installing a new NAM in an empty slot, remove the blank filler plate that is in the slot by unscrewing its captive screws and pulling the plate off the chassis. Go to Step 5 to continue the installation.

Step 4 To remove an existing NAM, follow these steps:

a. Shut down the module by using the **out-of-service module** command with the NX-OS CLI.

```
switch(config)# out-of-service module 2
switch(config)#
```

Note Alternatively, you can use the **poweroff module** command, but that command requires that you use the **no poweroff module** command after reinstalling the module. If you use the **out-of-service module** command, you do not need to use another command to bring the module up when you install it.

b. Disconnect any cables attached to the front of the module.

c. Loosen the two captive screws (one on each end of the module) until they are no longer in contact with the chassis.

d. Press ejector release buttons on each end of the module to push out the ejector levers.

e. Simultaneously rotate the two ejector levers outward to unseat the module from the midplane connector.

f. With a hand on each ejector, pull the module part way out of its slot in the chassis.

g. Grasp the front edge of the module and place your other hand under the module to support its weight. Pull the module out of its slot. Do not touch the module circuitry.

h. If you are removing the module from a Cisco Nexus 7010 chassis, rotate the module 90 degrees counterclockwise so that it is horizontal (with the electronics seen from above).

i. Place the module on an antistatic mat or repack it in its original packing materials.

Step 5 Install the new NAM as follows:

a. On the replacement NAM, rotate both ejector levers fully away from the front of the module. If necessary, press the two ejector buttons to release the levers from the front of the module and then rotate the levers away from the front of the module.

b. If you are inserting the module into a Cisco Nexus 7010 chassis, rotate the module 90 degrees clockwise so that the circuitry is seen from the right side.

c. Align the module to the chassis guides for the open slot, and slide the module into the slot until it stops with the front of the module being about 1/4 inch (0.6 cm) out from the front of the chassis.

d. Simultaneously push both ejector levers inward until they come in contact with the face of the module. The module moves completely into the slot with the front of the module being at the front of the chassis.

e. Verify that the ejector levers are fully closed before tightening the captive screws. Failure to fully seat the module in the midplane connectors can result in error messages or damage to the module.

f. Tighten the two captive screws on the I/O module to 8 in-lb (0.9 N·m) of torque.

g. If you disconnected any cables from the front of the module, reconnect those cables to the module.

h. Verify that the STATUS LED eventurally turns green to show that the module is operational. For information on the other states indicated by this LED, see the "NAM-NX1 Module LEDs" section on page D-5.

You are ready to install the Prime NAM software on the new module.

Installing the Cisco Prime NAM Software

To install the Cisco Prime NAM software, follow these steps:

Step 1 Use a browser to go to http://software.cisco.com/download/navigator.html.

The Software Download page opens.

Step 2 Choose **Cloud and Systems Management > Network Analysis Module (NAM) Products > Cisco Prime Network Analysis Module Software > Cisco Prime Network Analysis Module Software 6.2** (or later verssion). A list of software files appears.

Step 3 Click the Download button for the software file name beginning with nam-nx1. The filename is nam-nx1.*x-x-x*.bin.gz (where *x-x-x* is the NAM software release number).

Step 4 Using the NAM CLI, enter the **upgrade** command to specify the user, password, server,path to the file, and installation file name. For example, for the admin user, "secret" password, server IP address 10.10.10.10, archive/nam_software path, and nam-nx1.6.0.1.bin.gz installation file, you would use the **upgrade** command as follows:

```
upgrade ftp://admin:secret!10.10.10.10//archive/nam_software/nam-nx1.6.0.1.bin.gz
```

Configuring the NAM

To configure the NAM software, you must do all of the following:

- Configure the VLAN management port from the switch (see the "Configuring a VLAN Management Port for the NAM" section on page 10-47).
- Configure the SPAN session from the switch (see the "Configuring a SPAN Session for a Data Port" section on page 10-48).
- Set up the NAM network configuration for the NAM (see the "Specifying the NAM IP Configuration and Enabling the Web Server" section on page 10-50).

Configuring a VLAN Management Port for the NAM

Using the virtual device context (VDC) that the NAM belongs to, you must configure a VLAN for NAM management traffic, and you must assign that VLAN to the NAM management port.

To configure and assign a VLAN management port, follow these steps:

Step 1 Verify that the NAM is active.

```
switch# show service nam summary
Service          Service
Name             Type        Interface      Module    State     Version
---------------- ----------- -------------- --------- --------- ---------------
NAM7             NAM         Po4096, Po4095 7         active    6.0
```

Step 2 Allocate the NAM interfaces to the VDC as follows:

- If you are using the default VDC configuration, the NAM interfaces should be allocated to the default VDC automatically. Verify that allocation.

```
switch(config)# show run vdc
!Command: show running-config vdc
!Time: Wed May 29 18:47:17 2013

version 6.2(2)
no system admin-vdc
vdc N7K-8 id 1
  limit-resource module-type m1 m1x1 m2x1 f2e
```

- If you are not using the default VDC configuration,

Step 3 If a VLAN does not already exist for the NAM, create the VLAN.

```
switch(config)# config t
Enter configuration commands, one per line. End with CNTL/Z.
switch(config)# vlan 200
switch(config-vlan)# state active
switch(config-vlan)# no shut
switch(config-vlan)# exit
switch(config)#
```

Step 4 Add the VLAN to the external interface that will be used to access the NAM by specifying the interface.

```
switch(config)# int e4/48
switch(config-if)# switchport
switch(config-if)# switchport mode access
switch(config-if)# switchport access vlan 200
switch(config-if)# no shut
switch(config-if)# exit
switch(config)#
```

Step 5 Assign the VLAN to the management port for the NAM module by using the analysis module command.

```
switch(config)# analysis module 7 management-port 1 access-vlan 200
switch(config)# exit
switch#
```

After you have configured a VLAN management port for the NAM, you need to set up a SPAN session to define the switch as the traffic source and the NAM as the traffic destination. You can set up a SPAN session in either one of following ways:

- Configuring a SPAN Session for a Data Port, page 10-48
- Configuring a SPAN Session for a Port Channel, page 10-49

Configuring a SPAN Session for a Data Port

To use the NAM with a switch, you must define a SPAN session between the switch and the NAM. You can specify the switch by its interface and specify the NAM by its data port.

If you need to define the NAM by the port channel used, see the "Configuring a SPAN Session for a Port Channel" section on page 10-49.

SUMMARY STEPS

1. **config t**
2. **monitor session** *ID_number*
3. *switch_ip_address* **int** *interface*
4. *nam_ip_address* **analysis-module** *slot_number* **data-port** *port_number*
5. **no rate-limit**
6. **no shutdown**
7. **exit**

DETAILED STEPS

	Command	Purpose
Step 1	**config t** **Example:** switch# config t switch(config)#	Enters the global configuration mode.
Step 2	**monitor session** ID_number **Example:** switch(config)# monitor session 1 switch(config-monitor)#	Creates a monitor session.
Step 3	*switch_ip_address* **int** *interface* **Example:** switch(config-monitor)# 10.10.10.10 int e4/1 rx switch(config-monitor)#	Specifies the switch IP address and the interface used for traffic.

	Command	Purpose
Step 4	*nam_ip_address* **analysis-module** *slot_number* data-port *port_number* **Example:** switch(config-monitor)# 11.11.11.11 analysis-module 3 data-port 1	Specifies the NAM by its IP address, slot-number in the chassis, and the data port used on the NAM.
Step 5	**no rate-limit** **Example:** switch(config-monitor)# no rate-limit switch(config-monitor)#	Specifies not to use a rate limit.
Step 6	**no shutdown** **Example:** switch(config-monitor)# no shutdown switch(config-monitor)#	Starts the NAM.
Step 7	**exit** **Example:** switch(config-monitor)# exit switch(config)#	Exits the monitor session.

Configuring a SPAN Session for a Port Channel

To use the NAM with a switch, you must define a SPAN session between the switch and the NAM. You can specify the switch by its interface IP address and you can specify the NAM by the port channel that it uses.

If you need to define the NAM by its data port, see the "Configuring a SPAN Session for a Data Port" section on page 10-48.

SUMMARY STEPS:

1. **config t**
2. **monitor session** *ID_number*
3. *switch_ip_address* **int** *interface*
4. *nam_ip_address* **interface port-channel** *port-channel_number*
5. **no rate-limit**
6. **no shutdown**
7. **exit**

DETAILED STEPS

	Command	Purpose
Step 1	**config t** **Example:** switch# config t switch(config)#	Enters the global configuration mode.
Step 2	**monitor session** *ID_number* **Example:** switch(config)# monitor session 1 switch(config-monitor)#	Creates a monitor session.
Step 3	*switch_ip_address* **int** *interface* **Example:** switch(config-monitor)# 10.10.10.10 int e4/1 rx switch(config-monitor)#	Specifies the switch IP address and the interface used for traffic.
Step 4	*nam_ip_address* **interface port-channel** *port-channel_number* **Example:** switch(config-monitor)# 11.11.11.11 interface port-channel 3	Specifies the NAM by its IP address and port-channel number.
Step 5	**no rate limit** **Example:** switch(config-monitor)# no rate limit switch(config-monitor)#	Specifies to not use a rate limit.
Step 6	**no shutdown** **Example:** switch(config-monitor)# no shutdown switch(config-monitor)#	Starts the NAM.
Step 7	**exit** **Example:** switch(config-monitor)# exit switch(config)#	Exits the monitor session.

Specifying the NAM IP Configuration and Enabling the Web Server

After you assign the NAM to a VDC and set up a SPAN session between the switch and the NAM, you must go to the VDC for the NAM, set up the IP configuration for the NAM, and enable the web server. You can enable the NAM to function as either an HTTP server or an HTTPS secure server, but not both simultaneously. After you enable the web server, the NAM is functional.

Step 1 Use the Cisco NX-OS **attach module** *slot_number* **processor** *number* command to open a span session.

attach module *slot_number* **processor 1**
Example:

```
switch# attach module 3 processor 1
opening...
nam.localdomain login: root
Password:

Cisco Nexus 7000 Series Network Analysis Module (N7K-SM-NAM-K9) Console, 6.0
Copyright (c) 1999-2013 by Cisco Systems, Inc.

System Alert: Default password has not been changed!
Please enter a new password:
```

Tip Ensure that you are in the correct VDC. To switch to another VDC, you can use the **switchto vdc** command.

If you have not changed your password, you will be prompted to enter a new password.

Step 2 If you need to enter a new password, enter the password twice.

```
Please enter a new password:
Confirm new password:
Successfully changed password for user 'root'
```

Step 3 Enable either an HTTP or HTTPS server.

- To enable an HTTP server, use the **ip http server enable** command.

```
root@nam.localdomain# ip http server enable
No web users are configured.
Please enter a web administrator username [admin]:
```

- To enable an HTTPS server, use the **ip http secure server enable** command.

```
root@nam.localdomain# ip http secure server enable
No web users are configured.
Please enter a web administrator username [admin]:
```

Step 4 Enter the web admin username and password.

```
User admin added.
Starting httpd
root@nam.localdomain
```

Tip We recommend that you change the admin password. All default passwords should be changed as soon as possible.

Step 5 If you need to use a Telnet or SSH client, do one of the following:

- To use a Telnet client, use the **excession on** command.

```
root@nam.localdomain# exsession on
```

- To use an SSH client, use the **exsession on ssh** command.

```
root@nam.localdomain# exsession on ssh
```

Step 6 Verify network connectivity to an known IP address by using the **ping** *ip_address* command.

```
root@nam.localdomain# ping 3.3.3.3
PING 3.3.3.3 (3.3.3.3) 56(84) bytes of data.
64 bytes from 3.3.3.3: icmp_seq1= ttl-245 time=8.48 ms
64 bytes from 3.3.3.3: icmp_seq2= ttl-245 time=2.61 ms
64 bytes from 3.3.3.3: icmp_seq3= ttl-245 time=2.95 ms
64 bytes from 3.3.3.3: icmp_seq4= ttl-245 time=2.15 ms
64 bytes from 3.3.3.3: icmp_seq5= ttl-245 time=2.43 ms

--- 3.3.3.3 ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4005ms
rtt min/avg/max/mdev = 2.153/3.728/8.483/2.391 ms
root@nam.localdomain#
```

Step 7 Use an approved Firefox or Internet Explorer browser to access the NAM and confirm connectivity. For a list of approved browsers, see the Cisco Prime NAM Release Notes.

If the Cisco Prime NAM web server is properly configured, you can access the NAM login window.

At this point, the only user able to log into the NAM web server is the administrative user that you configured when you enabled the web server. There is no secondary user option. To configure additional users, see the *Prime NAM Command Reference Guide* or the *Prime NAM User Guide* on Cisco.com.

Upgrading the Cisco Prime NAM software

If you need the latest version of the Cisco Prime NAM software, see the "Installing the Cisco Prime NAM Software" section on page 10-46.

Replacing a Cisco Nexus 7009 Fabric Module During Operations

The Cisco Nexus 7009 switch has up five fabric modules located on the front of the chassis. You can replace one of these fabric modules at a time while the switch is operating.

You should replace a fabric module with another fabric module within a couple minutes to maintain the designed system airflow. If you cannot replace the fabric module, you must fill the slot with a blank module.

Warning **Hazardous voltage or energy is present on the backplane when the system is operating. Use caution when servicing.** Statement 1034

Caution Make sure that you wear an ESD wrist strap while you handle each fabric module. Hold the module only on its carrier edges without touching any electronic circuitry, and place it on antistatic mats or repack it in its original packing materials when it is not installed in the chassis.

To replace a fabric module, follow these steps:

Step 1 Place an antistatic mat or antistatic foam where you can place the fabric modules. Choose a place that prevents damage to the module while it is outside the chassis.

Step 2 Unpack and place the replacement fabric module on the antistatic mat or antistatic foam.

Step 3 Slide the eject button cover up and press the eject button. The ejector lever will pop out from the front of the fabric module.

Step 4 Rotate the ejector lever away from the front of the module and pull the module part way from the chassis.

Step 5 Place your other hand under the module, fully pull the module from the chassis, and place the module on an antistatic surface.

Step 6 On the replacement module, if the ejector lever is placed against the front of the module, slide the eject button cover up, press the eject button, and fully rotate the ejector lever away from the front of the module.

Step 7 Pick up the module with one hand under the module and the other holding the front of the module.

Caution To prevent ESD damage, avoid touching the electronic circuitry and prevent anything else from coming in contact with the circuitry.

Step 8 Align the replacement module to the open fabric slot and slide the module all the way into the slot until it comes into contact with the back plane.

Step 9 Rotate the ejector lever to the front of the module. The module is fully seated in the slot if the front of the module is flush with the front of the other modules in the chassis.

Replacing or Upgrading a Cisco Nexus 7010 or 7018 Fabric Module During Operations

The Cisco Nexus 7010 and 7018 switches have up to five fabric modules located on the back of the chassis. You can replace one of these fabric modules at a time while the switch is operating. You can also upgrade all of the Fabric 1 modules with Fabric 2 modules, which provide increased performance (when all of the operational fabric modules are Fabric 2 modules) and are recommended for F2 I/O modules.

This section describes how to replace fabric modules and includes the following topics:

Required Tools

You need a flat-blade or number 2 Phillips-head screwdriver to loosen or tighten the captive screws on the fan tray.

Replacing a Cisco Nexus 7010 or 7018 Fabric Module

You should replace a fabric module with another fabric module within a couple of minutes to maintain the designed system airflow. If you cannot replace the fabric module, you must fill the slot with a blank module. If you are replacing Fabric 1 modules with Fabric 2 modules, see the "Upgrading Fabric 1 Modules with Fabric 2 Modules" section on page 10-57.

Warning **Hazardous voltage or energy is present on the backplane when the system is operating. Use caution when servicing.** Statement 1034

Caution Make sure that you wear an ESD wrist strap while you handle each fabric module. Hold the module only on its carrier edges without touching any electronic circuitry, and place it on antistatic mats or repack it in its original packing materials when it is not installed in the chassis.

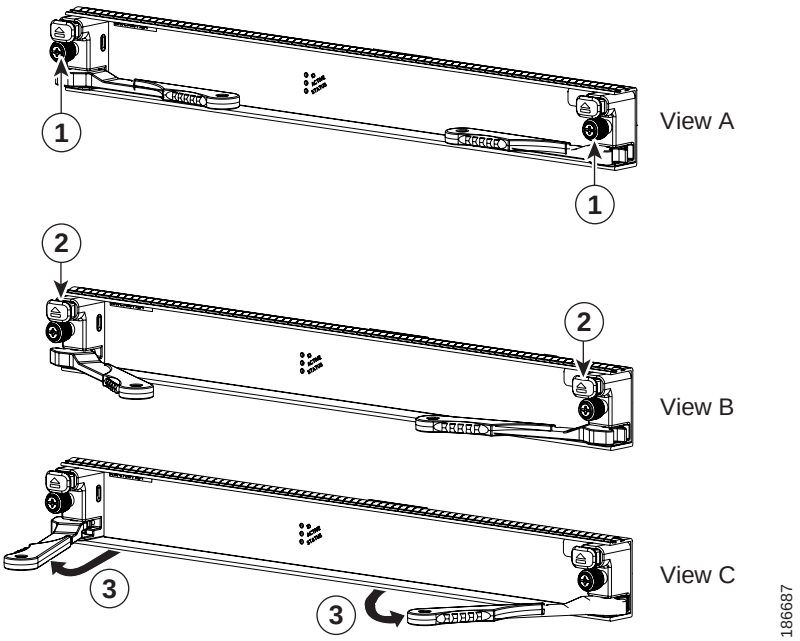
To replace a fabric module, follow these steps:

Step 1 Place an antistatic mat or antistatic foam where you can place the fabric modules. Choose a place that prevents damage to the module while it is outside the chassis.

Step 2 Unpack and place the replacement fabric module on the antistatic mat or antistatic foam.

Step 3 Loosen the two captive screws on the module that you are removing (see View A in Figure 10-14).

Figure 10-14 Unseating a Fabric Module



1	Loosen two captive screws (one on each end of the module).	**3**	Simultaneously rotate out both ejectors away from the face of the module.
2	Press both eject buttons.		

Step 4 Press both ejector release buttons to release the ejector levers (see View B in Figure 10-14).

Step 5 Simultaneously rotate both ejectors away from the face of the module to unseat the module from the midplane connector (see View C in Figure 10-14).

Step 6 Holding each ejector lever, pull the module part way out of its slot.

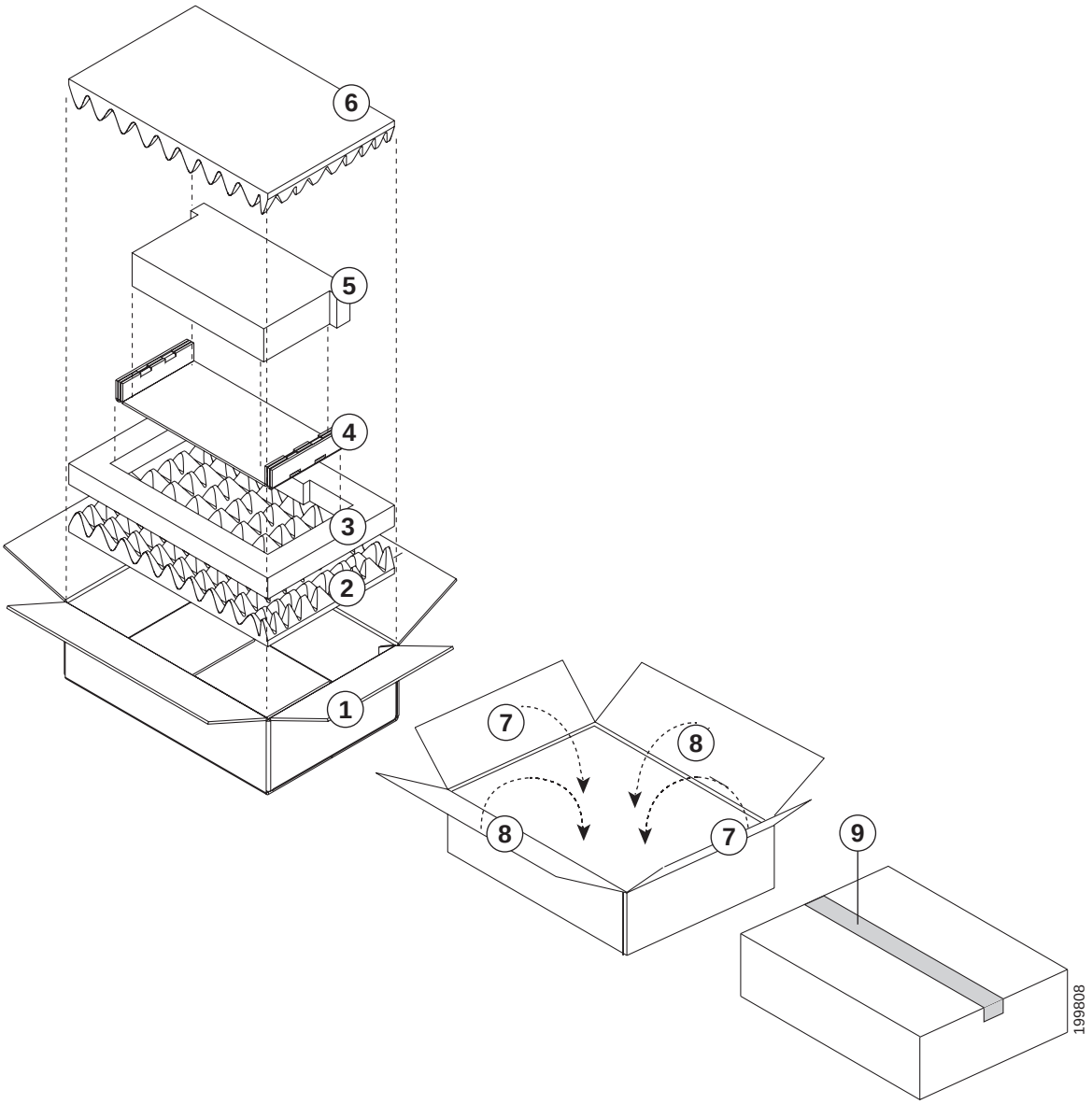
Step 7 Grasp the front edge of the module and place your other hand under the module to support its weight. Pull the module out of its slot. Do not touch the module circuitry.

Caution To prevent ESD damage, avoid touching the electronic circuitry and prevent anything else from coming in contact with the circuitry.

Step 8 If you are removing the module from a Cisco Nexus 7010 chassis. turn the module counterclockwise so that it is horizontal.

Step 9 Place the module on the antistatic mat or repack it in its original packing materials. If you are packing a Cisco Nexus 7010 fabric module (N7K-C7010-FAB-1), see Figure 10-15. If you are packing a Cisco Nexus 7018 fabric module (N7K-C7018-FAB-1), see Figure 10-16 on page 10-56.

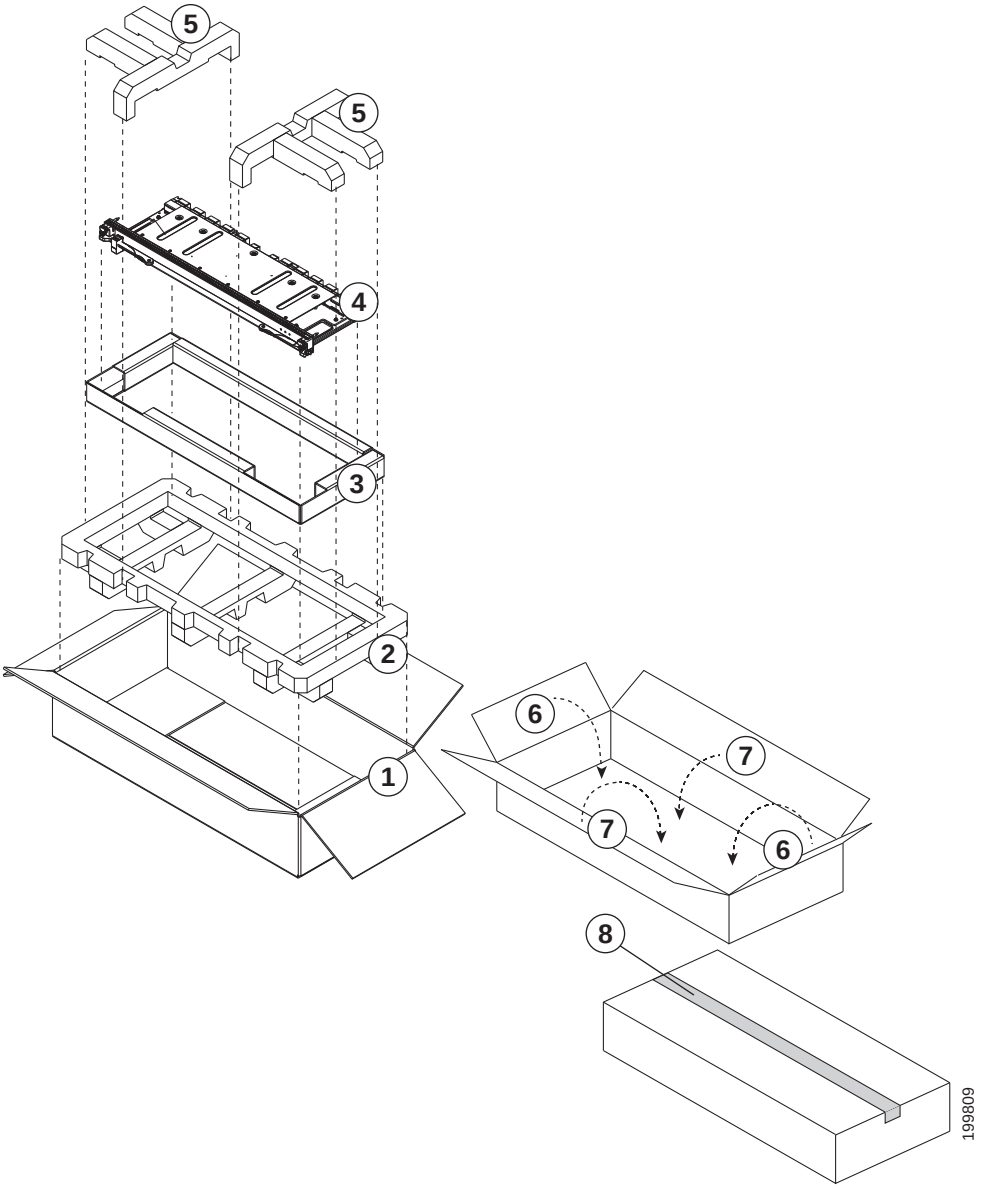
Figure 10-15 Packing a Cisco Nexus 7010 Fabric Module (N7K-C7010-FAB-1)



1	Open the box.	**6**	Place the foam padding on top of the module.
2	Place the foam padding on the bottom.	**7**	Fold the narrow flaps over the top of the box.

3	Place the foam padding with the middle cut out on top of the foam padding in the box.	**8**	Fold the wide flaps over the top of the box.
4	Place the trifold piece of cardboard inside the hole in the foam padding.	**9**	Tape the wide flaps together and to the box.
5	Put the fabric module in an ESD bag (not shown) and then place the bagged module in the hole of the padding.		

Figure 10-16 Packing a Cisco Nexus 7018 Fabric Module (N7K-C7018-FAB-1)



1	Open the box.	**5**	Place the two foam pads on top of the module.
2	Place the foam padding on the bottom.	**6**	Fold the narrow flaps over the top of the box.
3	Place the foam padding with the middle cut out on top of the foam padding in the box.	**7**	Fold the wide flaps over the top of the box.
4	Put the fabric module in an ESD bag (not shown) and then place the bagged module in the hole of the padding.	**8**	Tape the wide flaps together and to the box.

Step 10 On the replacement module, rotate the two ejector levers fully away from the face of the module.

Step 11 If you are inserting the module into a Cisco Nexus 7010 chassis, turn the module 90 degrees clockwise.

Step 12 With one hand holding each side of the module, align the backside of the module to the slot guides in the vacated slot, and slide the module part way into the slot.

Caution To prevent ESD damage, avoid touching the electronic circuitry and prevent anything else from coming in contact with the circuitry.

Step 13 With one or both hands on the face of the module, push the module all the way into the slot until it seats on the midplane connector. The EMI gasket will close the gap between this module and any module or chassis edge that is immediately above the module that you just installed.

Step 14 Simultaneously push both ejector levers inward until they come in contact with the face of the module. The captive screws should be aligned to their holes in the chassis.

Step 15 Tighten the two captive screws on the fabric module to 8 in-lb (0.9 N·m).

Step 16 Verify that the module Status LED is on and becomes green after the module is initialized. To see the different statuses indicated by this LED, see Table D-5 on page D-6.

Upgrading Fabric 1 Modules with Fabric 2 Modules

If you are running Cisco NX-OS 6.0(x) or a later release, you can upgrade all of the Fabric 1 modules with Fabric 2 modules in a Cisco Nexus 7010 or 7018 switch (the Cisco Nexus 7009 uses only Fabric 2 modules). You can upgrade the modules during operations if you replace each within a couple of minutes so that the switch can maintain its designed airflow. The upgrade process is non disruptive to switch operations if there is at least one fabric module installed and operating in the switch while you upgrade another fabric module.

When upgrading fabric modules, you must replace all of the Fabric 1 modules in the switch with Fabric 2 modules within 12 hours or you will see a syslog message that reminds you to complete the upgrade.

Note If you power up a switch that has both types of fabric modules installed, only the Fabric 2 modules power up. If you need the Fabric 1 modules to power up, you must first power off all of the Fabric 2 modules (see the "Shutting Down a Fabric Module" section on page 8-23) before the Fabric 1 modules can power up.

Warning **Hazardous voltage or energy is present on the backplane when the system is operating. Use caution when servicing.** Statement 1034

Caution Make sure that you wear an ESD wrist strap while you handle each fabric module. Hold the module only on its carrier edges without touching any electronic circuitry, and place it on antistatic mats or repack it in its original packing materials when it is not installed in the chassis.

To upgrade Fabric 1 modules with Fabric 2 modules, follow these steps:

Step 1 Verify that the switch is running Cisco NX-OS Release 6.0(1) or a later release. If not, you must install Cisco NX-OS Release 6.0(1) or a later release.

Step 2 Replace the Fabric 1 module that is in the lowest numbered fabric slot as explained in the "Replacing a Cisco Nexus 7010 or 7018 Fabric Module" section on page 10-53.

Step 3 Enter the **show module xbar** command, as shown in Example 10-2, to display the types of fabric modules installed in the fabric slots.

Example 10-2 Listing the Fabric Module Types Installed in the Switch

```
switch# show module xbar
Xbar Ports  Module-Type                  Model              Status
---  -----  ----------------------------- ------------------ --------
1    0      Fabric Module 2               N7K-C7010-FAB-2    ok
2    0      Fabric Module 1               N7K-C7010-FAB-1    ok
4    0      Fabric Module 2               N7K-C7010-FAB-2    ok

Xbar Sw              Hw
---  --------------- -------
1    NA              0.200
2    NA              1.1
4    NA              0.200


Xbar MAC-Address(es)            Serial-Num
---  -------------------------  ----------
1    NA                         JAF1504CAFR
2    NA                         JAF1409AMRL
4    NA                         JAF1504CAFB
```

Step 4 If one or more of the fabric modules is indicated as "Fabric Module 1," repeat Steps 2 and 3 to replace that module with a Fabric 2 module.

If you have replaced all of the Fabric 1 modules with Fabric 2 modules, you can then install F2 I/O modules (see the "Installing an I/O Module" section on page 10-38).

Replacing the Cisco Nexus 7004 Fan Tray During Operations

The Cisco Nexus 7004 switch has one fan tray (part number N7K-C7004-FAN) that is located on the front of the chassis.

Warning **Hazardous voltage or energy is present on the backplane when the system is operating. Use caution when servicing.** Statement 1034

The Cisco Nexus 7004 fan tray is designed to be removed and replaced during operations, but you should replace the fan tray within a couple of minutes to maintain the designed system airflow.

Warning **When removing the fan tray, keep your hands and fingers away from the spinning fan blades. Let the fan blades completely stop before you remove the fan tray.** Statement 258

To replace a Cisco Nexus 7004 fan tray, follow these steps:

Step 1 Place an antistatic mat or antistatic foam where you can place two fan trays (the new fan tray and the one that you will remove from the switch).

Choose a place that prevents damage to the fan trays while they are outside the chassis.

Step 2 Unpack and place the replacement fan tray on the antistatic mat or antistatic foam. Keep the shipping materials for the fan tray that you are removing.

Step 3 Unscrew the two captive screws on the front of the fan tray until they spring out from the fan tray.

Step 4 Grab the fan tray handle with one hand and pull the fan tray part way out of the chassis.

Step 5 Place your other hand under the fan tray to support its weight, pull the fan tray out of the chassis, and place it on the antistatic pad or repack it in the shipping materials.

Step 6 Grab the handle of the replacement power supply with one hand, place your other hand under the fan tray, and align the fan tray to the fan tray bay in the chassis.

Step 7 Push the fan tray all the way into the chassis until its front touches the front of the chassis.

Step 8 Screw in the two captive screws.

Step 9 Make sure that the STATUS LED turns on and is green.

Replacing a Cisco Nexus 7009 Fan Tray During Operations

The Cisco Nexus 7009 switch has one fan tray (part number N7K-C7009-FAN) that is located on the backside of the chassis.

Warning **Hazardous voltage or energy is present on the backplane when the system is operating. Use caution when servicing.** Statement 1034

The Cisco Nexus 7009 fan tray is designed to be removed and replaced during operations, but you should replace the fan tray within a couple of minutes to maintain the designed system airflow.

Warning **When removing the fan tray, keep your hands and fingers away from the spinning fan blades. Let the fan blades completely stop before you remove the fan tray.** Statement 258

To replace a Cisco Nexus 7009 fan tray, follow these steps:

Step 1 Place an antistatic mat or antistatic foam where you can place two fan trays (the new fan tray and the one that you will remove from the switch).

Choose a place that prevents damage to the fan trays while they are outside the chassis.

Step 2 Unpack and place the replacement fan tray on the antistatic mat or antistatic foam.

Step 3 With a hand on each of the ring handles at the top and bottom edges of the front of the fan tray, simultaneously press the spring knob on each handle, and pull the fan tray part way out of the chassis.

Step 4 Place one hand under the fan tray to support its weight and the other hand on the handle on the middle of the front of the module, and then pull the module fully out of the chassis.

Step 5 Turn the module counterclockwise so that its components can be seen from above, and place the module on an antistatic surface.

Step 6 Place one hand under the replacement fan tray and the other hand on its handle on the middle of the front of the fan tray.

Step 7 Pick up the module and turn it clockwise so that its left side is on top.

Step 8 Align the fan tray to the open fan tray slot in the chassis and press the module all the way into the slot until its front comes in contact with the chassis and the top and bottom spring clips click.

Step 9 Make sure that the STATUS LED turns on and is green.

Replacing a Cisco Nexus 7010 System Fan Tray During Operations

The Cisco Nexus 7010 switch has two system fan trays located on the upper backside of the chassis (see Figure 1-6 on page 1-11).

Warning **Hazardous voltage or energy is present on the backplane when the system is operating. Use caution when servicing.** Statement 1034

This section describes how to replace a system fan tray (N7K-C7010-FAN-S) and includes the following topics:

Required Tools

You need a flat-blade or number 2 Phillips-head screwdriver to loosen or tighten the captive screws on the fan tray.

Replacing a Cisco Nexus 7010 System Fan Tray

The Cisco Nexus 7010 system fan tray is designed to be removed and replaced while the system is operating, but you should replace the fan tray within a couple of minutes to maintain the designed system airflow.

Warning **When removing the fan tray, keep your hands and fingers away from the spinning fan blades. Let the fan blades completely stop before you remove the fan tray.** Statement 258

To replace a Cisco Nexus 7010 system fan tray, follow these steps:

Step 1 Place an antistatic mat or antistatic foam where you can place two fan trays.

Choose a place that prevents damage to the fan trays while they are outside the chassis.

Step 2 Unpack and place the replacement fan tray on the antistatic mat or antistatic foam.

Step 3 Loosen the two captive screws on the fan tray that you are replacing by turning them counterclockwise until they are free of the chassis.

Step 4 Grasp the fan tray handle with one hand and pull it part way out of the chassis.

If the fan tray power connector does not easily unseat from the backplane, rock it gently.

Step 5 Place the other hand under the fan tray to support its weight, pull the fan tray completely out of the chassis, and place the fan tray on an antistatic mat or repack it in its original packing materials.

Step 6 Make sure that the replacement fan tray is oriented so that the fans are on top and the fan status LED is on the right when you are looking at the front side with the handle.

Step 7 Grasp the replacement fan tray handle with one hand and place the other hand beneath the fan tray to support it, lift the fan tray to the open fan tray slot in the chassis, align the fan tray to the chassis guides, and push the fan tray into the slot until the power connector seats in the backplane and the captive screws are aligned to their holes in the chassis.

Step 8 Tighten the captive screws to 8 in-lb (0.9 N·m).

Step 9 Make sure that the STATUS LED turns on and is green.

Replacing a Cisco Nexus 7010 Fabric Fan Tray During System Operations

The Cisco Nexus 7010 system has two fabric fan trays located on the backside of the chassis immediately above the fabric modules (see Figure 1-6 on page 1-11).

Warning **Hazardous voltage or energy is present on the backplane when the system is operating. Use caution when servicing.** Statement 1034

This section describes how to replace fabric fan trays (N7K-C7010-FAN-F) and includes the following topics:

Required Tools

You need a flat-blade or number 2 Phillips-head screwdriver to loosen or tighten the captive screws on the fabric fan tray.

Replacing a Cisco Nexus 7010 Fabric Fan Tray

The Cisco Nexus 7010 fabric fan tray is designed to be removed and replaced while the system is operating without damaging the system. It is best to replace the fan tray within a couple of minutes to maintain the designed airflow and fan redundancy.

Warning **When removing the fan tray, keep your hands and fingers away from the spinning fan blades. Let the fan blades completely stop before you remove the fan tray.** Statement 258

To replace a Cisco Nexus 7010 fabric fan tray, follow these steps:

Step 1 Place an antistatic mat or antistatic foam where you can place two fabric fan trays.

Choose a place that prevents damage to the fan trays while they are outside the chassis.

Step 2 Unpack and place the replacement fabric fan tray on the antistatic mat or antistatic foam.

Step 3 Loosen the two captive screws on the fabric fan tray that you are replacing by turning them counterclockwise until they are free of the chassis.

Step 4 Grasp the fan tray handle with one hand, pull the fan tray out of its slot on the chassis, and place the fan tray on an antistatic pad or antistatic foam.

If the fan tray power connector does not easily unseat from the backplane, rock it gently.

Step 5 Grasp the handle for the replacement fan tray in one hand and orient it so that the side with two captive screws is on the left. Place your other hand under the fan tray to support its weight.

Step 6 Lift the fan tray to the open fabric fan tray slot and push the fan tray into the slot until the power connector seats in the backplane and the captive screws are aligned to their holes in the chassis.

Step 7 Tighten the captive screws to 8 in-lb (0.9 N·m).

Step 8 Make sure that the STATUS LED turns on and is green.

Replacing a Cisco Nexus 7018 Fan Tray During System Operations

The Cisco Nexus 7018 chassis uses two fan trays to cool its modules. The top fan tray cools slots 1 through 9 and the fabric modules, and the bottom fan tray cools slots 10 through 18. Each fan tray is designed to be removed and replaced while the system is operating, but you should replace the fan tray within three minutes or the switch will shutdown the modules cooled by the missing fan tray when the time expires.

Caution Do not use embedded event manager commands to override the shutdown that can occur when the three-minute timer expires or else an overtemperature condition can occur.

The fan trays are located on the back side of the Cisco Nexus 7018 chassis as shown in Figure 1-12 on page 1-19.

Warning **When removing the fan tray, keep your hands and fingers away from the spinning fan blades. Let the fan blades completely stop before you remove the fan tray.** Statement 258

To replace a Cisco Nexus 7018 fan tray (N7K-C7018-FAN=), follow these steps:

Step 1 Place an antistatic mat or antistatic foam where you can place two fan trays.

Choose a place that prevents damage to the fan trays while they are outside the chassis.

Step 2 Unpack and place the replacement fan tray on the antistatic mat or antistatic foam.

Step 3 Loosen the four captive screws on the fan tray that you are replacing by turning them counterclockwise until they are free of the chassis.

Step 4 Grasp the fan tray handle with one hand and pull the fan tray part way out of its slot on the chassis.

If the fan tray power connector does not easily unseat from the backplane, rock it gently.

Step 5 Place a hand under the bottom side of the fan tray to support it and pull the fan tray out of the chassis.

Step 6 Place the fan tray on an antistatic pad or repack it in its original packing materials.

Step 7 Grasp the handle for the replacement fan tray in one hand and orient the fan tray so that the lettering on the LED labels is upright and readable.

Step 8 Place one hand under the bottom side of the fan tray, lift the fan tray to the open fan tray slot, align the fan tray with the top and bottom chassis guides for the slot, and push the fan tray into the chassis until the power connector seats in the backplane and the captive screws are aligned to their holes in the chassis.

Step 9 Tighten the captive screws to 8 in-lb (0.9 N·m).

Step 10 Make sure that the STATUS LED turns on and is green.

Replacing Storage Media for a Supervisor Module

You can replace a CompactFlash card in either flash memory reader on any Supervisor 1 module or a USB drive in either USB port on any Supervisor 2 or Supervisor 2E module. The replacement media must already be formatted for the reader or port, or you must reformat the media after installing it.

Note The LOG FLASH and EXPANSION FLASH readers (Supervisor 1) and the LOG FLASH and SLOT0 ports (Supervisor 2 or 2E) require different formats for their cards.

To replace storage media on a supervisor module, follow these steps:

Step 1 Press the **Eject Request** button for the reader or port that has the media to be replaced.

Step 2 Wait for the reader or port LED to turn off and to see an offline message for that reader or port.

Step 3 Remove the card from the reader.

Step 4 Insert the replacement media as follows:

- For the Supervisor 1 modules, align the replacement card to the CompactFlash reader slot as shown in Figure 4-10 on page 4-17 and push the card all the way into the slot. The grooves on the thin side of the card must begin on the end of the card that goes into the reader first. If the card does not fit easily into the slot, flip the card so the bottom edge is on top, and try pushing the card into the slot.
- For the Supervisor 2 or Supervisor 2E modules, insert the replacement USB drive in the USB port.

Step 5 Wait for the reader LED to turn green and for an online message to appear on the console.

Note If you see an offline message or do not see a message, either the card is not fully pushed into the reader or it is improperly formatted. If the card is fully inserted, either format the card (see the *Cisco NX-OS Fundamentals Configuration Guide*) or replace the card with another card that is properly formatted for the reader.

Replacing the Cable Management Frames on the Cisco Nexus 7004 Chassis

This section describes how to remove and install the cable management frames on the Cisco Nexus 7004 chassis, and it includes the following topics:

Required Tools

You need a flat-blade or number 2 Phillips-head screwdriver with torque capability to loosen or tighten the screws that hold the frame members to the chassis.

Removing the Cable Management Frames from the Cisco Nexus 7004 Chassis

To remove the cable management frames from the Cisco Nexus 7004 chassis, follow these steps:

Step 1 Unscrew the three M3 screws that hold one of the two cable management frames to the chassis, and remove that frame from the chassis.

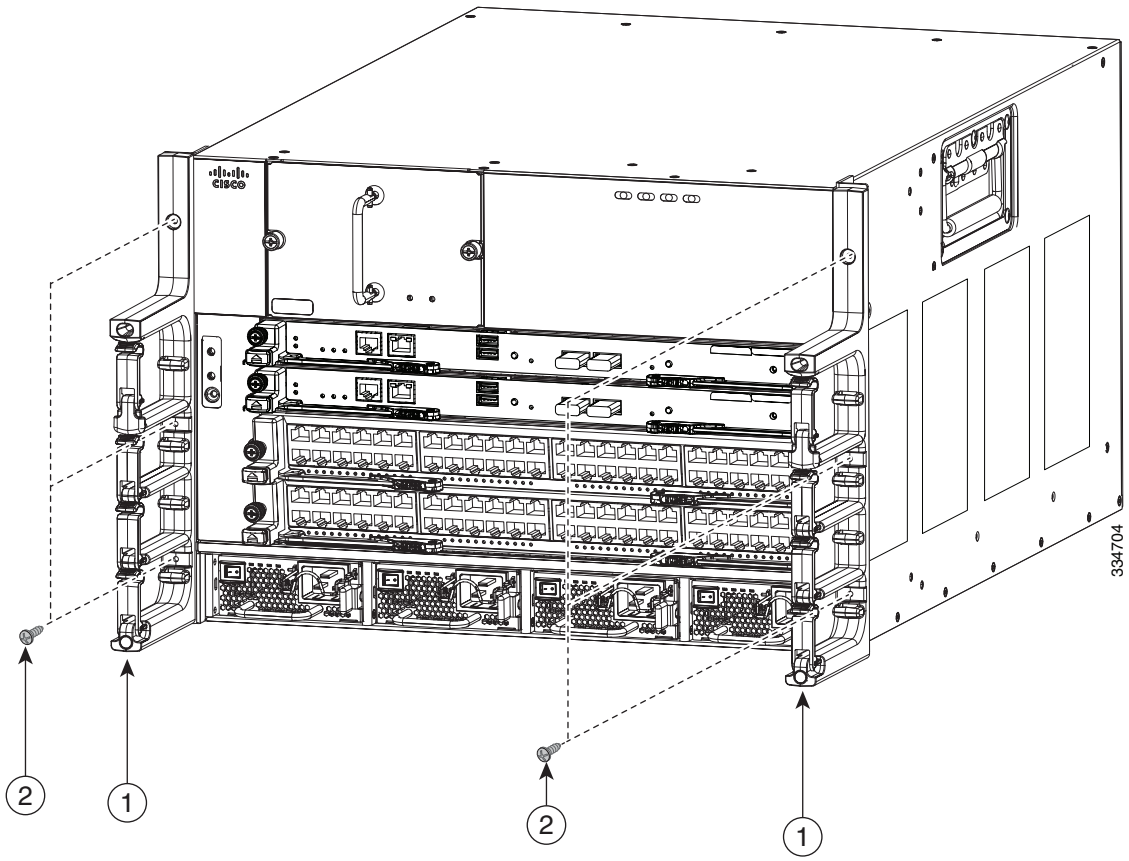
Step 2 Unscrew the three M3 screws that hold the other cable management frames to the chassis, and remove that frame from the chassis.

Installing the Cable Management Frames on the Cisco Nexus 7004 Chassis

To install a new set of cable management frames to the chassis, follow these steps:

Step 1 Align the guide guide pin on one of the two cable management frames to a guide-pin hole of the same size on the front-mounting bracket that is already attached to the chassis. The top of the frame should be at the same level as the top of the chassis (see Figure 10-17).

Figure 10-17 Installing the Cable Management Frames on a Cisco Nexus 7004 Chassis



1	Guide pins on the cable management frame aligned to two holes in the front-mount bracket.	**2**	Three M3 x 10 mm screws used to fasten the frame to the chassis (total of six screws for two frames).

Step 2 Fasten the frame to the chassis with three M3 x 10 mm screws (see Callout 2 in Figure 10-22). Tighten the screws to 5 to 7 in.lbs (0.56 to 0.79 N.m).

Step 3 Repeat Steps 1 and 2 to install the other cable management frame to the chassis.

Replacing the Front Doors and Frame Assembly on the Cisco Nexus 7010 Chassis

If the front door and frame assembly are already attached to the chassis when you need to ship the chassis or move the chassis from one rack to another, you should remove the front doors and frame assembly for safer and easier handling of the chassis.

This section describes how to remove and install the front doors and frame assembly, and it includes the following topics:

Required Tools

You need a flat-blade or number 2 Phillips-head screwdriver to loosen or tighten the screws that hold the frame members to the chassis.

Removing the Front Doors and Frame Assembly

Removing the optional front doors and frame assembly involves removing the side frames from the EMI frame, removing the bottom frame assembly, and removing the two front doors.

Note If you are installing a new chassis, you do not need to perform this task because the chassis is not shipped with these assemblies attached to it.

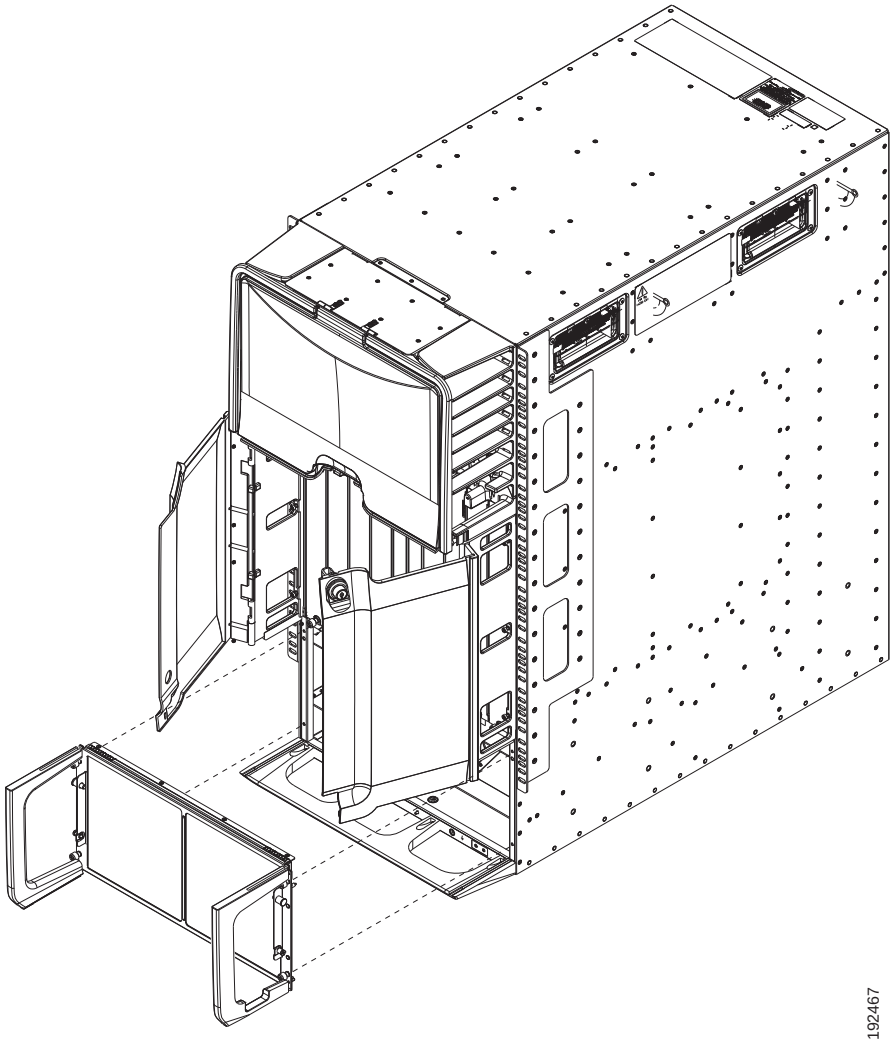
To remove the front doors and frame assemblies, follow these steps:

Step 1 Remove the two lower side frames from the EMI air filter frame by first removing the EMI panel from the chassis, and then unscrewing the side frame pieces. When done, replace the EMI frame on the chassis. The following steps explain each of these tasks:

a. On the EMI panel, which covers the air intake area on the lower front side of the chassis, loosen and completely unscrew each of the four captive screws that hold the panel to the chassis.

b. Pull the EMI panel away from the chassis, along with the attached side frame members and optional air filter (if attached) (see Figure 10-18).

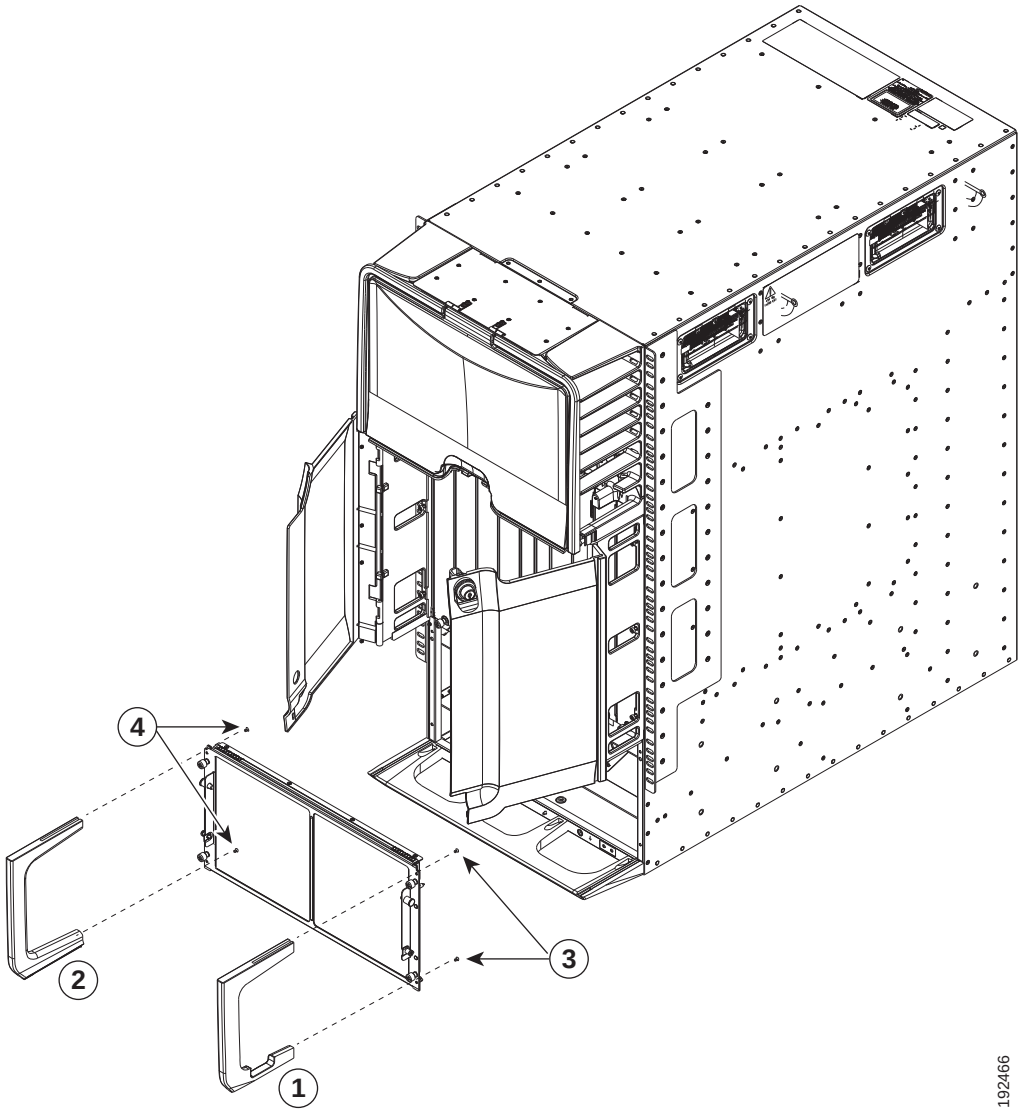
Figure 10-18 Removing the EMI Panel from the Chassis



1	Unscrew four captive screws from the chassis.	**2**	Remove the EMI panel from the chassis.

c. From the back of the EMI panel, unscrew each of the four screws that attach the two side frame pieces to the EMI panel, and remove the side frame pieces (see Figure 10-19).

Figure 10-19 Removing the Side Frame Assemblies from the EMI Panel



1	Right side frame.	**3**	Unscrew two 6-32 x 1/2-inch flat-head screws to remove the right side frame.
2	Left side frame.	**4**	Unscrew two 6-32 x 1/2-inch flat-head screws to remove the left side frame.

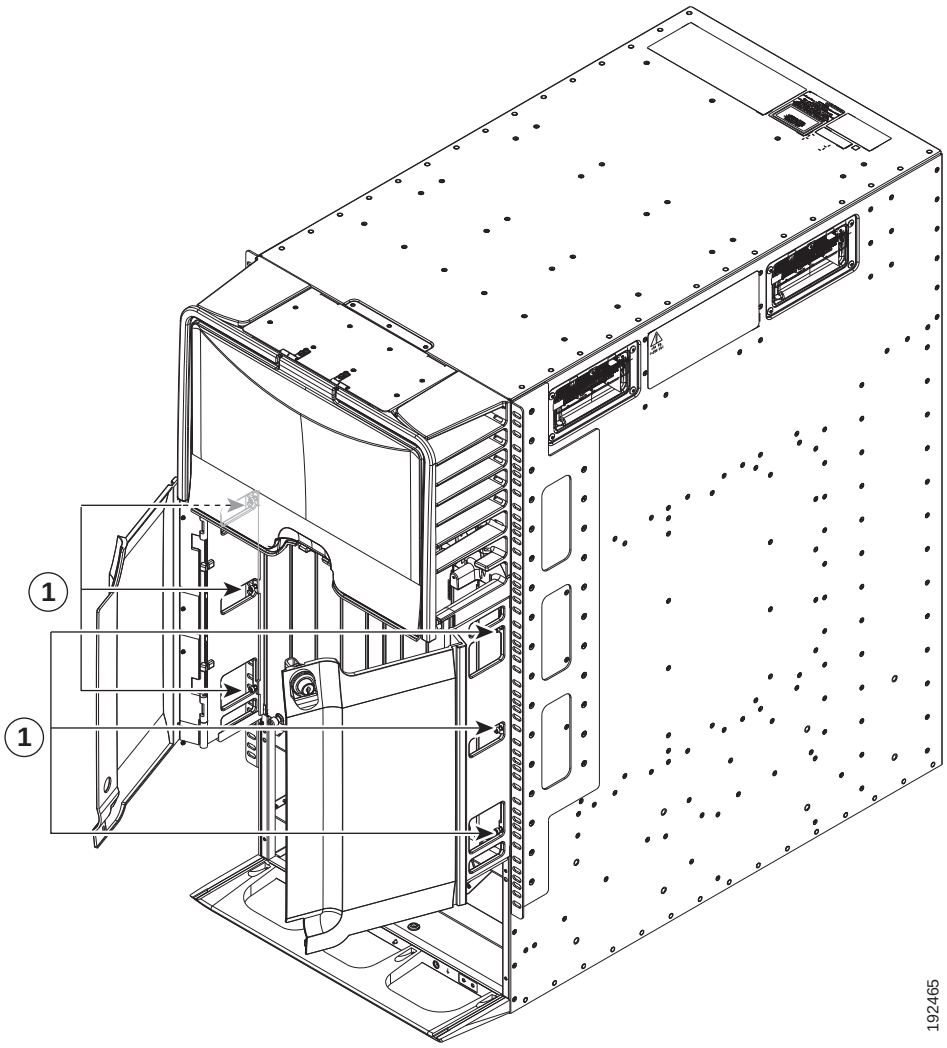
d. Realign the EMI panel to the air intake area on the chassis and tighten its four captive screws to 8 in-lb (0.9 N·m).

Step 2 Remove the front doors by following these steps:

a. Unscrew the three screws that hold one door frame assembly to the chassis until the screws are no longer in the chassis. Remove the door assembly from the chassis. See Figure 10-20.

b. Repeat step 4a for the other door assembly.

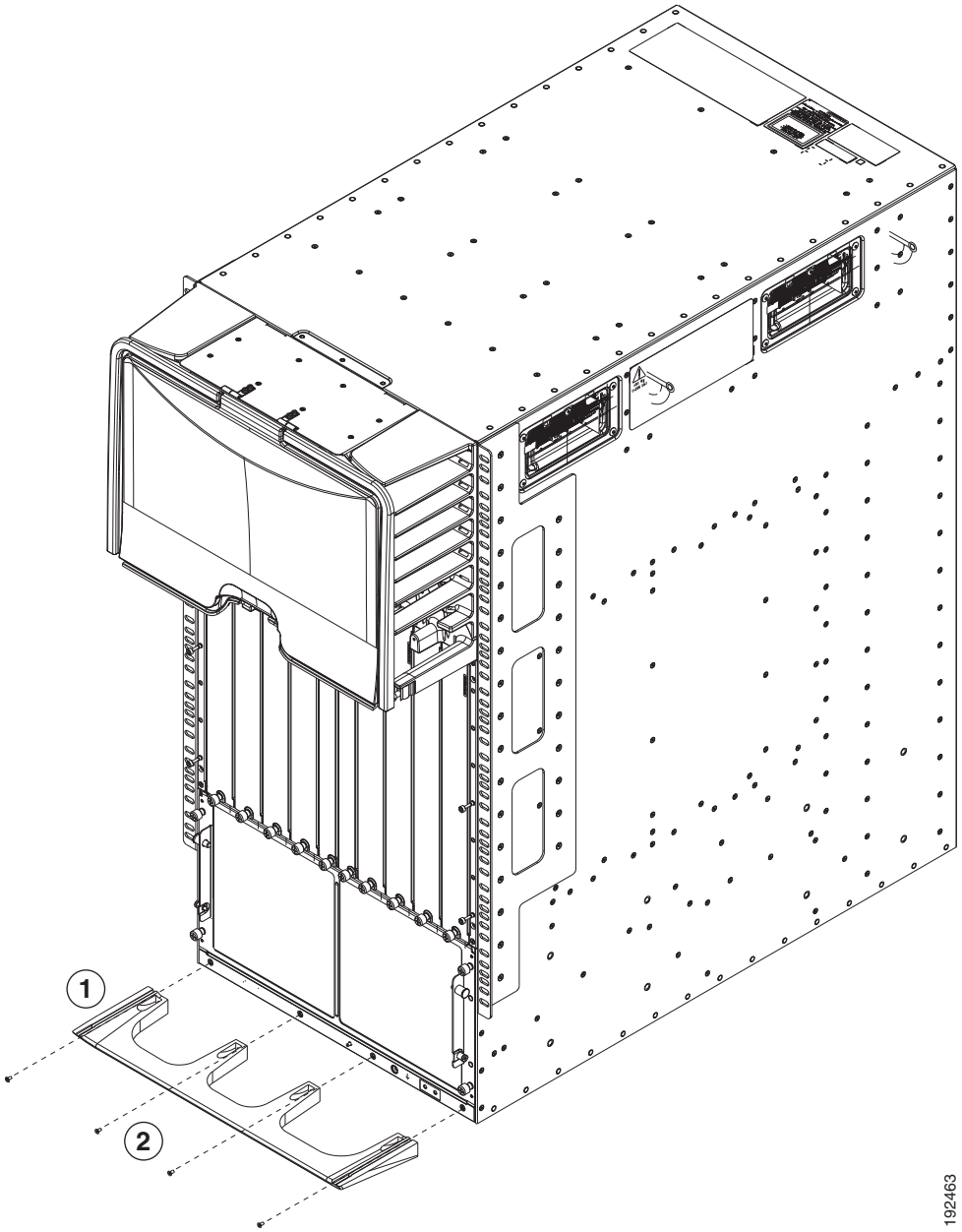
Figure 10-20 Removing the Front Door Assemblies



1	On each door frame, loosen three captive screws and remove the door frame from the chassis.		

Step 3 Remove the bottom frame assembly by completely unscrewing the four M4 x 6 mm screws identified in Figure 10-21.

Figure 10-21 Removing the Bottom Frame



1	Bottom frame	**2**	Unscrew four M4 x 6 mm screws that hold the bottom frame to the chassis

Step 4 If you are returning the frame components to Cisco, repack them in their original packing materials.

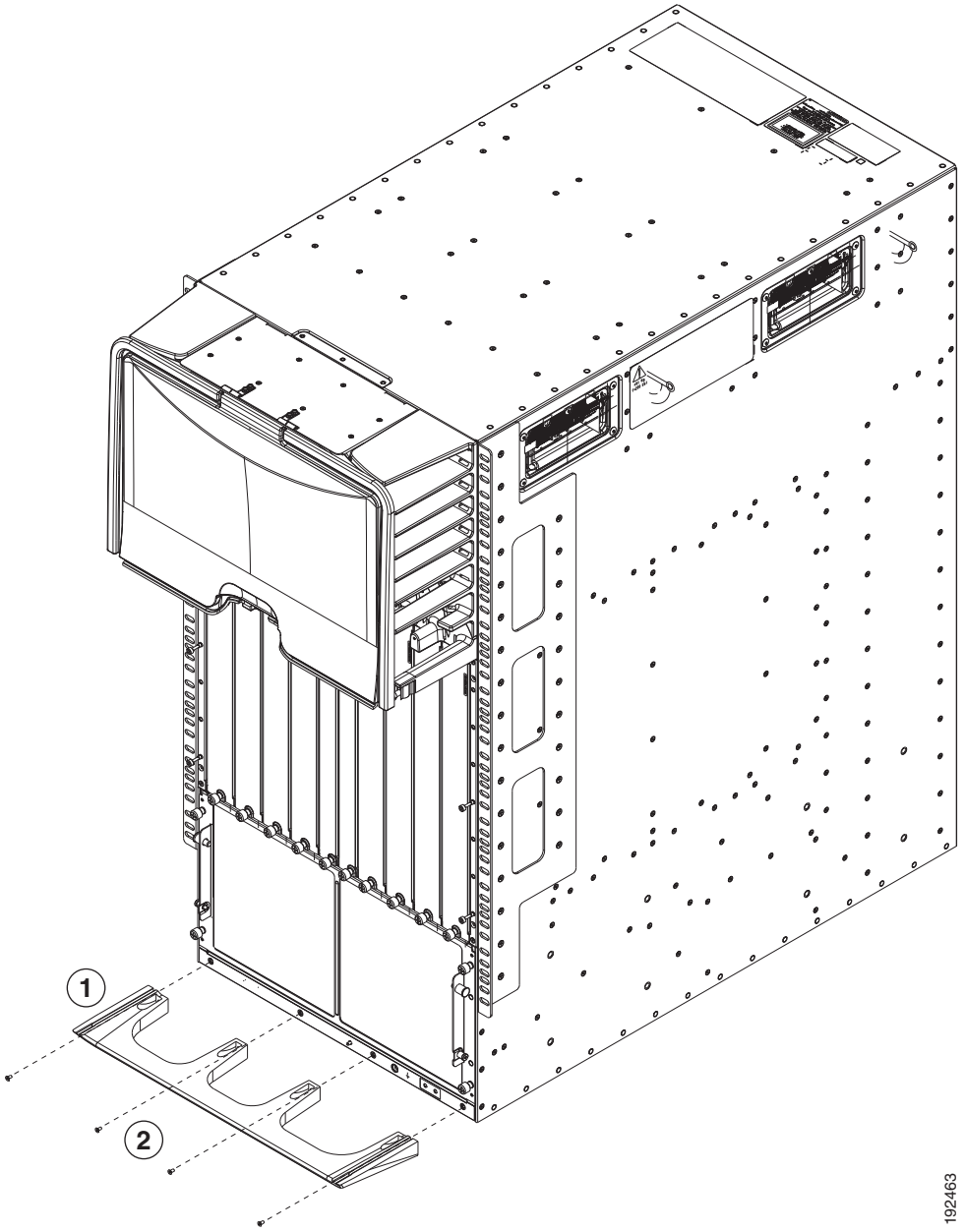
Installing the Front Doors and Frame Assembly

After you have finished moving the chassis to its rack (or after you have removed the doors and frame for their replacement), you can install the front doors and frame assemblies.

To install the front doors and frame assembly, follow these steps:

Step 1 Align the bottom frame assembly so that its four screw holes align to screw holes in the bottom of the chassis, and then screw in four M4 x 6 mm screws to attach the bottom frame to the chassis (see Figure 10-22).

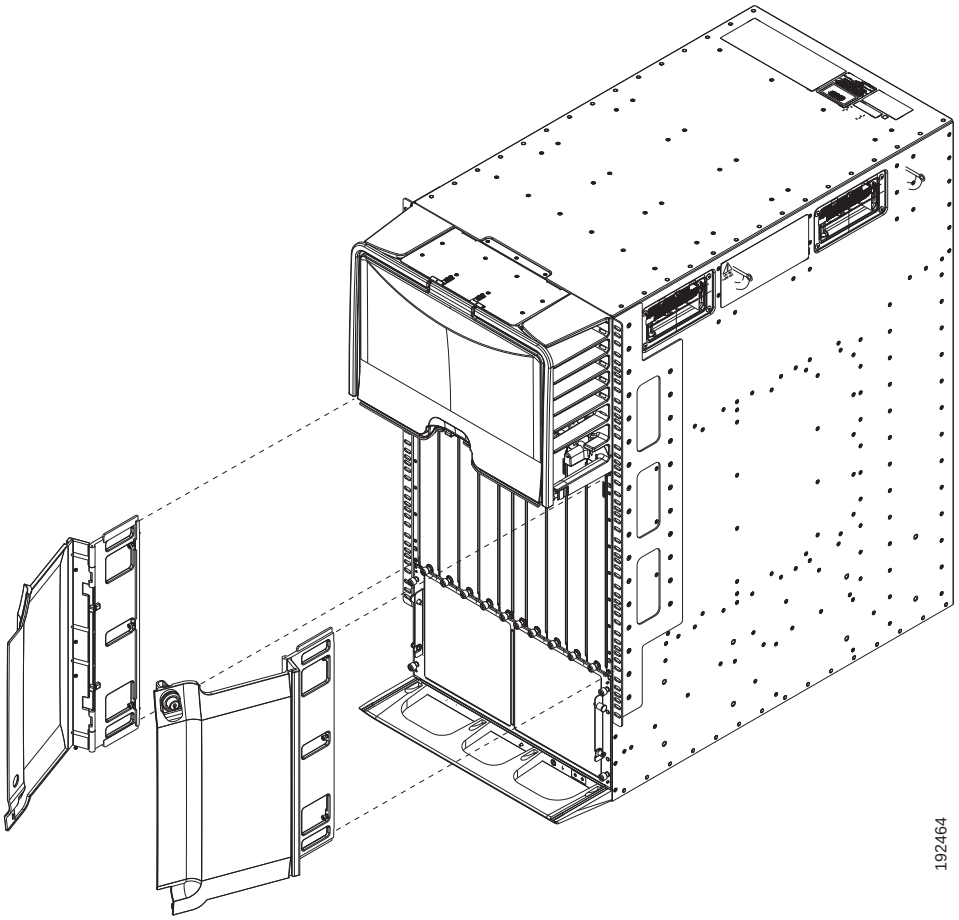
Figure 10-22 Installing the Bottom Frame



1	Bottom frame assembly with screw holes aligned to screw holes in chassis.	**2**	Tighten four M4 x 6 mm screws.

Step 2 For each of the two front doors, match the two alignment pins on the door frame to the alignment holes on the chassis. Position each door frame immediately under the cable management area (see Figure 10-23).

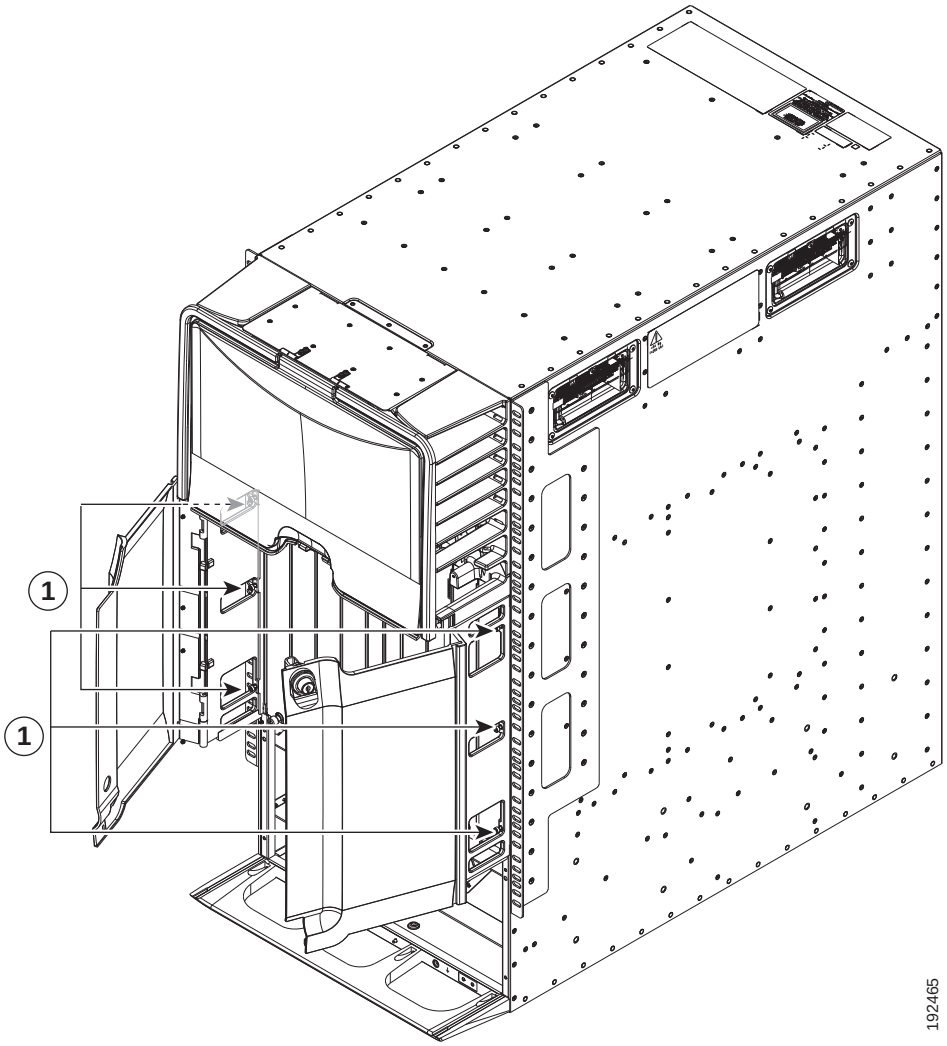
Figure 10-23 Installing the Front Doors



1	Front door frames.	**3**	Place each door frame on front edge of chassis and immediately under the cable management area.
2	Cable management area.		

Step 3 Tighten three captive screws for each door frame (see Figure 10-24).

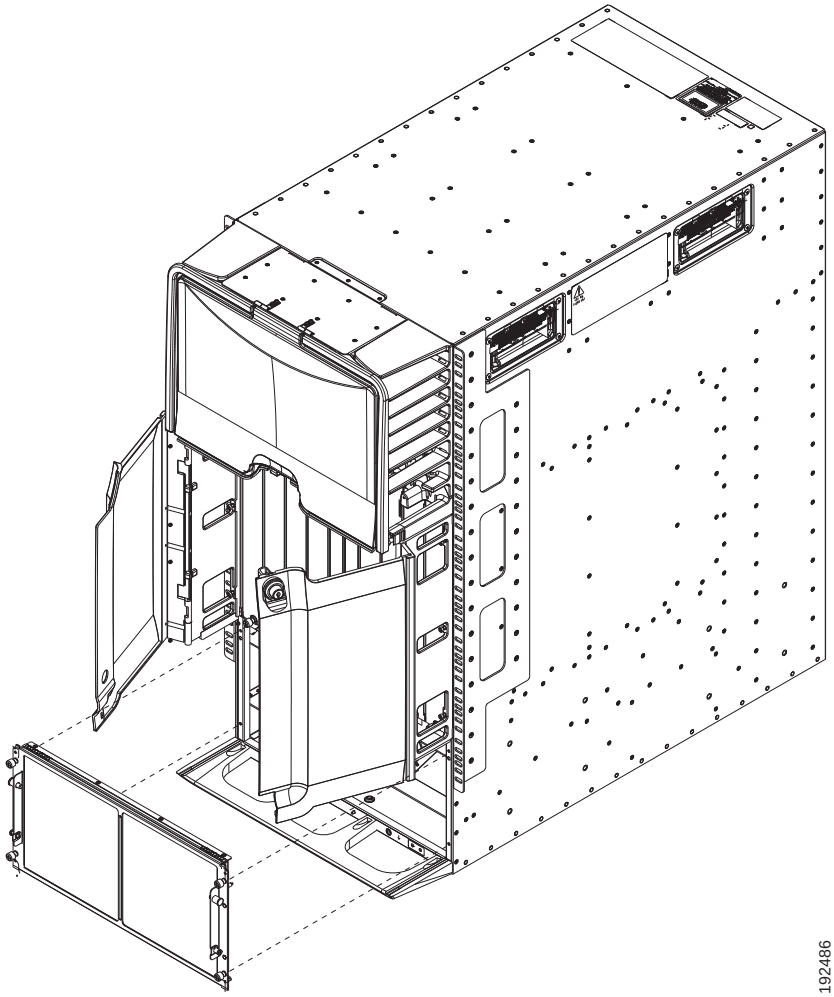
Figure 10-24 Attaching the Door Frames to the Chassis



1	Tighten three captive screws for each door frame.		

Step 4 On the EMI panel, unscrew four captive screws and remove the panel from the chassis (see Figure 10-25).

Figure 10-25 Removing the EMI Panel

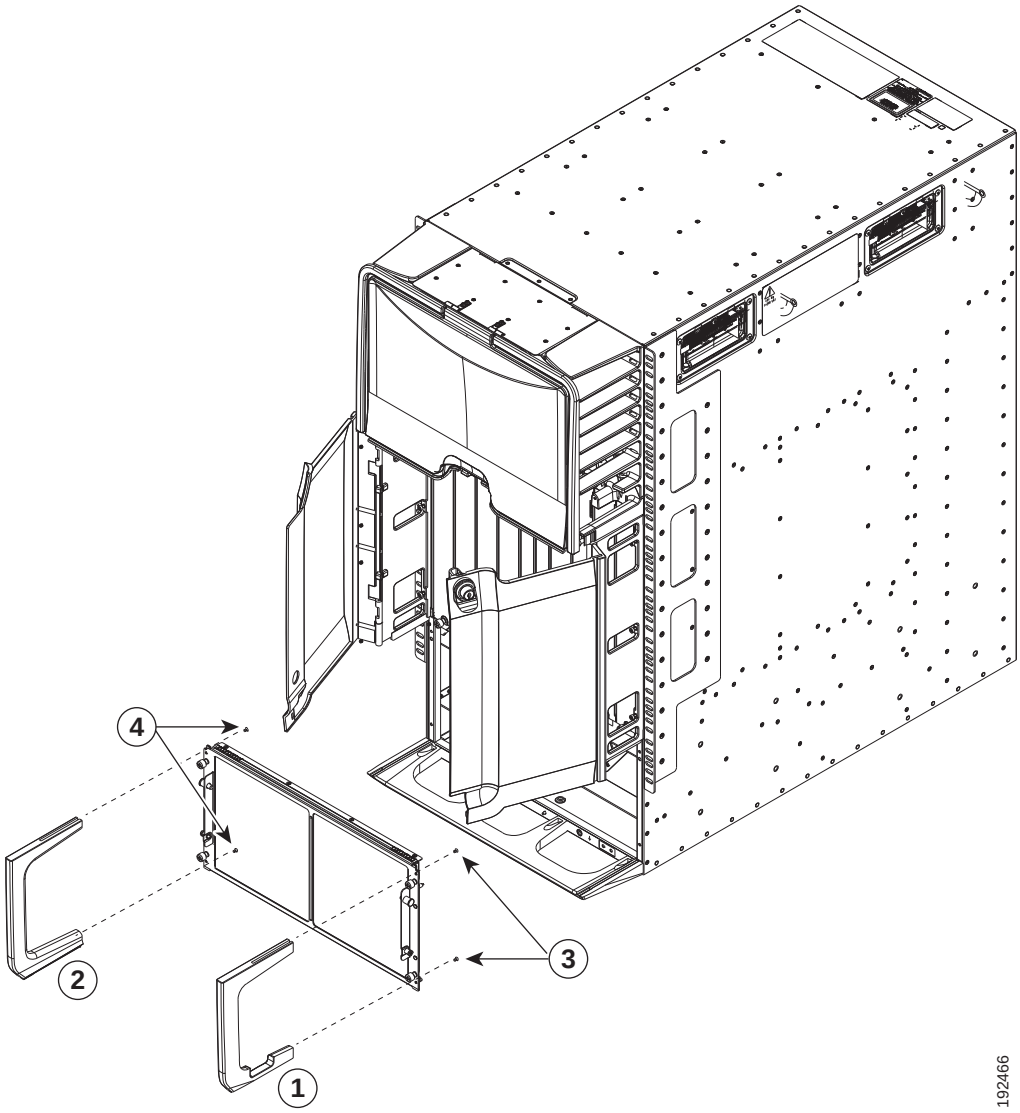


1	Completely loosen four captive screws.	**2**	Remove the EMI panel from the chassis.

Step 5 On the right side of the EMI panel (as seen from the front), align the right frame piece (the one with the notch in one of the two extensions) so that its two screw holes align to two screw holes on one side of the EMI panel and secure the side frame to the panel with two 6-32 x 1/2 inch flat head screws. Tighten the screws to 8 in-lb (0.9 N·m). See Figure 10-26.

Step 6 On the left side of the EMI panel, align the left frame piece (no notch on its extensions) so that its two screw holes align to two screw holes on one side of the EMI panel and secure the side frame to the panel with two 6-32 x 1/2 inch flat head screws. Tighten the screws to 8 in-lb (0.9 N·m). See Figure 10-26.

Figure 10-26 Attaching the Side Frame Assemblies to the EMI Panel



1	Right side frame.	**3**	Use two 6-32 x 1/2-inch flat-head screws to attach the right side frame to the right side of the EMI panel. Tighten the screws to 8 in-lb (0.9 N·m).
2	Left side frame.	**4**	Use two 6-32 x 1/2-inch flat-head screws to attach the left side frame to the left side of the EMI panel. Tighten the screws to 8 in-lb (0.9 N·m).

Step 7 Realign the EMI panel to the air intake area on the chassis, screw its four captive screws to the chassis, and tighten the captive screws to 8 in-lb (0.9 N·m).

Replacing the Cable Management Frame on the Cisco Nexus 7018 Chassis

This section describes how to remove cable management frame components and install the components for a replacement frame. The cable management frame includes two lower cable management assemblies, two upper cable management assemblies, and a top cover.

This section includes the following topics:

Required Tools

You need a flat-blade or number 2 Phillips-head screwdriver to loosen or tighten the screws that hold the cable management assemblies to the chassis.

Removing the Cable Management Frame

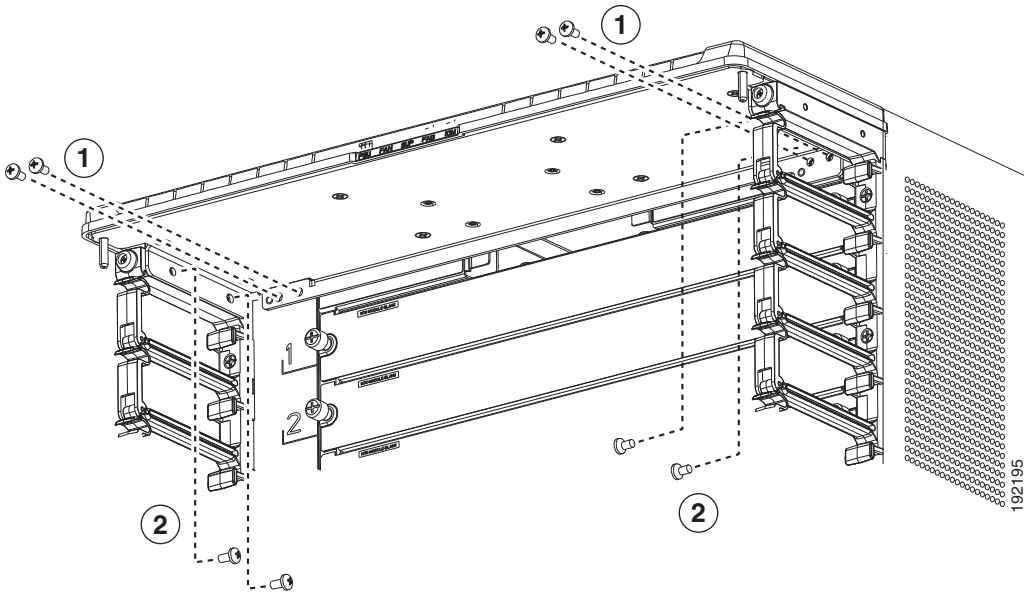
When you remove the cable management frame from the Cisco Nexus 7018 chassis, you must remove a top cover and four cable management assemblies.

Note Before you can remove the cable management frame from the Cisco Nexus 7018 chassis, you must remove the front door and its bracket if they are installed on the cable management frame. For information on removing the front door and its bracket, see the "Replacing the Front Door and Air Intake Assemblies on the Cisco Nexus 7018 Chassis" section on page 10-85.

To remove the cable management frame assemblies, follow these steps:

Step 1 Loosen and remove the eight M4x8 pan-head screws that fasten the top cover to the upper cable management assemblies and chassis (see Figure 10-27).

Figure 10-27 Detaching the Top Cover from the Upper-Cable-Management Assemblies and Chassis



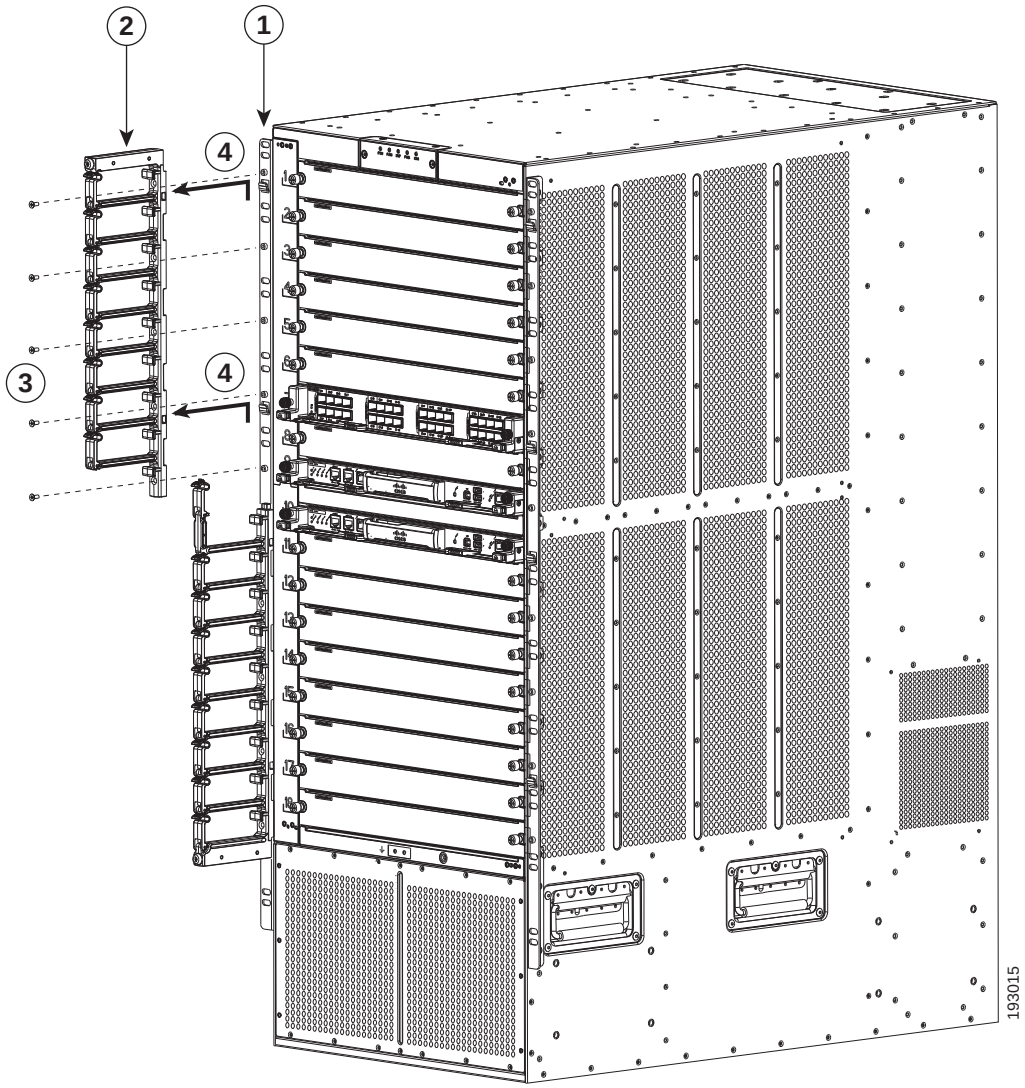
1	Four M4x8 pan-head screws fastened to the chassis	**2**	Four M4x8 pan-head screws fastened to the two upper cable management assemblies

Step 2 Remove the top cover from the chassis and the two upper cable management assemblies.

Step 3 For the upper cable management assembly on the left, loosen and remove five M4x10 screws, and then lift off the assembly as shown in Figure 10-28.

Step 4 Repeat Step 3 for the upper cable management assembly on the right side.

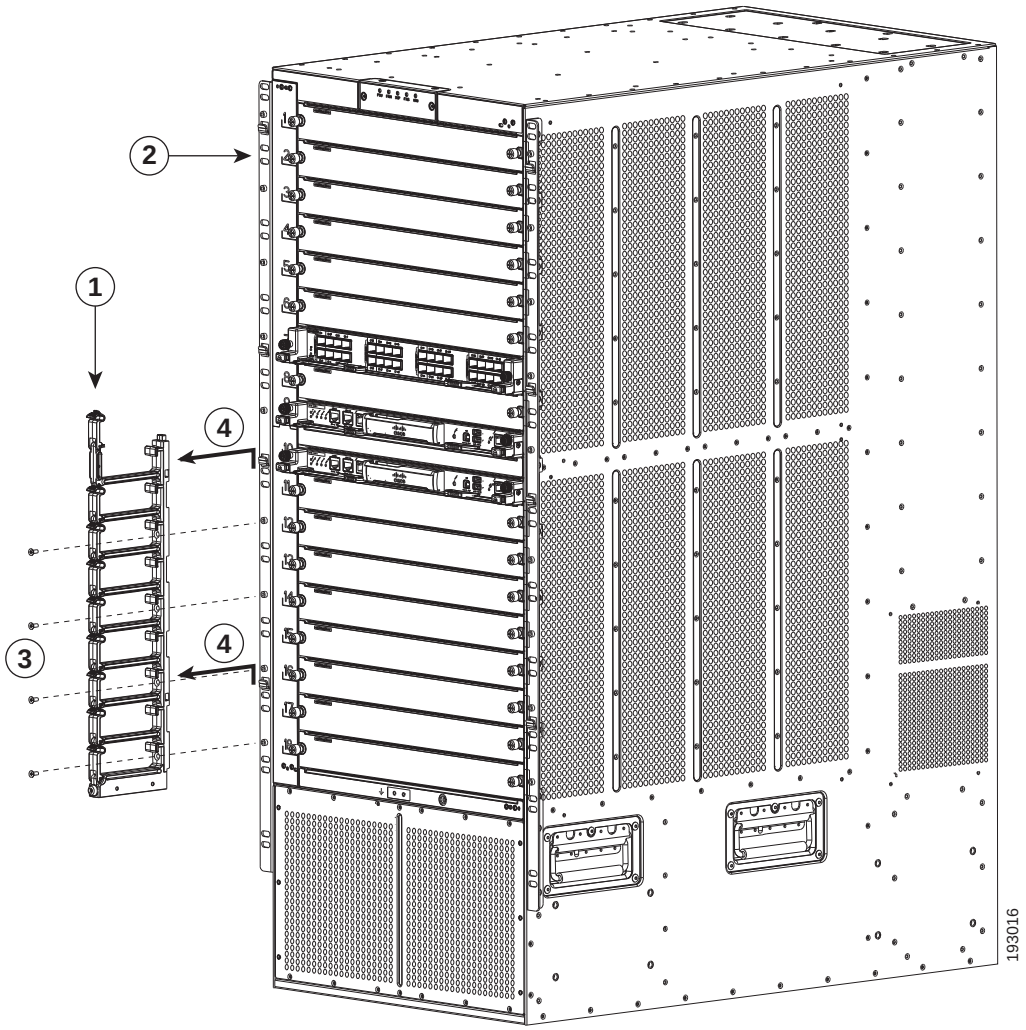
Figure 10-28 Removing an Upper-Cable-Management Assembly



1	Rack-mount bracket.	**3**	Loosen and remove five M4x10 screws.
2	Upper cable management assembly.	**4**	Lift the upper cable management assembly off the rack-mount bracket hooks.

Step 5 For the lower cable management assembly on the left, loosen and remove four M4x10 screws, and then lift off the assembly as shown in Figure 10-29.

Figure 10-29 Removing a Lower Cable Management Assembly



1	Lower cable management assembly.	**3**	Loosen and remove four M4x10 screws.
2	Left rack-mount bracket.	**4**	Lift the lower cable management assembly off the rack-mount bracket hooks.

Step 6 Repeat Step 5 for the lower cable management assembly on the right side.

Step 7 Pack the two lower cable management assemblies, two upper cable management assemblies, the top cover, and their screws in their original packing materials.

Installing a Cable Management Frame

When you install a cable management frame, you attach four cable management assemblies to the chassis and then attach a top cover to the top two cable management assemblies and the chassis.

To install the cable management frame on the Cisco Nexus 7018 switch chassis, follow these steps:

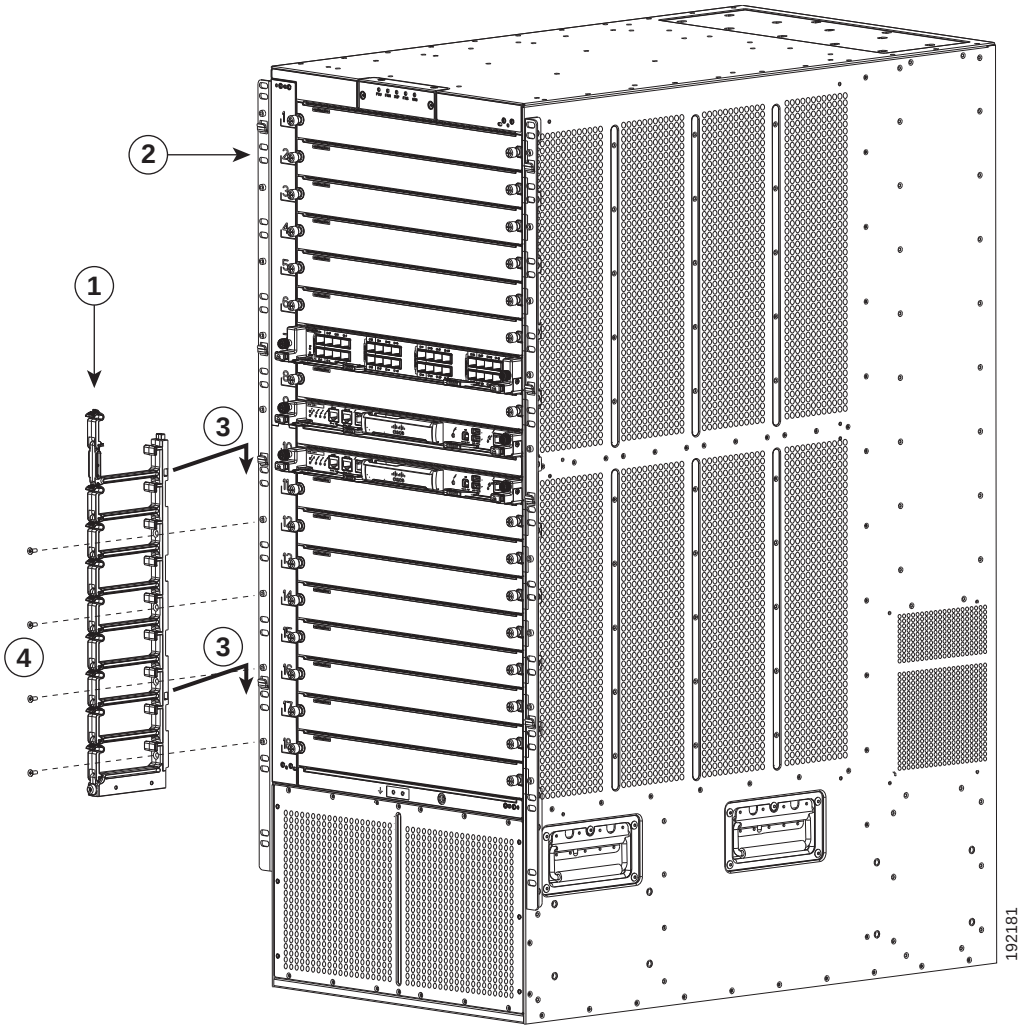
Step 1 Open the Cable Management kit (69-1961-01) and verify that you have the following parts:

- 2 lower cable management assemblies (800-31343-01)
- 2 upper cable management assemblies (800-31342-01)
- 1 top cover (800-31269-01)
- 8 M4x8 pan-head screws (48-0398-01)
- 18 M4x10 flat-head screws (48-2518-01)

If the kit is not complete, contact TAC and arrange for a complete kit.

Step 2 Attach a lower cable management assembly onto the two hooks that protrude from the lower half of the left rack-mount bracket that is attached to the Cisco Nexus 7018 switch chassis, and loosely fasten the assembly to the chassis with four flat-head M4x10 screws as shown in Figure 10-30.

Figure 10-30 Attaching a Lower Cable Management Assembly to a Rack-Mount Bracket

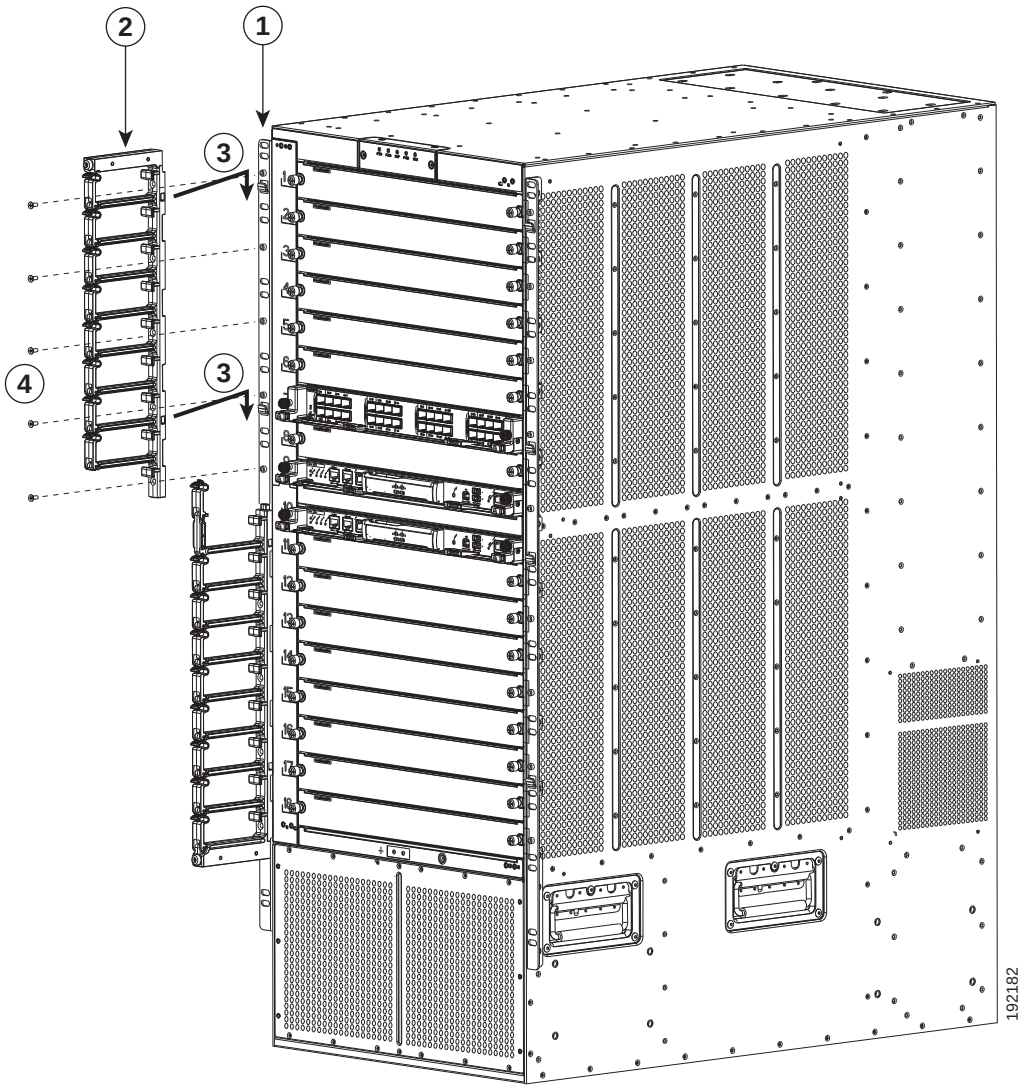


1	Lower cable management assembly.	**3**	Position the assembly so that the two lower hooks on the rack-mount bracket fit inside the two holes on the assembly, and then slide the assembly down so that it is held by the hooks.
2	Rack-mount bracket.	**4**	Loosely fasten the assembly to the rack-mount bracket with four M4x10 screws. Do not tighten these screws.

Step 3 Repeat Step 1 to attach a lower cable management assembly to the right side of the chassis.

Step 4 Attach an upper cable management assembly onto the two hooks that protrude from the upper half of the left rack-mount bracket that is attached to the Cisco Nexus 7018 switch chassis, and loosely fasten the assembly to the chassis with four flat-head M4x10 screws as shown in Figure 10-31.

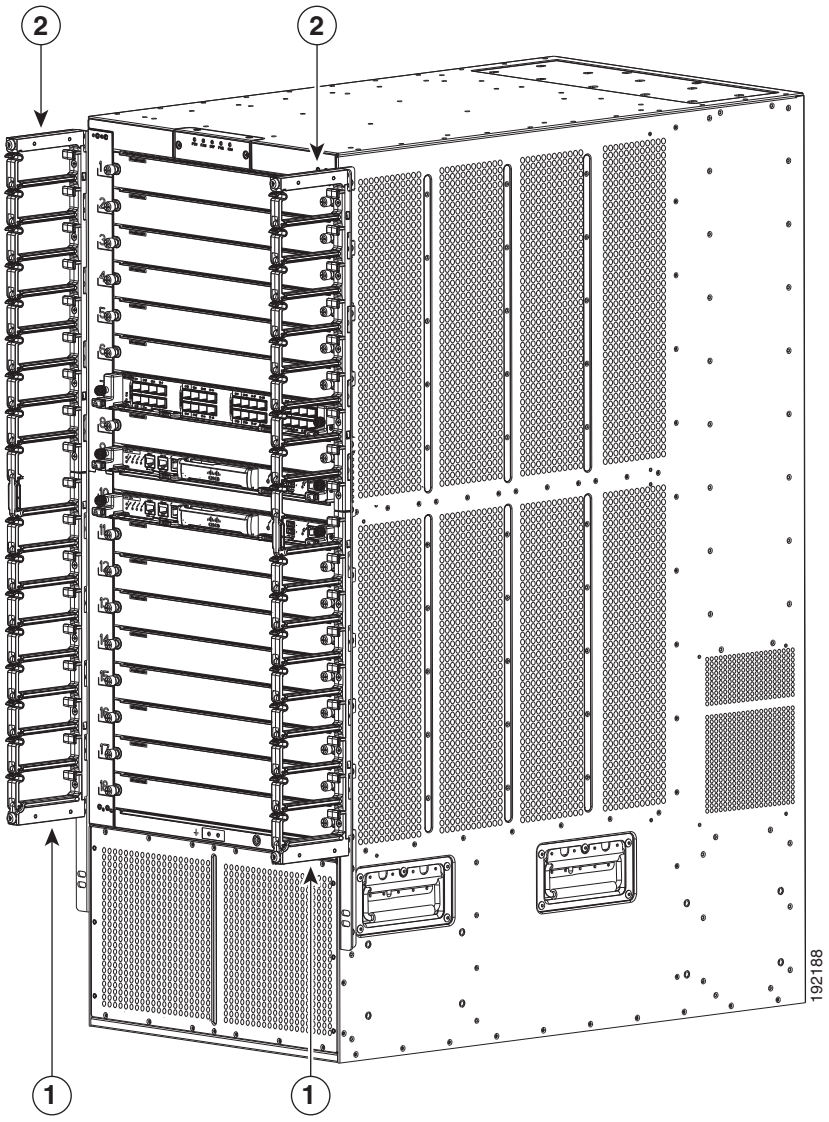
Figure 10-31 Attaching an Upper Cable Management Assembly to a Rack-Mount Bracket



1	Rack-mount bracket.	**3**	Position the assembly so that the two upper hooks on the rack-mount bracket fit inside the two holes on the assembly, and then slide the assembly down so that it is held by the hooks.
2	Upper cable management assembly.	**4**	Loosely fasten the assembly to the rack-mount bracket with four M4x10 screws. Do not tighten these screws.

Step 5 Repeat Step 3 to attach an upper cable management assembly to the upper right side of the chassis. When completed, the chassis will appear as shown in Figure 10-32.

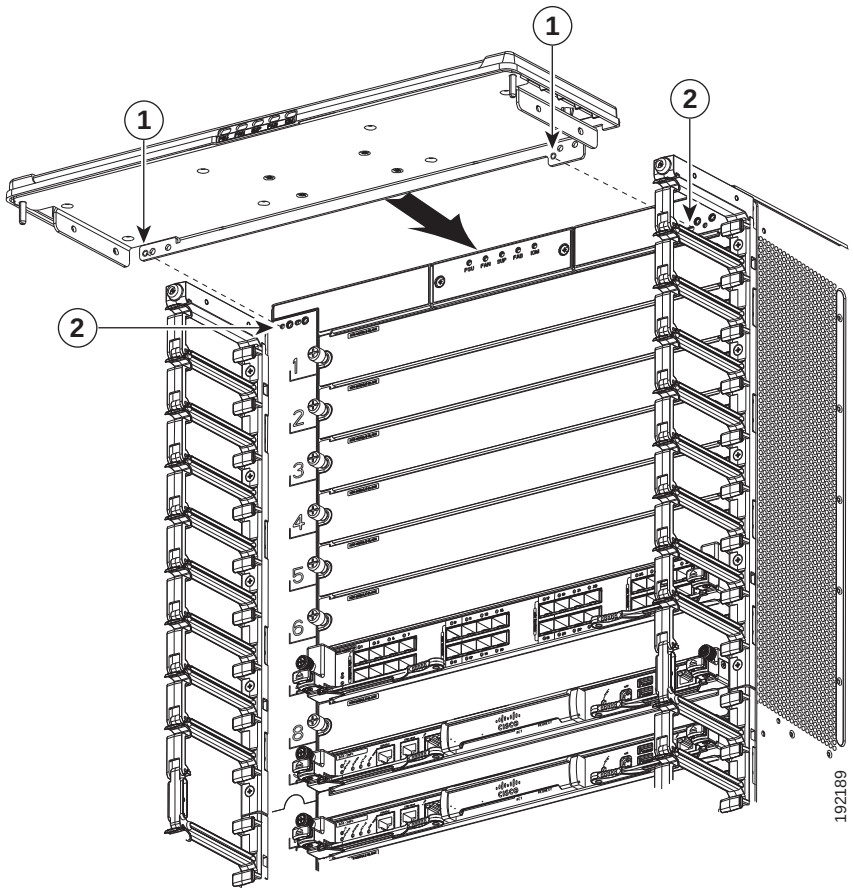
Figure 10-32 Cable Management Assemblies Attached to the Rack-Mount Brackets



1	Lower cable management assembly	**2**	Upper cable management assembly

Step 6 Place the top cover on top of the two upper cable management assemblies that are already installed. Make sure that the side of the top cover that is closest to the chassis has two alignment pins that align with the alignment holes in the chassis as shown in Figure 10-33. Push the top cover toward the chassis so that its alignment pins enter the alignment holes and the top cover rests against the chassis.

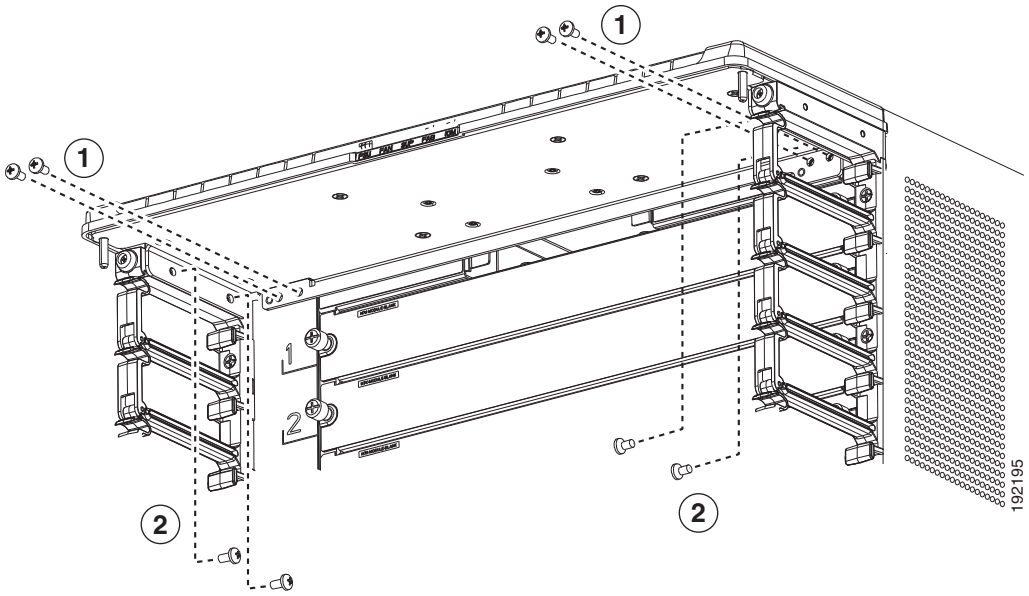
Figure 10-33 Positioning the Top Cover with the Upper Cable Management Assemblies and the Switch Chassis



1	Alignment pins	**2**	Alignment holes

Step 7 Use four M4x8 pan-head screws to loosely fasten the top cover to the chassis (see Callout 1 in Figure 10-34).

Figure 10-34 Fastening the Top Cover to the Chassis and Cable Management Assemblies



1	Four M4x8 pan-head screws that fasten the top cover to the chassis.	**2**	Four M4x8 pan-head screws that fasten the top cover to the left and right cable management assemblies.

Step 8 Use four M4x8 pan-head screws to loosely fasten the top cover to each of the two upper cable management assemblies (see Callout 2 in Figure 10-34).

Step 9 Tighten each of the four screws that fasten the top cover to the chassis to 11 to 15 in-lb (1.2 to 1.7 N·m).

Step 10 Tighten each of the four screws that fasten the top cover to the upper cable management assemblies to 11 to 15 in-lb (1.2 to 1.7 N·m).

Step 11 Tighten each of the 18 screws that fasten the upper and lower cable management assemblies to the rack-mount brackets to 11 to 15 in-lb (1.2 to 1.7 N·m).

Replacing the Front Door and Air Intake Assemblies on the Cisco Nexus 7018 Chassis

If you are going to move the Cisco Nexus 7018 chassis or if you need to replace the door and air intake assembly, you must first remove the installed door and air intake assemblies.

Note For the double-hinged door to easily open or close in either direction, make sure that the chassis is level. If necessary, remove the chassis from the rack and adjust the bottom-support rails so that the chassis is level. Also, make sure that the cable management assemblies are aligned to the vertical sides of the chassis and that the cable management top cover is level when you install those components.

This section includes the following topics:

Removing the Front Door and Air Intake Assemblies

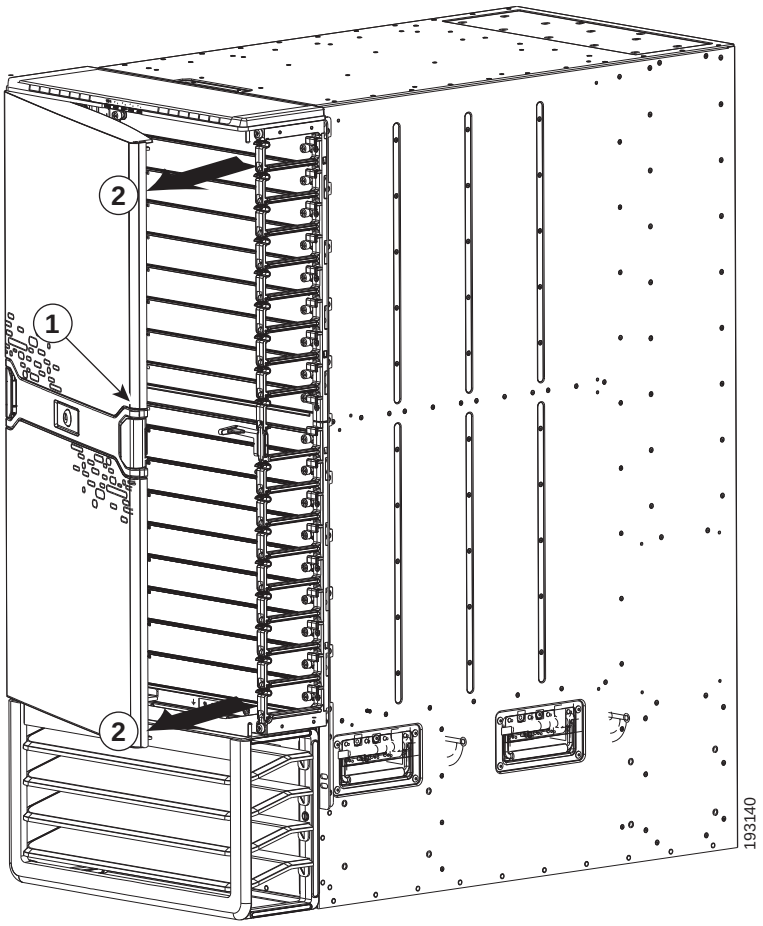
When you remove the front door and air intake assemblies, you remove the door, air intake assembly, and the hardware used to hold those components to the chassis.

To remove the front door and air intake assemblies on the Cisco Nexus 7018 chassis, follow these steps:

Step 1 Remove the front door by following these steps:

a. Open the door by pulling one of its latch handles out until it clicks (the handle clicks when you pull it out about 30 degrees) and rotating the door away from the chassis (see Callouts 1 and 2 in Figure 10-35).

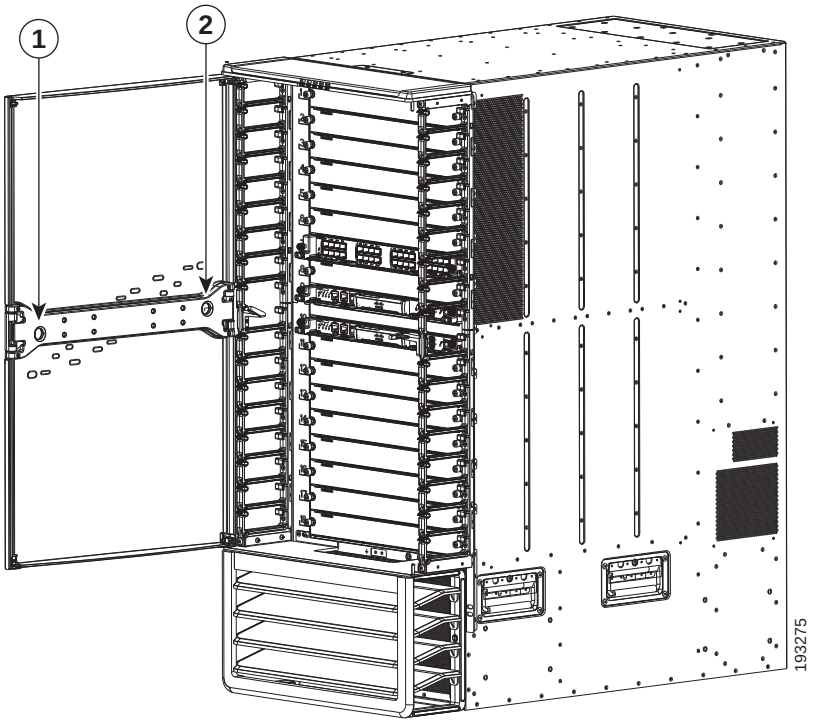
Figure 10-35 Opening the Front Door



1	Open one of the two latch handles until it clicks.	**2**	Swing open the door.

b. Press the locking button on the back side of the door (behind the opened latch handle) so that the latch handle flattens to the front side of the door (see Figure 10-36).

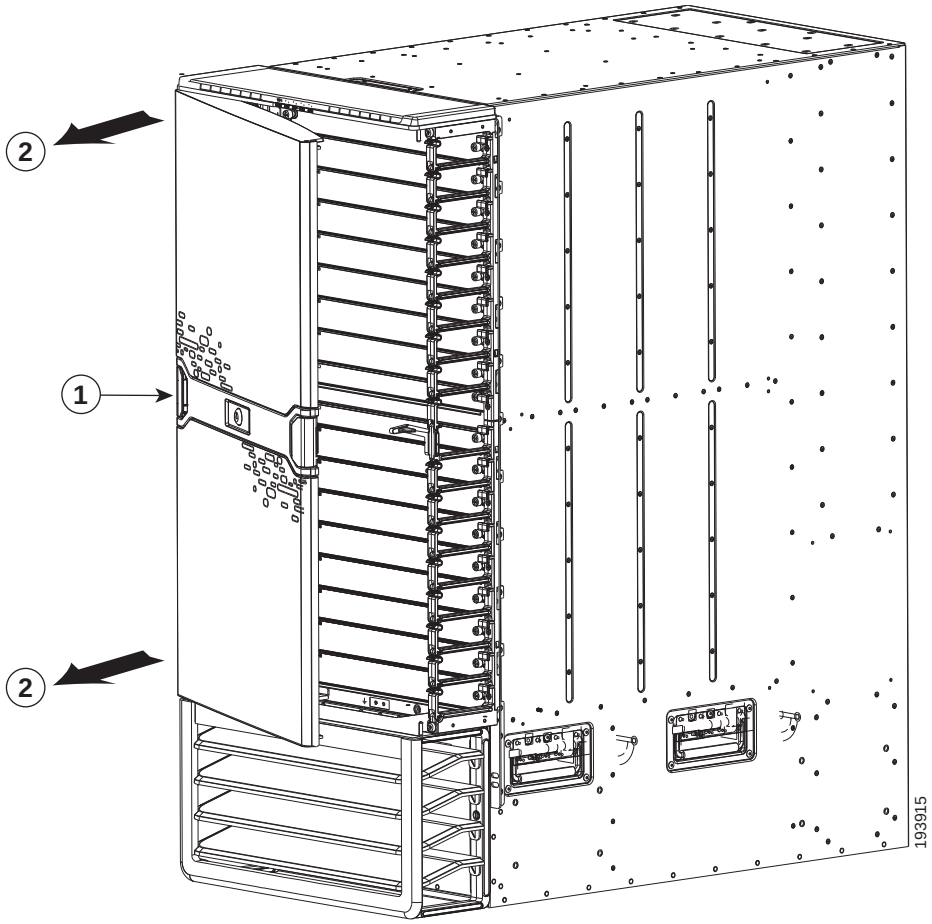
Figure 10-36 Flattening the Latch Handle to the Door



1	If you opened the right side of the door (as shown in this figure), press the locking button on the right side.	**2**	If you opened the left side of the door, press the locking button on the left side.

c. Hold the opened side of the door with one hand and use your other hand to open the latch handle on the hinged side of the door (see Callout 1 in Figure 10-37) until the handle clicks.

Figure 10-37 Removing the Front Door from the Chassis



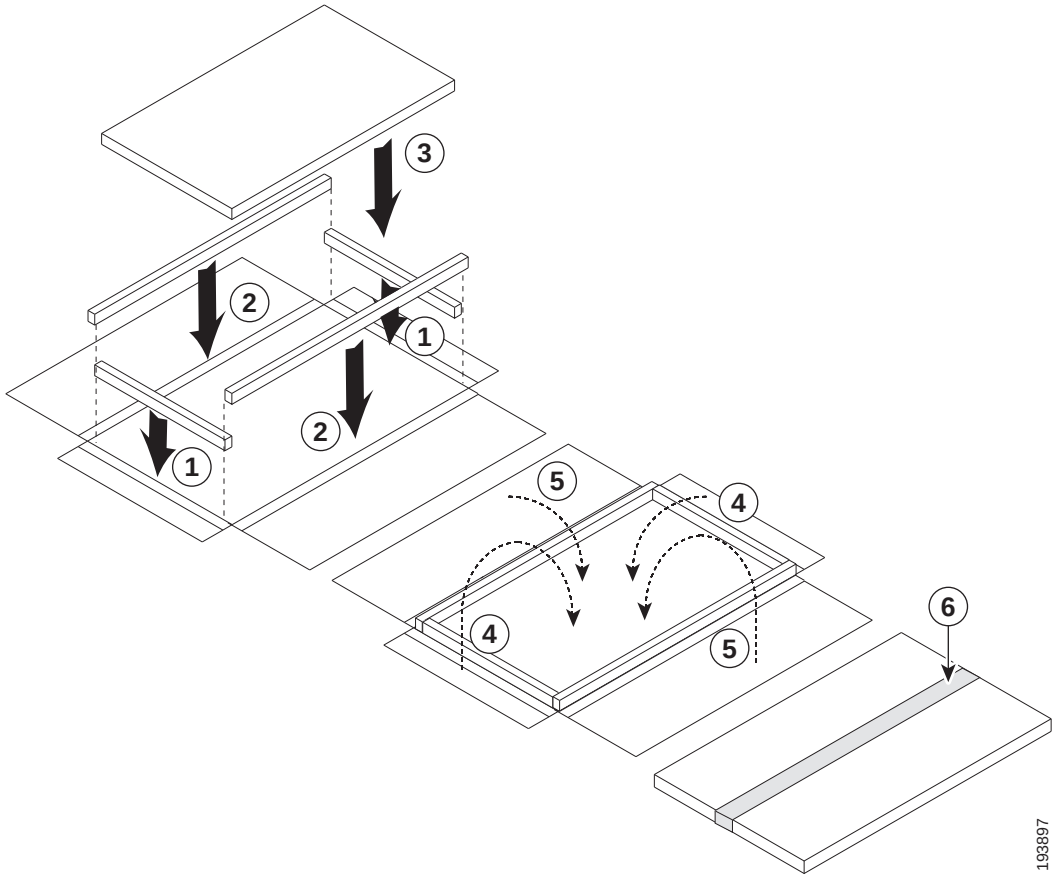
1	Open the latch handle until it clicks.	**2**	Pull the door off the chassis.

d. Holding the door with both hands, pull the door away from the chassis (see Callout 2 in Figure 10-37).

e. Press the locking button on the inside surface of the door behind the opened latch to flatten the latch handle to the front side of the door (see Figure 10-36).

f. Open the box for the front door. You can find this box in the box that contains the front door and air frame kit. Align the four side cushions to the sides of the center panel of the box (see Callouts 1 and 2 in Figure 10-38).

Figure 10-38 Packing the Front Door



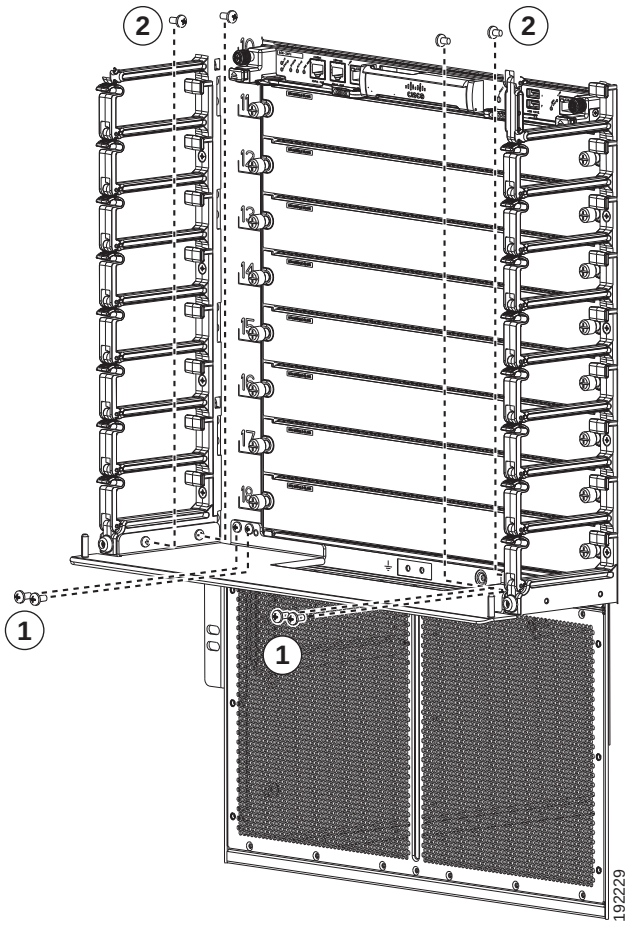
1	Align the two shorter side cushions to the shorter inside crease in the center panel of the box.	**4**	Fold the two short flaps up along the end side cushions and then fold them over the top of the front door.
2	Align the two longer side cushions to the longer inside crease in the center panel of the box.	**5**	Fold the two long flaps up along the side cushions and then fold them over the top of the side flaps and door.
3	Place the door in the open space between the side cushions.	**6**	Tape the two long flaps together and to the box with packing tape.

g. Fold the short side flaps of the box over the top and bottom ends of the door.

h. Fold the wider side flaps of the box over the door and tape them together.

i. Loosen and remove the eight screws holding the bottom hinge bracket for the door. Four of the screws are attached to the left and right side of the cable management frame (two screws on each side) and four of the screws are attached to the chassis (see Figure 10-39). Place the screws in the small parts bag.

Figure 10-39 Removing the Bottom Hinge Bracket



1	Remove four M4 x 8 screws from the cable management assemblies (two screws on each side)	**2**	Remove four M4 x 8 screws from the chassis.

j. Remove the bracket from the chassis and place it in the opened box for that component.

k. Fold the box flaps over the bracket and tape them in place.

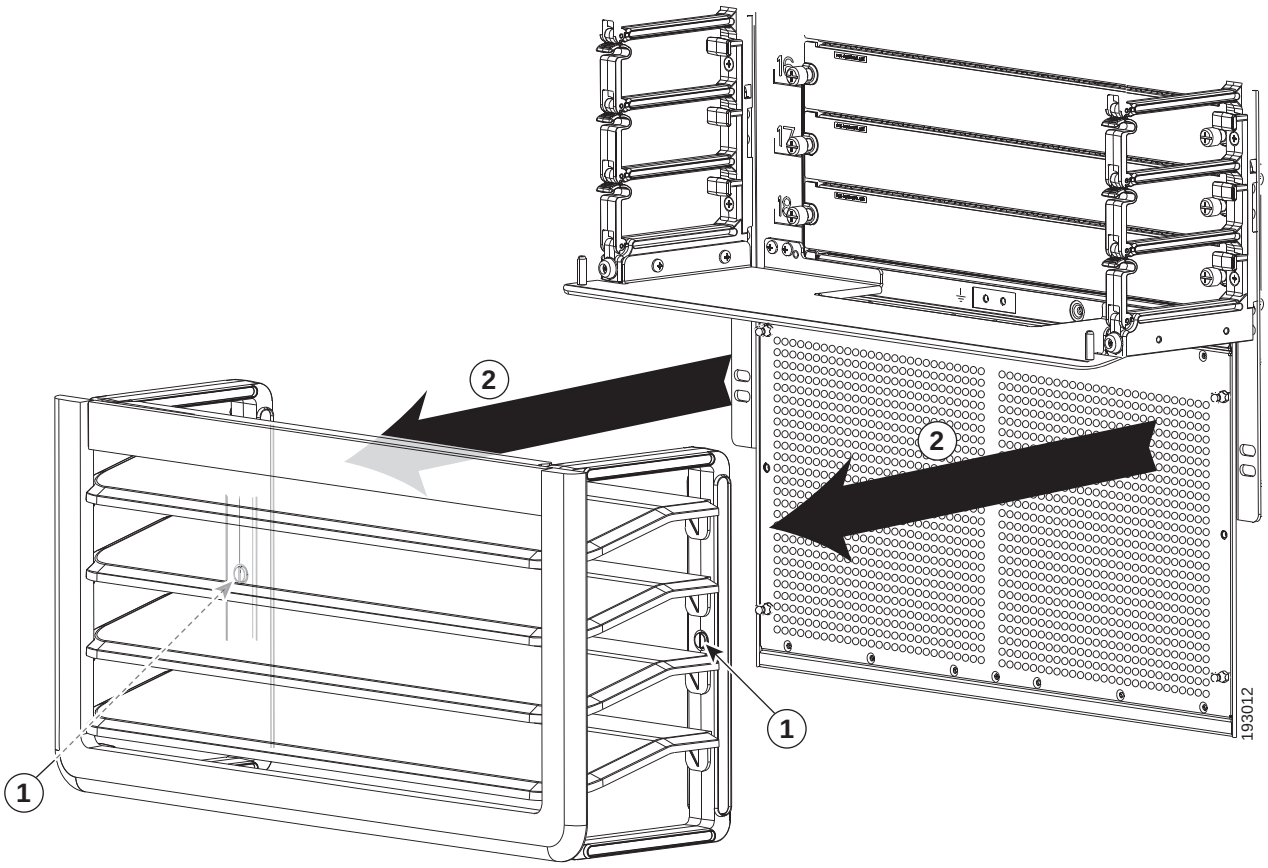
l. Loosen and remove the two M3 x 10 screws that hold the right door stopper to the right cable management frame. Place the two screws and the door stopper in the small parts bag.

m. Loosen and remove the two M3 x 10 screws that hold the left door stopper to the left cable management frame. Place the two screws and the door stopper in the small parts bag.

n. Fold the box flaps over the top and tape them in place.

o. While holding the air intake frame in place, loosen the two captive screws on the air intake frame (there is one captive screw on each side of that frame) so that they are no longer in contact with the chassis (see Callout 1 in Figure 10-40).

Figure 10-40 Removing the Air Intake Assembly



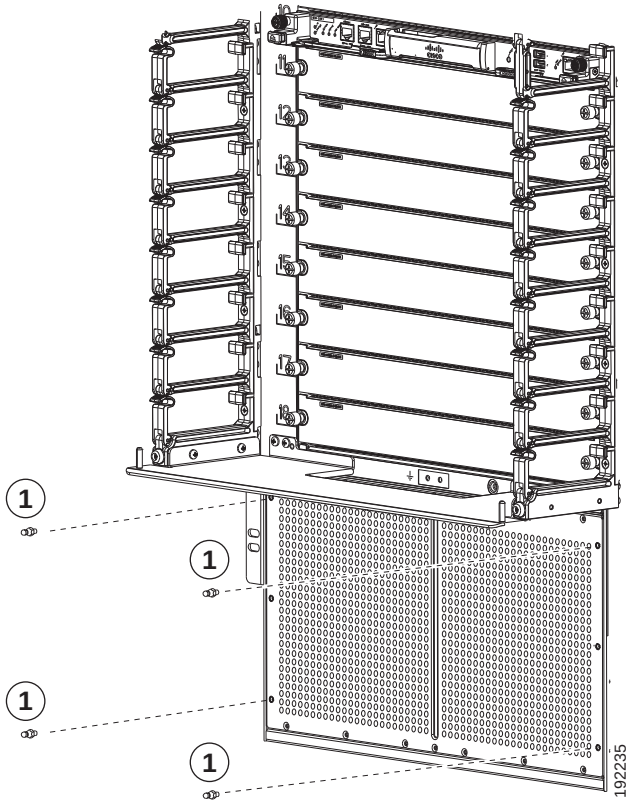
1	Loosen two captive screws until they are clear of the chassis.	**2**	Remove the air intake assembly from the chassis.

p. Pull the air intake assembly off the chassis.

q. Loosen and remove the four ball-point studs shown in Figure 10-41.

r. Repack the air intake frame and ball-point studs in their original packing materials.

Figure 10-41 Removing the Four Ball-Headed Studs



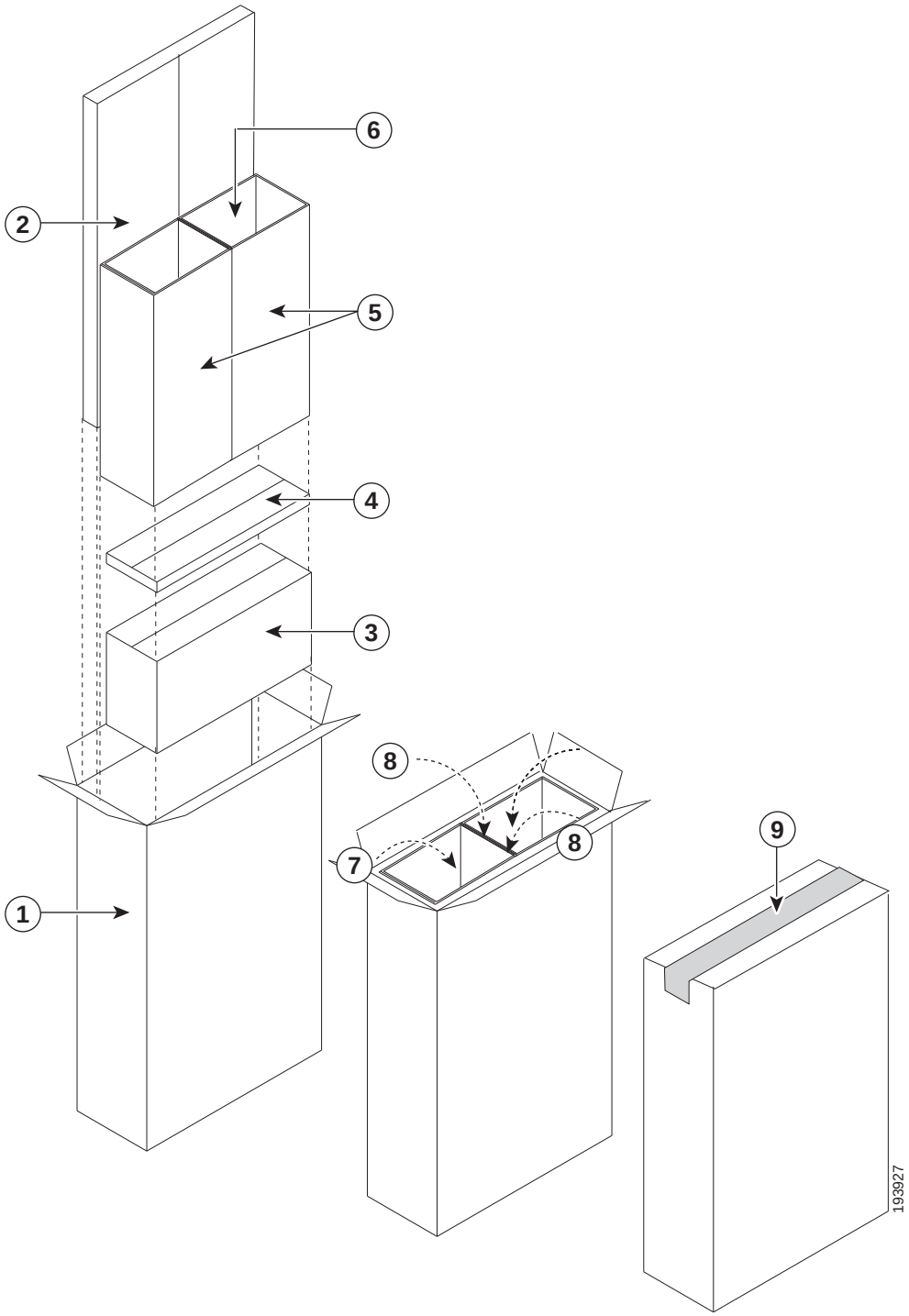
1	Ball-point stud		

s. Repack the air intake frame and ball-point studs in their original packing box, then fold over the box flaps and tape them shut.

t. Open the box for the front door and air intake frame kit and insert the components as shown in Figure 10-42.

u. Close the box flaps and tape them shut.

Figure 10-42 Packing the Front Door and Air Intake Frame Kit



1	Box for the kit	**6**	Small parts bag placed in a filler box
2	Front door box	**7**	Fold the short flaps on top.
3	Air intake frame box	**8**	Fold the long flaps on top of the short flaps.
4	Bottom hinge bracket box	**9**	Tape the long flaps to the box.
5	Filler boxes		

To replace the front door and air intake assemblies, see the "Installing a Front Door and Air Intake Assemblies" section on page 10-94.

Installing a Front Door and Air Intake Assemblies

When you install a front door and air intake assembly components, you install hardware to hold the door and air intake assemblies, attach the door, and then attach the air intake assembly.

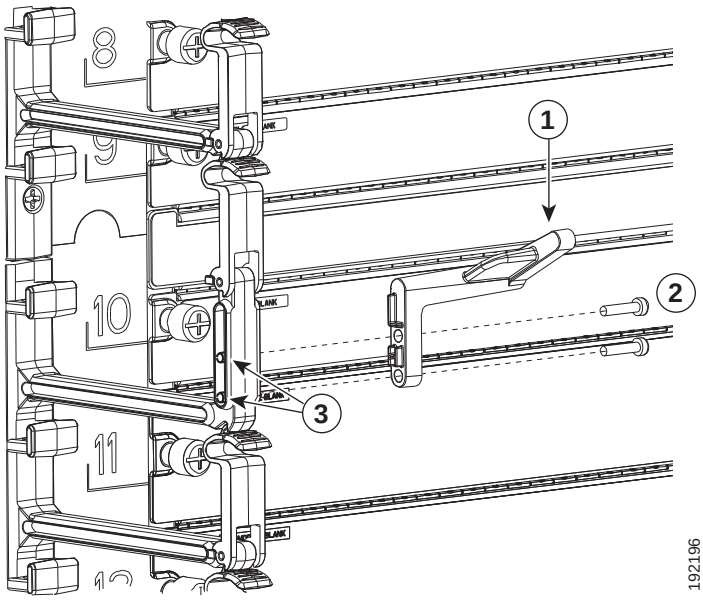
To install the front door and air intake assembly components, follow these steps:

Step 1 Open the Front Door and Air Intake kit (69-1962-01) and verify that it includes the following components:

- 1 front door (800-31268-01)
- 1 air intake frame (800-31270-01)
- 1 bottom hinge bracket (700-28491-02)
- 1 left door stopper (has an L on its base) (700-27454-01)
- 1 right door stopper (has an R on its base) (700-27592-01)
- 8 M4x8 pan head screws (48-0398-01)
- 4 M3x14 pan head screws (48-1699-01)
- 4 ball-point studs (51-5171-01)

Step 2 Position the left door stopper (has an L on its base) on the middle of the left side of the cable management frame and fasten it with two M3x14 pan-head screws as shown in Figure 10-43. Tighten these two screws to 8.4 to 11 in-lb (0.9 to 1.2 N·m).

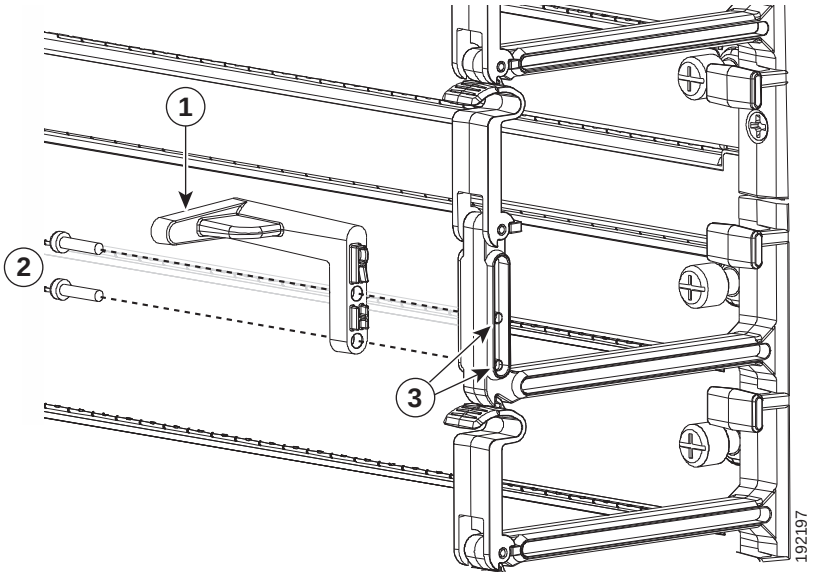
Figure 10-43 Attaching the Left Door Stopper



1	Left door stopper identified with an L on the bottom of the base.	**3**	Screw holes on the cable management assembly.
2	Two M3x14 screws that fasten the stopper to the left side of the cable management assembly.		

Step 3 Position the right door stopper (has an R on its base) on the middle of the right side of the cable management frame and fasten it with two M3x14 pan-head screws as shown in Figure 10-44. Tighten these two screws to 8.4 to 11 in-lb (0.9 to 1.2 N·m).

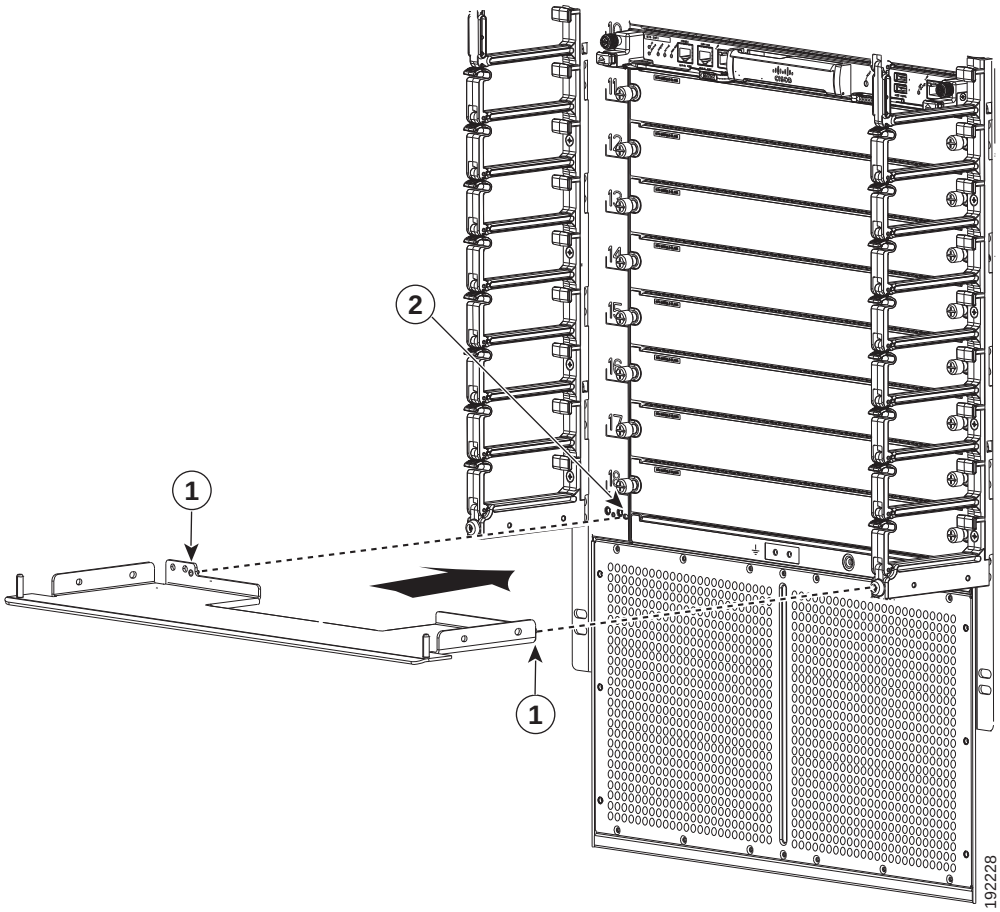
Figure 10-44 Attaching the Right Door Stopper



1	Right door stopper identified with an R on the bottom of the base.	**3**	Screw holes on the right side of the cable management frame.
2	Two M3x14 screws that fasten the stopper to the right side of the cable management assembly.		

Step 4 Position the bottom hinge bracket at the bottom of both sides of the cable management frame. Make sure that the side of the bracket that is closest to the chassis has two alignment pins that align with the alignment holes in the chassis as shown in Figure 10-45. Push the bracket toward the chassis so that its alignment pins enter the alignment holes and the bracket rests against the chassis.

Figure 10-45 Positioning the Hinge Bracket to the Cable Management Frame and Chassis

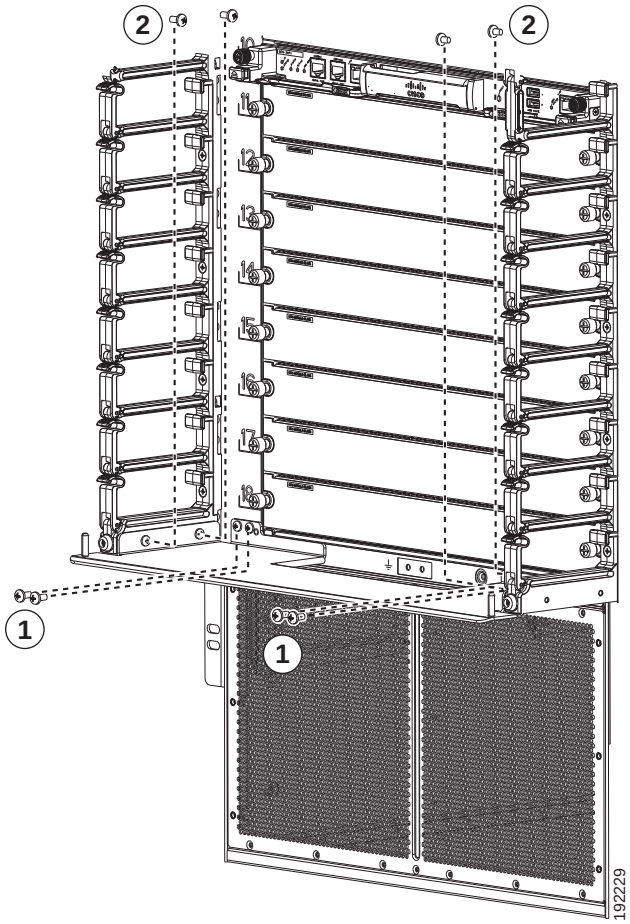


1	Alignment pins	**2**	Alignment holes

Step 5 Attach the bottom hinge bracket to the chassis with eight loosely fastened M4x8 screws (see Callout 1 in Figure 10-46).

Step 6 Attach the bottom hinge bracket to the bottom of both sides of the cable management frame (see Callout 2 in Figure 10-46).

Figure 10-46 Attaching the Hinge Bracket to the Cable Management Frame and Chassis



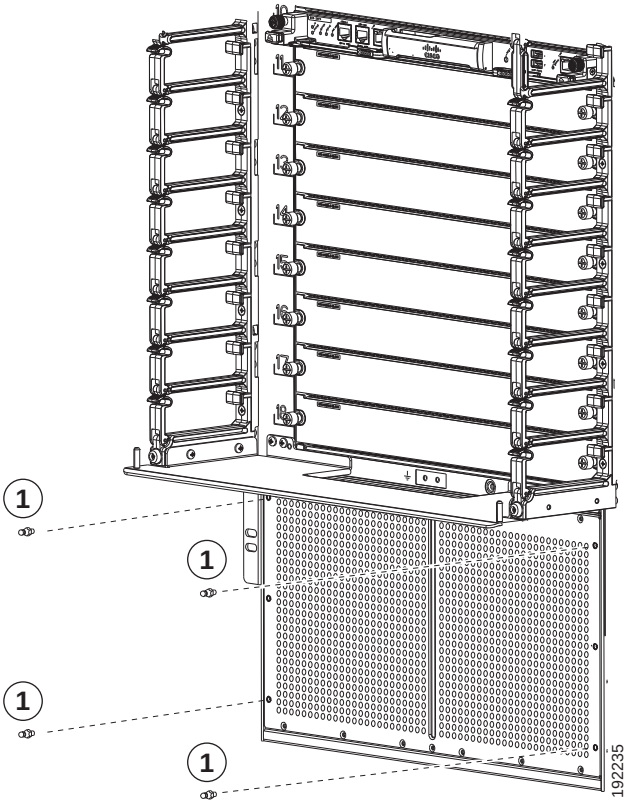
1	Four M4x8 pan-head screws that fasten the bottom hinge bracket to the chassis.	**2**	Four M4x8 pan-head screws that fasten the bottom hinge bracket to the left and right sides of the cable management frame.

Step 7 Tighten the four M4x8 screws that fasten the bottom hinge bracket to the chassis to 11 to 15 in-lb (1.2 to 1.7 N·m).

Step 8 Tighten the four M4x8 screws that fasten the bottom hinge bracket to the cable management frame to 11 to 15 in-lb (1.2 to 1.7 N·m).

Step 9 Fasten the four ball-point studs to the bottom portion of the chassis, one stud by each corner of the air intake area as shown in Figure 10-47.

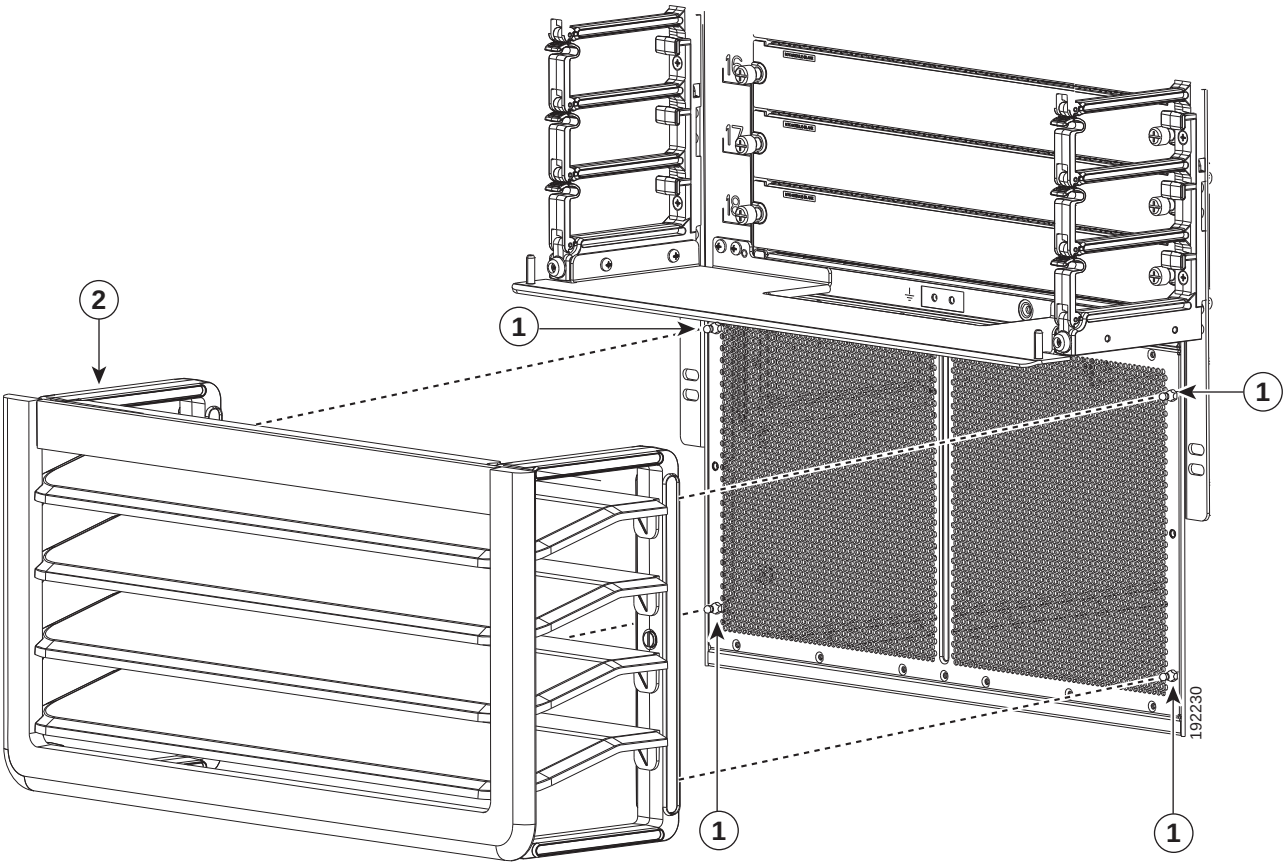
Figure 10-47 Fastening Ball-Point Studs to the Air Intake Area



1	Ball-point stud		

Step 10 Align the air intake frame to the four ball-point studs and press the frame onto the chassis, as shown in Figure 10-48. The two captive screws on the air-intake frame should align with their screw holes in the chassis.

Figure 10-48 Positioning the Air Intake Frame on the Chassis



1	Ball-point studs	**2**	Air-intake frame with holes to be aligned with the ball-point studs

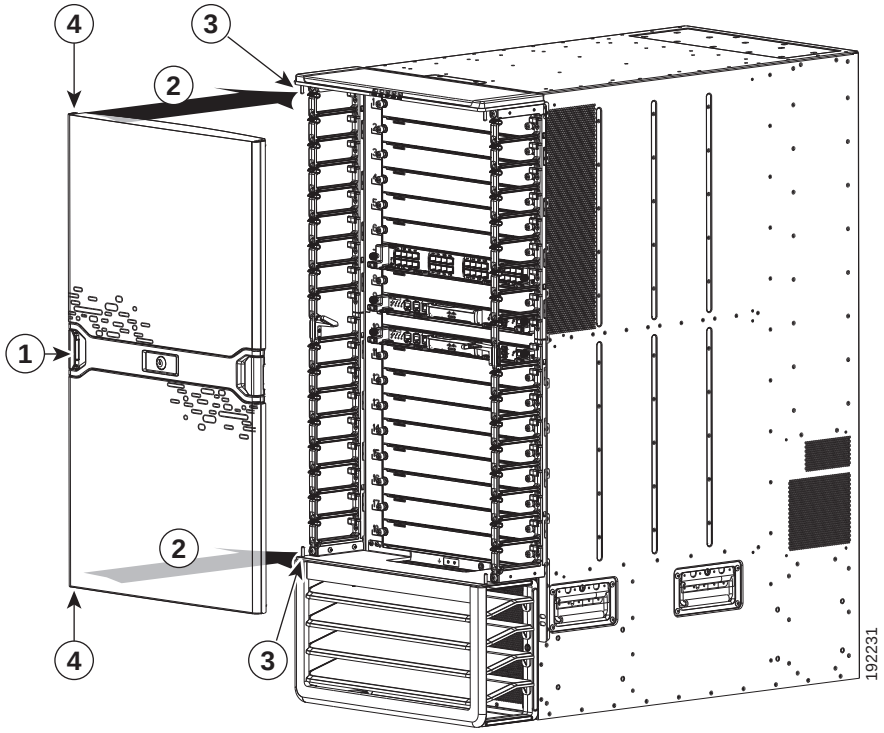
Step 11 Fasten the captive screws on the air intake frame to the chassis and tighten to 11 to 15 in-lb (95 to 130 N·m).

Step 12 On the chassis door, pull the door handle open on one of the two sides of the door until the handle clicks (the handle clicks when you pull it out about 30 degrees).

Step 13 Move the side of the door with the opened handle onto the two hinge pins as shown in Figure 10-49. Make sure that the hinge pins on the top cover and bottom hinge bracket fit through the slots on the top and bottom of that side of the door. Position the door so the hinge pins are located at the ends of the slots.

Note The double-hinged door can be installed and opened on either side. The figures in this procedure show how to install the door on the left side first, but you can use the instructions to install it on either side first.

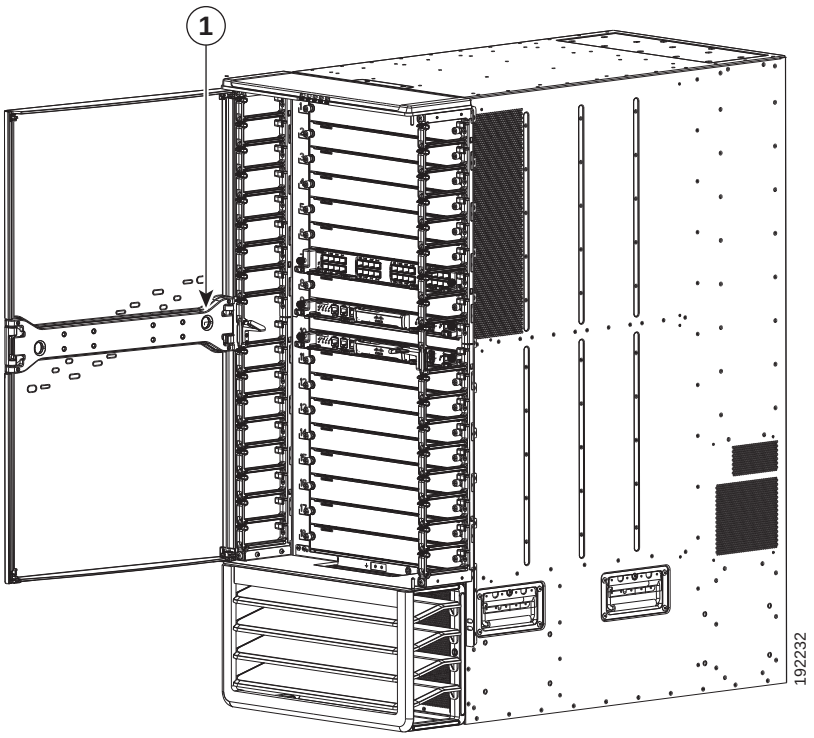
Figure 10-49 Attaching One Side of the Door to the Chassis



1	Open the latch handle until it clicks.	**3**	Hinge.
2	Move one side of the door to the hinge pins on the same side of the chassis.	**4**	Slot for hinge pin.

Step 14 Use one hand to hold the door on the hinge pins and use your other hand to press the locking button on the interior side of the door (see Figure 10-50). This action locks the latches on one side of the door to the hinge pins so that you no longer need to hold the door.

Figure 10-50 Locking the Door onto the Chassis

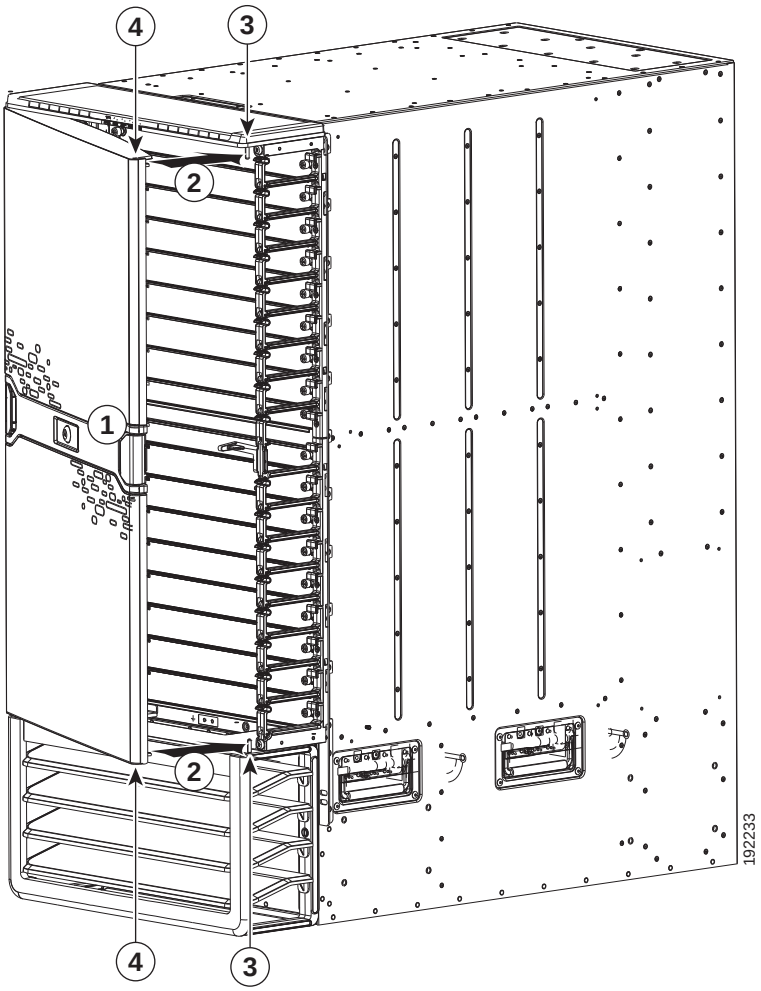


1	Press the locking button to lock the door onto the hinge pins.		

Note Be sure that the door is firmly latched to the two hinge pins. If both of the hinge pins are not secured behind the door latch, hold the door securely with one hand while opening the door handle for the unsecured side until the handle clicks, press that side of the door so that both of the pins are positioned all the way inside the door slots, press the door latch button on the interior side of the door, and then make sure that the door is firmly secured to both hinge pins.

Step 15 Open the door handle on the open side of the door until it clicks. This action opens the latches on the open side of the door. See Figure 10-51.

Figure 10-51 Attaching the Right Side of the Door



1	Pull the latch handle outwards until it clicks.	**3**	Hinge pins.
2	Swing the door closed.	**4**	Slots for hinge pins.

Step 16 Swing the door closed so that the remaining two pins on the bottom hinge bracket and top cover fit inside the slots on the top and bottom of the door. When you close the door, the door stopper automatically presses the lock button on the inside of the door so that the door is locked on the hinge pins. If the door stopper does not close the latches, press the door closed at the handle until you hear the latches click. Make sure that the door is fully secured to the frames on both sides.

Note If a hinge pin is not secured behind a door latch, open the door handle for that side of the door until it clicks, open that side of the door, and then press the door closed so that the pins are positioned all the way inside the door slots. When you close the door, the door stopper automatically closes the door latches. If you do not hear the latches click, press the door at the handle to fully close it and to activate the latches. Test the door to make sure that it is fully secured to the four hinge pins.

Tip Whenever you need to open the door, pull one of the latch handles open until it clicks and then swing that side of the door open.

Note If the double-hinged door and its holders are not level, it is possible that you will have some difficulty opening or closing the door on one or both sides without the door being defective. Either push in the bottom portion of the door or slightly lift up the door on that side just before closing. If the problem persists, open the door from the other side, which should be free of this problem, or adjust the cable management system and hinge bracket so that they are level.

Replacing the Air Filter on the Cisco Nexus 7004 Chassis

You can replace the optional air filter while the Cisco Nexus 7004 system is operational.

Note We recommend that you check the air filter once a month. If it is covered with a significant amount of dust, replace the air filter.

To replace the air filter, follow these steps:

Step 1 On the right side of the chassis, remove eight screws that hold the airfilter to the chassis.

Step 2 Remove the air filter.

Step 3 Place the new air filter over the air intake area on the right side of the chassis and align the eight screw holes in the filter to screw holes in the chassis.

Step 4 Fasten the air filter to the chassis using eight M3 x 5 mm screws that came with the air filter.. Tighten the screws to 5 to 7 in-lb (0.56 to 0.79 N.m).

Cleaning or Replacing the Air Filter for the Cisco Nexus 7010 Chassis

You can clean or replace the optional air filter while the Cisco Nexus 7010 system is operational.

Note We recommend that you check the air filter once a month. If it is covered with an oily substance, you should replace it. If it is covered with dust, you can clean it and continue to use it.

To clean or replace the air filter, follow these steps:

Step 1 On the left and right side of the existing air filter, loosen the two captive screws so they are no longer attached to the chassis. The air filter can be found covering the air intake area at the bottom of the front side of the chassis (see Figure 1-5 on page 1-10).

Step 2 With one hand holding the air filter in place, use the other hand to pull out the spring pin on one side of the air filter. Pull that side of the air filter away from the chassis and release the spring pin when it is clear of the bracket on the EMI frame.

Step 3 Switch the hands holding the air filter and use the other hand to pull out the spring pin on the other side of the air filter. Pull the air filter away from the chassis and release the spring pin.

Step 4 If the filter is covered with an oily substance, we recommend that you replace it. If the filter is dusty, you can take it outside the data center and clean it in one or more of the following ways:

- Use a vacuum cleaner over both sides of the filter.
- Blow compressed air through the exhaust side of the filter.
- Rinse the filter with cold water.
- Immerse the filter in warm, soapy water, and then rinse it.

Note If the filter gets wet while you clean it, make sure that it dries before you reinstall it.

Step 5 Align the cleaned or replacement air filter to the EMI frame covering the air intake area.

Step 6 Use one hand on the air filter to hold it in place while you use the other hand to pull out the spring pin on one side of the air filter. Adjust the air filter so that the spring pin will be released into its hole in the EMI frame bracket.

Step 7 Switch the hands holding the air filter and use the other hand to pull out the other spring pin on the other side of the air filter. With the spring pin pulled out, position the air filter so that the pin will be released into its hole on the EMI frame bracket. Release the spring pin and make sure that it holds the air filter on to the EMI frame.

Step 8 Screw in and tighten both captive screws, one on each side of the air filter.

Technical Specifications

This appendix describes the technical specifications for the Nexus 7000 system and includes these sections:

Environmental Specifications for the Cisco Nexus 7000 Series Systems

Table A-1 lists the environmental specifications for the Cisco Nexus 7000 Series systems.

Table A-1 Environmental Specifications for the Cisco Nexus 7000 Series Switches

Description		Cisco Nexus 7004	Cisco Nexus 7009	Cisco Nexus 7010	Cisco Nexus 7018
Temperature	Ambient operating	32 to 104ºF (0 to 40ºC)			
	Ambient nonoperating	–40 to 158ºF (–40 to 70ºC)			
Relative humidity	Ambient (noncondensing) operating	5 to 90% (45 to 50% recommended)			
	Ambient (noncondensing) nonoperating and storage	5 to 95%			
Altitude	Operating	–500 to 13,000 feet (–150 to 4,000 meters)			
	Storage	–1,000 to 30,000 feet (–305 to 9,144 meters)			

Table A-1 Environmental Specifications for the Cisco Nexus 7000 Series Switches (continued)

Description		Cisco Nexus 7004	Cisco Nexus 7009	Cisco Nexus 7010	Cisco Nexus 7018
Noise	Sound pressure levels				
	Without air filter	70 dBA	63.6 dBA	67.2 dBA	65.0 dBA
	With air filter	—	—	70.2 dBA	—
	Sound power levels				
	Without air filter	83 dBA	72.5 dBA	78.9 dBA	74.2 dBA
	With air filter	—	—	81.7 dBA	—

Physical Specifications for the Cisco Nexus 7000 Series Chassis

The physical specifications differ for the Cisco Nexus 7000 Series chassis depending on the model that you are installing and the type of installation you are doing (you can front mount all models but you can optionally do a center mount of the Cisco Nexus 7004 and 7009 chassis). Table A-2 lists the physical specifications for each model and installation type.

Table A-2 Physical Specifications for Cisco Nexus 7000 Series Chassis

Chassis	Width[1]	Front Depth[2]	Rear Depth[3]	Height[4]
Cisco Nexus 7004 (all mounts)	17.3 inches (43.9 cm)	7 inches (17.8 cm)	24.0 inches (61.0 cm)	12.25 inches (31.1 cm) (7 RU)
Cisco Nexus 7009 (front mount)	17.3 inches (43.9 cm)	7 inches (17.8 cm)	24.0 inches (61.0 cm)	24.5 inches (62.2 cm) (14 RU)
Cisco Nexus 7009 (center mount)	17.3 inches (43.9 cm)	13 inches (33.0 cm)	18.0 inches (45.8 cm)	24.5 inches (62.2 cm) (14 RU)
Cisco Nexus 7010 (all mounts)	17.3 inches (43.9 cm)	7 inches (17.8 cm)	33.1 inches (84.1 cm)	36.75 inches (93.3 cm) (21.0 RU)
Cisco Nexus 7018 (all mounts	17.3 inches (43.9 cm)	7 inches (17.8 cm)	33.1 inches (84.1 cm)	43.75 inches (111.1 cm) (25.0 RU)

1. Width is also the minimal clearance required between the two vertical mounting rails inside the rack or cabinet.
2. Front depth is also the minimal clearance required between the front mounting rails and the inside of the front of the rack or cabinet. For all switches, this includes 7 inches (17.8 cm) of space for cabling. For the Cisco Nexus 7009 center-mounted chassis, this distance also includes 6 inches of the chassis which is offset to the front by the center-mount bracket.
3. Rear depth is also the clearance required between the front-mounting rails and the inside of the rear of the rack or cabinet. For front mounted switches, this is the same as the depth of the chassis. For a center-mounted Cisco Nexus 7009 switch, this is 6 inches (15.2 cm) less than the depth of the chassis, which is offset to the front.
4. Height is also the clearance required between the top of the bottom support bracket and the top of the chassis that you are installing. If you are installing another chassis above this chassis, its bottom-support brackets must be positioned above this clearance area.

The weights and quantities are listed in the following tables:

- Cisco Nexus 7004 switch (see Table A-3)
- Cisco Nexus 7009 switch (see Table A-4 on page A-4)
- Cisco Nexus 7010 switch (see Table A-5 on page A-6)

- Cisco Nexus 7018 switch (see Table A-6 on page A-7)

The weights in these tables do not include the rack or cabinet that holds the chassis or the interface and power cables. For those weights, see the documentation provided by the manufacturers of those components.

Table A-3 Weights and Quantities for the Cisco Nexus 7004 Switch Components

Component	Weight per Unit	Quantity
Chassis	45.0 lb (20.0 kg)	1
Supervisor modules	—	1 or 2 (must be same model)
Supervisor 2 (N7K-SUP2)	10.4 lb (4.7 kg)	
Supervisor 2 Enhanced (N7K-SUP2E)	11.7 lb (5.3 kg)	
F2 I/O Modules	—	1 or 2 (can mix I/O module types)
48-port 1- and 10-Gigabit Ethernet I/O module (N7K-F248XP-25 and N7K-F248XP-25E)	14.0 lb (6.4 kg)	
48-port 1- and 10-GBASE-T I/O module (N7K-F248XT-25E)	14.0 lb (6.4 kg)	
F3 I/O Modules	—	
48-port 1- and 10-Gigabit Ethernet I/O module (N7K-F348XP-25)	15.0 lb (6.8 kg)	
12-port, 40-Gigabit Ethernet I/O module (N7K-F312FQ-25)	15.0 lb (6.8 kg)	
6-port, 100-Gigabit Ethernet I/O module (N7K-F306CK-25)	16.0 lb (7.3 kg)	
M1 I/O Modules	—	
48-port 10/100/1000 Ethernet I/O module (N7K-M148GT-11L)	14 lb (6.4 kg)	
48-port 1-Gigabit Ethernet I/O module with XL option (N7K-M148GS-11L)	15.5 lb (7.0 kg)	
32-port 10-Gigabit Ethernet I/O module with XL option (N7K-M132XP-12L)	17.0 lb (7.7 kg)	
8-port 10-Gigabit Ethernet I/O module with XL option (N7K-M108X2-12L)	14.0 lb (6.4 kg)	
M2 I/O Modules	—	
24-port 10-Gigabit Ethernet I/O module with XL option (N7K-M224XP-23L)	16.5 lb (7.5 kg)	
6-port 40-Gigabit Ethernet I/O module with XL option (N7K-M206FQ-23L)	16.5 lb (7.5 kg)	
2-port 100-Gigabit Ethernet I/O module with XL option (N7K-M202CF-22L)	17.0 lb (7.7 kg)	
M3 I/O Modules	—	
48-port 1- and 10-Gigabit Ethernet I/O module with XL option (N7K-M348XP-25L)	12 lb (5.44 kg)	
24-port 40-Gigabit Ethernet I/O module with XL option (N7K-M324FQ-25L)	12 lb (5.44 kg)	
Service Modules	—	0 or 1
NAM (N7K-SM-NAM-K9)	17.9 lbs. (8.1 kg)	
Fan tray (N7K-C7004-FAN)	25.0 lb (11.3 kg)	1
Power Supplies	—	1 to 4 (can mix power supply types)
3-kW AC power supply (N7K-AC-3KW)	11.0 lb (5.0 kg)	
3-kW DC power supply (N7K-DC-3KW)	11.0 lb (5.0 kg)	
3.5-kW HVAC/HVDC power supply (N7K-HV-3.5KW	11.0 lb (5.0 kg)	
Optional Components	—	—

Table A-3 Weights and Quantities for the Cisco Nexus 7004 Switch Components (continued)

Component	Weight per Unit	Quantity
Front door kit (N7K-C7004-FD-MB)	—	0 or 1
Air filter (N7K-C7004-AFLT)	—	0 or 1

Table A-4 Weights and Quantities for the Cisco Nexus 7009 Switch Components

Component	Weight per Unit	Quantity
Chassis	100 lb (45.0 kg)	1
Supervisor modules	—	1 or 2 (same type if using 2)
Supervisor 1 (N7K-SUP1)	9.9 lb (4.5 kg)	
Supervisor 2 (N7K-SUP2)	10.4 lb (4.7 kg)	
Supervisor 2 Enhanced (N7K-SUP2E)	11.7 lb (5.3 kg)	
F1 I/O Modules	—	1 to 7 (can mix I/O module types)
32-port 1- and 10-Gigabit Ethernet I/O module (N7K-F132XP-15)	14.0 lb (6.4 kg)	
F2 I/O Modules	—	
48-port 1- and 10-Gigabit Ethernet I/O module (N7K-F248XP-25 and N7K-F248XP-25E)	14.0 lb (6.4 kg)	
48-port 1- and 10-GBASE-T I/O module (N7K-F248XT-25E)	14.0 lb (6.4 kg)	
F3 I/O Modules	—	
48-port 1- and 10-Gigabit Ethernet I/O module (N7K-F348XP-25)	15.0 lb (6.8 kg)	
12-port, 40-Gigabit Ethernet I/O module (N7K-F312FQ-25)	15.0 lb (6.8 kg)	
6-port, 100-Gigabit Ethernet I/O module (N7K-F306CK-25)	16.0 lb (7.3 kg)	
M1 I/O Modules	—	
48-port 10/100/1000 Ethernet I/O module (N7K-M148GT-11)	14 lb (6.4 kg)	
48-port 10/100/1000 Ethernet I/O module (N7K-M148GT-11L)	14 lb (6.4 kg)	
48-port 1-Gigabit Ethernet I/O module (N7K-M148GS-11)	15.5 lb (7.0 kg)	
48-port 1-Gigabit Ethernet I/O module with XL option (N7K-M148GS-11L)	15.5 lb (7.0 kg)	
32-port 10-Gigabit Ethernet I/O module (N7K-M132XP-12)	17.0 lb (7.7 kg)	
32-port 10-Gigabit Ethernet I/O module with XL option (N7K-M132XP-12L)	17.0 lb (7.7 kg)	
8-port 10-Gigabit Ethernet I/O module with XL option (N7K-M108X2-12L)	14.0 lb (6.4 kg)	
M2 I/O Modules	—	
24-port 10-Gigabit Ethernet I/O module with XL option (N7K-M224XP-23L)	16.5 lb (7.5 kg)	
6-port 40-Gigabit Ethernet I/O module with XL option (N7K-M206FQ-23L)	16.5 lb (7.5 kg)	
2-port 100-Gigabit Ethernet I/O module with XL option (N7K-M202CF-22L)	17.0 lb (7.7 kg)	
M3 I/O Modules	—	
48-port 1- and 10-Gigabit Ethernet I/O module with XL option (N7K-M348XP-25L)	12 lb (5.44 kg)	
24-port 40-Gigabit Ethernet I/O module with XL option (N7K-M324FQ-25L)	12 lb (5.44 kg)	

Table A-4 Weights and Quantities for the Cisco Nexus 7009 Switch Components (continued)

Component	Weight per Unit	Quantity
Service Modules	—	0 or 1
NAM (N7K-SM-NAM-K9)	17.9 lbs. (8.1 kg)	
Fabric Modules	—	For F2 I/O, use 5. For F1, M1, and M2 I/O, use 3 to 5.
Fabric-2 module (N7K-C7009-FAB-2)	5 lb (2.27 kg)	
Fan tray (N7K-C7009-FAN)	25.0 lb (11.3 kg)	1
Power Supplies	—	1 or 2 (can mix power supply types)
6-kW AC power supply unit (N7K-AC-6.0KW)	18 lb (8.2 kg)	
7.5-kW AC power supply unit (N7K-AC-7.5KW-INT and N7K-AC-7.5KW-US)	26 lb (11.8 kg)	
6-kW DC power supply unit (N7K-DC-6.0KW)	21 lb (9.5 kg)	
DC Power Interface Unit	5 lb (2.3 kg)	0 to 2
Optional Components	—	—
Door and air frame (optional)	—	0 or 1

Table A-5 Weights and Quantities for the Cisco Nexus 7010 Components

Component	Weight per Unit	Quantity
Chassis	200 lb (90.9 kg)	1
Supervisor Modules	—	1 or 2 (same type if using 2)
Supervisor 1 (N7K-SUP1)	9.9 lb (4.5 kg)	
Supervisor 2 (N7K-SUP2)	10.4 lb (4.7 kg)	
Supervisor 2 Enhanced (N7K-SUP2E)	11.7 lb (5.3 kg)	
F1 I/O Modules	—	1 to 8 (can mix I/O module types)
32-port 1- and 10-Gigabit Ethernet I/O module (N7K-F132XP-15)	14.0 lb (6.4 kg)	
F2 I/O Modules	—	
48-port 1- and 10-Gigabit Ethernet I/O module (N7K-F248XP-25 and N7K-F248XP-25E)	14.0 lb (6.4 kg)	
48-port 1- and 10-GBASE-T I/O module (N7K-F248XT-25E)	14.0 lb (6.4 kg)	
F3 I/O Modules	—	
48-port 1- and 10-Gigabit Ethernet I/O module (N7K-F348XP-25)	15.0 lb (6.8 kg)	
12-port, 40-Gigabit Ethernet I/O module (N7K-F312FQ-25)	15.0 lb (6.8 kg)	
6-port, 100-Gigabit Ethernet I/O module (N7K-F306CK-25)	16.0 lb (7.3 kg)	
M1 I/O Modules	—	
48-port 10/100/1000 Ethernet I/O module (N7K-M148GT-11)	14 lb (6.4 kg)	
48-port 10/100/1000 Ethernet I/O module (N7K-M148GT-11L)	14 lb (6.4 kg)	
48-port 1-Gigabit Ethernet I/O module (N7K-M148GS-11)	15.5 lb (7.0 kg)	
48-port 1-Gigabit Ethernet I/O module with XL option (N7K-M148GS-11L)	15.5 lb (7.0 kg)	
32-port 10-Gigabit Ethernet I/O module (N7K-M132XP-12)	17.0 lb (7.7 kg)	
32-port 10-Gigabit Ethernet I/O module with XL option (N7K-M132XP-12L)	17.0 lb (7.7 kg)	
8-port 10-Gigabit Ethernet I/O module with XL option (N7K-M108X2-12L)	14.0 lb (6.4 kg)	
M2 I/O Modules	—	
24-port 10-Gigabit Ethernet I/O module with XL option (N7K-M224XP-23L)	16.5 lb (7.5 kg)	
6-port 40-Gigabit Ethernet I/O module with XL option (N7K-M206FQ-23L)	16.5 lb (7.5 kg)	
2-port 100-Gigabit Ethernet I/O module with XL option (N7K-M202CF-22L)	17.0 lb (7.7 kg)	
M3 I/O Modules	—	
48-port 1- and 10-Gigabit Ethernet I/O module with XL option (N7K-M348XP-25L)	12 lb (5.44 kg)	
24-port 40-Gigabit Ethernet I/O module with XL option (N7K-M324FQ-25L)	12 lb (5.44 kg)	
Service Modules	—	0 or 1
NAM (N7K-SM-NAM-K9)	17.9 lbs. (8.1 kg)	

Table A-5 Weights and Quantities for the Cisco Nexus 7010 Components (continued)

Component	Weight per Unit	Quantity
Fabric Modules	—	For F2 I/O, use 5. For F1, M1, and M2 I/O, use 3 to 5.
Fabric-1 module (N7K-C7010-FAB-1)	4 lb (1.8 kg)	
Fabric-2 module (N7K-C7010-FAB-2)	4 lb (1.8 kg)	
Fan Trays	—	—
System fan tray (N7K-C7010-FAN-S)	20 lb (9.1 kg)	2
Fabric fan tray (N7K-C7010-FAN-F)	5 lb (2.3 kg)	2
Power Supplies	—	2 to 3 (can mix power supply types)
6-kW AC power supply unit (N7K-AC-6.0KW)	18 lb (8.2 kg)	
7.5-kW AC power supply unit (N7K-AC-7.5KW-INT and N7K-AC-7.5KW-US)	26 lb (11.8 kg)	
6-kW DC power supply unit (N7K-DC-6.0KW)	21 lb (9.5 kg)	
DC Power Interface Unit	5 lb (2.3 kg)	0 to 2
Optional Components	—	—
Mid-frame doors and frame	—	0 or 1

Table A-6 Weights and Quantities for the Cisco Nexus 7018 Components

Component	Weight per Unit	Quantity
Chassis	187 lb (85.0 kg)	1
Supervisor Modules	—	1 or 2 (same type if using 2)
Supervisor 1 (N7K-SUP1)	9.9 lb (4.5 kg)	
Supervisor 2 (N7K-SUP2)	10.4 lb (4.7 kg)	
Supervisor 2 Enhanced (N7K-SUP2E)	11.7 lb (5.3 kg)	

Table A-6 Weights and Quantities for the Cisco Nexus 7018 Components (continued)

Component	Weight per Unit	Quantity
F1 I/O Modules	—	1 to 8 (can mix I/O module types)
32-port 1- and 10-Gigabit Ethernet I/O module (N7K-F132XP-15)	14.0 lb (6.4 kg)	
F2 I/O Modules	—	
48-port 1- and 10-Gigabit Ethernet I/O module (N7K-F248XP-25 and N7K-F248XP-25E)	14.0 lb (6.4 kg)	
48-port 1- and 10-GBASE-T I/O module (N7K-F248XT-25E)	14.0 lb (6.4 kg)	
F3 I/O Modules	—	
48-port 1- and 10-Gigabit Ethernet I/O module (N7K-F348XP-25)	15.0 lb (6.8 kg)	
12-port, 40-Gigabit Ethernet I/O module (N7K-F312FQ-25)	15.0 lb (6.8 kg)	
6-port, 100-Gigabit Ethernet I/O module (N7K-F306CK-25)	16.0 lb (7.3 kg)	
M1 I/O Modules	—	
48-port 10/100/1000 Ethernet I/O module (N7K-M148GT-11)	14 lb (6.4 kg)	
48-port 10/100/1000 Ethernet I/O module (N7K-M148GT-11L)	14 lb (6.4 kg)	
48-port 1-Gigabit Ethernet I/O module (N7K-M148GS-11)	15.5 lb (7.0 kg)	
48-port 1-Gigabit Ethernet I/O module with XL option (N7K-M148GS-11L)	15.5 lb (7.0 kg)	
32-port 10-Gigabit Ethernet I/O module (N7K-M132XP-12)	17.0 lb (7.7 kg)	
32-port 10-Gigabit Ethernet I/O module with XL option (N7K-M132XP-12L)	17.0 lb (7.7 kg)	
8-port 10-Gigabit Ethernet I/O module with XL option (N7K-M108X2-12L)	14.0 lb (6.4 kg)	
M2 I/O Modules	—	
24-port 10-Gigabit Ethernet I/O module with XL option (N7K-M224XP-23L)	16.5 lb (7.5 kg)	
6-port 40-Gigabit Ethernet I/O module with XL option (N7K-M206FQ-23L)	16.5 lb (7.5 kg)	
2-port 100-Gigabit Ethernet I/O module with XL option (N7K-M202CF-22L)	17.0 lb (7.7 kg)	
M3 I/O Modules	—	
48-port 1- and 10-Gigabit Ethernet I/O module with XL option (N7K-M348XP-25L)	12 lb (5.44 kg)	
24-port 40-Gigabit Ethernet I/O module with XL option (N7K-M324FQ-25L)	12 lb (5.44 kg)	
Service Modules	—	0 or 1
NAM (N7K-SM-NAM-K9)	17.9 lbs. (8.1 kg)	
Fabric Modules	—	For F2 I/O, use 5. For F1, M1, and M2 I/O, use 3 to 5.
Fabric-1 module (N7K-C7018-FAB-1)	7.5 lb (3.4 kg)	
Fabric-2 module (N7K-C7018-FAB-2)	7.5 lb (3.4 kg)	
Fan tray (N7K-C7018-FAN)	25.8 lb (11.7 kg)	2
Power Supplies	—	2 to 4 (can mix power supply types)
6-kW AC power supply unit (N7K-AC-6.0KW)	18 lb (8.2 kg)	
7.5-kW AC power supply unit (N7K-AC-7.5KW-INT and N7K-AC-7.5KW-US)	26 lb (11.8 kg)	
6-kW DC power supply unit (N7K-DC-6.0KW)	21 lb (9.5 kg)	

Table A-6 Weights and Quantities for the Cisco Nexus 7018 Components (continued)

Component	Weight per Unit	Quantity
DC Power Interface Unit	5 lb (2.3 kg)	0 to 2
Optional Components	—	—
Front door (optional)	25 lb (11.3 kg)	0 or 1

Power Specifications for the Cisco Nexus 7000 Series Switches

The number of power supplies that a Cisco Nexus 7000 Series switch requires depends on the quantities and types of modules that you include in the switch chassis. the type of power supply unit that you are using, and the power redundancy mode that you are using.

The following topics explain how to calculate the switch power requirements and the amount of power available for each type of power supply configuration mode:

- Power Requirements for Switch Components, page A-9
- Power Supply Configuration Modes, page A-14

Power Requirements for Switch Components

To determine the power requirements of the Cisco Nexus 7000 Series switches, add the power requirements of each of its components. For each component, multiply the number of its modules by its maximum or typical power requirement. To find the quantities and power requirements for each Cisco Nexus 7000 Series switch, see the following tables:

- Cisco Nexus 7004—see Table A-7
- Cisco Nexus 7009—see Table A-8 on page A-10
- Cisco Nexus 7010—see Table A-9 on page A-12
- Cisco Nexus 7018—see Table A-10 on page A-13

Table A-7 Power Requirements for the Cisco Nexus 7004 Switch

Component	Quantity	Maximum	Typical
Supervisor Modules	1 or 2 (same type if using 2)	—	—
Supervisor 2 (N7K-SUP2)		300 W	109 W
Supervisor 2 Enhanced (N7K-SUP2E)		300 W	147 W

Table A-7 Power Requirements for the Cisco Nexus 7004 Switch (continued)

Component	Quantity	Maximum	Typical
F2 I/O Modules	1 or 2	—	—
48-port 1- and 10-Gigabit Ethernet I/O module (N7K-F248XP-25 and N7K-F248XP-25E)		450 W	400 W
48-port 1- and 10-GBASE-T I/O module (N7K-F248XT-25E)		550 W	420 W
F3 I/O Modules		—	—
48-port 1- and 10-Gigabit Ethernet I/O module (N7K-F348XP-25)		340 W	325 W
12-port, 40-Gigabit Ethernet I/O module (N7K-F312FQ-25)		340 W	310 W
6-port, 100-Gigabit Ethernet I/O module (N7K-F306CK-25)		400 W	325 W
M1 I/O Modules		—	—
48-port 10/100/1000 Ethernet I/O module with XL option (N7K-M148GT-11L)		400 W	358 W
48-port 1-Gigabit Ethernet I/O module with XL option (N7K-M148GS-11L)		400 W	358 W
32-port 10-Gigabit Ethernet I/O module with XL option (N7K-M132XP-12L)		750 W	611 W
8-port 10-Gigabit Ethernet I/O module with XL option (N7K-M108X2-12L)		650 W	520 W
M2 I/O Modules		—	—
24-port 10-Gigabit Ethernet I/O module with XL option (N7K-M224XP-23L)		795 W	720 W
6-port 40-Gigabit Ethernet I/O module with XL option (N7K-M206FQ-23L)		795 W	720 W
2-port 100-Gigabit Ethernet I/O module with XL option (N7K-M202CF-22L)		795 W	690 W
M3 I/O Modules		—	—
48-port 1-/10-Gigabit Ethernet I/O modules with XL option(N7K-M348XP-25L)		525 W	400 W
24-port 40-Gigabit Ethernet I/O modules with XL option(N7K-M324FQ-25L)		750 W	600 W
Fan Tray	1	650 W	185 W

Table A-8 Power Requirements for the Cisco Nexus 7009 Switch

Component	Quantity	Maximum	Typical
Supervisor Modules	1 or 2 (same type if using 2)	—	—
Supervisor 1 (N7K-SUP1)		210 W	190 W
Supervisor 2 (N7K-SUP2)		300 W	109 W
Supervisor 2 Enhanced (N7K-SUP2E)		300 W	147 W

Table A-8 Power Requirements for the Cisco Nexus 7009 Switch (continued)

Component	Quantity	Maximum	Typical
F1 I/O Modules	1 to 7	—	—
32-port 1- and 10-Gigabit Ethernet I/O module (N7K-F132XP-15)		385 W	283 W
F2 I/O Modules		—	—
48-port 1- and 10-Gigabit Ethernet I/O module (N7K-F248XP-25 and N7K-F248XP-25E)		450 W	400 W
48-port 1- and 10-GBASE-T I/O module (N7K-F248XT-25E)		550 W	420 W
F3 I/O Modules		—	—
48-port 1- and 10-Gigabit Ethernet I/O module (N7K-F348XP-25)		340 W	325 W
12-port, 40-Gigabit Ethernet I/O module (N7K-F312FQ-25)		340 W	310 W
6-port, 100-Gigabit Ethernet I/O module (N7K-F306CK-25)		400 W	325 W
M1 I/O Modules		—	—
48-port 10/100/1000 Ethernet I/O module (N7K-M148GT-11)		400 W	358 W
48-port 10/100/1000 Ethernet I/O module with XL option (N7K-M148GT-11L)		400 W	358 W
48-port 1-Gigabit Ethernet I/O module (N7K-M1148GS-11)		400 W	358 W
48-port 1-Gigabit Ethernet I/O module with XL option (N7K-M148GS-11L)		400 W	358 W
32-port 10-Gigabit Ethernet I/O module (N7K-M132XP-12)		750 W	611 W
32-port 10-Gigabit Ethernet I/O module with XL option (N7K-M132XP-12L)		750 W	611 W
8-port 10-Gigabit Ethernet I/O module with XL option (N7K-M108X2-12L)		650 W	520 W
M2 I/O Modules		—	—
24-port 10-Gigabit Ethernet I/O module with XL option (N7K-M224XP-23L)		795 W	720 W
6-port 40-Gigabit Ethernet I/O module with XL option (N7K-M206FQ-23L)		795 W	720 W
2-port 100-Gigabit Ethernet I/O module with XL option (N7K-M202CF-22L)		795 W	690 W
M3 I/O Modules		—	—
48-port 1-/10-Gigabit Ethernet I/O modules with XL option(N7K-M348XP-25L)		525 W	400 W
24-port 40-Gigabit Ethernet I/O modules with XL option(N7K-M324FQ-25L)		750 W	600 W
Fabric Modules	3 to 5	—	—
Fabric-2 module (N7K-C7009-FAB-2)		70 W	55 W
Fan Trays	—	—	—
All fan trays (total) (N7K-C7009-FAN)		650 W	190 W

Table A-9 Power Requirements for the Cisco Nexus 7010 System Components

Component	Quantity	Maximum	Typical
Supervisor Modules	1 or 2 (same type if using 2)	—	—
Supervisor 1 (N7K-SUP1)		210 W	190 W
Supervisor 2 (N7K-SUP2)		300 W	109 W
Supervisor 2 Enhanced (N7K-SUP2E)		300 W	147 W
F1 I/O Modules	1 to 8 (can mix types)	—	—
32-port 1- and 10-Gigabit Ethernet I/O module (N7K-F132XP-15)		385 W	283 W
F2 I/O Modules		—	—
48-port 1- and 10-Gigabit Ethernet I/O module (N7K-F248XP-25 and N7K-F248XP-25E)		450 W	400 W
48-port 1- and 10-GBASE-T I/O module (N7K-F248XT-25E)		550 W	420 W
F3 I/O Modules		—	—
48-port 1- and 10-Gigabit Ethernet I/O module (N7K-F348XP-25)		340 W	325 W
12-port, 40-Gigabit Ethernet I/O module (N7K-F312FQ-25)		340 W	310 W
6-port, 100-Gigabit Ethernet I/O module (N7K-F306CK-25)		400 W	325 W
M1 I/O Modules		—	—
48-port 10/100/1000 Ethernet I/O module (N7K-M148GT-11)		400 W	358 W
48-port 10/100/1000 Ethernet I/O module with XL option (N7K-M148GT-11L)		400 W	358 W
48-port 1-Gigabit Ethernet I/O module (N7K-M1148GS-11)		400 W	358 W
48-port 1-Gigabit Ethernet I/O module with XL option (N7K-M148GS-11L)		400 W	358 W
32-port 10-Gigabit Ethernet I/O module (N7K-M132XP-12)		750 W	611 W
32-port 10-Gigabit Ethernet I/O module with XL option (N7K-M132XP-12L)		750 W	611 W
8-port 10-Gigabit Ethernet I/O module with XL option (N7K-M108X2-12L)		650 W	520 W
M2 I/O Modules		—	—
24-port 10-Gigabit Ethernet I/O module with XL option (N7K-M224XP-23L)		795 W	720 W
6-port 40-Gigabit Ethernet I/O module with XL option (N7K-M206FQ-23L)		795 W	720 W
2-port 100-Gigabit Ethernet I/O module with XL option (N7K-M202CF-22L)		795 W	690 W
M3 I/O Modules		—	—
48-port 1-/10-Gigabit Ethernet I/O modules with XL option(N7K-M348XP-25L)		525 W	400 W
24-port 40-Gigabit Ethernet I/O modules with XL option(N7K-M324FQ-25L)		750 W	600 W
Fabric Modules	3 to 5 (same type)	—	—
Fabric-1 module (N7K-C7010-FAB-1)		60 W	55 W
Fabric-2 module (N7K-C7010-FAB-2)		80 W	60W
Fan Trays (N7K-C7010-FAN-F and N7K-C7010-FAN-S)	—	—	—
All fan trays (total)		2184 W	300 W

Table A-10 Power Requirements for the Cisco Nexus 7018 System Components

Component	Quantity	Maximum	Typical
Supervisor Modules	1 or 2 (same type if using 2)	—	—
Supervisor 1 (N7K-SUP1)		210 W	190 W
Supervisor 2 (N7K-SUP2)		300 W	109 W
Supervisor 2 Enhanced (N7K-SUP2E)		300 W	147 W
F1 I/O Modules	1 to 16 (can mix types)	—	—
32-port 1- and 10-Gigabit Ethernet I/O module (N7K-F132XP-15)		385 W	283 W
F2 I/O Modules		—	—
48-port 1- and 10-Gigabit Ethernet I/O module (N7K-F248XP-25 and N7K-F248XP-25E)		450 W	400 W
48-port 1- and 10-GBASE-T I/O module (N7K-F248XT-25E)		550 W	420 W
F3 I/O Modules		—	—
48-port 1- and 10-Gigabit Ethernet I/O module (N7K-F348XP-25)		340 W	325 W
12-port, 40-Gigabit Ethernet I/O module (N7K-F312FQ-25)		340 W	310 W
6-port, 100-Gigabit Ethernet I/O module (N7K-F306CK-25)		400 W	325 W
M1 I/O Modules		—	—
48-port 10/100/1000 Ethernet I/O module (N7K-M148GT-11)		400 W	358 W
48-port 10/100/1000 Ethernet I/O module with XL option (N7K-M148GT-11L)		400 W	358 W
48-port 1-Gigabit Ethernet I/O module (N7K-M1148GS-11)		400 W	358 W
48-port 1-Gigabit Ethernet I/O module with XL option (N7K-M148GS-11L)		400 W	358 W
32-port 10-Gigabit Ethernet I/O module (N7K-M132XP-12)		750 W	611 W
32-port 10-Gigabit Ethernet I/O module with XL option (N7K-M132XP-12L)		750 W	611 W
8-port 10-Gigabit Ethernet I/O module with XL option (N7K-M108X2-12L)		650 W	520 W
M2 I/O Modules		—	—
2-port 100-Gigabit Ethernet I/O module with XL option (N7K-M202CF-22L)		795 W	690 W
6-port 40-Gigabit Ethernet I/O module with XL option (N7K-M206FQ-23L)		795 W	720 W
24-port 10-Gigabit Ethernet I/O module with XL option (N7K-M224XP-23L)		795 W	720 W
M3 I/O Modules		—	—
48-port 1-/10-Gigabit Ethernet I/O modules with XL option(N7K-M348XP-25L)		525 W	400 W
24-port 40-Gigabit Ethernet I/O modules with XL option(N7K-M324FQ-25L)		750 W	600 W
Fabric Modules	3 to 5 (same type)	—	—
Fabric-1 module (N7K-C7018-FAB-1)		100 W	90 W
Fabric-2 module (N7K-C7018-FAB-2)		150 W	110 W
Fan Trays (N7K-C7018-FAN)		—	—
All fan trays (total)	2	1000 W	569 W

Power Supply Configuration Modes

You can configure one of the following power modes to either use the combined power provided by the installed power supplies or to provide power redundancy when there is a power loss:

- Combined mode—Provides the maximum amount of available power by utilizing the combined power output from all installed power supplies for switch operations. This mode does not provide redundancy.
- Power-supply redundancy mode—Allows you to replace a power supply during switch operations. All power supplies are active. The available power is calculated as the least amount of power available from all but one of the power supplies (N+1). The reserve power is the amount of power output by the power supply that can output the most power. For example, if three power supplies output 3 kW, 6 kW, and 6 kW, the available power is 9 kW (3 kW + 6 kW) and the reserve power is 6 kW.
- Input source redundancy mode—Takes power from two electrical grids so that if one grid goes down, the other grid can provide the power needed by the switch. For the Cisco Nexus 7004 chassis, each grid powers half of the power supplies. For the Cisco Nexus 7009, 7010, and 7018 chassis, each grid powers half of each power supply (grid A is connected to the Input 1 receptacle on each power supply and grid B is connected to the Input 2 receptacle on each power supply). The available power is the amount of power output by the portions of the power supplyies that are connected to the same grid. For example, if three power supplies are connected to a 110-V grid and a 220-V grid, each power supply outputs 1.2 kW for the 110-V grid and 3.0 kW for the 220-V grid. The available power would be 3.6 kW (1.2 kW + 1.2 kW + 1.2 kW) and the reserve power would be 9.0 kW (3.0 kW + 3.0 kW + 3.0 kW).
- Full redundancy mode—Provides both power-supply redundancy and input-source redundancy. This mode allows you to replace a power supply without interrupting switch operations or continue powering the switch if one of two grids goes down. The available power is the lesser amount of output power for power supply redundancy or input source redundancy.

The amount of power available for use with your Cisco Nexus 7000 Series switch depends on the number of power supplies, input voltage used, and the power mode used. To determine the amount of available power for the power supplies, see the following tables:

- For the 3-kW AC power supplies, see Table A-11
- For the 6-kW AC power supplies, see Table A-13 on page A-16
- For the 7.5-kW AC power supplies, see Table A-14 on page A-17
- For the 3-kW DC power supplies, see Table A-15 on page A-18
- For the 6-kW DC power supplies, see Table A-17 on page A-19
- For the 3.5-kW HVAC/HVDC power supplies, see Table A-12 on page A-15 and Table A-16 on page A-18

Table A-11 Power Availability for 3-kW AC Power Supplies

Power Inputs	Combined Mode	Power Supply Redundancy Mode	Input Source Redundancy Mode	Full Redundancy Mode
Single input per power supply [1]				
220-V input				
1 power supply	3000 W	—	—	—
2 power supplies	6000 W	3000 W	3000 W	3000 W
3 power supplies	9000 W	6000 W	—	—
4 power supplies	12,000 W	9000 W	6000 W	6000 W
110-V input				
1 power supply	1450 W	—	—	—
2 power supplies	2900 W	1450 W	1450 W	1450 W
3 power supplies	4350 W	2900 W	—	—
4 power supplies	5800 W	4350 W	2900 W	2900 W

1. The Cisco Nexus 7004 uses up to four 3.0 kW AC power supplies.

Table A-12 Power Availability for 3.5-kW Inputs (AC)

Power Inputs	Combined Mode	Power Supply Redundancy Mode	Input Source Redundancy Mode	Full Redundancy Mode
Single input per power supply [1]				
277-V input				
1 power supply	3500 W	—	—	—
2 power supplies	7000 W	3500 W	3500 W	3500 W
3 power supplies	10,500 W	7000 W	—	—
4 power supplies	14,000 W	10,500 W	7000 W	7000 W
220/230-V input				
1 power supply	3500 W	—	—	—
2 power supplies	7000 W	3500 W	3500 W	3500 W
3 power supplies	10,500 W	7000 W	—	—
4 power supplies	14,000 W	10,500 W	7000 W	7000 W
210-V input				
1 power supply	3100 W	—	—	—
2 power supplies	6200 W	3100 W	3100 W	3100 W
3 power supplies	9300 W	6200 W	—	—

Table A-12 Power Availability for 3.5-kW Inputs (AC) (continued)

Power Inputs	Combined Mode	Power Supply Redundancy Mode	Input Source Redundancy Mode	Full Redundancy Mode
4 power supplies	12,400 W	9300 W	6200 W	6200 W
110-V input				
1 power supply	1500 W	—	—	—
2 power supplies	3000 W	1500 W	1500 W	1500 W
3 power supplies	4500 W	3000 W	—	—
4 power supplies	6000 W	4500 W	3000 W	3000 W

1. The Cisco Nexus 7004 uses up to four 3.5 kW inputs.

Table A-13 Power Availability for 6-kW AC Power Supply Units

	Combined Mode	Power Supply Redundancy Mode	Input Source Redundancy Mode	Full Redundancy Mode
Dual inputs per power supply				
220-V and 220-V inputs				
1 power supply	6000 W	—	3000 W	—
2 power supplies[1]	12,000 W	6000 W	6000 W	6000 W
3 power supplies[1]	18,000 W	12,000 W	9000 W	9000 W
4 power supplies[1]	24,000 W	18,000 W	12,000 W	12,000 W
220-V and 110-V inputs				
1 power supply	4200 W	—	1200 W	—
2 power supplies[1]	8400 W	4200 W	2400 W	2400 W
3 power supplies[1]	12,600 W	8400 W	3600 W	3600 W
4 power supplies[1]	16,800 W	12,600 W	4800 S	4800 W
110-V and 110-V inputs				
1 power supply	2400 W	—	1200 W	—
2 power supplies[1]	4800 W	2400 W	2400 W	2400 W
3 power supplies[1]	7200 W	4800 W	3600 W	3600 W
4 power supplies[1]	9600 W	7200 W	4800 W	4800 W
Single input per power supply				
220-V input				
1 power supply	3000 W	—	—	—
2 power supplies[1]	6000 W	3000 W	—	—
3 power supplies[1]	9000 W	6000 W	—	—

Table A-13 Power Availability for 6-kW AC Power Supply Units (continued)

	Combined Mode	Power Supply Redundancy Mode	Input Source Redundancy Mode	Full Redundancy Mode
4 power supplies[1]	12,000 W	9000 W	—	—
110-V input				
1 power supply	1200 W	—	—	—
2 power supplies[1]	2400 W	1200 W	—	—
3 power supplies[1]	3600 W	2400 W	—	—
4 power supplies[1]	4800 W	3600 W	—	—

1. The Cisco Nexus 7018 switch uses up to four 6-kW power supplies, the Cisco Nexus 7010 switch uses up to three 6-kW power supplies, and the Cisco Nexus 7009 uses up to two 6-kW power supplies.

Table A-14 Power Availability for 7.5-kW AC Power Supplies

	Combined Mode	Power Supply Redundancy Mode	Input Source Redundancy Mode	Full Redundancy Mode
Dual inputs per power supply				
220-V and 220-V inputs				
1 power supply	7500 W	—	3750 W	—
2 power supplies[1]	15,000 W	7500 W	7500 W	7500 W
3 power supplies[1]	22,500 W	15,000 W	11,250 W	11,250 W
4 power supplies[1]	30,000 W	22,500 W	15,000 W	15,000 W
Single input per power supply				
220-V input				
1 power supply	3750 W	—	—	—
2 power supplies[1]	7500 W	3750 W	—	—
3 power supplies[1]	11,250 W	7500 W	—	—
4 power supplies[1]	15,000 W	11,250 W	—	—

1. The Cisco Nexus 7018 switch uses up to four 7.5-kW power supplies, the Cisco Nexus 7010 switch uses up to three 7.5-kW power supplies, and the Cisco Nexus 7009 uses up to two 7.5-kW power supplies.

Table A-15 Power Availability for 3.0-kW DC Power Supplies

Power Inputs	Combined Mode	Power Supply Redundancy Mode	Input Source Redundancy Mode	Full Redundancy Mode
Dual inputs per power supply[1]				
1 power supply	3,000 W	—	—	—
2 power supplies	6,000 W	3,000 W	3,000 W	3,000 W
3 power supplies	9,000 W	6,000 W	3,000 W	3,000 W
4 power supplies	12,000 W	9,000 W	6,000 W	6,000 W

1. The Cisco Nexus 7004 uses up to four 3.0 kW DC power supplies.

Table A-16 Power Availability for 3.5-kW Inputs (DC)

Power Inputs	Combined Mode	Power Supply Redundancy Mode	Input Source Redundancy Mode	Full Redundancy Mode
Dual inputs per power supply[1]				
380-V input				
1 power supply	3,500 W	—	—	—
2 power supplies	7,000 W	3,500 W	3,500 W	3,500 W
3 power supplies	10,500 W	7,000 W	3,500 W	3,500 W
4 power supplies	14,000 W	10,500	7,000 W	7,000 W
220/240-V input				
1 power supply	3,500 W	—	—	—
2 power supplies	7,000 W	3,500 W	3,500 W	3,500 W
3 power supplies	10,500 W	7,000 W	3,500 W	3,500 W
4 power supplies	14,000 W	10,500	7,000 W	7,000 W
210-V input				
1 power supply	3,100 W	—	—	—
2 power supplies	6,200 W	3,100 W	3,100 W	3,100 W
3 power supplies	9,300 W	6,200 W	3,100 W	3,100 W
4 power supplies	12,400 W	9,300 W	6,200 W	6,200 W

1. The Cisco Nexus 7004 uses up to four 3.5 kW DC power supplies.

Table A-17 Power Availability for 6.0-kW DC Power Supply Units

Power Inputs	Combined Mode	Power Supply Redundancy Mode	Input Source Redundancy Mode	Full Redundancy Mode
Dual inputs per power supply				
1 power supply	6,000 W	—	3,000 W	—
2 power supplies[1]	12,000 W	6,000 W	6,000 W	6,000 W
3 power supplies[1]	18,000 W	12,000 W	9,000 W	9,000 W
4 power supplies[1]	24,000 W	18,000 W	12,000 W	12,000 W
Single input per power supply				
1 power supply	3,000 W	—	—	—
2 power supplies[1]	6,000 W	3,000 W	—	—
3 power supplies[1]	9,000 W	6,000 W	—	—
4 power supplies[1]	12,000 W	9,000 W	—	—

1. The Cisco Nexus 7018 switch uses up to four 6-kW power supplies, the Cisco Nexus 7010 switch uses up to three 6-kW power supplies, and the Cisco Nexus 7009 uses up to two 6-kW power supplies.

Power Supply Cable Specifications

For power supply cable specifications, see the following tables:

- Table A-18 on page A-20 for the 3-kW and 6-kW AC Power Cords
- Table A-19 on page A-24 for the 3.5-kW HVAC/HVDC Power Supply AC Power Cords
- Table A-20 on page A-36 for the 7.5-kW AC Power Cords
- Table A-21 on page A-37 for the 3-kW DC Power Cords
- Table A-22 on page A-37 for the 3.5-kW HVAC/HVDC Power Supply DC Power Cords
- Table A-23 on page A-39 for the 6-kW DC Power Cords

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.

Table A-18 3-kW and 6-kW AC Power Supply Power Cords

Locale	Power Cord Part Number	Cord Set Rating	Power Cord Reference Illustration
Australia and New Zealand	CAB-AC-16A-AUS	16A, 250 VAC	Figure A-1
Peoples Republic of China	CAB-AC-16A-CH	16A, 250 VAC	Figure A-2
Continental Europe	CAB-AC-2500W-EU	16A, 250 VAC	Figure A-3
International	CAB-AC-2500W-INT	16A, 250 VAC	Figure A-4
Israel	CAB-AC-2500W-ISRL	16A, 250 VAC	Figure A-5
Japan and North America (non locking) 200-240 VAC operation	CAB-9K16A-US1	16A, 250 VAC	Figure A-6
Japan and North America (locking) 200-240 VAC operation	CAB-AC-C6K-TWLK	16A, 250 VAC	Figure A-7
Japan and North America 100-120 VAC operation	CAB-7513AC	16A, 250 VAC	Figure A-8
Korea	CAB-9K16A-KOR	16A, 250 VAC	Figure A-9
Power distribution unit (PDU)	CAB-C19-CBN	16A, 250 VAC	Figure A-10
Switzerland	CAB-ACS-16	16A, 250 VAC	Figure A-11

Figure A-1 CAB-AC-16A-AUS Power Cord and Plugs for the 3-kW and 6-kW AC Power Supply Unit

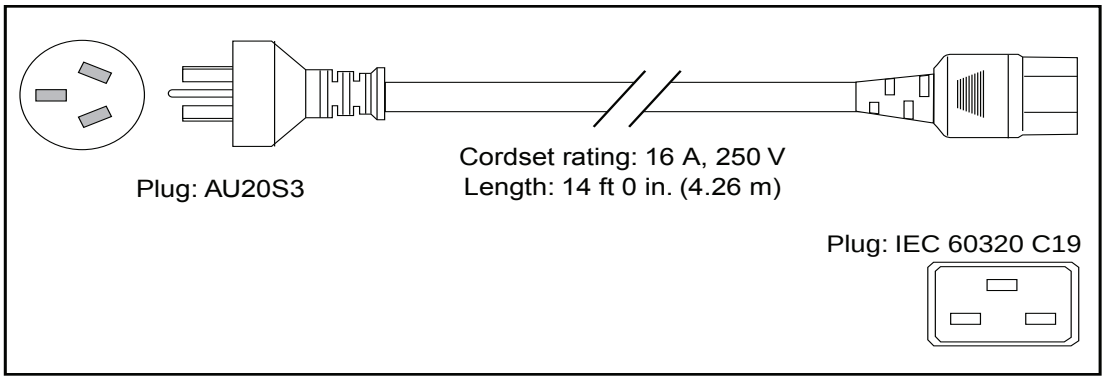


Figure A-2 CAB-AC-16A-CH Power Cord and Plugs for the 3-kW and 6-kW AC Power Supply Unit

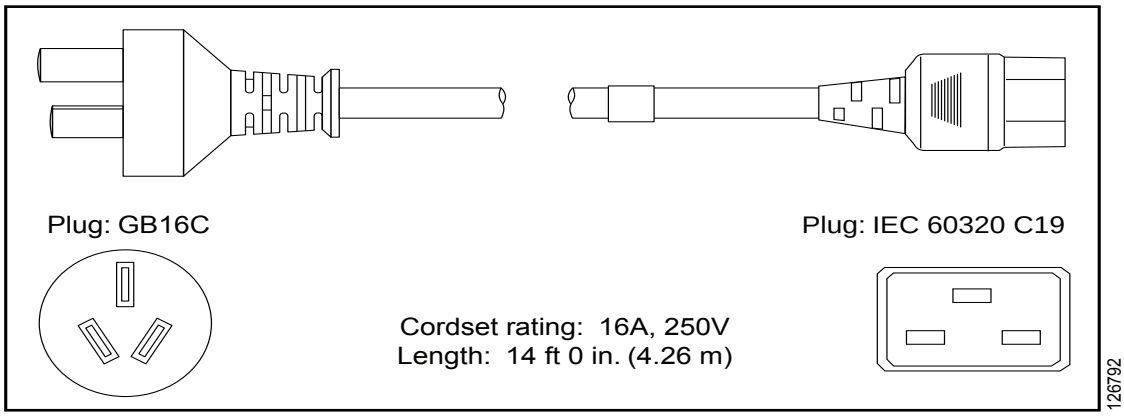


Figure A-3 CAB-AC-2500W-EU Power Cord and Plugs for the 3-kW and 6-kW AC Power Supply Unit

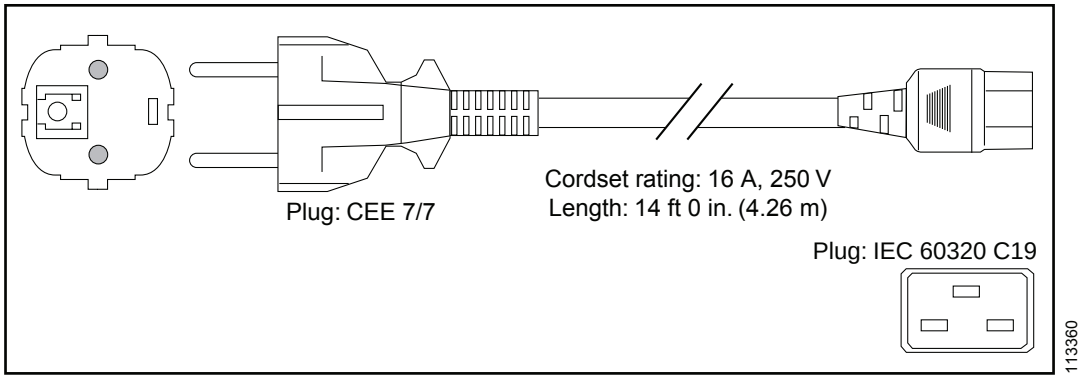


Figure A-4 CAB-AC-2500W-INT Power Cord and Plugs for the 3-kW and 6-kW AC Power Supply Unit

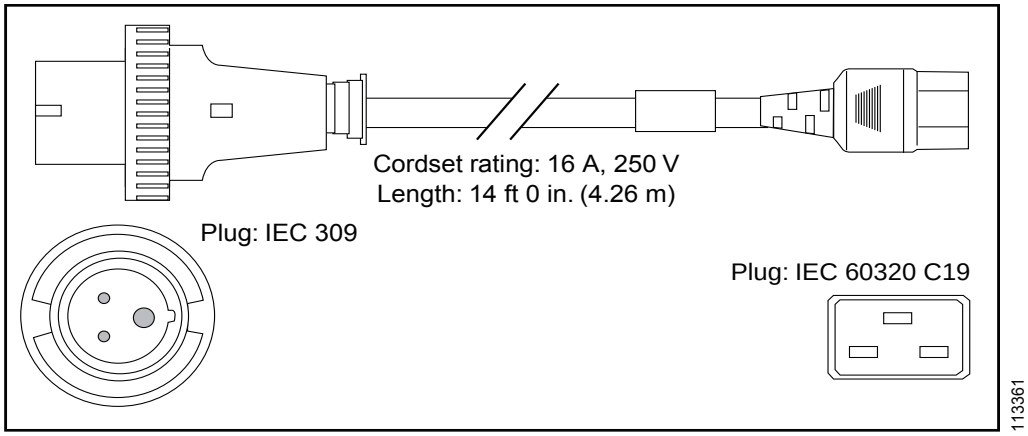


Figure A-5 CAB-AC-2500W-ISRL Power Cord and Plugs for the 3-kW and 6-kW AC Power Supply Unit

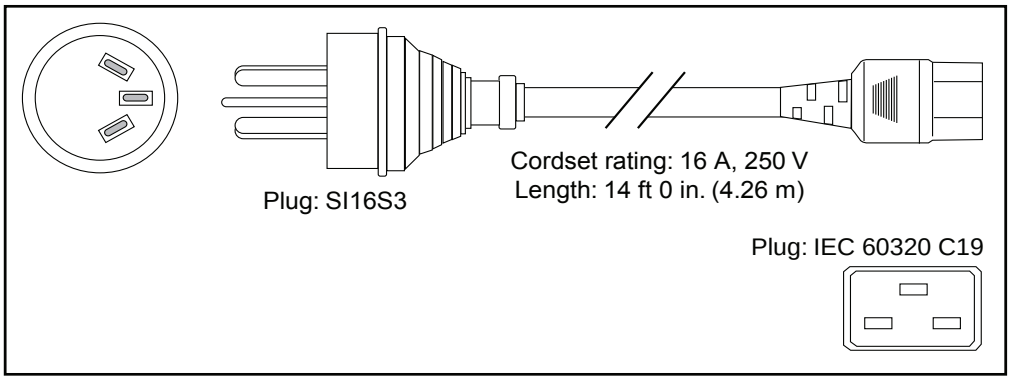


Figure A-6 CAB-9K16A-US1 Power Cord and Plugs for the 3-kW and 6-kW AC Power Supply Unit

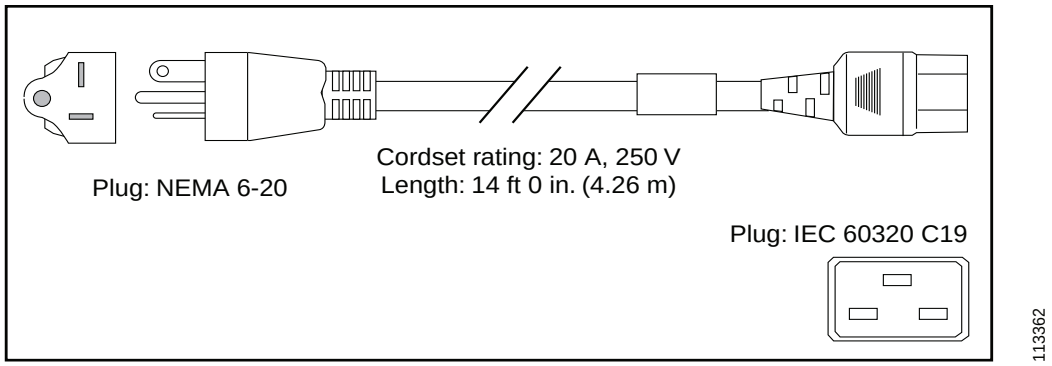


Figure A-7 CAB-AC-C6K-TWLK Power Cord and Plugs for the 3-kW and 6-kW AC Power Supply Unit

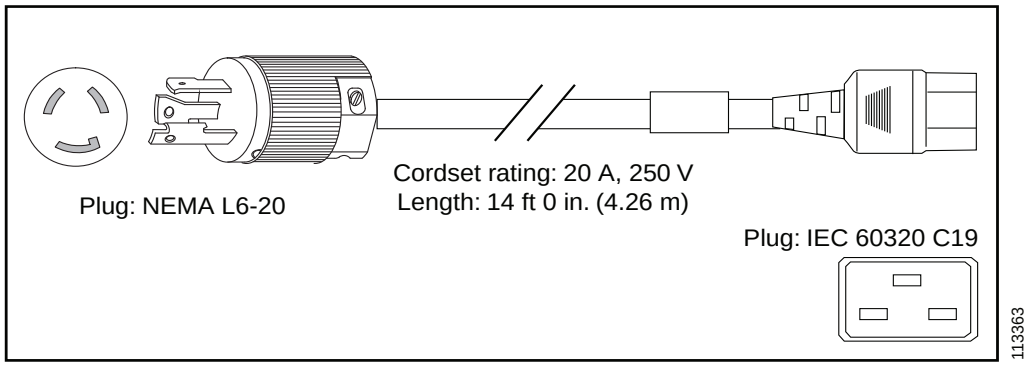


Figure A-8 CAB-7513AC Power Cord and Plugs for the 3-kW and 6-kW AC Power Supply Unit

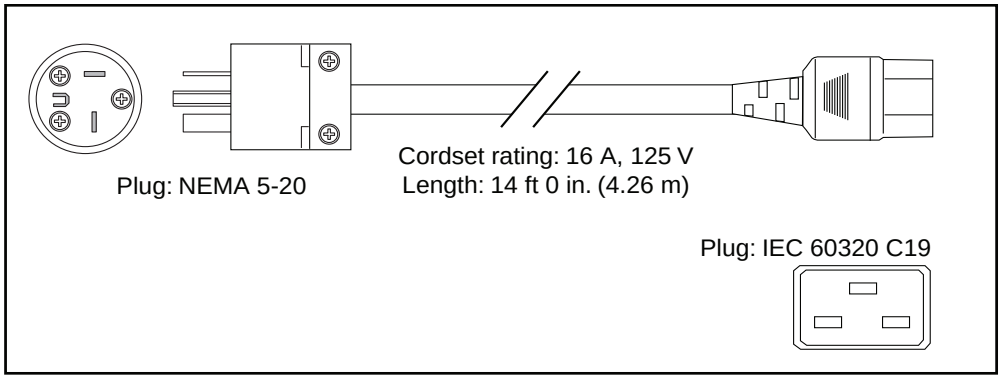


Figure A-9 CAB-9K16A-KOR Power Cord and Plugs for the 3-kW and 6-kW AC Power Supply Unit

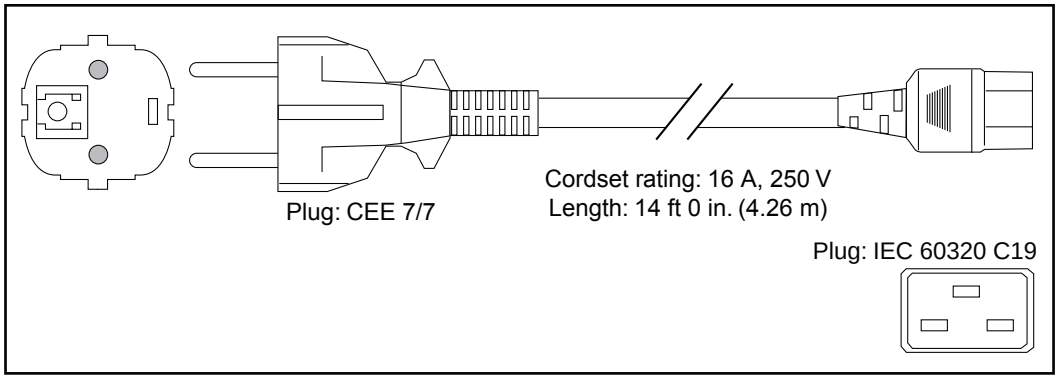


Figure A-10 CAB-C19-CBN Power Cord and Plugs for the 3-kW and 6-kW AC Power Supply Unit

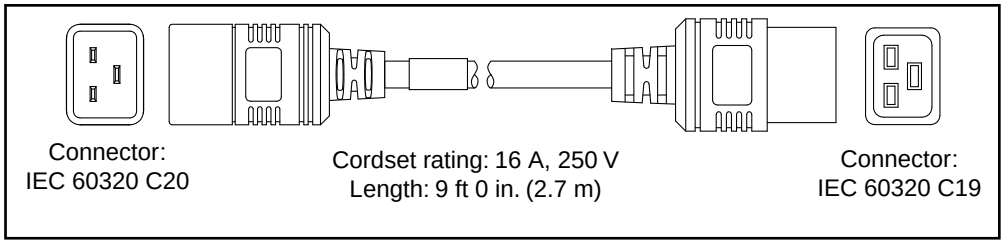


Figure A-11 CAB-ACS-16 Power Cord and Plugs for the 3-kW and 6-kW AC Power Supply Unit

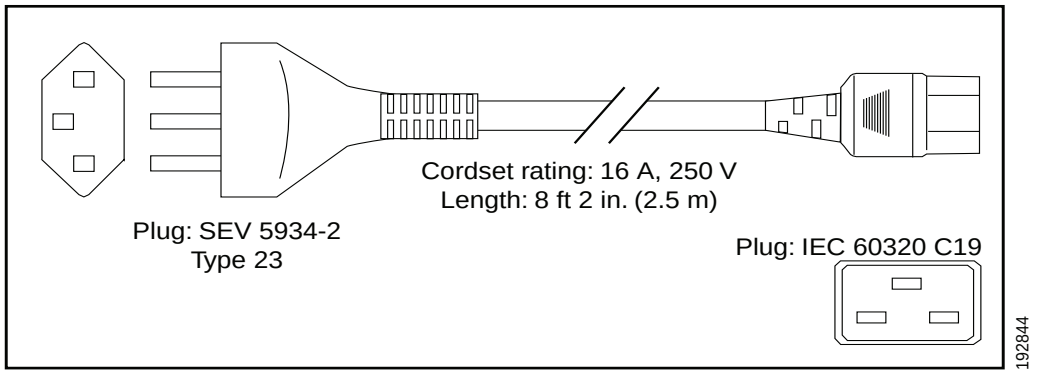


Figure A-12 CAB-AC-16A-AUS Power Cord and Plugs for the 3-kW and 6-kW AC Power Supply Unit

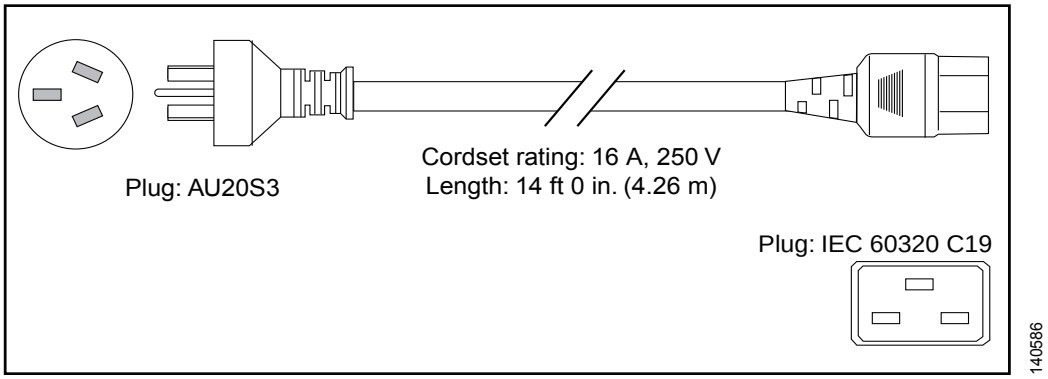


Table A-19 3.5-kW HVAC/HVDC Power Supply AC Power Cords

Locale	Power Supply Part Number	Cisco Part Number (CPN)	Length	Cord rating	Power cord reference illustration
Argentina	CAB-AC-16A-SG-AR	37-1649-01	14' 0" (4.26 m)	16A, 250 VAC	Figure A-13
Australia and New Zealand	CAB-AC-16A-SG-AZ	37-1661-01	14' 0" (4.26 m)	16A, 250 VAC	Figure A-14
Brazil	CAB-AC-16A-SG-BR	37-1650-01	14' 0" (4.26 m)	16A, 250 VAC	Figure A-15
Peoples Republic of China	CAB-AC-16A-SG-CH	37-1655-01	14' 0" (4.26 m)	16A, 250 VAC	Figure A-16
Continental Europe	CAB-AC-16A-SG-EU	37-1660-01	14' 0" (4.26 m)	16A, 250 VAC	Figure A-17

Table A-19 3.5-kW HVAC/HVDC Power Supply AC Power Cords (continued)

Locale	Power Supply Part Number	Cisco Part Number (CPN)	Length	Cord rating	Power cord reference illustration
India	CAB-AC-16A-SG-IND	37-1648-01	14' 0" (4.26 m)	16A, 250 VAC	Figure A-18
International	CAB-AC-16A-SG-IN	37-1659-01	14' 0" (4.26 m)	16A, 250 VAC	Figure A-19
Israel	CAB-AC-16A-SG-IS	37-1658-01	14' 0" (4.26 m)	16A, 250 VAC	Figure A-20
Italy	CAB-AC-16A-SG-IT	37-1651-01	14' 0" (4.26 m)	16A, 250 VAC	Figure A-21
North America (non locking) 110 VAC operation	CAB-AC-20A-SG-US	37-1662-01	14' 0" (4.26 m)	20A, 110 VAC	Figure A-22
North America (locking) 125 VAC operation	CAB-AC-20A-SG-US1	37-1652-01	14' 0" (4.26 m)	20A, 125 VAC	Figure A-23
North America (non locking) 200-240 VAC operation	CAB-AC-20A-SG-US2	37-1657-01	14' 0" (4.26 m)	20A, 250 VAC	Figure A-24
North America (locking) 200-240 VAC operation	CAB-AC-20A-SG-US3	37-1656-01	14' 0" (4.26 m)	20A, 250 VAC	Figure A-25
North America 277 VAC operation	CAB-AC-20A-SG-US4	37-1645-01	14' 0" (4.26 m)	20A, 277 VAC	Figure A-26
North America Cabinet Jumper Power distribution unit (PDU)	CAB-AC-20A-SG-C20	37-1653-01	14' 0" (4.26 m)	20A, 250 VAC	Figure A-27
South Africa	CAB-AC-16A-SG-SA	37-1647-01	14' 0" (4.26 m)	16A, 250 VAC	Figure A-28
Korea	CAB-AC-16A-SG-SK	37-1646-01	14' 0" (4.26 m)	16A, 250 VAC	Figure A-29
Switzerland	CAB-AC-16A-SG-SW	37-1654-01	14' 0" (4.26 m)	16A, 250 VAC	Figure A-30
International, IEC/EU, Ring Terminal source plug	CAB-HV-25A-SG-IN2	37-1640-01	14' 0" (4.26 m)	20A, 300 VAC/500 VDC	Figure A-31
International, IEC/EU	CAB-HV-25A-SG-IN3	37-100904-01	14' 0" (4.26 m)	20A, 300 VAC	Figure A-32
North America, Ring Terminal source plug	CAB-HV-25A-SG-US2	37-1641-01	14' 0" (4.26 m)	20A, 300 VAC/500 VDC	Figure A-33
North America	CAB-HV-25A-SG-US5	37-100903-01	14' 0" (4.26 m)	20A, 300 VAC	Figure A-34

Note All cables will not be orderable at first customer shipment (FCS).

Figure A-13 CAB-AC-16A-SG-AR Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit

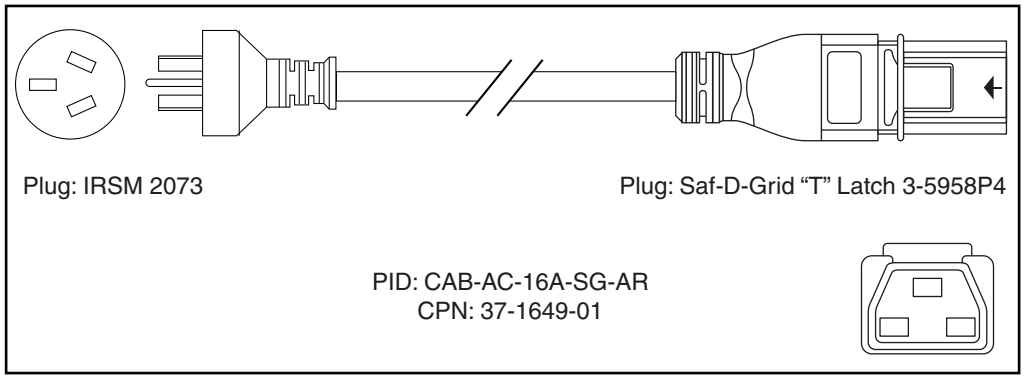


Figure A-14 CAB-AC-16A-SG-AZ Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit

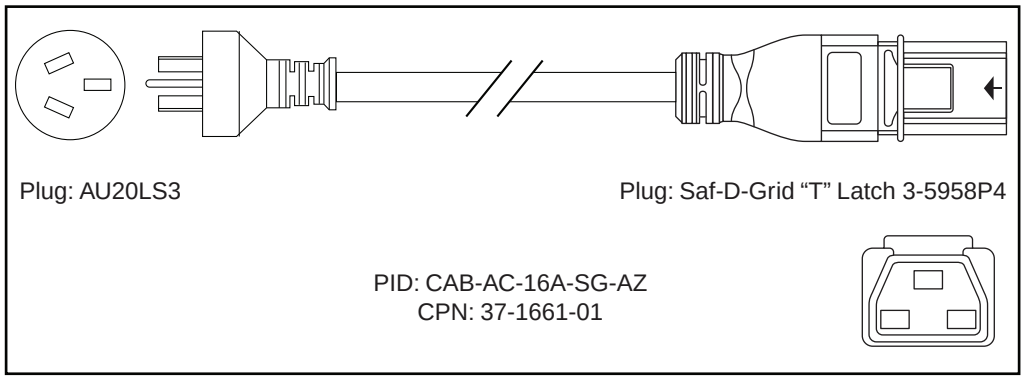


Figure A-15 CAB-AC-16A-SG-BR Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit

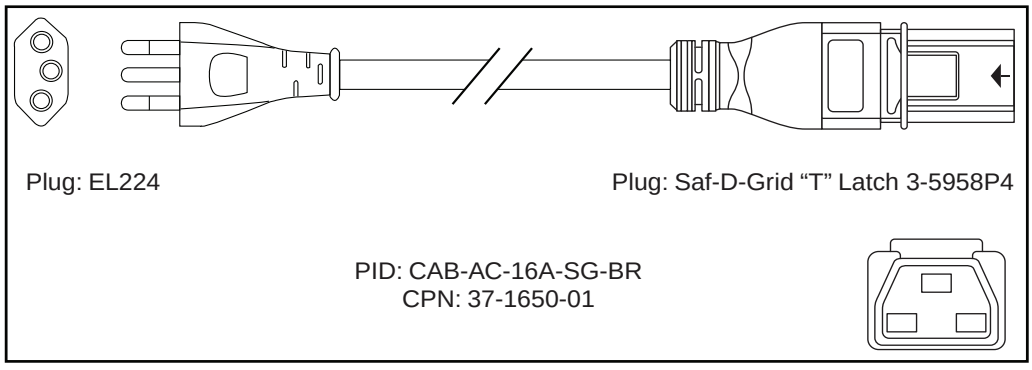


Figure A-16 CAB-AC-16A-SG-CH Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit

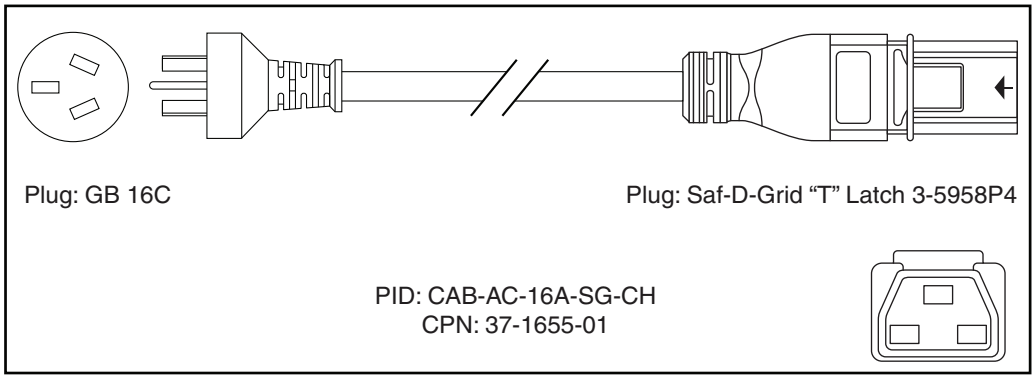


Figure A-17 CAB-AC-16A-SG-EU Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit

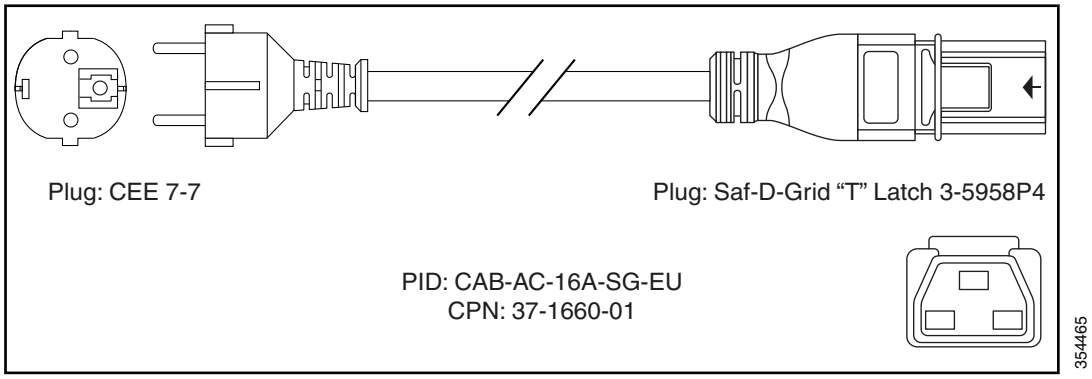


Figure A-18 CAB-AC-16A-SG-IND Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit

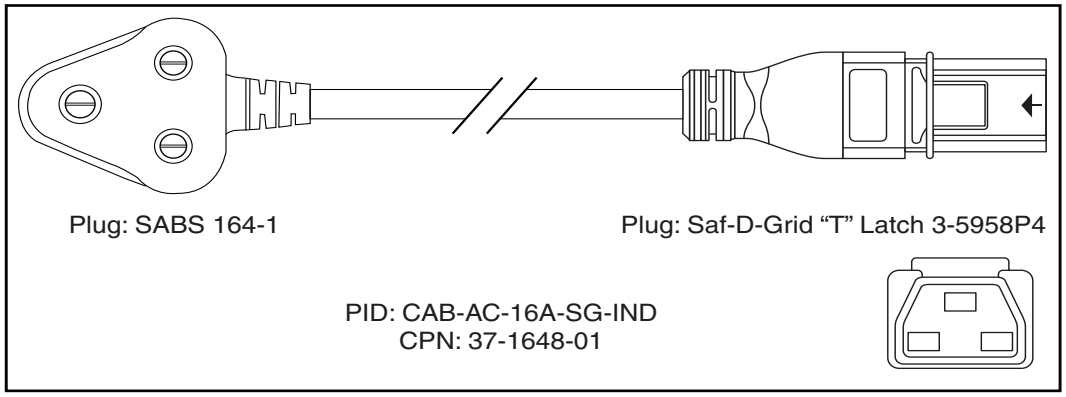


Figure A-19 CAB-AC-16A-SG-IN Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit

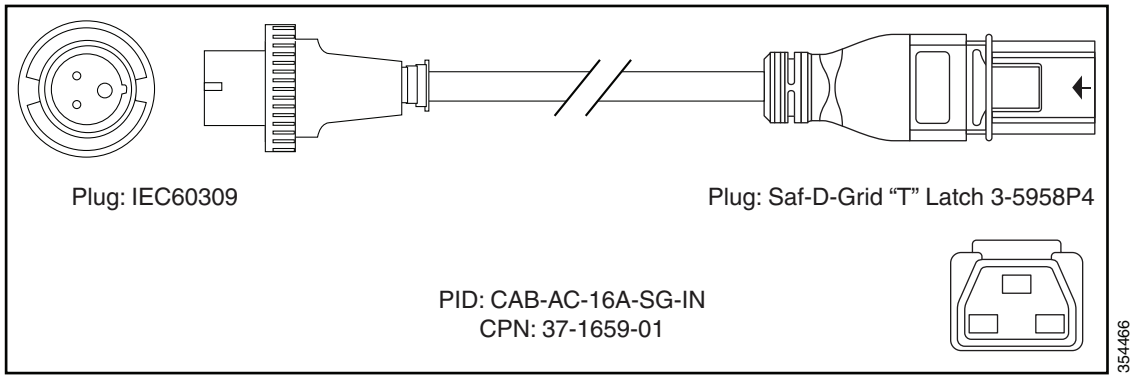


Figure A-20 CAB-AC-16A-SG-IS Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit

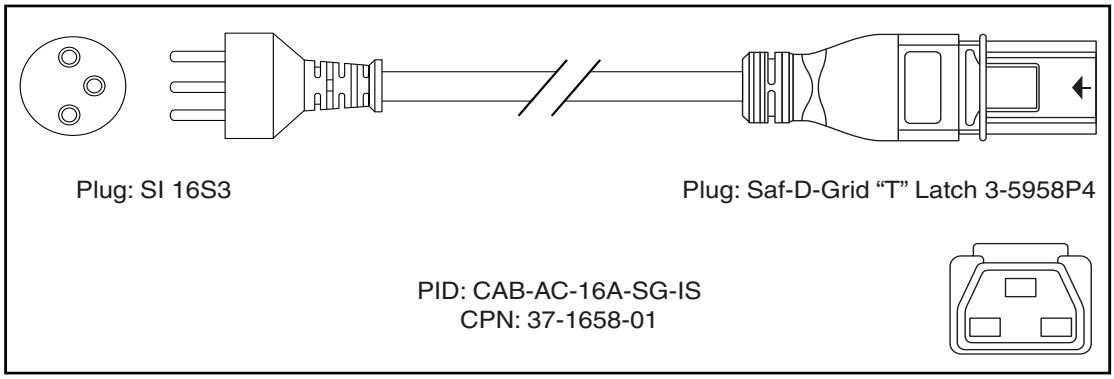


Figure A-21 CAB-AC-16A-SG-IT Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit

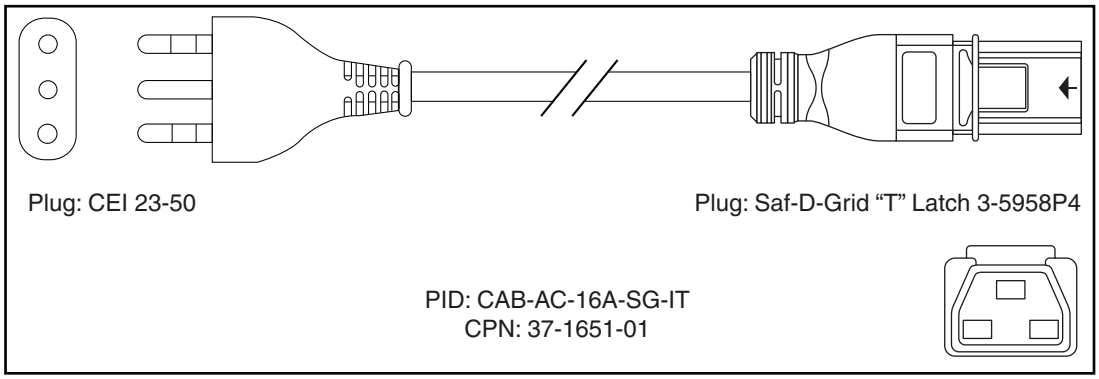


Figure A-22 CAB-AC-20A-SG-US Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit

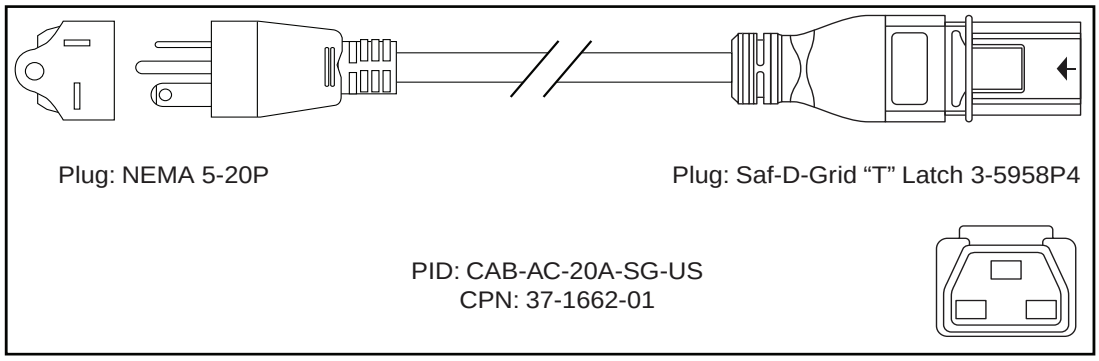


Figure A-23 CAB-AC-20A-SG-US1 Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit

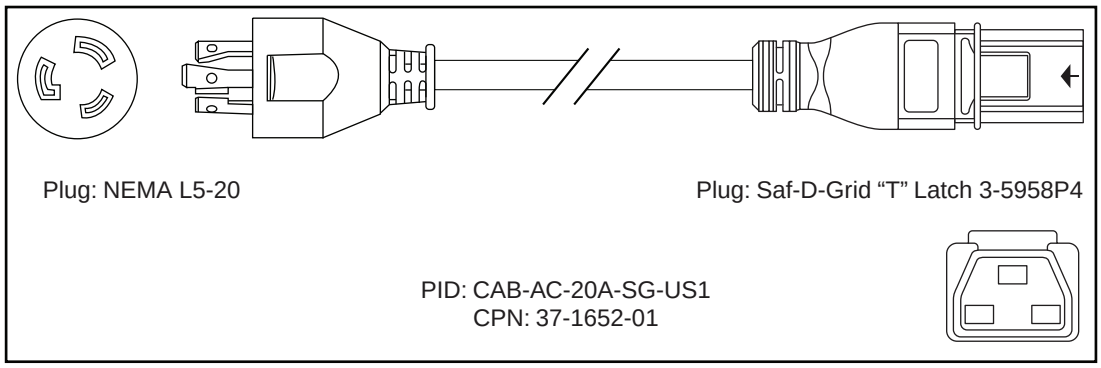


Figure A-24 CAB-AC-20A-SG-US2 Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit

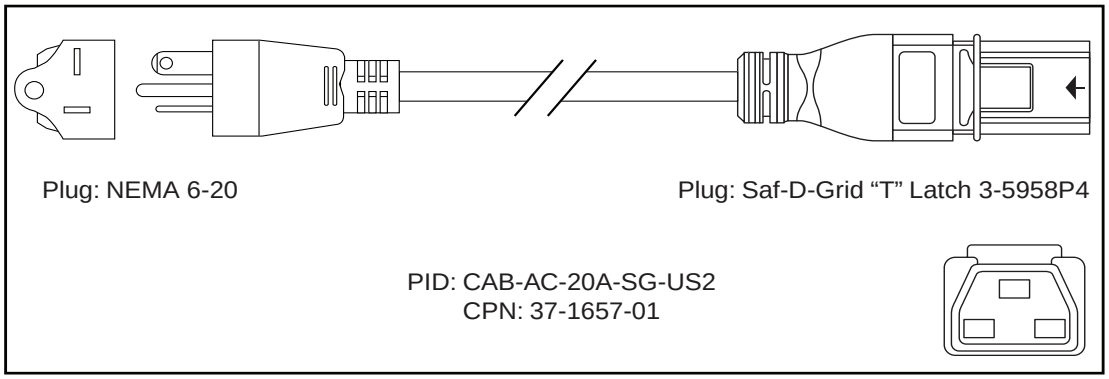


Figure A-25 CAB-AC-20A-SG-US3 Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit

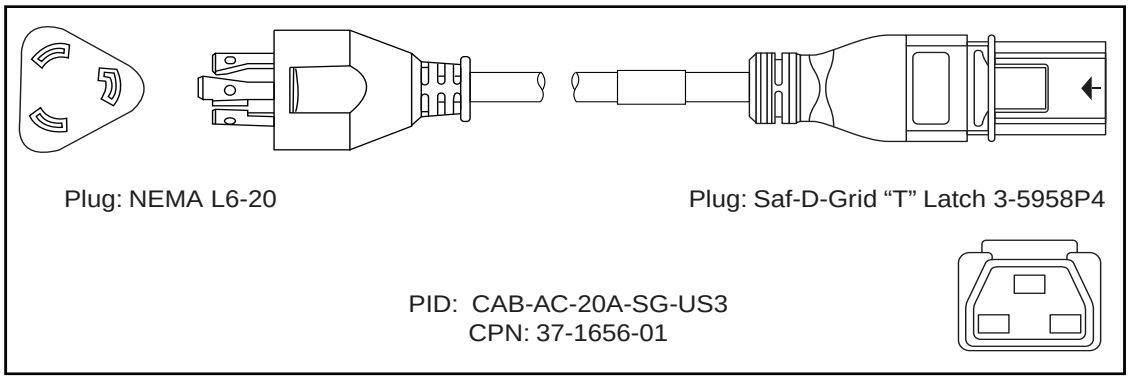


Figure A-26 CAB-AC-20A-SG-US4 Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit

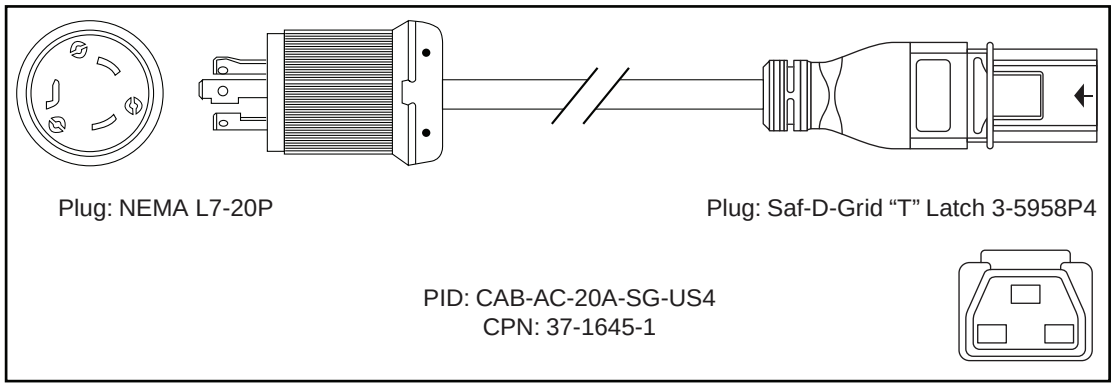


Figure A-27 CAB-AC-20A-SG-C20 Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit

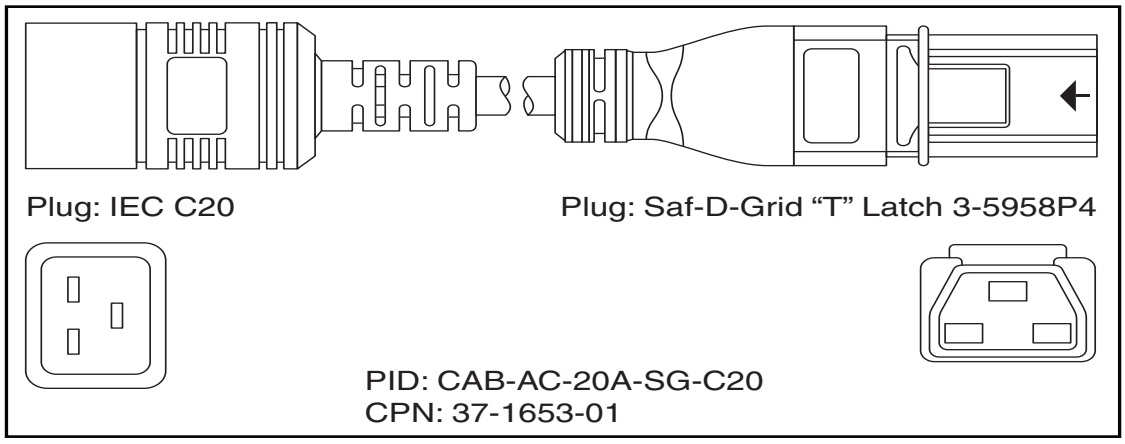


Figure A-28 CAB-AC-16A-SG-SA Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit

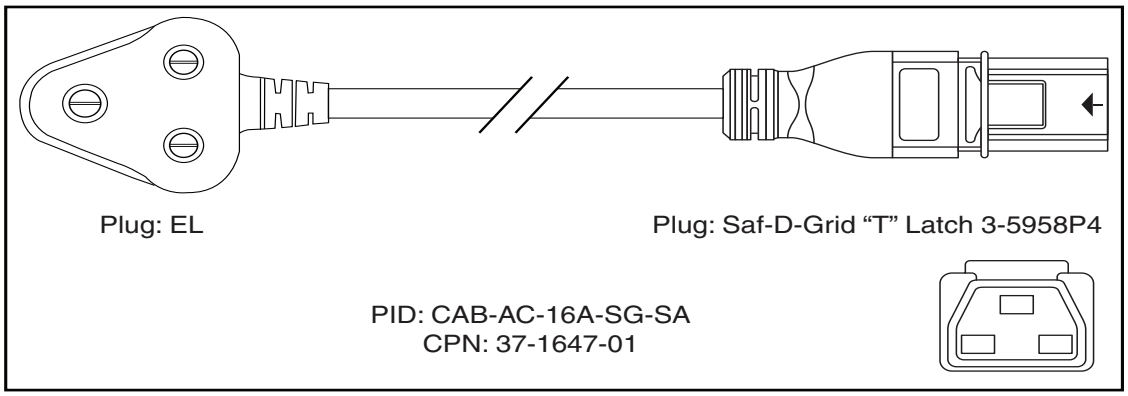


Figure A-29 CAB-AC-16A-SG-SK Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit

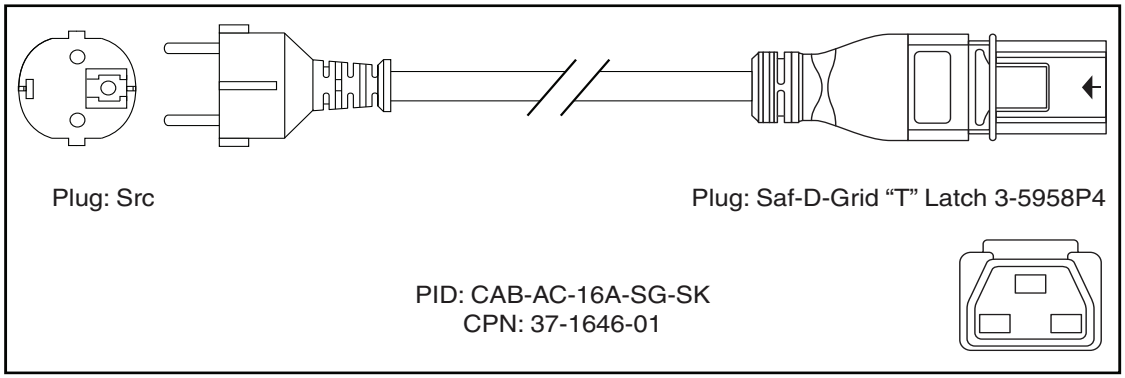


Figure A-30 CAB-AC-16A-SG-SW Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit

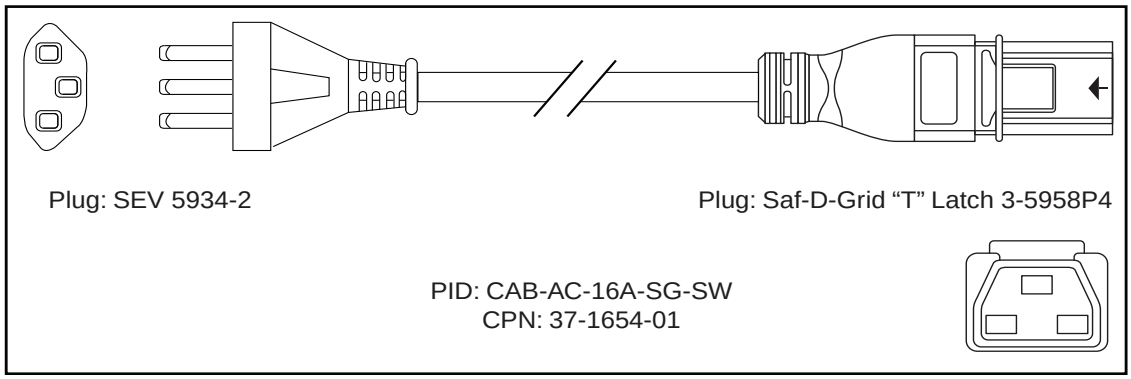


Figure A-31 CAB-HV-25A-SG-IN2 Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit

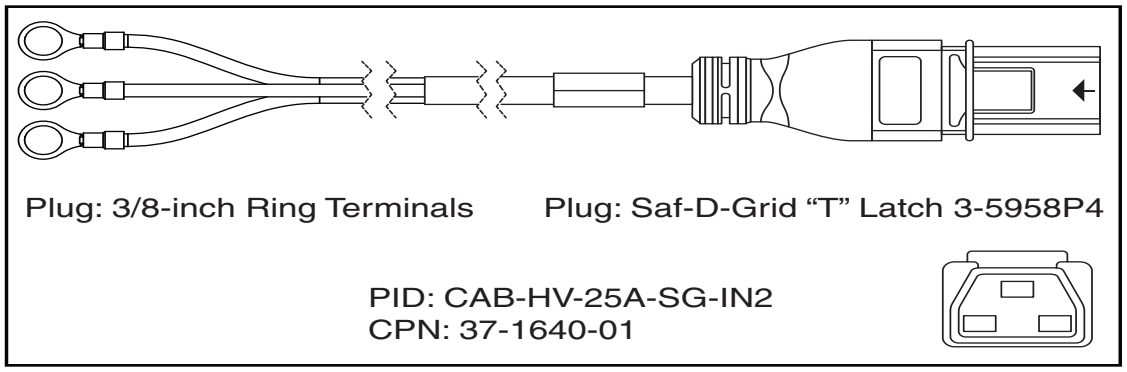


Figure A-32 CAB-HV-25A-SG-IN3 Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit

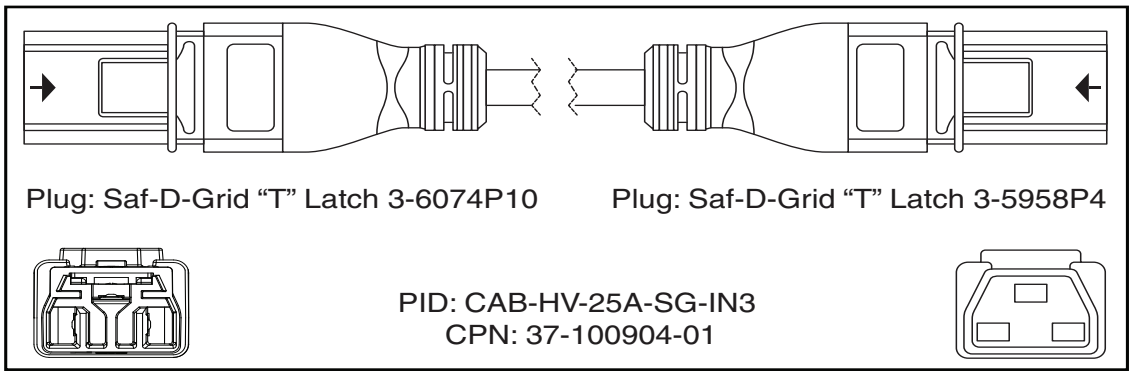


Figure A-33 CAB-HV-25A-SG-US2 Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit

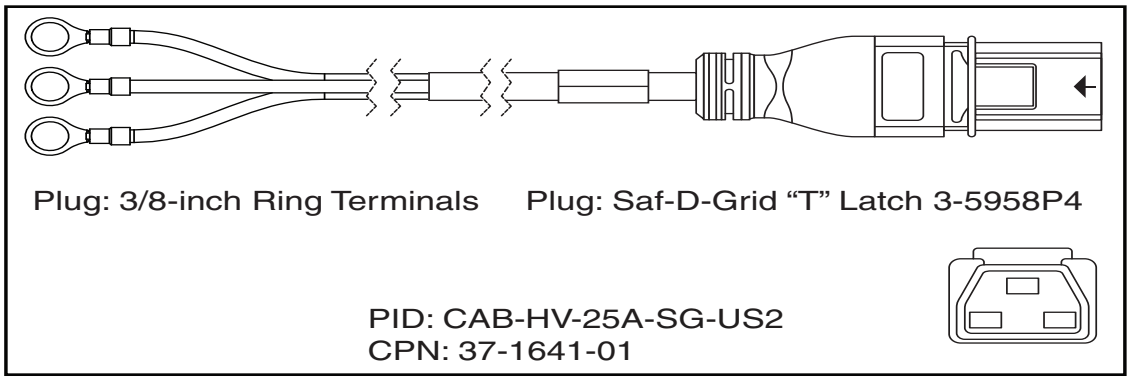


Figure A-34 CAB-HV-25A-SG-US5 Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit

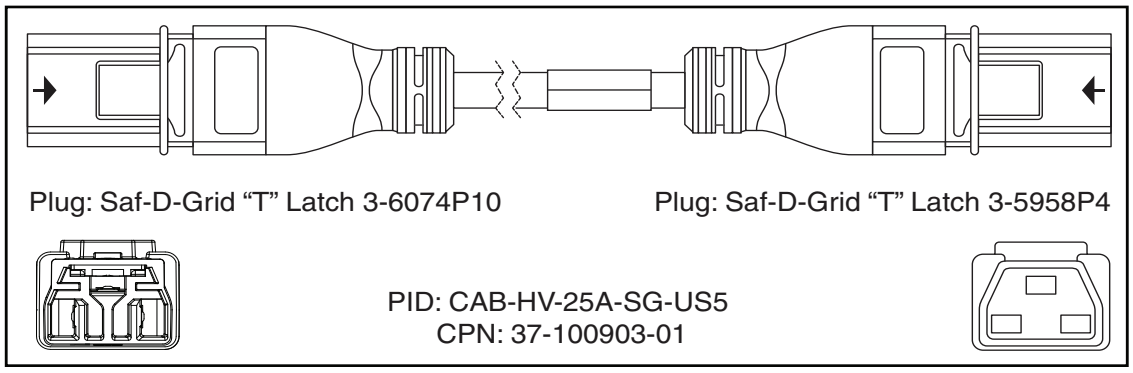


Table A-20 7.5-kW AC Power Supply Power Cord

Locale	Power Supply Part Number	Cord rating	Power cord reference illustration
Japan and North America	N7K-AC-7.5KW-US	30 A, 250 VAC	Figure A-35
International	N7K-AC-7.5KW-INT	32 A, 250 VAC	Figure A-36

Figure A-35 NEMA L6-30 Power Connector for the 7.5-kW AC Power Supply Unit

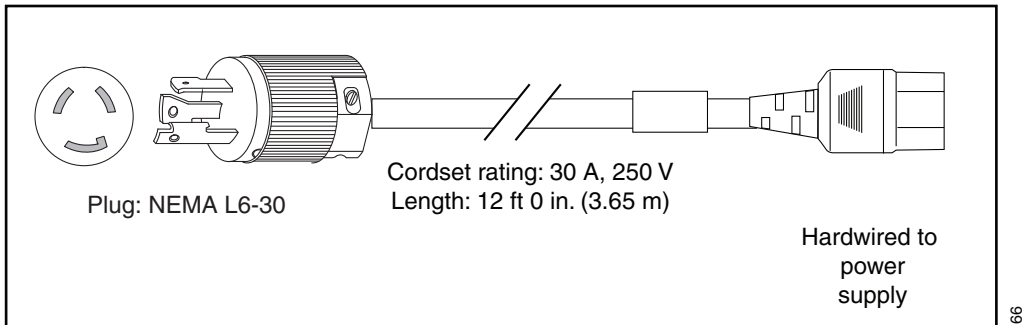


Figure A-36 IEC 603090 Power Connector for the 7.5-kW AC Power Supply Unit

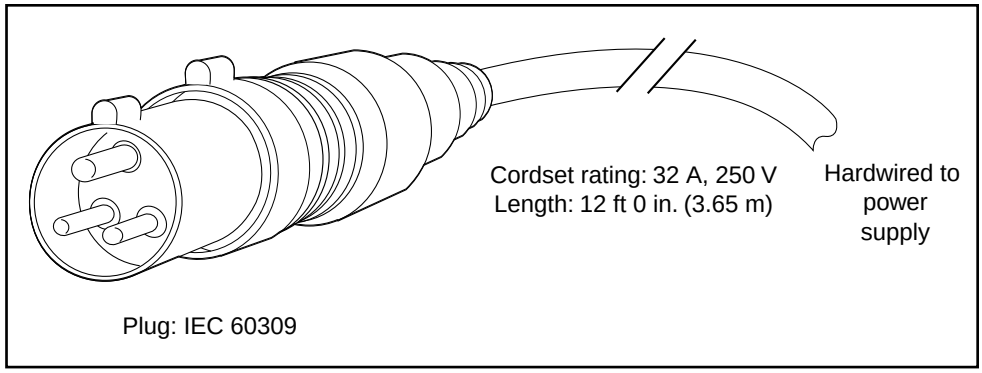


Table A-21 3-kW DC Power Supply Power Cord

Locale	Part Number	Cord Ratings	Power Cord Comments
All	—[1]	45 A	6 AWG

1. Power cords used for the 3-kW DC power supply are supplied by the customer.

Table A-22 3.5-kW HVAC/HVDC Power Supply DC Power Cords

Locale	Part Number	Cisco Part Number (CPN)	Length	Cord Ratings	Power Cord Reference Illustration
North America	CAB-HV-25A-SG-US1	37-1643-01	14' 0" (4.26 m)	20 A, 400 VDC	Figure A-37
North America, Ring Terminal source plug	CAB-HV-25A-SG-US2	37-1641-01	14' 0" (4.26 m)	20 A, 300 VAC/500 VDC	Figure A-38
International	CAB-HV-25A-SG-IN1	37-1642-01	14' 0" (4.26 m)	20 A, 400 VDC	Figure A-39
International, Ring Terminal source plug	CAB-HV-25A-SG-IN2	37-1640-01	14' 0" (4.26 m)	20 A, 300 VAC/500 VDC	Figure A-40

Note All cables will not be orderable at first customer shipment (FCS).

Figure A-37 CAB-HV-25A-SG-US1 Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply

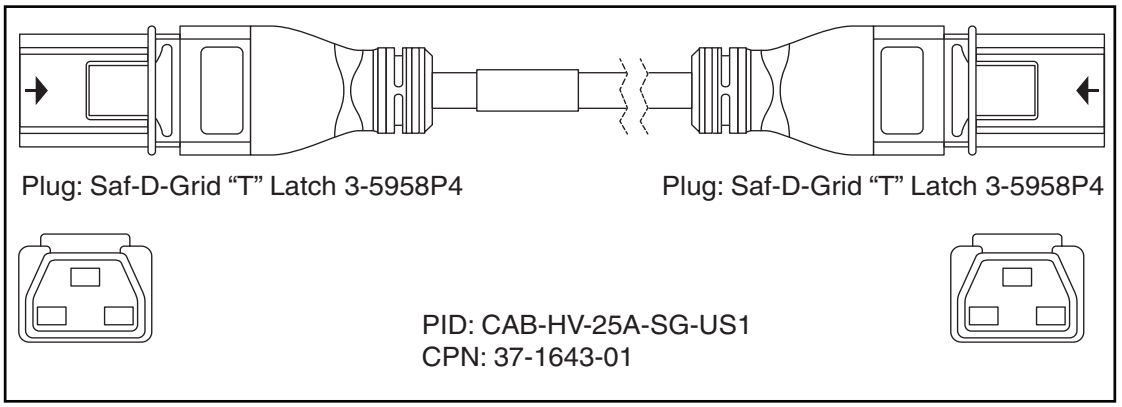


Figure A-38 CAB-HV-25A-SG-US2 Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply

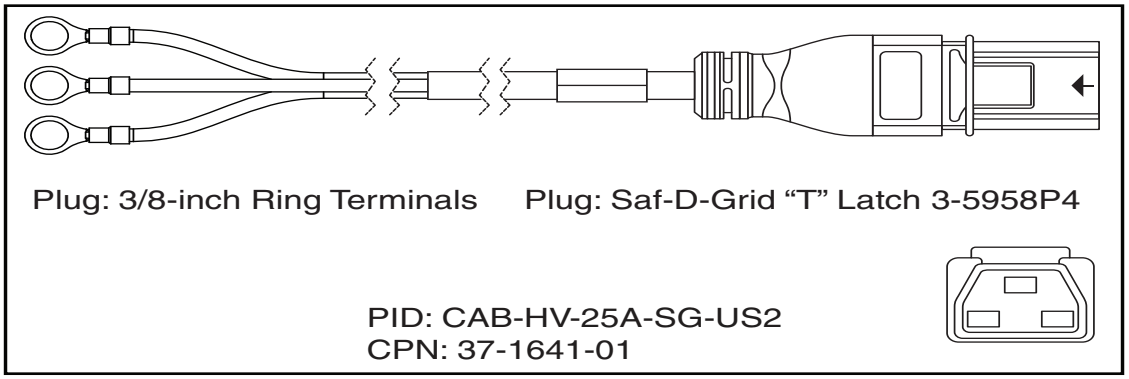


Figure A-39 CAB-HV-25A-SG-IN1 Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply Unit

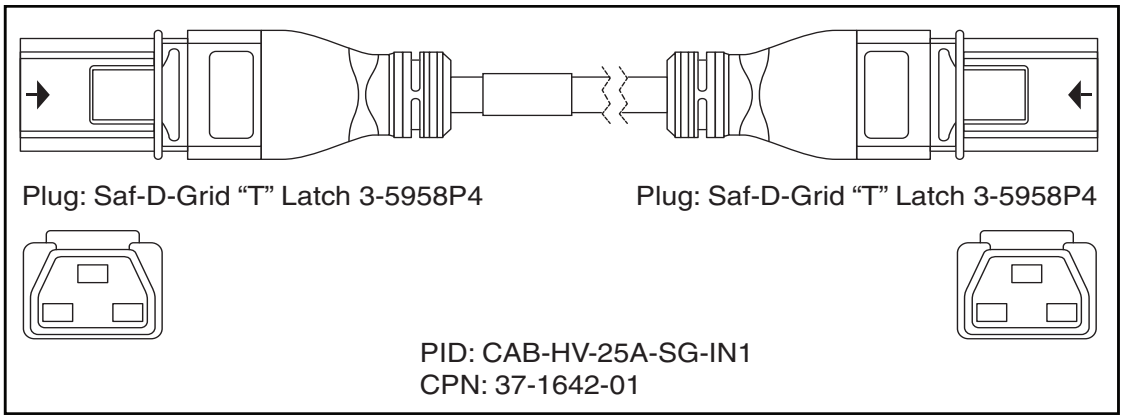


Figure A-40 CAB-HV-25A-SG-IN2 Power Cord and Plugs for the 3.5-kW HVAC/HVDC Power Supply

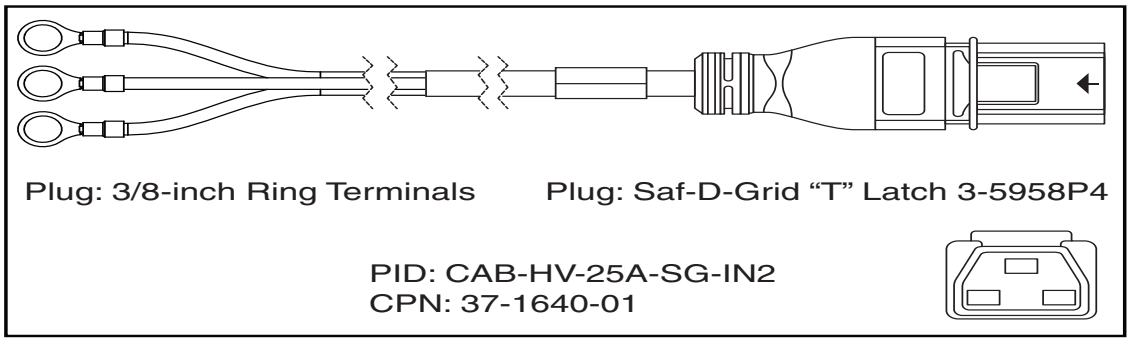
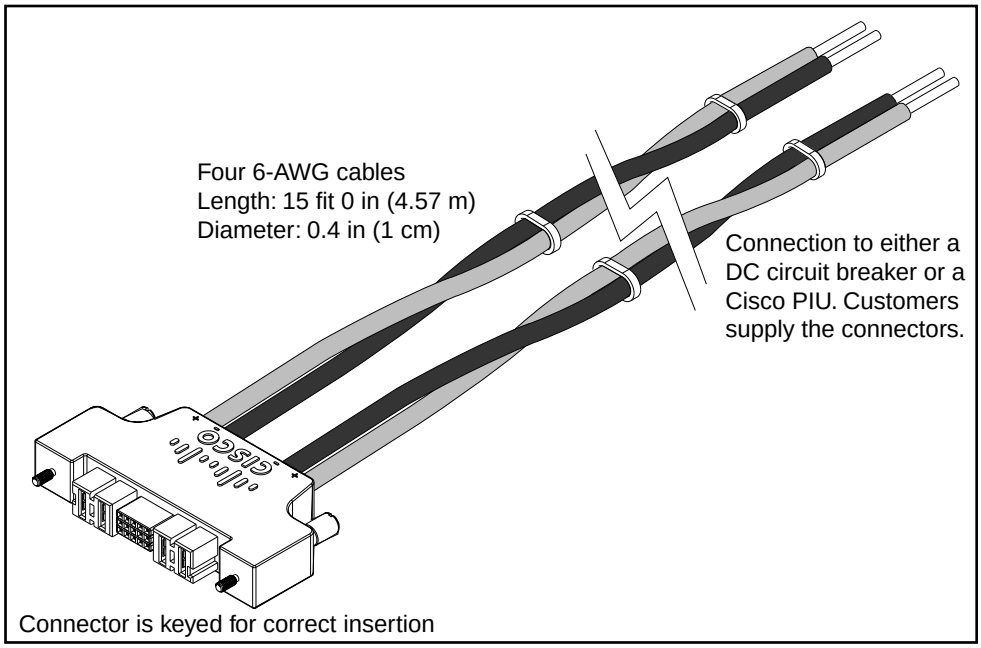


Table A-23 6-kW DC Power Supply Power Cord

Locale	Part Number	Cord Rating	Power Cord Reference Illustration
All	N7K-DC-CAB	40 A, 48V-48V	Figure A-41

Figure A-41 Power Connector for the 6.0-kW DC Power Supply Unit



Chassis Clearances

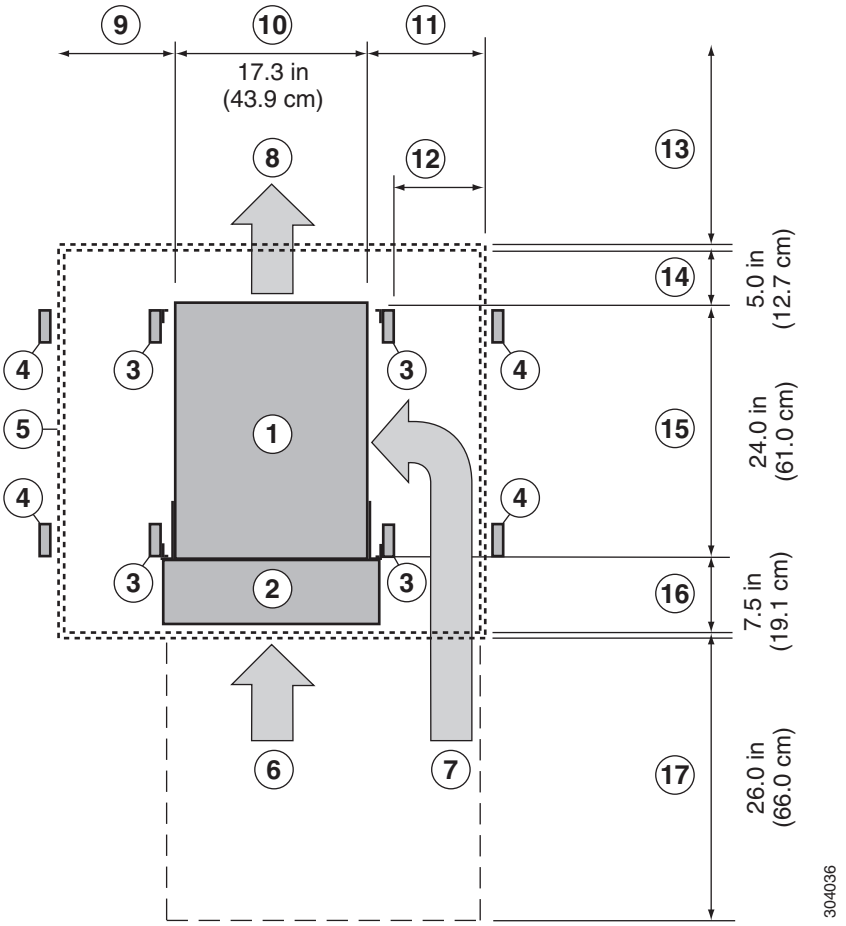
You must provide each Cisco Nexus 7000 Series switch with adequate clearance for installation, maintenance, cabling, and airflow. Installation clearance includes the cold aisle spacing required in front of the rack or cabinet to allow you to move the switch with a mechanical lift to its rack or cabinet. Maintenance clearance is the hot or cold aisle spacing required to replace supervisor, I/O, fabric, fan, and power supply modules. Cabling clearance provides the required space in front of the chassis (often within a cabinet) for cables to bend and connect to the chassis. Airflow clearance is typically the spacing on the left or right of the chassis for side-to-side airflow into and out of the chassis. If a chassis has front-to-back airflow, it uses the maintenance clearance for airflow instead of airflow clearance on the sides of the chassis.

This section includes the following topics:

Cisco Nexus 7004 Chassis Clearances

The Cisco Nexus 7004 chassis requires front clearance for cable management and maintenance, right side clearance for cooling air intake, and an unobstructed rear for exhausing air to the hot aisle behind the chassis. For the front, the cable management frames require 7.5 inches (19.1 cm) of clearance in front of the mounting rails and an additional 26 inches (66.0 cm) in front of the cable management frames or the cabinet door for maintenance. If you install the chassis with the optional center-mount bracket in place of the standard front-mount bracket, you must add 5.7 inches (14.4 cm) to the front clearance in front of the mounting rails on the rack. For cabinet installations, we recommend a right-side clearance of 11 inches (27.9 cm) between the switch and the inside of the cabinet. For rack installations, we recommend a right-side clearance of either 6 inches (15.2 cm) between racks or 11 inches (27.9 cm) between the chassis and a wall. The rear of the chassis must be unobstructed and open to the hot aisle in back of the switch for airflow exhaust. Figure A-42 shows the required clearances for a chassis in a four-post rack with a front-mount installation. Figure A-43 on page A-42 shows the required clearances for a chassis in a two-post rack with a front-mount installation. Figure A-44 on page A-44 shows the required clearances for chassis in a two-post rack with a center-mount installation.

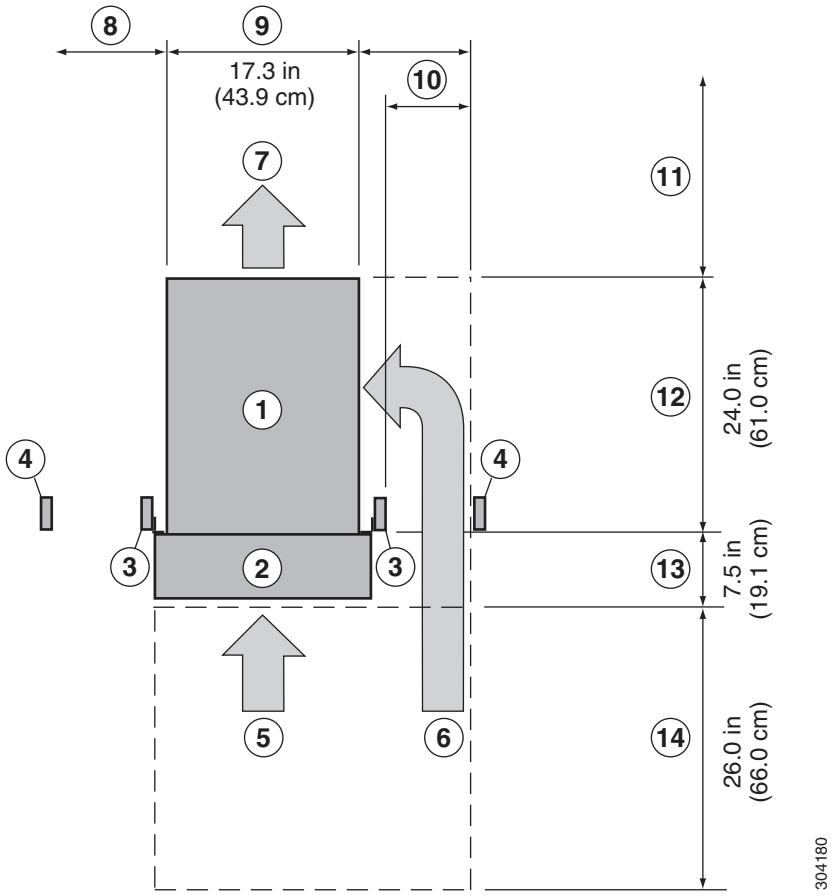
Figure A-42 Clearances Required for the Cisco Nexus 7004 in a Four-Post Rack with Front-Mount Brackets



1	Chassis	**10**	Chassis width
2	Cable management frames	**11**	Right side clearance recommended for cabinet installations: • Use 11 inches (27.9 cm).
3	Vertical rack-mount posts	**12**	Right side clearance recommended for open rack installations: • If next to another open rack, use 6 inches (15.2 cm) between racks. • If next to a wall, use 11 inches (27.9 cm) between the chassis and the wall.
4	Vertical rack-mount posts for neighboring rack	**13**	No rear clearance required but the rear must be open to the hot aisle to exhaust air
5	Inside of cabinet (no left side clearance required)	**14**	Airflow clearance required between the chassis and inside of cabinet (if a cabinet is used)
6	Air intake from cold aisle for power supplies	**15**	Chassis depth

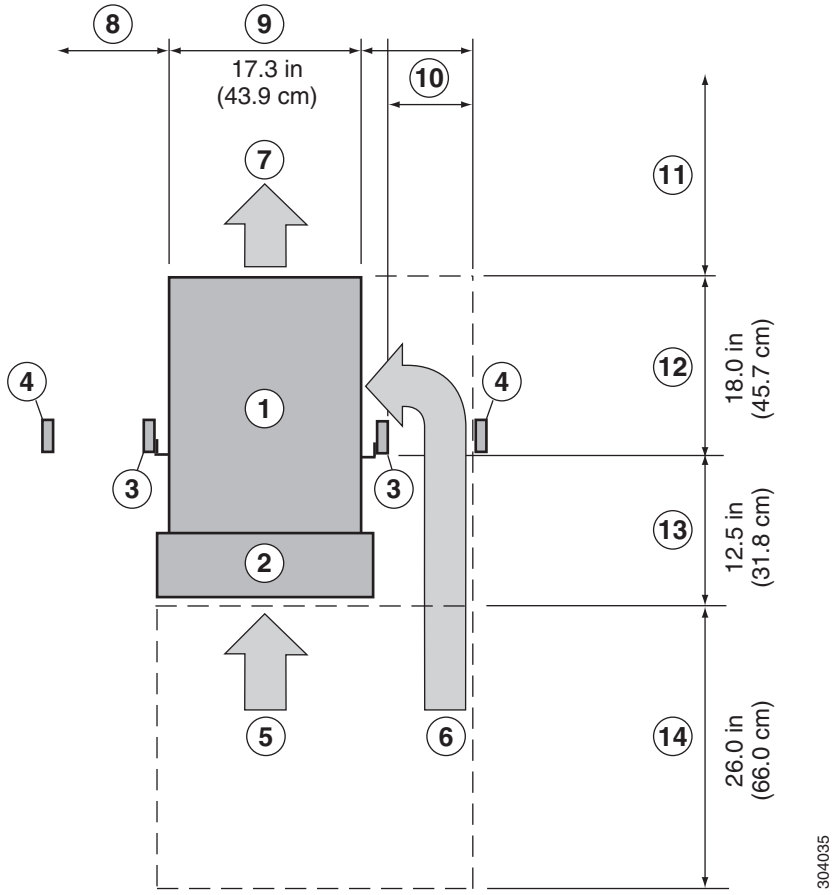
7	Air intake from cold aisle for the supervisor and I/O modules	**16**	Clearance required between the front of the chassis and the inside of the cabinet (if used) or the edge of the cold aisle (if no cabinet) for the cable management frames and the optional front doors
8	Air exhaust to hot aisle for all modules and power supplies	**17**	Front service clearance required for installing the chassis and replacing the modules
9	No left side clearance required (no airflow on left side)		

Figure A-43 Clearances Required for the Cisco Nexus 7004 in a Two-Post Rack with Front-Mount Brackets



1	Cisco Nexus 7004 chassis	**8**	No left side clearance required (no airflow on left side)
2	Cable management frames	**9**	Chassis width.
3	Vertical rack-mount posts	**10**	Right side clearance recommended for open rack installations: • If next to another open rack, use 6 inches (15.2 cm) between racks. • If next to a wall, use 11 inches (27.9 cm) between the chassis and the wall.
4	Vertical rack-mount posts for neighboring racks	**11**	No rear clearance required but the rear must be open to the hot aisle to exhaust air
5	Air intake from cold aisle for power supplies	**12**	Chassis depth
6	Air intake from cold aisle for the supervisor and I/O modules	**13**	Clearance required between the front of the chassis and the inside of the cabinet for the cable management frames and the optional front door
7	Air exhaust to hot aisle for all modules and power supplies	**14**	Front clearance required for installing the chassis and replacing the modules

Figure A-44 Clearances Required for the Cisco Nexus 7004 in a Two-Post Rack with Center-Mount Brackets



1	Cisco Nexus 7004 chassis	**8**	No left side clearance required (no airflow on left side)
2	Cable management frames	**9**	Chassis width
3	Vertical rack-mount posts	**10**	Right side clearance recommended for open rack installations: • If next to another open rack, use 6 inches (15.2 cm) between racks. • If next to a wall, use 11 inches (27.9 cm) between chassis and wall.
4	Vertical rack-mount posts for neighboring rack	**11**	No rear clearance required but the rear must be open to the hot aisle to exhaust air

5	Air intake from cold aisle for power supplies	**12**	Distance from front of vertical rack-mount posts to rear of chassis
6	Air intake from cold aisle for the supervisor and I/O modules	**13**	Clearance required between the front of the chassis and the inside of the chassis for the cable management frames and the optional front doors
7	Air exhaust to hot aisle for all modules and power supplies	**14**	Front service clearance required for installing the chassis and replacing the modules

Cisco Nexus 7009 Chassis Clearances

The Cisco Nexus 7009 chassis has different clearance requirements for installations with four-post racks or cabinets, two-post racks with front-mount brackets, and two-post racks with center-mount brackets.

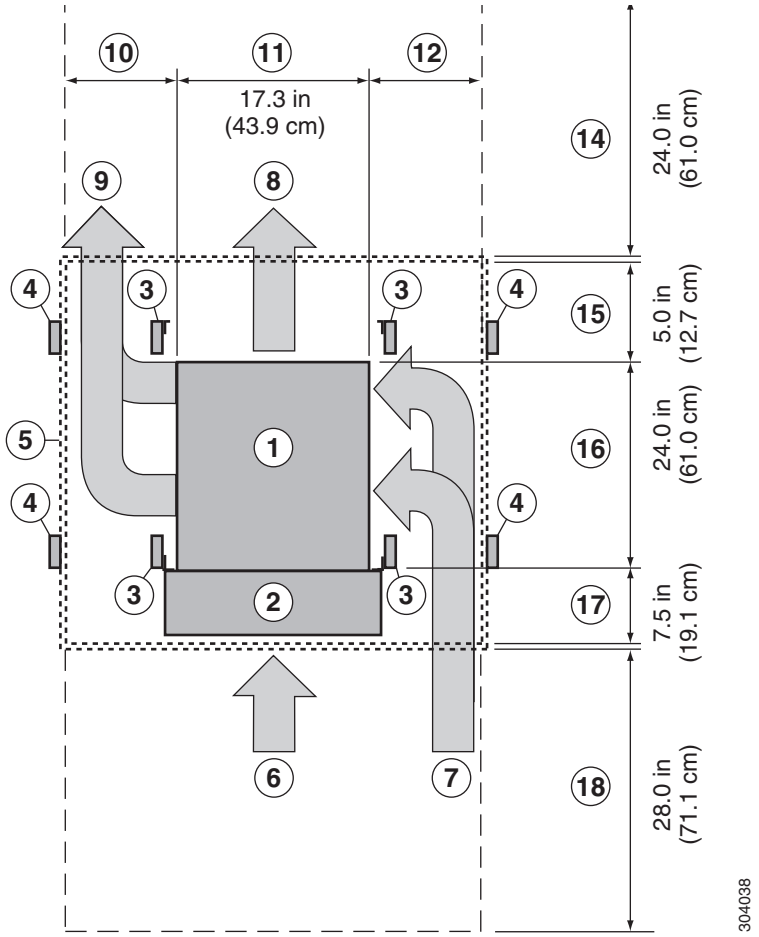
For four-post rack or cabinet installations, the chassis requires the following clearances (see Figure A-45):

- Front clearance requires both of the following:
  - Cabling area of 7.5 inches (19.1 cm) between the front of the chassis and the inside surface of the cabinet or rack (this area can include the optional cable management frames)
  - Maintenance area of 24 inches (61.1 cm) between the front of the rack or cabinet and the next object in the cold aisle.

Note You might need to increase the maintenance area to accommodate a wide mechanical lift used to move the chassis to or from the rack.

- Rear clearance includes both of the following:
  - Cabling area of 7 inches (17.8 cm) between the rear of the chassis and the inside surface of the cabinet or rack
  - Maintenance area of 24 inches (61.1 cm) between the rear of the rack or cabinet and the next object in the hot aisle
- Side clearance of 11 inches (27.9 cm) for air flow on each side of the chassis.

Figure A-45 Clearances Required for a Front-Mounted Cisco Nexus 7009 Chassis in a Four-Post Rack



1	Cisco Nexus 7009 chassis	**10**	Left side clearance required with an unobstructed opening to the hot aisle to exhaust air
2	Cable management frames	**11**	Chassis width
3	Vertical rack-mount post	**12**	Side clearance recommended for cabinet installations: • use 11 inches (27.9 cm)
4	Vertical rack-mount post for neighboring rack	**13**	Side clearance recommended for open rack installations: • If next to another open rack, use 6 inches (15.2 cm). • If next to a wall, use 11 inches (27.9 cm).
5	Nearest object or inside of cabinet	**14**	Rear service clearance required to replace fan trays and fabric modules
6	Air intake from cold aisle for the power supplies	**15**	Airflow clearance required between the chassis rear and inside of cabinet (if used)

7	Air intake from cold aisle for the supervisor, fabric, and I/O modules	**16**	Chassis depth
8	Air exhaust to hot aisle for power supplies	**17**	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
9	Air exhaust to hot aisle for the supervisor, fabric, and I/O modules	**18**	Front clearance required for installing the chassis and replacing the modules

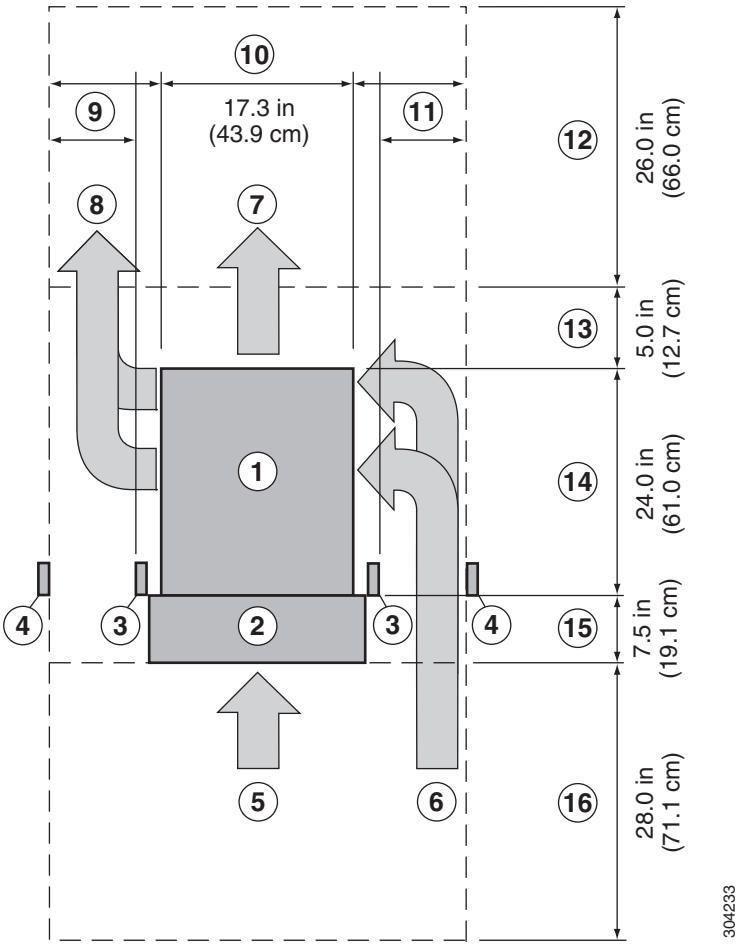
For two-post rack installations with front-mount brackets, the chassis requires the following clearances (see Figure A-46):

- Front clearance requires both of the following:
  - Cabling area of 7.5 inches (19.1 cm) between the front of the chassis and the cold aisle (this area can include the optional cable management frames)
  - Maintenance area of 28 inches (71.1 cm) in front of the cabling area for installing the chassis and replacing modules

Note You might need to increase the maintenance area to accommodate a wide mechanical lift used to move the chassis to or from the rack.

- Rear clearance requires 26 inches (66.0 cm) behind the chassis for cable management and for replacing modules and power supplies
- Side clearance recommendation depends on whether you use a rack or cabinet for the installation as follows:
  - For cabinet installations, we recommend that you use 11 inches (27.9 cm) for airflow on each side of the chassis.
  - For rack installations, we recommend 11 inches (27.9 cm) between the chassis and a wall or 6 inches (15.2 cm) between racks.

Figure A-46 Clearances Required for a Front-Mounted Cisco Nexus 7009 Chassis in a Two-Post Rack



1	Cisco Nexus 7009 chassis	**9**	Side clearance required for open rack installations: • If next to another open rack, use 6 inches (15.2 cm). • If next to a wall, use 11 inches (27.9 cm).
2	Cable management frames	**10**	Chassis width
3	Vertical rack-mount post	**11**	Side clearance required for open rack installations: • If next to another open rack, use 6 inches (15.2 cm). • If next to a wall, use 11 inches (27.9 cm).
4	Vertical rack-mount post for neighboring rack	**12**	Rear service clearance required to replace fan trays and fabric modules
5	Air intake from cold aisle for the power supplies	**13**	Airflow clearance required between the chassis and inside of cabinet (if used)

6	Air intake from cold aisle for the supervisor, fabric, and I/O modules	**14**	Chassis depth
7	Air exhaust to hot aisle for power supplies	**15**	Clearance required between the front of the chassis and edge of cold aisle for the cable management frames and the optional front doors
8	Air exhaust to hot aisle for the supervisor, fabric, and I/O modules	**16**	Front clearance required for installing the chassis and replacing the modules

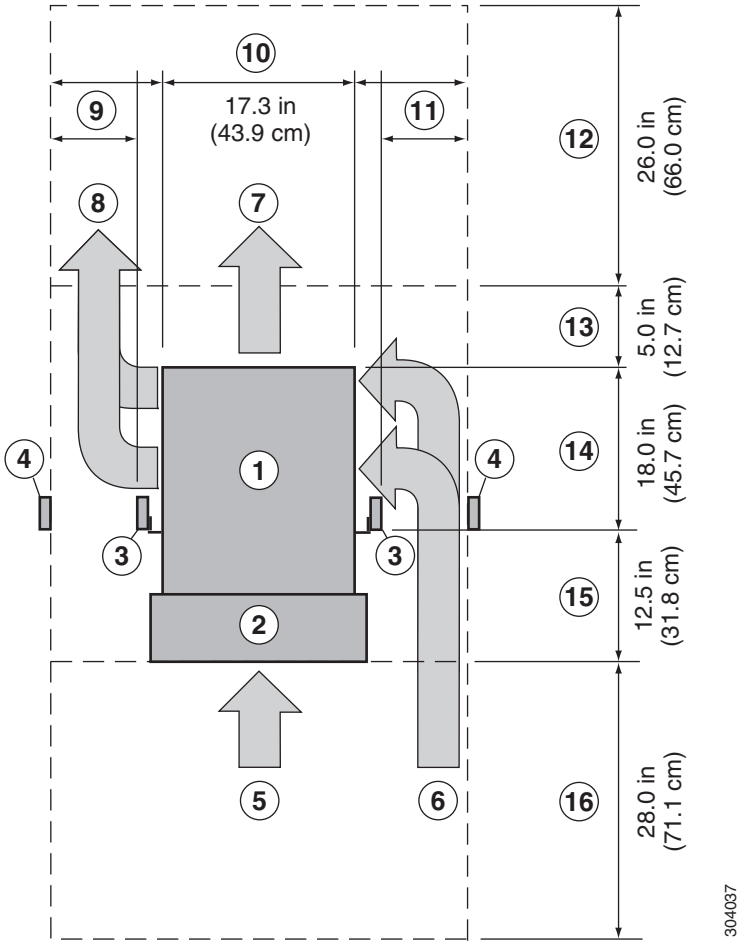
For two-post rack installations with center-mount brackets, the chassis requires the following clearances (see Figure A-47):

- Front clearance of 37 inches (94.0 cm) for both of the following:
  - Cabling area of 13.5 inches (34.3 cm) between the front of the posts (posts are 6 inches (15.2 cm) behind the front of the chassis)
  - Maintenance area of 26 inches (66.0 cm) in front of the cabling area for installing the chassis and replacing modules.

Note You might need to increase the maintenance area to accommodate a wide mechanical lift used to move the chassis to or from the rack.

- Rear clearance of 26 inches (66.0 cm) behind the chassis for cable management and for replacing the fan modules and power supplies.
- Side clearance of 11 inches (27.9 cm) for airflow on each side of the chassis.

Figure A-47 Clearances Required for a Center-Mounted Cisco Nexus 7009 Chassis in a Two-Post Rack



1	Cisco Nexus 7009 chassis	**9**	Right side clearance (for rack installations) recommended to input air from the cold aisle: • If next to another open rack, use 6 inches (15.2 cm). • If next to a wall, use 11 inches (27.9 cm).
2	Cable management frames	**10**	Chassis width
3	Vertical rack-mount posts	**11**	Right side clearance (for rack installations) recommended to input air from the cold aisle: • If next to another open rack, use 6 inches (15.2 cm). If next to a wall, use 11 inches (27.9 cm).
4	Vertical rack-mount post for neighboring rack	**12**	Rear service clearance required to replace fan trays and fabric modules
5	Air intake from cold aisle for power supplies	**13**	Airflow clearance required between the chassis and inside of cabinet (if used)

6	Air intake from cold aisle for the supervisor, fabric, and I/O modules	**14**	Chassis depth
7	Air exhaust to hot aisle for the power supplies	**15**	Clearance required between the front of the chassis and the front of the cable management frames and the optional front doors
8	Air exhaust to hot aisle for the supervisor, fabric, and I/O modules	**16**	Front service clearance required for installing the chassis and replacing the modules

Cisco Nexus 7010 Chassis Clearances

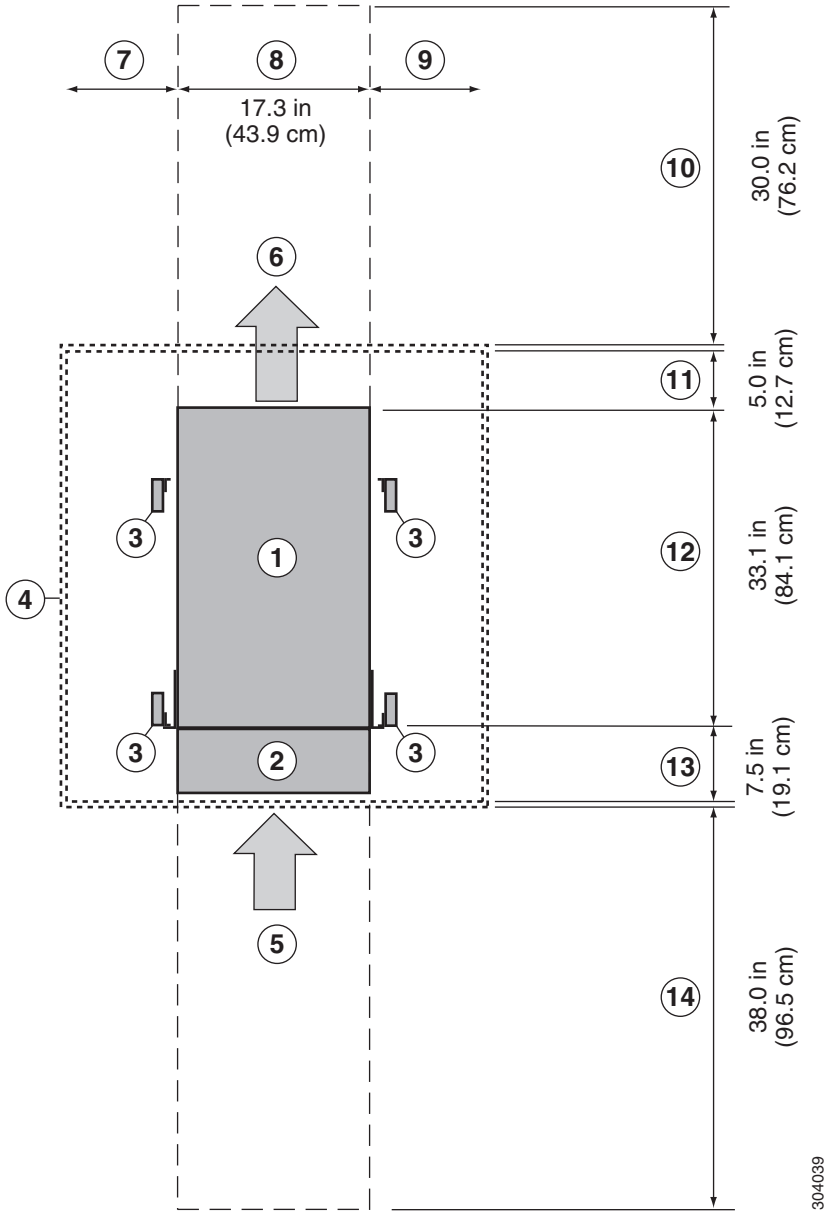
The Cisco Nexus 7010 chassis requires the following clearances (see Figure A-48):

- Front clearance of 45.5 inches (115.6 cm) for both of the following:
  - Cabling area of 7.5 inches (19.1 cm) between the front of the chassis and the inside of the cabinet or front of the rack
  - Maintenance area of 38 inches (96.5 cm) of cold-aisle passageway in front of the rack or cabinet

Note You might need to increase the maintenance area to accommodate a wide mechanical lift used to move the chassis to or from the rack.

- Rear clearance of 35 inches (88.9 cm) for both of the following:
  - Airflow area of 5 inches (12.7 cm) inside of the cabinet or rack
  - Maintenance area of 30 inches (76.2 cm) of hot-aisle passageway behind the rack or cabinet

Figure A-48 Clearances Required for the Cisco Nexus 7010 Switch



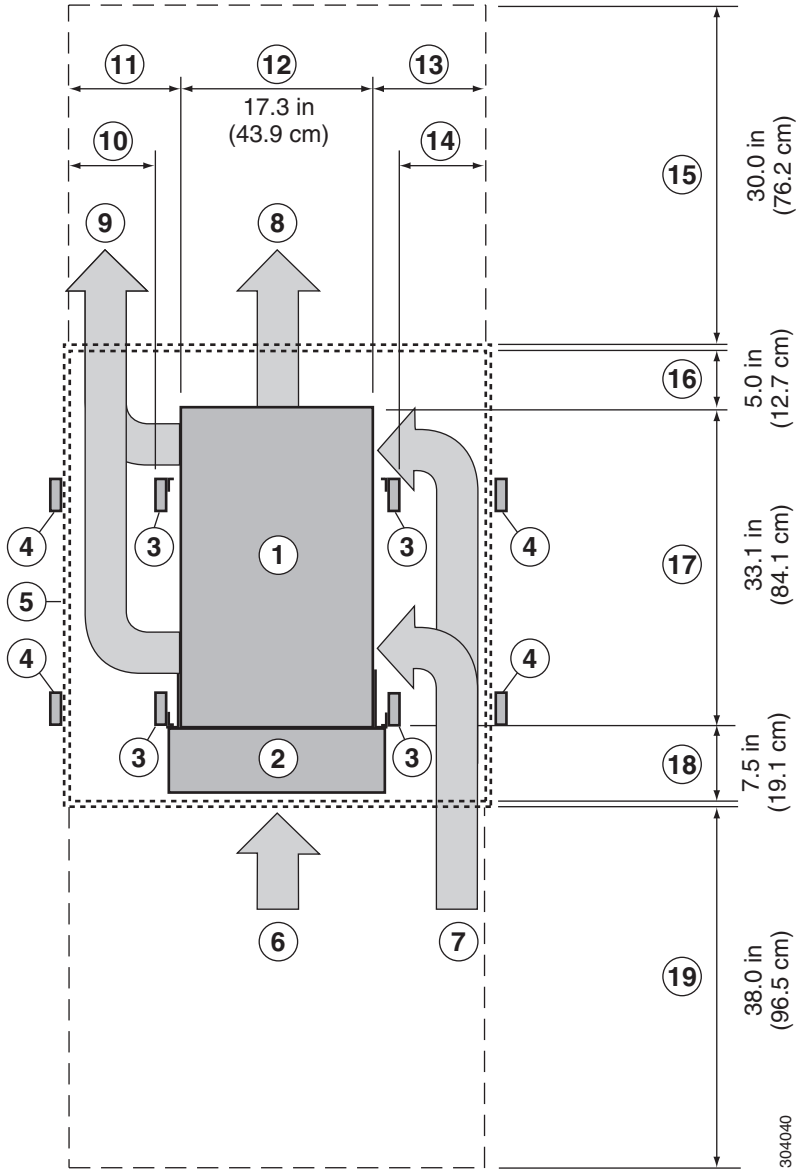
Cisco Nexus 7018 Chassis Clearances

1	Cisco Nexus 7010 chassis	**8**	Chassis width
2	Cable management system	**9**	No right side clearance required (no airflow on right side)
3	Vertical rack-mount posts	**10**	Rear service clearance required to replace fan trays and fabric modules
4	Inside of cabinet (no side clearance required)	**11**	Airflow clearance required between the chassis and inside of cabinet (if used)
5	Air intake from cold aisle for all modules and power supplies	**12**	Chassis depth, which includes the fan tray handles at the rear of the chassis
6	Air exhaust to hot aisle for all modules and power supplies	**13**	Clearance required between the front of the chassis and the inside of the cabinet (if used) or edge of the cold aisle (if no cabinet) for the cable management frames and the optional front doors
7	No left side clearance required (no airflow on left side)	**14**	Front service clearance required for installing the chassis and replacing the modules

The Cisco Nexus 7018 chassis requires the following clearances (see Figure A-49):

- Front clearance of 45 inches (114.3 cm) for both of the following:
  - Cabling area of 7.5 inches (19.1 cm) between the front of the chassis and the inside of the cabinet or front of the rack
  - Maintenance area of 38 inches (96.5 cm) between the front of the rack or cabinet and the next rack, cabinet, or wall in the cold aisle (additional area might be needed for a larger mechanical lift used to move the chassis)
- Rear clearance of 35 inches (88.9 cm) for both of the following:
  - Airflow area of 5 inches (12.7 cm) inside a cabinet (if used)
  - Maintenance area of 30 inches (76.2 cm) of hot-aisle passageway behind the rack or cabinet
- Side clearance recommendation depends on whether a cabinet or rack is used:
  - For cabinet installations, use 11 inches (27.9 cm) between the chassis and inside of the cabinet.
  - For rack installations, use either 11” (27.9 cm) between the chassis and a wall or 6” (15.2 cm) between racks.

Figure A-49 Clearances Required for the Cisco Nexus 7018 Switch



1	Cisco Nexus 7018 chassis	**11**	Side clearance recommended for cabinet installations:: • Use 11 inches (27.9 cm)
2	Cable management frames	**12**	Chassis width
3	Vertical rack-mount post	**13**	Side clearance recommended for cabinet installations:: • Use 11 inches (27.9 cm)

4	Vertical rack-mount post for neighboring rack	**14**	Side clearance recommended for open rack installations: • If next to another open rack, use 6 inches (15.2 cm). If next to a wall, use 11 inches (27.9 cm)
5	Nearest object or inside of cabinet (side clearance required for airflow)	**15**	Rear service clearance required to replace fan trays and fabric modules
6	Air intake from cold aisle for the power supplies	**16**	Airflow clearance required between the chassis and inside of cabinet (cabinet installations only)
7	Air intake from cold aisle for the supervisor, fabric, and I/O modules	**17**	Chassis depth
8	Air exhaust to hot aisle for the power supplies	**18**	Clearance required between the front of the chassis and the inside of the cabinet (cabinet installations) or edge of the cold aisle (rack installations) for the cable management frames and the optional front door
9	Air exhaust to hot aisle for the supervisor, fabric, and I/O modules	**19**	Front service clearance required for installing the chassis and replacing the modules
10	Side clearance recommended for open rack installations: • If next to another open rack, use 6 inches (15.2 cm). • If next to a wall, use 11 inches (27.9 cm).		

Facility Cooling Requirements

The Cisco Nexus 7000 Series switches dissipate considerable power that generates much heat. The following is the heat dissipation requirement for these switches:

- Cisco Nexus 7004 dissipates up to 9737 BTUs per hour
- Cisco Nexus 7009 dissipates up to 28,101 BTUs per hour
- Cisco Nexus 7010 dissipates up to 35,162 BTUs per hour
- Cisco Nexus 7018 dissipates up to 51,195 BTUs per hour

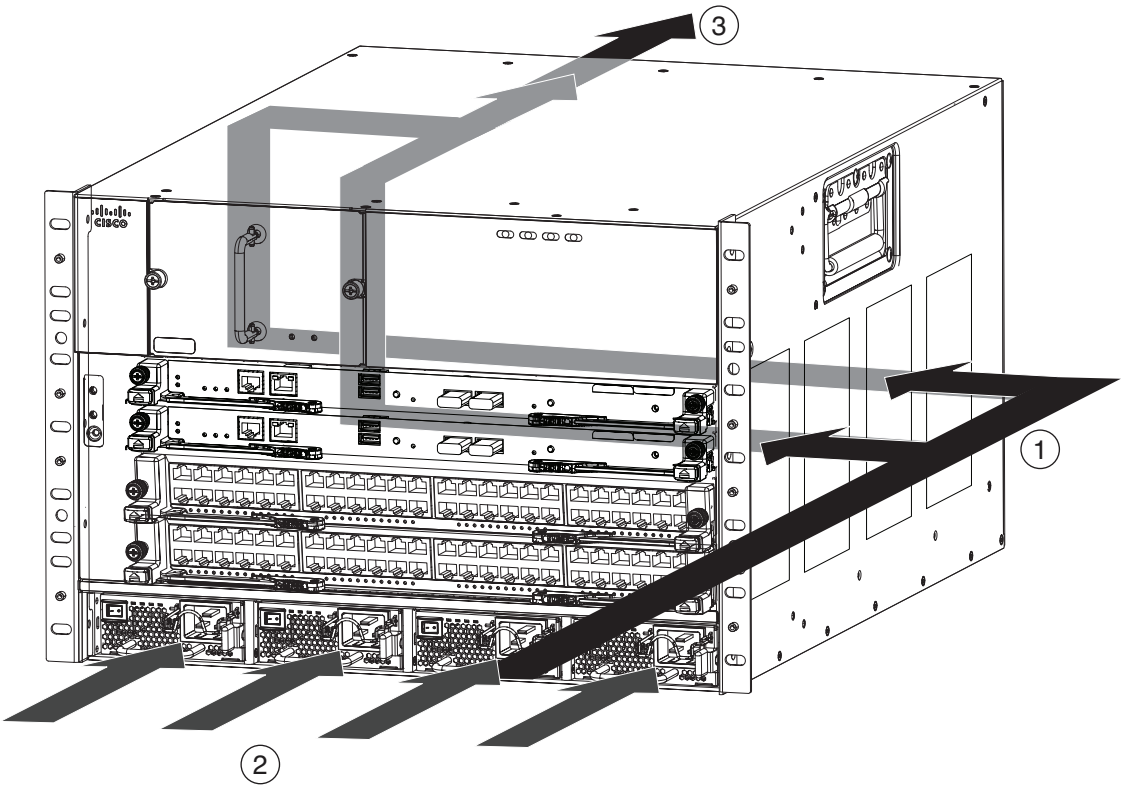
Chassis Airflow

The Cisco Nexus 7000 Series switches are designed to work in a hot-aisle/cold-aisle environment using front-to-back, side-to-side, or side-to-back airflow. Each of these switches uses one of the following airflow directions:

- The Cisco Nexus 7004 switch uses side-to-back airflow to cool its modules and front-to-back airflow to cool its power supplies as shown in Figure A-50. This switch requires right-side clearance for airflow into the chassis.

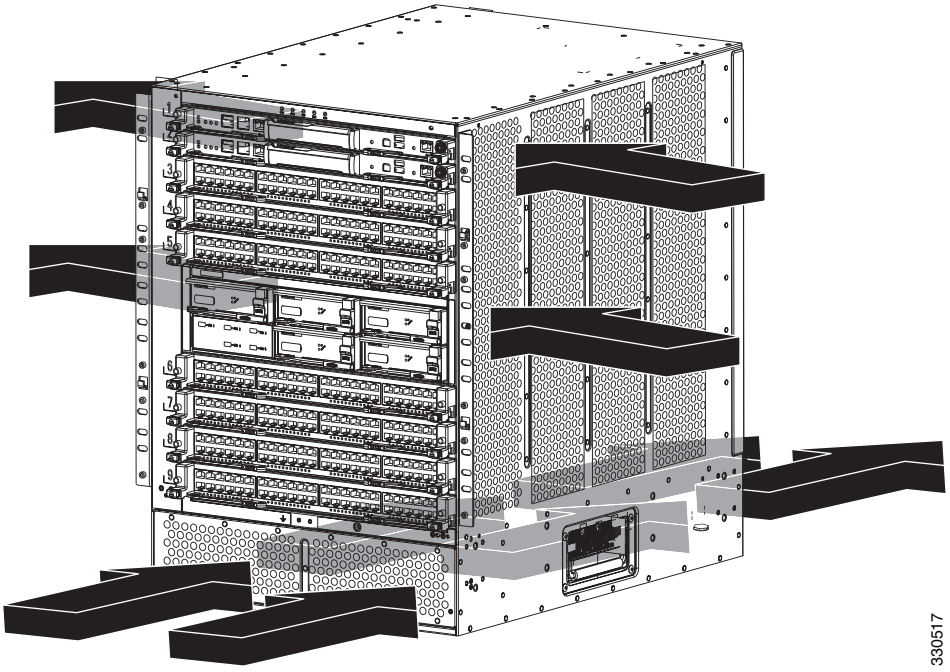
- The Cisco Nexus 7009 switch uses side-to-side airflow to cool its modules and front-to-back airflow to cool its power supplies as shown in Figure A-51. This switch requires right- and left-side clearance for airflow into and out of the chassis.
- The Cisco Nexus 7010 switch uses front-to-back airflow as shown in Figure A-52.
- The Cisco Nexus 7018 switch uses side-to-side airflow to cool its modules and front-to-back airflow to cool its power supply units as shown in Figure A-53. This switch requires right- and left-side clearance for airflow into and out of the chassis.

Figure A-50 Airflow for the Cisco Nexus 7004 Chassis



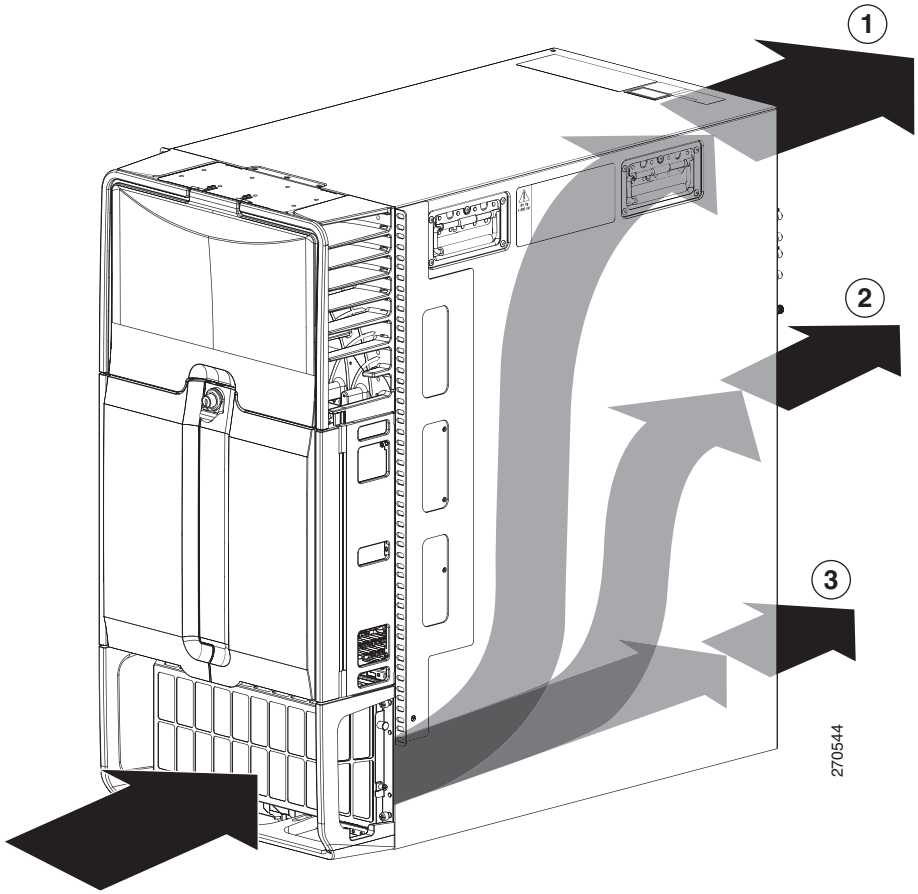
1	Right side-to-rear airflow for cooling supervisor and I/O modules	**3**	Exhaust out the rear to the hot aisle
2	Front-to-rear airflow for cooling power supplies		

Figure A-51 Airflow for the Cisco Nexus 7009 Chassis



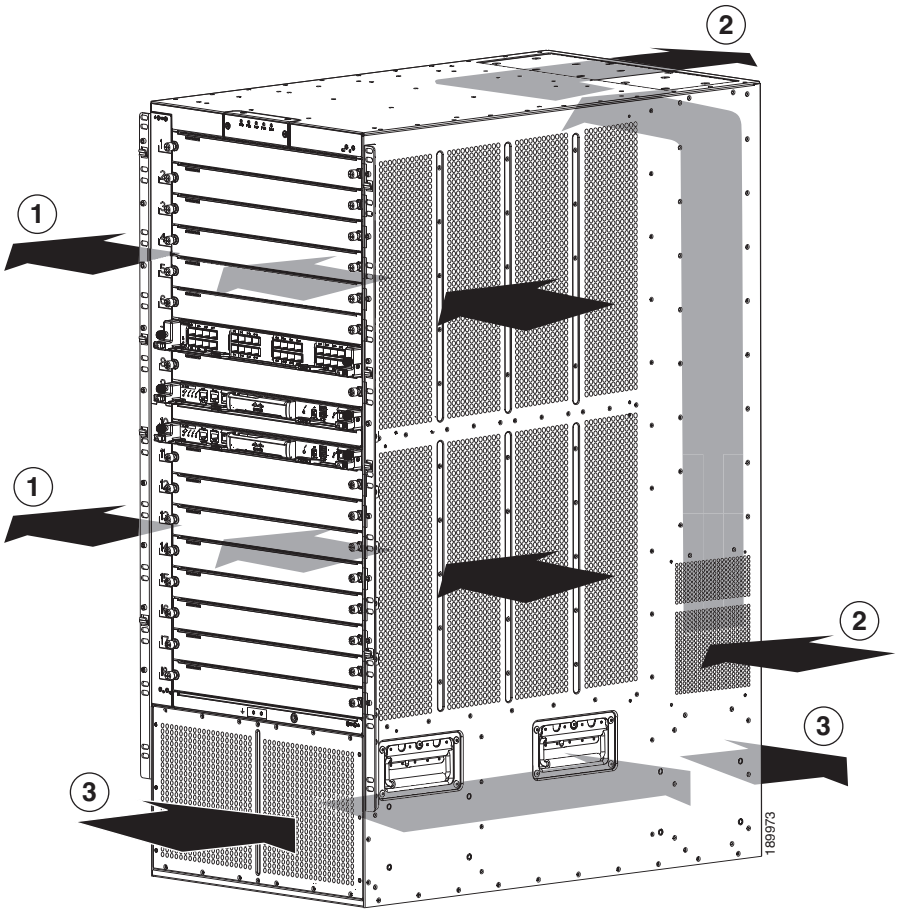
1	Airflow for cooling the supervisor modules, I/O modules, and fabric modules	**2**	Airflow for cooling the power supply units

Figure A-52 Airflow for the Cisco Nexus 7010 Chassis



1	Airflow for cooling the supervisor and I/O modules	**3**	Airflow for cooling the power supply units
2	Airflow for cooling the fabric modules		

Figure A-53 Airflow for the Cisco Nexus 7018 Chassis



1	Airflow for cooling the supervisor and I/O modules	**3**	Airflow for cooling the power supply units
2	Airflow for cooling the fabric modules		

For the Cisco Nexus 7004 switch, you can route cables on the left or right side without interferring with coolant airflow, which goes in on the right side. Be sure to otherwise leave the right side unblocked so that cool air can flow from the cold aisle in the front to the chassis.

To allow for the Cisco Nexus 7009 and 7018 switches to take in air from the cold aisle and floor on the right side, you should route cables on the left front side of the switch. If necessary, you can route cables on the upper right front side of the chassis, which leaves the lower right side open to cooling air from the cold aisle in front of the chassis. By having the cables on the left side and leaving the left rear side unobstructed, the exhaust is directed to the hot aisle in back.

For the clearances required on each side of the switch, see the "Chassis Clearances" section on page A-40.

Transceivers and Module Connectors

This appendix specifies the transceivers and module connectors used with the Cisco Nexus 7000 Series switches.

This appendix includes the following sections:

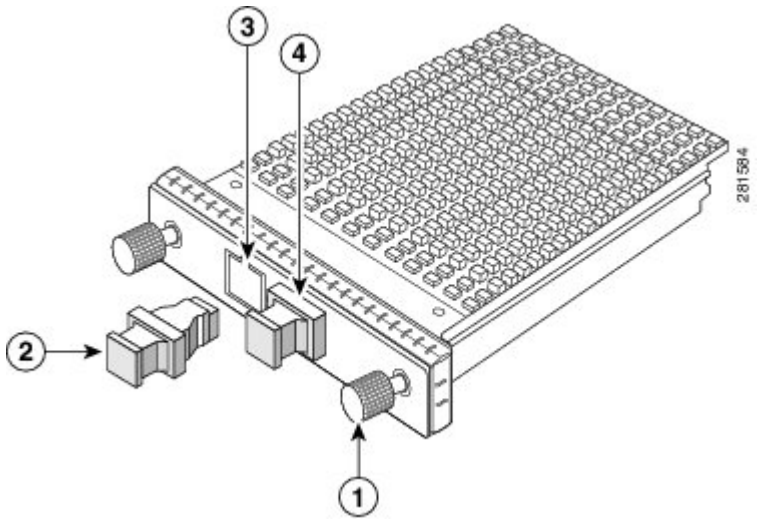
100-Gigabit CFP Transceivers

The following 100-Gigabit CFP transceivers are used with the M2-Series 100-Gigabit I/O module (N7K-M202CF-22L):

- CFP-100G-ER4
- CFP-100G-LR4
- CFP-100G-SR10

Figure B-1 identifies the major features of these transceivers. For the cable specifications that apply to these transceivers, see Table B-1. For the optical specifications, see Table B-2. For the environmental specifications, see Table B-3.

Figure B-1 CFP Transceivers



1	Thumb screws	**3**	Transmit optical bore
2	Dust plug	**4**	Receive optical bore

Table B-1 Cable Specifications for the CFP Transceivers

Transceiver	Cable Type	Connector Type	Wavelength (nm)	Core Size (microns)	Modal Bandwidth (MHz-km)	Maximum Cable Distance
CFP-100G-ER4	SMF		1310	G.652	—	24.85 miles (40 km)
CFP-100G-LR4	SMF	Dual SC/PC	1310	G.652	—	6.21 miles (10 km)
CFP-100G-SR10	MMF	MPO/MTP	850	50.0 50.0	2000 (OM3) 4700 (OM4)	328 feet (100 m) 492 feet (150 m)

Table B-2 CFP Transceiver Optical Transmit and Receive Specifications

Product Number	Transceiver Type	Transmit Power (dBm)	Receive Power (dBm)	Transmit and Receive Wavelength (nm)
CFP-100G-ER4	100GBASE-ER 4 CFP	2.9 (maximum per lane) –2.9 (minimum per lane)	4.5 (maximum per lane) –20.9 (minimum per lane)	Four lanes: 1295.6 nm, 1300.1 nm, 1304.6 nm, and 1309.1 nm
CFP-100G-LR4	100GBASE-LR 4 CFP	4.5 (maximum per lane) –4.3 (minimum per lane)	4.5 (maximum per lane) –10.6 (minimum per lane)	Four lanes: 1295.6 nm, 1300.1 nm, 1304.6 nm, and 1309.1 nm
CFP-100G-SR10	100GBASE-SR 10 CFP	–1.0 (maximum per lane) –7.6 (minimum per lane)	2.4 (maximum per lane) –9.5 (minimum per lane)	Ten lanes: 840 to 860 nm

Table B-3 Environmental and Power Specifications for CFP Transceivers

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

100-Gigabit CPAK Transceivers

The following 100-Gigabit CPAK transceivers are used with the F3-Series 100-Gigabit I/O modules (N7K-F306CK-25):

- CPAK-100G-ER4L
- CPAK-100G-LR4
- CPAK-100G-SR10

For the cable specifications that apply to these transceivers, see Table B-4. For the optical specifications, see Table B-5. For the environmental specifications, see Table B-6.

Table B-4 Cable Specifications for the CPAK Transceivers

Transceiver	Cable Type	Connector Type	Wavelength (nm)	Core Size (microns)	Modal Bandwidth (MHz-km)	Maximum Cable Distance
CPAK-100G-ER4L	SMF	SC Duplex	1310	G.652	—	15.53 miles (25 km)
CPAK-100G-LR4	SMF	SC Duplex	1310	G.652	—	6.21 miles (10 km)
CPAK-100G-SR10	MMF (OM3) MMF (OM4)	24-fiber MTP/MPO	850	50.0 50.0	2000 (OM3) 4700 (OM4)	328 feet (100 m) 492 feet (150 m)

Table B-5 CPAK Transceiver Optical Transmit and Receive Specifications

Product Number	Transceiver Type	Transmit Power (dBm)	Receive Power (dBm)	Transmit and Receive Wavelength (nm)
CPAK-100G-ER 4L	100GBASE-ER 4L	2.9 (maximum per lane) –2.9 (minimum per lane)	4.5 (maximum per lane) –14 (minimum per lane)	Four lanes: 1294.53 to 1296.59, 1299.02 to 1301.09, 1303.54 to 1305.63, 1308.09 to 1310.19
CPAK-100G-LR 4	100GBASE-LR 4	4.5 (maximum per lane) –4.3 (minimum per lane)	4.5 (maximum per lane) –10.6 (minimum per lane)	Four lanes:1294.53 to 1296.59, 1299.02 to 1301.09, 1303.54 to 1305.63, 1308.09 to 1310.19
CPAK-100G-SR 10	100GBASE-SR 10	–1.0 (maximum per lane) –7.6 (minimum per lane)	2.4 (maximum per lane) –9.5 (minimum per lane)	Ten lanes: 850 to 860 nm

Table B-6 Environmental and Power Specifications for CPAK Transceivers

Parameter	Specification
Storage temperature	–40 to 185°F (–40 to 85°C)
Operating temperature	32 to 158°F (0 to 70°C)

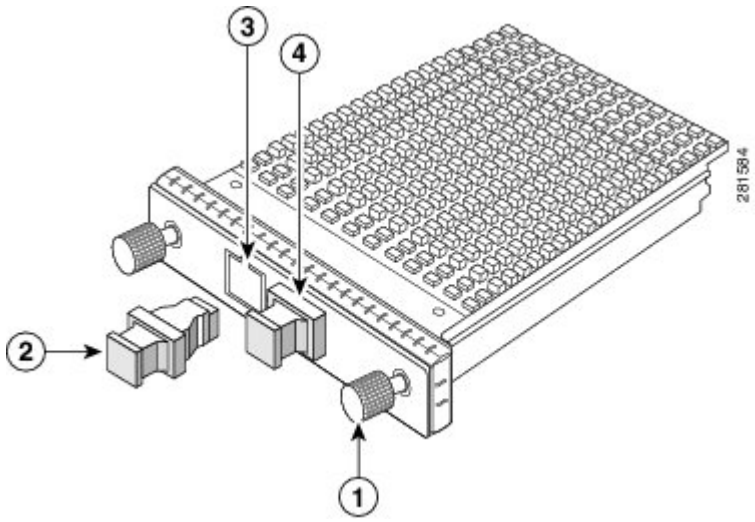
40-Gigabit CFP Transceivers

The following 40-Gigabit CFP transceivers are used with the M2-Series 100-Gigabit I/O modules (N7K-M202CF-22L):

- CFP-40G-SR4
- CFP-40G-LR4

Figure B-2 identifies the major features of these transceivers. For the cable specifications that apply to these transceivers, see Table B-7. For the optical specifications, see Table B-8. For the environmental specifications, see Table B-9.

Figure B-2 CFP Transceivers



1	Thumb screws	**3**	Transmit optical bore
2	Dust plug	**4**	Receive optical bore

Table B-7 Cable Specifications for the CFP Transceivers

Transceiver	Cable Type	Connector Type	Wavelength (nm)	Core Size (microns)	Modal Bandwidth (MHz-km)	Maximum Cable Distance
CFP-40G-SR4	MMF	Dual SC/PC	850	50.0 50.0 50.0	500 (OM2) 2000 (OM3) 4700 (OM4)	98.4 feet (30 m) 328.1 feet (100 m) 492.1 feet (150 m)
CFP-40G-LR4	SMF	Dual SC/PC	1310	G.652	—	32.8 feet (10 km)

Table B-8 CFP Transceiver Optical Transmit and Receive Specifications

Product Number	Transceiver Type	Transmit Power (dBm)	Receive Power (dBm)	Transmit and Receive Wavelength (nm)
CFP-40G-SR4	40GBASE CFP	2.4 (maximum per lane) -7.6 (minimum per lane)	2.4 (maximum per lane) -9.5 (minimum per lane)	Four lanes: 840 to 860 nm
CFP-40G-LR4	40GBASE CFP	2.3 (maximum per lane) -7 (minimum per lane)	2.3 (maximum per lane) -13.7 (minimum per lane)	Four lanes: 1271 nm, 1291 nm, 1311 nm, and 1331 nm

Table B-9 Environmental and Power Specifications for CFP Transceivers

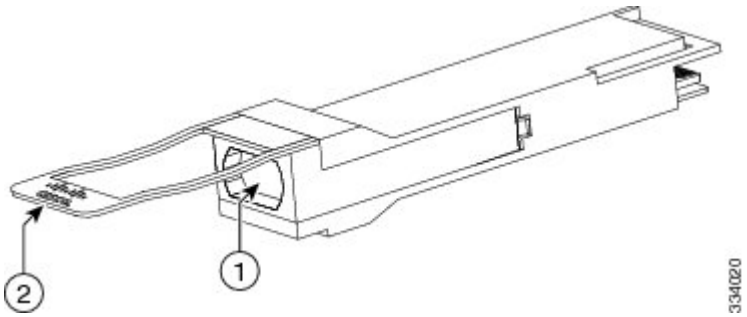
Parameter	Specification
Storage temperature	–40 to 185°F (–40 to 85°C)
Operating temperature	32 to 158°F (0 to 70°C)
Case temperature	–40 to 158°F (–40 to 70°C)
Storage relative humidity	5 to 95 percent

40-Gigabit QSFP+ Transceivers

The 40-Gigabit Quad Small-Form Factor Pluggable Plus (QSFP+) transceivers are used with the F3-Series 40-Gigabit Ethernet (N7K-F312FQ-25), M2-Series 40-Gigabit Ethernet (N7K-M206FQ-23L) and M3-Series 40-Gigabit Ethernet (N7K-M324FQ-25L) I/O modules.

Figure B-3 identifies the major features of these transceivers. For the cable specifications that apply to these transceivers, see Table B-10. For the optical specifications, see Table B-11. For the environmental specifications, see Table B-12.

Figure B-3 QSFP+ Transceiver



1	Optical bore	**2**	Pull tab

The following 40-Gigabit QSFP+ transceivers are used with the F3-Series 40-Gigabit Ethernet (N7K-F312FQ-25) I/O modules:

- CVR-QSFP-SFP10G
- FET-40G
- QSFP-40G-SR-BD
- QSFP-40G-SR4
- QSFP-40G-SR4-S
- QSFP-40G-CSR4
- QSFP-40G-LR4
- QSFP-40G-LR4-S
- QSFP-H40G-ACUxM

- QSFP-4X10G-ACxM
- QSFP-4X10G-LR-S
- QSFP-H40G-AOCxM
- QSFP-H40G-AOC15M
- QSFP-4X10G-AOCxM
- QSFP-40G-ER4
- WSP-Q40GLR4L

The following 40-Gigabit QSFP+ transceivers are used with the F3-Series 40-Gigabit Ethernet (N7K-M206FQ-23L) I/O modules:

- FET-40G
- QSFP-40G-SR-BD
- QSFP-40G-SR4
- QSFP-40G-SR4-S
- QSFP-40G-CSR4
- QSFP-40G-LR4
- QSFP-40G-LR4-S
- QSFP-H40G-ACUxM
- QSFP-4X10G-ACxM
- QSFP-H40G-AOCxM
- QSFP-H40G-AOC15M
- QSFP-4X10G-AOCxM
- QSFP-40G-ER4
- WSP-Q40-GLR4L

The following 40-Gigabit QSFP+ transceivers are used with the F3-Series 40-Gigabit Ethernet (N7K-M324FQ-25L) I/O modules:

- QSFP-H40G-ACUxM
- QSFP-H40G-AOCxM
- QSFP-4X10G-AC7M
- QSFP-4X10G-AC10M
- QSFP-4X10G-ACUxM
- QSFP-4X10G-AOC1M
- QSFP-4X10G-AOC2M
- QSFP-4X10G-AOC3M
- QSFP-4X10G-AOC5M
- QSFP-4X10G-AOC7M
- QSFP-4X10G-AOC10M

- QSFP-40G-CSR4
- QSFP-40G-ER4
- QSFP-4x10G-LR-S
- QSFP-40G-LR4
- QSFP-40G-LR4-S
- QSFP-40G-SR4
- QSFP-40G-SR4-S
- QSFP-40G-SR-BD

Table B-10 Cable Specifications for the 40-Gigabit QSFP+ Transceivers

Transceiver	Cable Type	Connector Type	Wavelength (nm)	Core Size (microns)	Modal Bandwidth (MHz-km)	Maximum Cable Distance
FET-40G **Note** FET-40G is not supported with N7K-M324FQ-25L.	MMF	QSFP+ to QSFP+	850	50.0 50.0 50.0	500 (OM2) 2000 (OM3) 4700 (OM4)	98.4 feet (30 meters) 328.1 feet (100 meters) 328.1 feet (100 meters)
QSFP-H40G-ACU*x*M	Direct attach copper, active	QSFP+ to QSFP+	—	—	—	23.0 feet (7 meters) 32.8 feet (10 meters)
QSFP-H40G-AOC*x*M	Active optical cable assembly	QSFP+ to QSFP+	—	—	—	3.3 feet (1 meter) 6.6 feet (2 meters) 9.8 feet (3 meters) 16.4 feet (5 meters) 23.0 feet (7 meters) 32.8 feet (10 meters) 49.2 feet (15 meters)
QSFP-4X10G-AC*x*M	Direct attach breakout copper, active	QSFP+ to four SFP+	—	—	—	23.0 feet (7 meters) 32.8 feet (10 meters)

Table B-10 Cable Specifications for the 40-Gigabit QSFP+ Transceivers (continued)

Transceiver	Cable Type	Connector Type	Wavelength (nm)	Core Size (microns)	Modal Bandwidth (MHz-km)	Maximum Cable Distance
QSFP-4X10G-ACU*x*M	Direct attach breakout copper, active	QSFP+ to four SFP+	—	—	—	23.0 feet (7 meters) 32.8 feet (10 meters)
QSFP-4X10G-AOC*x*M	Active optical breakout cable assembly	QSFP+ to four SFP+	—	—	—	3.3 feet (1 meter) 6.6 feet (2 meters) 9.8 feet (3 meters) 16.4 feet (5 meters) 23.0 feet (7 meters) 32.8 feet (10 meters)
QSFP-40G-CSR4	MMF	12-fiber MTP/MPO	850	62.5 50.0 50.0 50.0	200 (OM1) 500 (OM2) 2000 (OM3) 4700 (OM4)	108.2 feet (33 m) 269.0 feet (82 m) 984.3 feet (300 m) 132.3 feet (400 m)
QSFP-40G-ER4	SMF	LC	1310	G.652	—	40 km[4]
QSFP-4x10G-LR-S	SMF	12-fiber MTP/MPO	1310	G.652		6.1 miles (10 km)
QSFP-40G-LR4	SMF	LC	1310	G.652	—	6.1 miles (10 km)
QSFP-40G-LR4-S	SMF	LC	1310	G.652	—	6.1 miles (10 km)
QSFP-40G-SR4	MMF	PC or UPC	850	50.0 50.0 50.0	500 (OM2) 2000 (OM3) 4700 (OM4)	98.4 feet (30 meters) 328.1 feet (100 meters)(492.1 feet (150 meters)

Table B-10 Cable Specifications for the 40-Gigabit QSFP+ Transceivers (continued)

Transceiver	Cable Type	Connector Type	Wavelength (nm)	Core Size (microns)	Modal Bandwidth (MHz-km)	Maximum Cable Distance
QSFP-40G-SR4-S	MMF	12-fiber MPO	850	50.0 50.0	2000 (OM3) 4700 (OM4)	100m 150 m^2
QSFP-40G-SR-BD	MMF	LC Duplex	850/900	50.0 50.0 50.0	500 (OM2) 2000 (OM3) 4700 (OM4)	98.4 feet (30 meters) 328.1 feet (100 meters)(492.1 feet (150 meters)

Table B-11 QSFP+ Transceiver Optical Transmit and Receive Specifications

Product Number	Transceiver Type	Transmit Power (dBm)	Receive Power (dBm)	Transmit and Receive Wavelength (nm)
FET-40G	FEX	–1 (maximum per lane*6) –8.0 (minimum per lane)	–1 (maximum per lane) –9.9 (minimum per lane)	840 to 860
QSFP-40G-CSR4	40GBASE-CSR4	0 (maximum per lane) –7.3 (minimum per lane)	0 (maximum per lane*6) –9.9 (minimum per lane)	840 to 860
QSFP-40G-ER4	40GBASE-ER4	4.5 (maximum per lane) –2.7 (minimum per lane)	–4.5 (maximum per lane) –21.2 (minimum per lane)	Four lanes: 1271 nm, 1291 nm, 1311 nm, and 1331 nm
QSFP-4x10G-LR-S	4x10GBASE-LR	0.5 (maximum per lane) –8.2 (minimum per lane)	0.5 (maximum per lane) –14.4 (minimum per lane)	1260 to 1355
QSFP-40G-LR4	40GBASE-LR4	2.3 (maximum per lane) –7.0 (minimum per lane)	2.3 (maximum per lane) –13.7 (minimum per lane)	Four lanes: 1271 nm, 1291 nm, 1311 nm, and 1331 nm
QSFP-40G-LR4-S	40GBASE-LR4	2.3 (maximum per lane) –7.0 (minimum per lane)	2.3 (maximum per lane) –13.7 (minimum per lane)	Four lanes: 1271 nm, 1291 nm, 1311 nm, and 1331 nm
QSFP-40G-SR4	40GBASE-SR4	–1.0 (maximum per lane) –7.6 (minimum per lane)	2.4 (maximum per line) –9.5 (minimum per line)	840 to 860

Table B-11 QSFP+ Transceiver Optical Transmit and Receive Specifications

Product Number	Transceiver Type	Transmit Power (dBm)	Receive Power (dBm)	Transmit and Receive Wavelength (nm)
QSFP-40G-SR4-S	40GBASE-SR4	2.4 (maximum per lane) –7.6 (minimum per lane)	2.4 (maximum per line) –9.5 (minimum per line)	840 to 860
QSFP-40G-SR-BD	40GBASE-SR-BiDi	5 (maximum per lane) –4 (minimum per lane)	5 (maximum per line) –6 (minimum per line)	832 to 918

Table B-12 Environmental and Power Specifications for CFP Transceivers

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-Gigabit SFP+ Transceivers and Fabric Extender Transceivers

The 10-Gigabit SFP+ transceivers are used with the following I/O modules:

- F1 Series 32-port 1- and 10-Gigabit Ethernet I/O module (N7K-F132XP-15)
- F2 Series 48-port 1- and 10-Gigabit I/O module (N7K-F248XP-25 and N7K-F248XP-25E)
- F3 Series 48-port 1- and 10-Gigabit I/O module (N7K-F348XP-25)
- M1 Series 32-port 10-Gigabit Ethernet I/O module (N7K-M132XP-12)
- M1 Series 32-port 10-Gigabit Ethernet I/O module with XL option (N7K-M132XP-12L)
- M1 Series 8-port 10-Gigabit Ethernet I/O module with XL option (N7K-M108X2-12L) (requires the OneX Converter Module to adapt the SFP+ transceiver to the X2 ports on this I/O module)
- M2 Series 24-port 10-Gigabit Ethernet I/O module with XL option(N7K-M224XP-23L)
- M3 Series 48-port 1- and 10-Gigabit Ethernet I/O module with XL option(N7K-M348XP-25L)

The 10-Gigabit Fabric Extender Transceiver (FET) is used with only the following I/O modules when connecting them to the Cisco Nexus 2248TP, 2248TP-E, 2232PP, 2232TM, and 2224TP Fabric Extenders (FEXs):

- F2 Series 48-port 1- and 10-Gigabit I/O module (N7K-F248XP-25 and N7K-F248XP-25E)
- F3 Series 48-port 1- and 10-Gigabit I/O module (N7K-F348XP-25)
- M1 Series 32-port 10-Gigabit Ethernet I/O module (N7K-M132XP-12)
- M1 Series 32-port 10-Gigabit Ethernet I/O module with XL option (N7K-M132XP-12L)
- M2 Series 24-port 10-Gigabit Ethernet I/O module with XL option (N7K-M224XP-23L)

Starting with Cisco NX-OS Release 8.1(1), the 10-Gigabit Fabric Extender Transceiver (FET) can be used with M3 Series 48-port 1- and 10-Gigabit Ethernet I/O modules with XL option(N7K-M348XP-25L) when connecting them to the Cisco Nexus 2248TP, 2248TP-E, 2232PP, 2232TM, and 2224TP Fabric Extenders (FEXs).

You can also use the SFP-10G-SR and SFP-10G-LR transceivers when connecting the 32-port 10-Gigabit Ethernet I/O modules to FEXs.

This section includes the following sections:

10BASE-X SFP+ Transceivers

To see which SFP+ transceivers are used with the F1 or F2 Series I/O modules, see Table B-13. To see which SFP+ transceivers are used with the M1, M2 and M3 Series I/O modules, see Table B-14. To see information on the DWDM SFP+ transceivers, see the "10BASE-DWDM SFP+ Transceivers" section on page B-17.

Table B-13 SFP+ Transceivers Used with F1, F2 and F3 Series I/O Modules

Transceiver	I/O Module		
	32-port 1- and 10-Gigabit (N7K-F132XP-15)	**48-port 1- and 10-Gigabit (N7K-F248XP-25 and N7K-F248XP-25E)**	**48-port 1- and 10-Gigabit (N7K-F348XP-25)**
DWDM-SFP10G-*xx.xx*	X	X	X
FET-10G		X[1]	X[1]
SFP-10G-ER	X	X	X
SFP-10G-LR	X[1]	X	X
SFP-10G-LRM	X	X	X
SFP-10G-SR	X	X	X
SFP-10G-ZR	X	X	X
SFP-H10GB-CU1M	X	X	X
SFP-H10GB-CU3M	X	X	X
SFP-H10GB-CU5M	X	X	X
SFP-H10GB-ACU7M	X	X	X
SFP-H10GB-ACU10M	X	X	X

1. Requires revision 2 of this transceiver.

Table B-14 SFP+ Transceivers Used with M1, M2 and M3 Series Modules

Transceiver	8-port 10-Gigabit (N7K-M108X2-12L)	32-port 10-Gigabit (N7K-M132XP-12)	32-port 10-Gigabit with XL option (N7K-M132XP-12L)	24-Port 10-Gigabit (N7K-M224XP-23L)	48-Port 1-/10-Gigabit (N7K-M348XP-25L)
CWDM-SFP 10G-1xxx					X
DWDM-SFP 10G-xx.xx			X	X	X
FET-10G		X[1]	X[1]	X[1]	X[2]
SFP-10G-BXD-I					X
SFP-10G-BXU-I					X
SFP-10G-AOC1M			X	X	X
SFP-10G-AOC2M			X	X	X
SFP-10G-AOC3M			X	X	X
SFP-10G-AOC5M			X	X	X
SFP-10G-AOC7M			X	X	X
SFP-10G-AOC10M			X	X	X
SFP-10G-ER		X	X	X	X
SFP-10G-ER-S			X	X	X
SFP-10G-LR	X	X	X	X	X
SFP-10G-LR-S	X		X	X	X
SFP-10G-LRM (SMF)	X		X	X	X
SFP-10G-LRM (MMF)	X		X	X	
SFP-10G-SR	X[3]	X	X	X	X
SFP-10G-SR-S	X		X	X	X

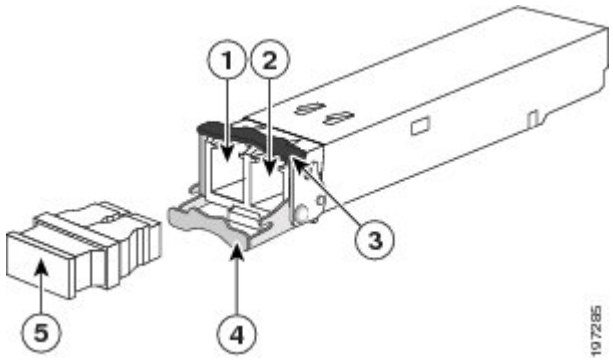
Table B-14 SFP+ Transceivers Used with M1, M2 and M3 Series Modules

Transceiver	8-port 10-Gigabit (N7K-M108X2-12L)	32-port 10-Gigabit (N7K-M132XP-12)	32-port 10-Gigabit with XL option (N7K-M132XP-12L)	24-Port 10-Gigabit (N7K-M224XP-23L)	48-Port 1-/10-Gigabit (N7K-M348XP-25L)
SFP-10G-ZR		X[3]	X[3]	X[3]	X
SFP-10G-ZR-S			X	X	X
SFP-H10GB-ACU7M		X[4]	X	X	X
SFP-H10GB-ACU10M		X[3]	X	X	X
SFP-H10GB-CU1M	X		X[3]	X[3]	X
SFP-H10GB-CU1-5M			X	X	X
SFP-H10GB-CU2M			X	X	X
SFP-H10GB-CU2-5M			X	X	X
SFP-H10GB-CU3M	X		X[3]	X[3]	X
SFP-H10GB-CU5M	X		X[3]	X[3]	X

1. The FET-10G transceiver is used only for connections with a Cisco Nexus 2248TP, 2248TP-E, 2232PP, 2232TM, and 2224TP Fabric Extender (FEX).
2. Supported from Cisco NX-OS Release 8.1(1).
3. Requires the OneX Converter Module (part number CVR-X2-SFP10G) when this transceiver is used with the 8-port 10-GB I/O module.
4. Requires revision 2 of this transceiver.

Figure B-4 identifies the major features of these transceivers. For the cable specifications that apply to SFP+ transceivers and FETs, see Table B-15. For the physical and environmental specifications, see Table B-16. For the environmental specifications that apply to these transceivers, see Table B-17.

Figure B-4 SFP+ Transceivers and FETs



1	Receive optical bore	**4**	Clasp shown in open position
2	Transmit optical bore	**5**	Dust plug
3	Clasp shown in closed position		

Table B-15 Cable Specifications for the 10-Gigabit SFP+ Transceivers and FETs

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 50	500 2000	82 feet (25 meters) 328 feet (100 meters)
SFP-H10GB-ACU*x*M	Twinax cable, active, 30-AWG cable assembly	—	—	—	—	22.8 feet (7 meters) 32.5 feet (10 meters)
SFP-H10GB-CU1M	Twinax cable, passive, 30-AWG cable assembly	—	—	—	—	3.3 feet (1 meter) 9.8 feet (3 meters) 16.4 feet (5 meters)
SFP-10G-AOC*x*M	Active optical cable assembly	—	—	—	—	3.3 feet (1 meter) 6.6 feet (2 meters) 9.8 feet (3 meters) 16.4 feet (5 meters) 23.0 feet (7 meters) 32.8 feet (10 meters)
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)

Table B-15 Cable Specifications for the 10-Gigabit SFP+ Transceivers and FETs (continued)

Transceiver	Cable Type	Connector Type	Wavelength (nm)	Core Size (microns)	Modal Bandwidth (MHz-km)	Maximum Cable Distance
SFP-10G-LRM	MMF	Dual LC/PC	1310	62.5	500	722 feet (220 meters)
				50	400	328 feet (100 meters)
				50	500	722 feet (220 meters)
	SMF			G.652	—	984 feet (300 meters)
SFP-10G-SR	MMF	Dual LC/PC	850	62.5	160	85 feet (26 meters)
				62.5	200	108 feet (33 meters)
				50.0	400	216 feet (66 meters)
				50.0	500	269 feet (82 meters)
				50.0	2000	984 feet (300 meters)

Table B-16 SFP+ Transceiver Optical Transmit and Receive Specifications

X2 Transceiver Product Number	Transceiver Type	Transmit Power (dBm)	Receive Power (dBm)	Transmit and Receive Wavelength (nm)
SFP-10G-ER	10GBASE-ER, 1550-nm SMF	4.0 (maximum)	–1.0 (maximum)	1530 to 1565
		–4.7 (minimum)	–15.8 (minimum)	
SFP-10G-LR	10GBASE-LR, 1310-nm SMF	0.5 (maximum)	0.5 (maximum)	1260 to 1355
		–8.2 (minimum)	–14.4 (minimum)	
SFP-10G-LRM	10GBASE-LRM, 1310-nm MMF and SMF	0.5 (maximum)	0.5 (maximum)	1260 to 1355
		–6.5 (minimum)	–8.4 (minimum) (in average)	
			–6.4 (minimum) (in OMA)[1]	
SFP-10G-SR	10GBASE-SR, 850-nm MMF	–1.2 (maximum)[2]	–1.0 (maximum)	840 to 860
		–7.3 (minimum)	–9.9 (minimum)	

1. Both the average and the OMA specifications must be met simultaneously.
2. 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.

Table B-17 Environmental and Power Specifications for the 10-Gigabit SFP+ Transceivers and FETs

Parameter	Specification
Storage temperature	–40 to 185°F (–40 to 85°C)
Operating temperature	32 to 158°F (0 to 70°C)
Case temperature	32 to 158°F (0 to 70°C)
Module supply voltage	3.1 to 3.5 V

10BASE-DWDM SFP+ Transceivers

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 Figure B-4 on page B-15.

For the specifications that differentiate the 10GBASE-DWDM SFP+ transceivers, see the *10-Gigabit Ethernet Transceiver Modules Compatibility Matrix*.

10-Gigabit X2 Transceivers

Note Starting with Cisco NX-OS Release 8.0(1), the 8-port 10-GB Ethernet (N7K-M108X2-12L) I/O modules are not supported.

The following 10-Gigabit X2 transceivers are used with the 8-port 10-GB Ethernet (N7K-M108X2-12L) I/O modules:

- DWDM-X2-xx.xx
- X2-10GB-CX4
- X2-10GB-ER
- X2-10GB-LR
- X2-10GB-LRM
- X2-10GB-LX4
- X2-10GB-SR
- X2-10GB-ZR

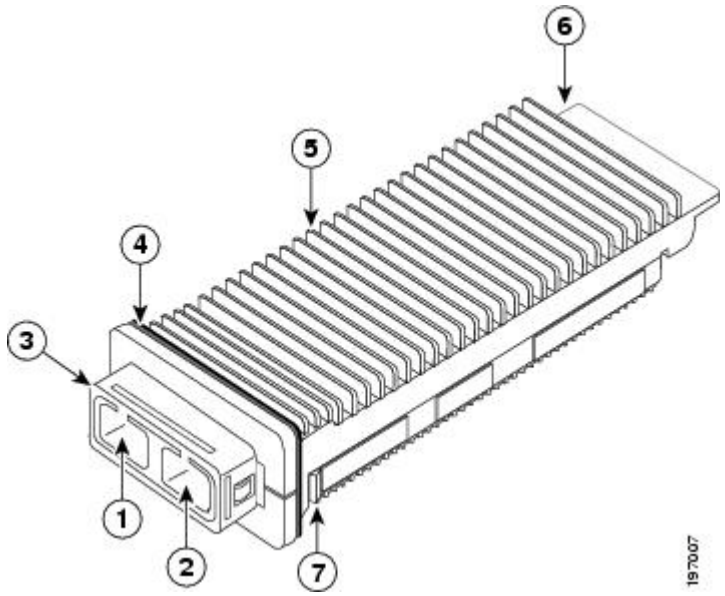
Additionally, you can use the following SFP+ transceivers with the OneX Converter Module (part number CVR-X2-SFP10G) that adapts SFP+ transceivers to X2 ports:

- SFP-10G-SR
- SFP-H10GB-CUxM

For information on the SFP+ 10GB transceivers, see the "10-Gigabit SFP+ Transceivers and Fabric Extender Transceivers" section on page B-11.

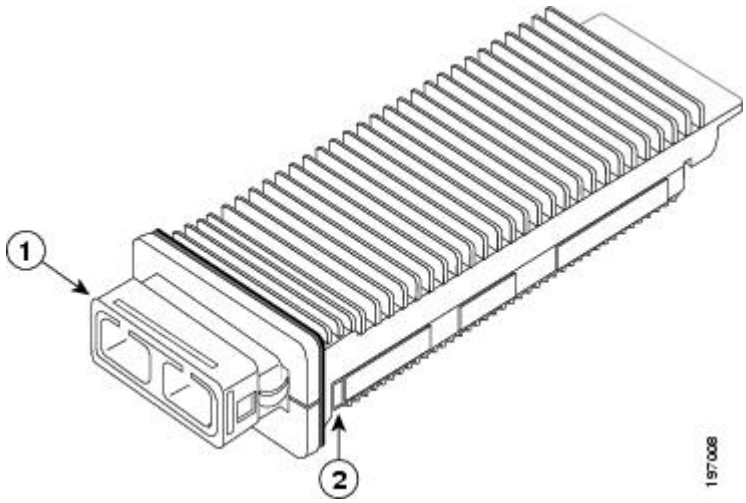
Figure B-5 identifies the major features of the X2 transceivers, and Figure B-6 shows the transceiver with its latching sleeve extended (you pull the sleeve out to remove the transceiver from the I/O module).

Figure B-5 10-Gigabit X2 Transceiver (Latching Sleeve Not Extended)



1	Transmit optical bore	**5**	Transceiver heat sink
2	Receive optical bore	**6**	Module connector
3	Latching sleeve (retracted)	**7**	Latch (extended when sleeve is retracted)
4	EMI gasket		

Figure B-6 X2 Transceiver with Latching Sleeve Extended



1	Latching sleeve (extended to remove transceiver)	**2**	Latch (retracted to enable you to remove the transceiver)

This section includes the following topics:

10GBASE-X X2 Transceivers

For the 10GBASE-X X2 transceiver cabling specifications, see Table B-18. For the optical transmit and receive specifications, see Table B-19. For the physical and environmental specifications, see Table B-20.

Table B-18 X2 Transceiver Cabling Specifications

X2 Transceiver Product Number	Cable Type	Connector Type	Wavelength (nm)	Core Size (microns)	Modal Bandwidth (MHz-km)	Maximum Cabling Distance[1]
X2-10GB-CX4	Copper		—	—	—	49.2 feet (15 meters)
X2-10GB-ER	SMF	SC duplex	1550	G.652 fiber	—	24.9 miles (40 km)
X2-10GB-LR	SMF	SC duplex	1310	G.652 fiber	—	6.2 miles (10 km)
X2-10GB-LRM	MMF	SC duplex	1310	62.5	500	722 feet (220 meters)
				50.0	400	328 feet (100 meters)
				50.0	500	722 feet (220 meters)
	SMF			G.652 fiber	—	984 feet (300 meters)
X2-10GB-LX4	MMF		1300	62.5	500	984 feet (300 meters)
				50.0	400	787 feet (240 meters)
				50.0	500	984 feet (300 meters)
X2-10GB-SR	MMF	SC duplex	850	62.5	160	85 feet (26 meters)
				62.5	200	108 feet (33 meters)
				50.0	400	217 feet (66 meters)
				50.0	500	269 feet (82 meters)
				50.0	2000	984 feet (300 meters)
X2-10GB-ZR	SMF					49.3 miles (80 km)

1. Cable distances are based on fiber loss. Additional factors, such as the number of splices and the optical quality of the fiber, can affect cabling distances.

Table B-19 X2 Transceiver Optical Transmit and Receive Specifications

X2 Transceiver Product Number	Transceiver Type	Transmit Power (dBm)	Receive Power (dBm)	Transmit and Receive Wavelength (nm)
X2-10GB-ER	10GBASE-ER, 1550-nm SMF	4.0 (maximum) –4.7 (minimum)	–1.0 (maximum) –15.8 (minimum)	1530 to 1565
X2-10GB-LR	10GBASE-LR, 1310-nm SMF	0.5 (maximum) –8.2 (minimum)	0.5 (maximum) –14.4 (minimum)	1260 to 1355
X2-10GB-LRM	10GBASE-LRM, 1310-nm MMF and SMF	0.5 (maximum) –6.5 (minimum)	0.5 (maximum) –8.4 (minimum) (in average) –6.4 (minimum) (in OMA)[1]	1260 to 1355
X2-10GB-SR	10GBASE-SR, 850-nm MMF	–1.2 (maximum)[2] –7.3 (minimum)	–1.0 (maximum) –9.9 (minimum)	840 to 860

1. Both the average and the OMA specifications must be met simultaneously.
2. 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.

Table B-20 X2 Transceiver Physical and Environmental Specifications

Characteristic	Specification
Dimensions (H x W x D)	0.53 x 1.41 x 3.58 inches (13.46 x 36 x 91 mm)
Operating temperature	
X2-10GB-ER	32º to 122ºF (0º to 50ºC)
X2-10GB-LR	32º to 122ºF (0º to 50ºC)
X2-10GB-LRM	32º to 158ºF (0º to 70ºC)
X2-10GB-LX4	32º to 158ºF (0º to 70ºC)
X2-10GB-SR	32º to 122ºF (0º to 50ºC)
X2-10GB-ZR	32º to 122ºF (0º to 50ºC)
Storage temperature	–40º to 185º F (–40º to 85ºC)

10GBASE-DWDM X2 Transceivers

The Dense Wavelength Division Multiplexing (DWDM) X2 transceivers are part of a DWDM optical network to provide high-capacity bandwidth across a fiber-optic network. As listed in Table B-21, there are 32 fixed-wavelength DWDM X2 transceivers that support the International Telecommunications Union (ITU) 100-GHz wavelength grid. These transceivers have duplex SC connectors. DWDM X2 transceivers can transmit and receive optical signals up to 50 miles (80 km) depending on the quality of the fiber-optic cable used.

DWDM X2 transceivers look like the typical 10GBASE-X X2 transceivers as shown in Figure B-5 on page B-18.

For the specifications that differentiate the 10GBASE-DWDM X2 transceivers, see the 10-Gigabit Ethernet Transceiver Modules Compatibility Matrix.

Table B-21 DWDM X2 Transceivers

Part Number	100-GHz ITU Channel	Description
DWDM-X2-60.61=	21	10GBASE-DWDM 1560.61 nm X2
DWDM-X2-59.79=	22	10GBASE-DWDM 1559.79 nm X2
DWDM-X2-58.98=	23	10GBASE-DWDM 1558.98 nm X2
DWDM-X2-58.17=	24	10GBASE-DWDM 1558.17 nm X2
DWDM-X2-56.55=	26	10GBASE-DWDM 1556.55 nm X2
DWDM-X2-55.75=	27	10GBASE-DWDM 1555.75 nm X2
DWDM-X2-54.94=	28	10GBASE-DWDM 1554.94 nm X2
DWDM-X2-54.13=	29	10GBASE-DWDM 1554.13 nm X2
DWDM-X2-52.52=	31	10GBASE-DWDM 1552.52 nm X2
DWDM-X2-51.72=	32	10GBASE-DWDM 1551.72 nm X2
DWDM-X2-50.92=	33	10GBASE-DWDM 1550.92 nm X2
DWDM-X2-50.11=	34	10GBASE-DWDM 1550.11 nm X2
DWDM-X2-48.51=	36	10GBASE-DWDM 1548.51 nm X2
DWDM-X2-47.72=	37	10GBASE-DWDM 1547.72 nm X2
DWDM-X2-46.92=	38	10GBASE-DWDM 1546.92 nm X2
DWDM-X2-46.12=	39	10GBASE-DWDM 1546.12 nm X2
DWDM-X2-44.53=	41	10GBASE-DWDM 1544.53 nm X2
DWDM-X2-43.73=	42	10GBASE-DWDM 1543.73 nm X2
DWDM-X2-42.94=	43	10GBASE-DWDM 1542.94 nm X2
DWDM-X2-42.14=	44	10GBASE-DWDM 1542.14 nm X2
DWDM-X2-40.56=	46	10GBASE-DWDM 1540.56 nm X2
DWDM-X2-39.77=	47	10GBASE-DWDM 1539.77 nm X2
DWDM-X2-38.98=	48	10GBASE-DWDM 1538.98 nm X2
DWDM-X2-38.19=	49	10GBASE-DWDM 1538.19 nm X2
DWDM-X2-36.61=	51	10GBASE-DWDM 1536.61 nm X2
DWDM-X2-35.82=	52	10GBASE-DWDM 1535.82 nm X2
DWDM-X2-35.04=	53	10GBASE-DWDM 1535.04 nm X2
DWDM-X2-34.25=	54	10GBASE-DWDM 1534.25 nm X2
DWDM-X2-32.68=	56	10GBASE-DWDM 1532.68 nm X2
DWDM-X2-31.90=	57	10GBASE-DWDM 1531.90 nm X2
DWDM-X2-31.12=	58	10GBASE-DWDM 1531.12 nm X2
DWDM-X2-30.33=	59	10GBASE-DWDM 1530.33 nm X2

1-Gigabit SFP Transceivers

The 1-Gigabit Ethernet SFP transceivers are used with the following 1-Gigabit Ethernet I/O modules:

- F1 Series 32-port 1- and 10-Gigabit Ethernet I/O modules (N7K-F132XP-15)
- F2 Series 48-port 1- and 10-Gigabit Ethernet I/O modules (N7K-F248XP-25 and N7K-F248XP-25E)
- F3 Series 48-port 1- and 10-Gigabit Ethernet I/O modules (N7K-F348XP-25)
- M1 Series 48-port 1-Gigabit Ethernet I/O modules (N7K-M148GS-11)
- M1 Series 48-port 1-Gigabit Ethernet I/O modules with XL option (N7K-M148GS-11L)
- M3 Series 48-port 1- and 10-Gigabit Ethernet I/O modules with XL option (N7K-M348XP-25L)

To see which of these transceivers are used with each of these I/O modules, see Table B-22.

Table B-22 SFP Transceivers Used with Each I/O Module

	I/O Modules					
Transceiver	**32-port 1- and 10-Gigabit (N7K-F132XP-15)**	**48-port 1- and 10-Gigabit (N7K-F248XP-25 and N7K-F248XP-25E)**	**48-port 1- and 10-Gigabit (N7K-F348XP-25)**	**48-port 1-Gigabit (N7K-M148GS-11)**	**48-port 1-Gigabit with XL option (N7K-M148GS-11L)**	**48-port 1- and 10-Gigabit with XL option (N7K-M348XP-25L)**
CWDM-SFP-xxxx	X	X	X	X	X	X
DWDM-SFP-xxxx	X	X	X	X	X	X
GLC-BX-D		X	X	X	X	X
GLC-BX-U		X	X	X	X	X
GLC-EX-SMD	X	X	X			X
GLC-LH-SMD	X	X	X	X	X	X
GLC-SX-MMD	X	X	X	X	X	X
GLC-TE	X	X	X	X	X	X
GLC-ZX-SMD	X	X	X	X	X	X
SFP-GE-L	X	X		X	X	
SFP-GE-S	X	X		X	X	
SFP-GE-T	X	X		X	X	
SFP-GE-Z	X	X		X	X	

This section includes the following topics:

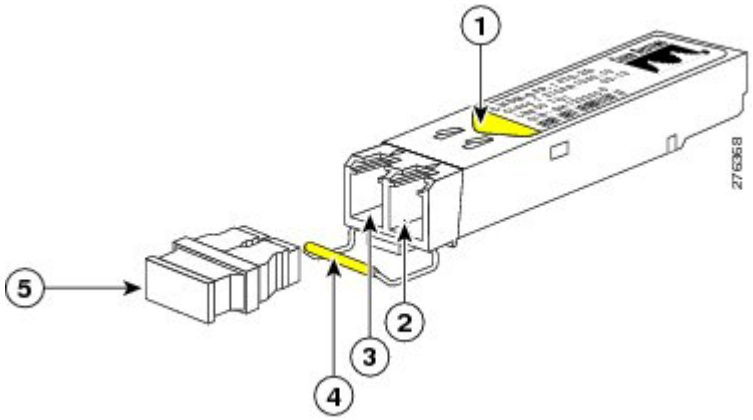
1000BASE-CWDM SFP Transceiver Cables

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 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. Figure B-7 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.

Note 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.

Figure B-7 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		

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 Transceivers

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.

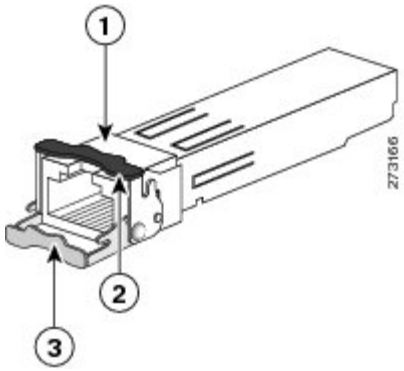
DWDM SFP transceivers look like the typical 1000BASE-X transceivers as shown in Figure B-9 on page B-24.

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 Transceivers

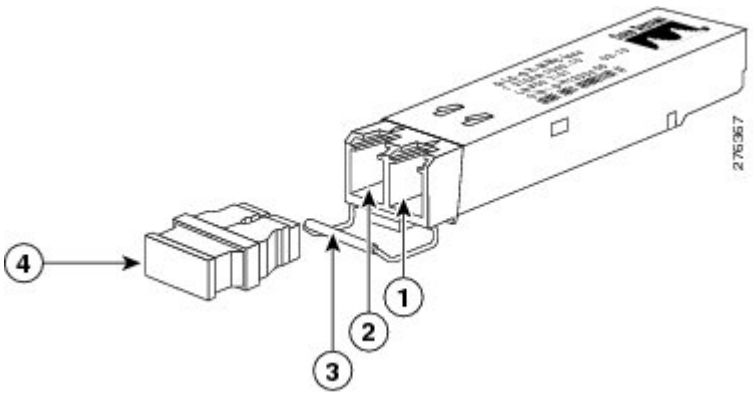
The 1000BASE-T and 1000BASE-X SFPs are hot-swappable transceivers that you plug into SFP-compatible I/O modules. The 1000BASE-T transceiver, shown in Figure B-8, provides an RJ-45 connection for copper cables, and the 1000BASE-X transceiver, shown in Figure B-9, provides an optical connection for fiber-optic cables.

Figure B-8 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		

Figure B-9 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 Table B-23.

Table B-23 Cable Specifications for 1000BASE-X and 1000BASE-T SFP Transceivers

Transceiver Type	Cable Type	Connector Type	Wavelength (nm)	Core Size (microns)	Modal Bandwidth (MHz-km)	Maximum Cable Distance
1000BASE-BX10 (GLC-BX-U)	SMF[1]	Single LC/PC	1310	G.652[4]	—	6.2 miles (10 km)
1000BASE-BX10 (GLC-BX-D)	SMF[1]	Single LC/PC	1490	G.652[4]	—	6.2 miles (10 km)
1000BASE-SX (GLC-SX-MMD, GLC-SX-MM, and SFP-GE-S)	MMF[2]	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, GLC-LH-SM, and SFP-GE-L)	MMF[2]	LC duplex	1310	62.5	500	1804 feet (550 m)[3]
				50.0	400	1804 feet (550 m)[3]
				50	500	1804 feet (550 m)[3]
	SMF[1]	LC duplex	1310	G.652[4]	—	6.2 miles (10 km)
1000BASE-ZX (GLC-ZX-SM and SFP-GE-Z)	SMF[1]	LC duplex	1550	G.652[2]	—	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	RJ45	—	—	—	328 feet (100 meters)

1. Single-mode fiber optic (SMF)
2. Multimode fiber optic (MMF)
3. You must use a mode-conditioning patch cord, as specified by the IEEE standard, regardless of the amount of span.
4. ITU-T G.652 SMF as specified by the IEEE 802.32 standard.

The transceivers that support Digital Optical Monitoring have a greater range of temperatures for operations, as shown in Table B-24.

Table B-24 Environmental Specifications for 1000BASE-X and 1000BASE-T Transceivers

Transceiver Type	Part Number	Digital Optical Monitoring Support	Operating Temperature	Storage Temperature
1000BASE-SX	GLC-SX-MMD	YES	EXT[2]	–40 to 185°F (–40 to 85°C)
	GLC-SX-MM	No	COM[1]	
	SFP-GE-S	Yes	EXT[2]	
1000BASE-LX	GLC-LH-SMD	Yes	EXT[2]	
	GLC-LH-SM	No	COM[1]	
	SFP-GE-L	Yes	EXT[2]	
1000BASE-ZX	GLC-ZX-SM	No	COM[1]	
	SFP-GE-Z	Yes	EXT[2]	
1000BASE-T	GLC-T	—	COM[1]	
	SFP-GE-T	—	EXT[2]	

1. Commercial (COM) temperature range is 32 to 158°F (0 to 70°C).
2. 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:

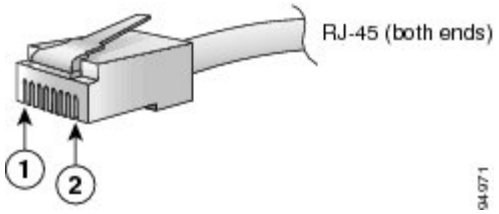
- Supervisor modules
  - CONSOLE port
  - COM1/AUX port
  - MGMT ETH port
  - CMP MGMT ETH port
- 48-port 10/100/1000 Ethernet I/O modules (N7K-M148GT-11 and N7K-M148GT-11L)
  - 10/100/1000 ports
- 48-port 1- and 10-GBASE-T I/O modules (N7K-F248XT-25E)
  - 1- and 10-GBASE-T ports
- Cisco Nexus 2248TP and 2248TP-E Fabric Extenders
  - 100/1000 downlink ports

Note If you need to connect a host that operates at up to 10 Mbps to a FEX, you can connect the host to a Cisco Nexus 2248TP-E FEX, which has large port buffers that enable it to work at the slower 10-Mbps speed. If the 10-Mbps host that you are connecting cannot autonegotiate speeds, you must configure the host for 10 Mbps when connecting it to the Cisco Nexus 2248TP-E FEX.

Caution To comply with GR-1089 intrabuilding, lightning immunity requirements, you must use foil twisted-pair (FTP) cable that is properly grounded at both ends.

Figure B-10 shows the RJ-45 connector.

Figure B-10 RJ-45 Connector



1	Pin 1	**2**	Pin 8

Accessory Kits Contents

This appendix describes the contents of the Cisco Nexus 7000 Series accessory kits.

This appendix includes the following sections:

Cisco Nexus 7004 Switch Accessory Kit

This section describes the contents of the accessory kit that you can order for the Cisco Nexus 7004 switch. The accessory kit is shipped with each Cisco Nexus 7004 chassis. You use that kit for mounting the chassis on a four-post or two-post rack. Typically, you mount the front of the chassis using the front-mount brackets, which are already attached to the chassis, but if you need to mount the center of the chassis, you use the center-mount brackets (order part number N7K-C7004-RMK), which you must order separately. The kit also includes the screws, grounding lug, and other equipment that you use for all installations of this chassis.

Table C-1 lists and illustrates the contents for this kit.

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Table C-1 Cisco Nexus 7004 Switch Accessory Kit Contents

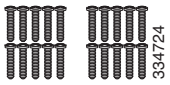
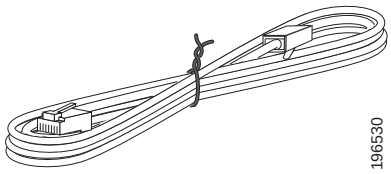
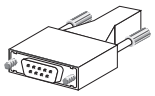
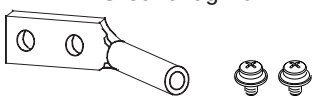
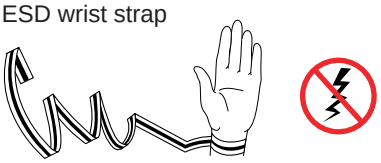
Illustration	Description	Quantity
	Chassis mounting screws • 12-24 x 3/4-in. Phillips screws • M6 x 19 mm Phillips screws	 10 10
	RJ-45 rollover cable	1

Table C-1 Cisco Nexus 7004 Switch Accessory Kit Contents (continued)

Illustration	Description	Quantity
 196531	D B9F/RJ-45F PC terminal	1
Ground lug kit  185847	Ground lug kit (includes the following parts): • Two-hole lug • M4 x 8-mm Phillips pan-head screws	1 kit 1 per kit 2 per kit
 334652	Cable ties, 8.5 inches	1 kit (3 pieces)
ESD wrist strap  113078	ESD wrist strap (disposable)	1
Not applicable	Hazardous substances list for customers in China	1
Not applicable	Cisco Information Packet 1-Year Limited Warranty for Hardware	1 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 cable for 6 AWG and up to 45 A).

The shipped cables depend on your specification when placing a Cisco Nexus 7000 Series device order.

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-AC16A-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

The available AC power cords for the 3.5-kW HVAC/HVDC power supplies are as follows:

- CAB-AC-16A-SG-AR—power cord, 250-VAC 16A, IRSM 2073Saf-D-Grid, Argentina
- CAB-AC-16A-SG-AZ—power cord, 250-VAC 16A, AU20LS3/Saf-D-Grid, Australia and New Zealand
- CAB-AC-16A-SG-BR—power cord, 250-VAC 16A, EL224/Saf-D-Grid, Brazil
- CAB-AC-16A-SG-CH—power cord, 250-VAC 16A, GB 16C/Saf-D-Grid, China
- CAB-AC-16A-SG-EU—power cord, 250-VAC 16A, CEE 7-7/Saf-D-Grid, Europe
- CAB-AC-16A-SG-IN—power cord, 250-VAC 16A, IEC60309/Saf-D-Grid, International
- CAB-AC-16A-SG-IND—power cord, 250-VAC 16A, SABS 164-1/Saf-D-Grid, India
- CAB-AC-16A-SG-IS—power cord, 250-VAC 16A, SI 16S3/Saf-D-Grid, Israel
- CAB-AC-16A-SG-IT—power cord, 250-VAC 16A, CEI 23-50/Saf-D-Grid to IEC-C19, Italy
- CAB-AC-16A-SG-SA—power cord, 250-VAC 16A, EL/Saf-D-Grid, South Africa
- CAB-AC-16A-SG-SK—power cord, 250-VAC 16A, Src/Saf-D-Grid, South Korea
- CAB-AC-20A-SG-US—power cord, 110-VAC 20A, straight blade, NEMA 5-20P/Saf-D-Grid, North America
- CAB-AC-20A-SG-US1—power cord, 125-VAC 20A, twist lock, NEMA L5-20/Saf-D-Grid, North America
- CAB-AC-20A-SG-US2—power cord, 250-VAC 20A, straight-blade, NEMA 6-20/Saf-D-Grid
- CAB-AC-20A-SG-US3—power cord, 250-VAC 20A, twist lock, NEMA L6-20/Saf-D-Grid
- CAB-AC-20A-SG-US4—power cord, 277-VAC 20A, NEMA L7-20P/Saf-D-Grid, North America
- CAB-AC-20A-SG-C20—cabinet jumper PDU power cord, 250-VAC, 20A, IEC C20/Saf-D-Grid, North America
- CAB-AC-16A-SG-SW—power cord, 250-VAC 16A, SEV 5934-2/Saf-D-Grid, Switzerland
- CAB-HV-25A-SG-US2—power cord, 300-VAC/500-VDC 20A, Ring Terminal/Saf-D-Grid, North America
- CAB-HV-25A-SG-US5—power cord, 300-VAC 20A, Saf-D-Grid P-10/Saf-D-Grid P4, North America
- CAB-HV-25A-SG-IN2—power cord, 300-VAC/500-VDC 20A, IEC/EU, Ring Terminal/Saf-D-Grid, International
- CAB-HV-25A-SG-IN3—power cord, 300-VAC 20A, Saf-D-Grid P-10/Saf-D-Grid P4, IEC/EU, International

Note All cables will not be orderable at first customer shipment (FCS).

The available DC power cords for the 3.5-kW HVAC/HVDC power supplies are as follows:

- CAB-HV-25A-SG-US1—power cord, 400-VDC 20A, Saf-D-Grid/Saf-D-Grid, North America
- CAB-HV-25A-SG-US2—power cord, 300-VAC/500-VDC 20A, Ring Terminal/Saf-D-Grid, North America
- CAB-HV-25A-SG-IN1—power cord, 400-VDC 20A, IEC/EU, Saf-D-Grid/Saf-D-Grid, International
- CAB-HV-25A-SG-IN2—power cord, 300-VAC/500-VDC 20A, IEC/EU, Ring Terminal/Saf-D-Grid, International

Note All cables will not be orderable at first customer shipment (FCS).

Cisco Nexus 7009 Switch Accessory and Optional Kits

This section describes the contents of the Cisco Nexus 7009 accessory kits and the other kits that you can order for the Cisco Nexus 7009 switch. The accessory kit is shipped with each Cisco Nexus 7009 chassis. You use that kit for mounting the front of the chassis on a four-post or two-post rack. If you are centering the chassis on a two-post rack, you must also order the Cisco Nexus 7009 Center Mount Kit (part number N7K-C7009-CMK). If you need to another bottom support bracket for front-mounting the chassis, order the Cisco Nexus 7009 Bottom Support Kit (part number N7K-C7009-BSK). If you need an additional set of brackets for mounting the front of the chassis to a rack, order the Cisco Nexus 7009 Rack Mount Kit (part number N7K-C7009-RMK).

This section includes the following topics:

Cisco Nexus 7009 Accessory Kit

The Cisco Nexus 7009 Accessory Kit is shipped with each Cisco Nexus 7009 chassis. Table C-2 lists and illustrates the contents for this kit.

Table C-2 Cisco Nexus 7009 Switch Accessory Kit Contents

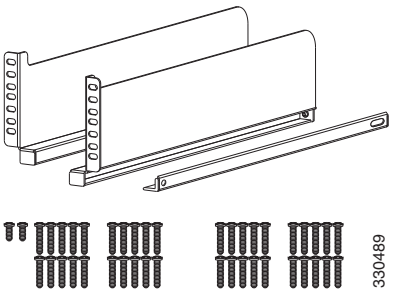
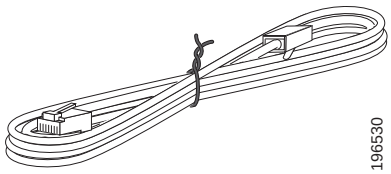
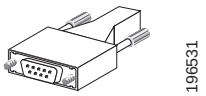
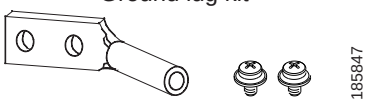
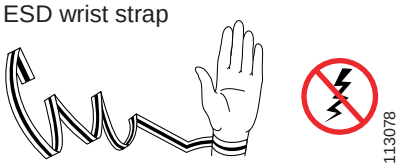
Illustration	Description	Quantity
	Front-mount Bottom-Support Kit (available separately as N7K-C7009-BSK) includes the following parts: • Front-mount bottom support rails • Crossbar • 12-24 x 3/4-in. Phillips screws • M6 x 19-mm Phillips screws • M4 x 8-mm Phillips screws **Note**: This accessory kit does not include the center-mount bottom-support kit (part number N7K-C7009-CMK). If you ordered that kit, it is included separately with the switch shipment.	1 kit 2 per kit 1 per kit 20 per kit 20 per kit 2 per kit
	RJ-45 rollover cable	1
	D B9F/RJ-45F PC terminal	1
Ground lug kit 	Ground lug kit (includes the following parts): • Two-hole lug • M4 x 8-mm Phillips pan-head screws	1 kit 1 per kit 2 per kit
	Cable ties, 8.5 inches	1 kit (7 pieces)
ESD wrist strap 	ESD wrist strap (disposable)	1
Not applicable	DCNM License for one Nexus 7000 Series chassis (optional)	1

Table C-2 Cisco Nexus 7009 Switch Accessory Kit Contents (continued)

Illustration	Description	Quantity
Not applicable	Hazardous substances list for customers in China	1
Not applicable	Cisco Information Packet	1
	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.

If your Cisco Nexus 7000 Series system includes 6 kW power supply units, the product shipment includes one or two country-specific power cords for each of those power supply units. The shipped cables depend on your specification when placing a Cisco Nexus 7000 Series device order. The available power cords for the 6 kW power supplies are as follows:

- CAB-AC-16A-AUS—power cord, 250-VAC 16A, C19, Australia
- CAB-AC16A-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

Cisco Nexus 7009 Center-Mount Kit

The Cisco Nexus 7009 Center-Mount Kit is not included in the Cisco Nexus 7009 accessory kit, but, if you are centering the Cisco Nuexus 7009 chassis on a two-post rack, you must order this kit (N7K-C7009-CMK) when you order the switch. Table C-3 lists the contents for this kit.

Table C-3 Cisco Nexus 7009 Center-Mount Kit (N7K-C7009-CMK)

Description	Quantity
Center-Mount Kit includes the following parts:	1 kit
• Center-mount rack mounting brackets (right and left brackets)	2 per kit
• Center-mount bottom support rails (right and left rails)	2 per kit

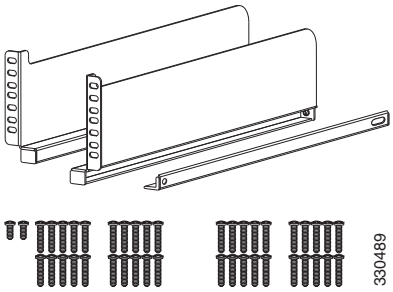
Table C-3 Cisco Nexus 7009 Center-Mount Kit (N7K-C7009-CMK) (continued)

Description	Quantity
• Crossbar	1 per kit
• 12-24 x 3/4-in. Phillips screws	20 per kit
• M6 x 19-mm Phillips screws	20 per kit
• M4 x 8-mm screws	2 per kit

Cisco Nexus 7009 Bottom Support Kit

The Cisco Nexus 7009 Bottom Support Kit is included in the Cisco Nexus 7009 Accessory Kit for use in mounting the front of the chassis to a two-post or four-post rack. If you need to replace these parts, you can order this kit by using part number N7K-C7009-BSK. Table C-4 lists and illustrates the contents for this kit.

Table C-4 Cisco Nexus 7009 Bottom Support Kit (N7K-C7009-BSK)

Illustration	Description	Quantity
	Front-mount Bottom Support Kit includes the following parts:	1 kit
	• Front-mount bottom support rails (right and left rails)	2 per kit
	• Crossbar	1 per kit
	• 12-24 x 3/4-in. Phillips screws	20 per kit
	• M6 x 19-mm Phillips screws	20 per kit
	• M4 x 8-mm Phillips screws	2 per kit

Cisco Nexus 7009 Rack-Mount Kit

The Cisco Nexus 7009 switch ships with the front-mount rack mounting brackets assembled onto the chassis, but you can order the Cisco Nexus 7009 Rack-Mount Kit (order number N7K-C7009-RMK) if you need replacement parts. Table C-5 lists and illustrates the contents for this kit.

Table C-5 Cisco Nexus 7009 Rack-Mount Kit (N7K-C7009-RMK)

Description	Quantity
Rack-Mount Kit (available separately as N7K-C7009-RMK) includes the following parts:	1 kit
• Front-mount rack mounting brackets (right and left brackets)	2 per kit
• M4 x 6-mm Phillips screws	12 per kit

Cisco Nexus 7010 Switch Accessory Kits

Table C-6 lists and illustrates the accessory kit contents for the Cisco Nexus 7010 switch.

Table C-6 Cisco Nexus 7010 System Accessory Kit Contents

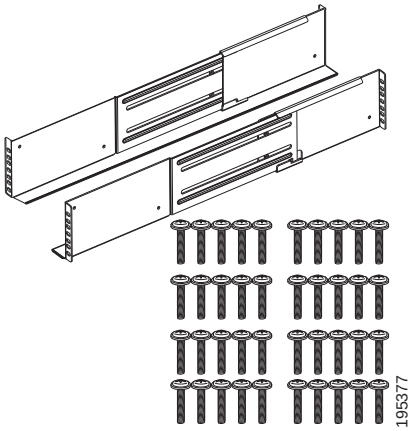
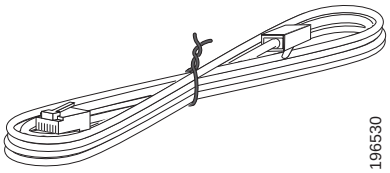
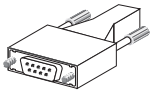
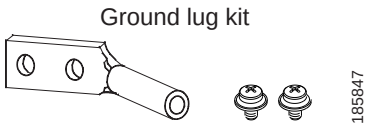
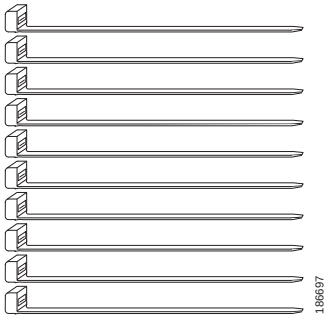
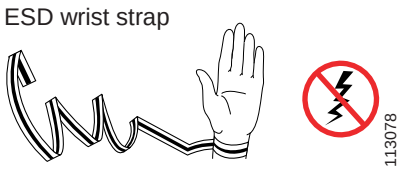
Illustration	Description	Quantity
	Bottom support rails kit (includes the following parts): • 12-24 x 3/4-in. Phillips screws • M6 x 19-mm Phillips screws • Adjustable bottom support rails	1 kit 20 per kit 20 per kit 2 per kit
	RJ-45 rollover cable	1
	DB-9F/RJ-45F PC terminal	1
	Ground lug kit (includes the following parts): • Two-hole lug • M4 x 8-mm Phillips pan-head screws	1 kit 1 per kit 2 per kit
	Cable ties, 8.5 inches	1 kit (10 pieces)

Table C-6 Cisco Nexus 7010 System Accessory Kit Contents (continued)

Illustration	Description	Quantity
	ESD wrist strap (disposable)	1
Not applicable	DCNM License for one Nexus 7000 Series chassis (optional)	1
Not applicable	Hazardous substances list for customers in China	1
Not applicable	Cisco Information Packet 1-Year Limited Warranty for Hardware	1 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.

If your Cisco Nexus 7000 Series system includes 6 kW power supply units, the product shipment includes one or two country-specific power cords for each of those power supply units. The shipped cables depend on your specification when placing a Cisco Nexus 7000 Series device order. The available power cords for the 6 kW power supplies are as follows:

- CAB-AC-16A-AUS—power cord, 250-VAC 16A, C19, Australia
- CAB-AC16A-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

Cisco Nexus 7018 Switch Accessory Kits

Table C-7 lists and illustrates the accessory kit contents for the Cisco Nexus 7018 switch.

Table C-7 Cisco Nexus 7018 Switch Accessory Kit Contents

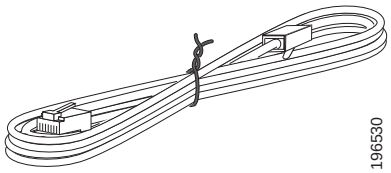
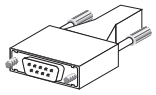
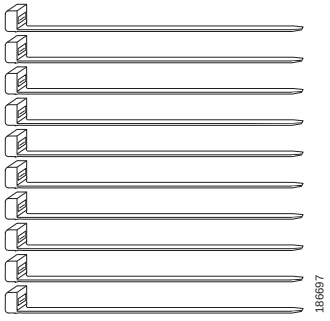
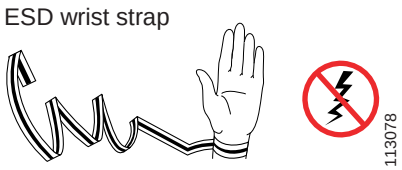
Illustration	Description	Quantity
	Bottom support rails kit (includes the following parts): • 12-24 x 3/4-in. Phillips screws • M6 x 19-mm Phillips screws • Adjustable bottom support rails	1 kit 34 per kit 34 per kit 2 per kit
	RJ-45 rollover cable	1
	D B9F/RJ-45F PC terminal	1
	Ground lug kit (includes the following parts): • Two-hole lug • M4 x 8-mm Phillips pan-head screws	1 kit 1 per kit 2 per kit
	Cable ties, 8.5 inches	1 kit (10 pieces)

Table C-7 Cisco Nexus 7018 Switch Accessory Kit Contents (continued)

Illustration	Description	Quantity
	ESD wrist strap (disposable)	1
Not applicable	DCNM License for one Nexus 7000 Series chassis (optional)	1
Not applicable	Hazardous substances list for customers in China	1
Not applicable	Cisco Information Packet 1-Year Limited Warranty for Hardware	1 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.

If your Cisco Nexus 7000 Series system includes 6 kW power supply units, the product shipment includes one or two country-specific power cords for each of those power supply units. The shipped cables depend on your specification when placing a Cisco Nexus 7000 Series device order. The available power cords for the 6 kW power supplies are as follows:

- CAB-AC-16A-AUS—power cord, 250-VAC 16A, C19, Australia
- CAB-AC16A-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

Chassis and Module LEDs

This appendix lists the Cisco Nexus 7000 Series system LEDs and describes the conditions they indicate for the chassis and each type of module installed in the chassis.

This appendix includes the following sections:

Switch LEDs

Table D-1 describes the switch LEDs that are located on the front of the chassis.

Table D-1 Switch LEDs

LED	Color	Condition
PSU	Green	Power supply units are all operational.
	Amber	One of the following problems has occurred: • Any power supply unit LED is red. • Any power supply unit is down.
FAN	Green	Fan tray modules are all operational.
	Amber	At least one fan tray module has a red STATUS LED.
	Red	Unknown
SUP	Green	Supervisor modules are all operational.
	Amber	At least one supervisor module has a red STATUS LED.
FAB	Green	Fabric modules are all operational.
	Amber	At least one fabric module has a red STATUS LED.

Table D-1 Switch LEDs

LED	Color	Condition
IOM	Green	The modules in the I/O slots are all operational.
	Amber	At least one module in the I/O slots has a red STATUS LED.

Supervisor Module LEDs

Table D-2 describes the supervisor module LEDs.

Table D-2 Supervisor Module LEDs

LED	Status	Description
STATUS	Green	All diagnostics pass. The module is operational (normal initialization sequence).
	Red	The module has detected a slot ID parity error and will not power on or boot up. or The module is not fully inserted and does not have a reliable connection to the midplane. or The diagnostic test has failed.
	Flashing red	The inlet air temperature of the system has exceeded the safe operating temperature limits of the module (a major environmental warning). The module has been shut down to prevent permanent damage. The system will be shut down after two minutes if this condition is not cleared. or The module is resetting, and both ejector levers are out.
	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.
SYSTEM	Green	All chassis environmental monitors are reporting okay.
	Amber	At least one power supply has failed or the power supply fan has failed.
	Red	The temperature of the supervisor engine major threshold has been exceeded.
	Off	The slot has detected a slot ID parity error.
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 of the installed modules.
	Amber	Insufficient power is available for all of the installed modules.

Table D-2 Supervisor Module LEDs (continued)

LED	Status	Description
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.
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.
ACT LOG FLASH (Supervisor 1)	Green	The log flash CompactFlash or USB disk is being accessed. Do not remove the media until the LED is off.
LOG FLASH (Supervisor 2 and 2E)	Off	The expansion flash CompactFlash or USB disk is not being accessed. You can remove the media while this LED is off.
ACT EXPANSION FLASH (Supervisor 1)	Green	The expansion flash CompactFlash or USB disk is being accessed. Do not remove the media until the LED is off.
Slot 0 (Supervisor 2 and 2E)	Off	The log flash CompactFlash or USB disk is not being accessed. You can remove the media while this LED is off.
CMP MGMT ETH (Supervisor 1 module only)	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 does not detect a signal.
CMP STATUS (Supervisor 1 module only)	Green	All diagnostics pass. The CMP is operational (normal initialization sequence).
	Amber	Sufficient power is not available for all modules.
	Flashing amber	The diagnostic test has failed. or The CMP is not operational because a fault has occurred during the initialization sequence.
	Red	The module has detected a slot ID parity error.
	Off	The CMP is not receiving power.
LINK (Supervisor 1 module only)	Green	The module has detected a link.
	Off	The module has not detected a link.
ACT (Supervisor 1 module only)	Flashing green	The module is transmitting or receiving.
	Off	The module is not transmitting or receiving.

I/O Module LEDs

Table D-3 describes the I/O module LEDs.

Table D-3 I/O Module LEDs

LED	Status	Description
ID	Flashing blue	The operator has activated this LED to identify this module in the chassis.
	Off	This module is not being identified.
Status	Green	All diagnostics pass. The module is operational (normal initialization sequence).
	Red	The module has detected a slot ID parity error and will not power on or boot up. or The module is not fully inserted, and it is not making a reliable connection with the supervisor. or The module has failed diagnostic tests and has powered down. **Note** While reloading an F3-Series or M3-Series I/O module, the status LED is Amber until the testing phase is complete. While reloading an F2e-Series or an M2-Series I/O module, the status LED blinks RED until the testing phase is complete.
	Flashing red	The switch has just been powered on, and the module is resetting. or The module is resetting and both ejector levers are out. or The module has been inserted during the initialization process. or The module could not power up because of insufficient power. or An overtemperature condition has occurred. A major temperature threshold has been exceeded during environmental monitoring.
	Off	The module is not receiving power.
Link (for each port)	Green	The port is active (the link is connected and active).
	Orange	The port is disabled by the operator or is not initializing.
	Flashing orange	The port is faulty and disabled.
	Off	The port is not active or the link is not connected.

NAM-NX1 Module LEDs

Table D-4 describes the LEDs on the NAM-NX1.

Table D-4 NAM-NX1 LEDs

LED	Color	Condition
STATUS	Green	The NAM is operational.
	Orange	Indicates one of the following conditions: • The module is booting up and running diagnostic tests. • The module is disabled and not in service. • The module is shutting down or coming up.
	Red	Indicates one of the following conditions: • The module is booting up and running diagnostic tests. • The module is disabled and not in service. The module is shutting down or coming up.
	Off	The module is powered off.
ID	Blue	Identifies the module.
	Off	The module is not being identified.
Sync Link Status	Green	The port is active (link is connected).
	Off	The port is not active (link is not connected)
SAS Link Status LED	Green	The port is active (link is connected).
	Orange	The port is disabled by the operator or is not initializing.
	Flashing orange	The port is faulty and disabled.
	Off	The port is not active or the link is not connected.

Fabric Module LEDs

Table D-5 describes the fabric module LEDs.

Table D-5 Fabric Module LEDs

LED	Status	Description
Status	Green	All diagnostics pass. The module is operational (normal initialization sequence).
	Red	The diagnostic test has failed. The module is not operational because a fault has occurred during the initialization sequence. or 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.
	Flashing red	The fabric module has just been inserted and is booting up. or An overtemperature condition has occurred and the module has powered down. or The power was turned off with a CLI command. or The module is resetting and both ejector levers are out.
ID	Flashing blue	The operator has activated this LED to identify this module in the chassis.
	Off	This module is not being identified.

Power Supply LEDs

Table D-6 describes the power supply unit LEDs. The Output, Fault, and ID LEDs have the same function for the AC, DC and HVAC/HVDC power supply units.

Table D-6 Power Supply LEDs

LED	Color	Condition
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.
Input 2 (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.

Table D-6 Power Supply LEDs (continued)

LED	Color	Condition
	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.
	Flashing 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.

Fan Tray LEDs

Table D-7 describes the fan tray LEDs.

Table D-7 Fan Tray LEDs

LED	LED Indication	Condition
STATUS	Green	The fan tray is operational.
	Flashing red	One or more fans is running below the threshold speed. 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.

Repacking the Cisco Nexus 7000 Series Switch for Shipment

This appendix describes how to repack a Cisco Nexus 7000 Series system for shipment. This appendix includes the following sections:

Disconnecting the Cisco Nexus 7000 Series System

Before you can remove the Cisco Nexus 7000 Series system components and repack the system, you must disconnect the system from the AC power source, console, and network as explained in the following topics:

Caution When you are handling the Cisco Nexus 7000 Series switch or switch components, you must follow the 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 in the data center building.

Powering Down the Cisco Nexus 7000 Series System

To power down the Cisco Nexus 7000 Series system, turn the power switch on each power supply from Power to standby, and then disconnect the power cords to each power supply. The system is powered down when the LEDs on each power supply are all off.

Disconnecting the System from the Console

To disconnect the system from the console, you must disconnect each interface cable that connects to the management Ethernet (Mgmt Ethernet) and CMP (available only on Supervisor 1 modules) interfaces on each supervisor module. You must also disconnect the cables and their adapters from the console.

Disconnecting the System from the Network

To disconnect the system from the network, you must remove each I/O cable from the system I/O modules.

Repacking the System Components

You repack the Cisco Nexus 7000 Series system in its shipping materials, which you can order if they are not available at your facility. To make the Cisco Nexus 7000 Series lighter and easier to move, remove its power supply units, its external frames and doors, and, for the Cisco Nexus 7010 switch, its optional air filter before you move the chassis. You should pack each of these components separately. To pack the chassis, you typically use a mechanical lift (required whenever lifting over 120 pounds [54.4 kg]) to move the chassis from the rack to its shipping pallet, where you can package the chassis and its components.

This section includes the following topics:

Prerequisites for Repacking the System

You must power down and disconnect the system from the network before you begin removing the switch from the rack or cabinet (see the "Disconnecting the Cisco Nexus 7000 Series System" section on page E-1).

Required Tools and Equipment for Repacking the System

Before you repack the Cisco Nexus 7000 Series chassis into its original shipping materials, make sure that you have the following tools and equipment:

- Mechanical lift capable of lifting one of the following weights:
  - Cisco Nexus 7004 chassis—50 lbs (68 kg)
  - Cisco Nexus 7009 chassis—300 lbs (136 kg)
  - Cisco Nexus 7010 chassis—550 lbs (250 kg)
  - Cisco Nexus 7018 chassis—700 lbs (318 kg)
- Number 1 Phillips screwdriver with torque capability
- Nut driver attachment for screwdriver or ratchet wrench with torque capability (used only for DC power supplies)
- 3/16-inch flat-blade screwdriver
- ESD wrist strap

- Original shipping container and packing materials, which you can order with one of the following part numbers:
  - Cisco Nexus 7004 chassis—N7K-C7004-SHPPKG=
  - Cisco Nexus 7009 chassis—N7K-C7009-SHPPKG=
  - Cisco Nexus 7010 chassis—N7K-C7010-SHPPKG=
  - Cisco Nexus 7018 chassis—N7K-C7018-SHPPKG=
- Strapping

Caution When you are handling the Cisco Nexus 7000 Series switch or switch components, you must follow the 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 in the data center building.

Repacking the Cisco Nexus 7004 Switch

If you plan to lift the Cisco Nexus 7004 chassis off the rack, you must lighten it to less than 120 pounds (54.4 kg) by removing the power supplies from the chassis. Otherwise, you must position a mechanical lift to hold the chassis as you remove it from the rack.

Before you remove a chassis from the rack, lay its pallet on the floor and set its packing materials nearby. If you do not have the original packing materials for the Cisco Nexus 7004 switch, order another set of these materials (part number N7K-C7004-SHPPKG=).

Caution Do not subject the pallet, switch, or package to water or moisture.

To repack the Cisco Nexus 7004 switch, follow these steps:

Step 1 For each power supply installed in the chassis, turn the power switch to standby (labelled as 0) and verify that its OUTPUT LED is not lit.

Step 2 For each AC power supply, remove the power cord as follows:

a. Remove the power cable from the power source and verify that none of the power supply LEDs are lit.

b. Lift the power cable retention clip that holds the power plug onto the power supply and pull the plug out of the recepticle on the power supply.

Step 3 For each DC power supply, remove the power cord as follows:

a. Verify that the power is turned off at the source (circuit breaker) and that no LEDs are lit on the power supply.

b. Remove the power cables from the source.

c. Remove the cover for the terminal box on the DC power supply by removing its three screws and pulling the lid off the box. For the location of the terminal box and the screws that secure its lid, see Figure 6-7 on page 6-18.

d. Remove the two nuts holding each of four lugs to the terminal box.

e. Replace the terminal box cover and secure with three screws.

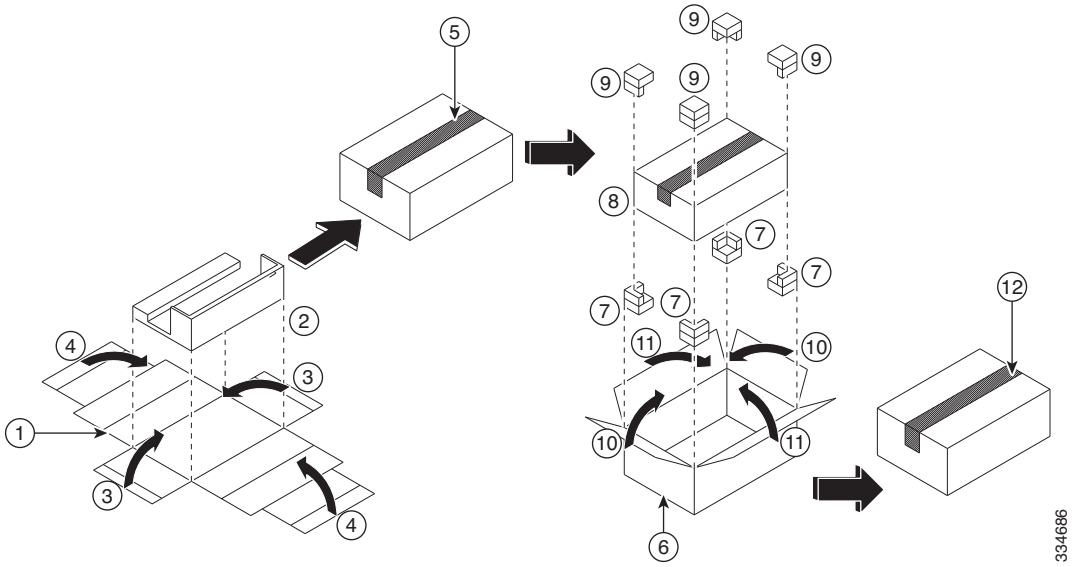
Step 4 If there is a front door on the chassis, remove and repack it as follows:

a. Set the packing materials for the front door by the chassis.

b. Holding the door on both sides, pull it away from the front of the chassis.

c. Center the door (front side down as shown in Callout 2 in Figure E-1) on center section of the flattened inner box.

Figure E-1 Packing the Front Door for the Cisco Nexus 7004 Chassis



1	Flattened inner box for the front door	**7**	Corner pads placed in each corner
2	Front door (front side down)	**8**	Inner box placed in outer box and on corner pads
3	Smaller flaps (2) folded over the door	**9**	Corner pads placed on each inner box corner
4	Larger flaps (2) folded over the door	**10**	Smaller flaps (2) folded over inner box
5	Larger flaps taped together and to the box	**11**	Larger flaps (2) folded over inner box
6	Outer box opened for inner box	**12**	Larger flaps taped together and to box

d. Fold the two smaller inner box flaps over the door (see Callout 3 in Figure E-1).

e. Fold the two larger inner box flaps over the door (see Callout 4 in Figure E-1).

f. Tape the larger inner box flaps together and to the box (see Callout 5 in Figure E-1).

g. Open the outer box (see Callout 6 in Figure E-1).

h. Place four corner pads in the inner lower corners of the outer box (see Callout 7 in Figure E-1).

i. Place the inner box inside the outer box and on the corner pads (see Callout 8 in Figure E-1).

j. Place four corner pads on the upper corners of the inner box (see Callout 9 in Figure E-1).

k. Fold the smaller flaps over the inner box (see Callout 10 in Figure E-1).

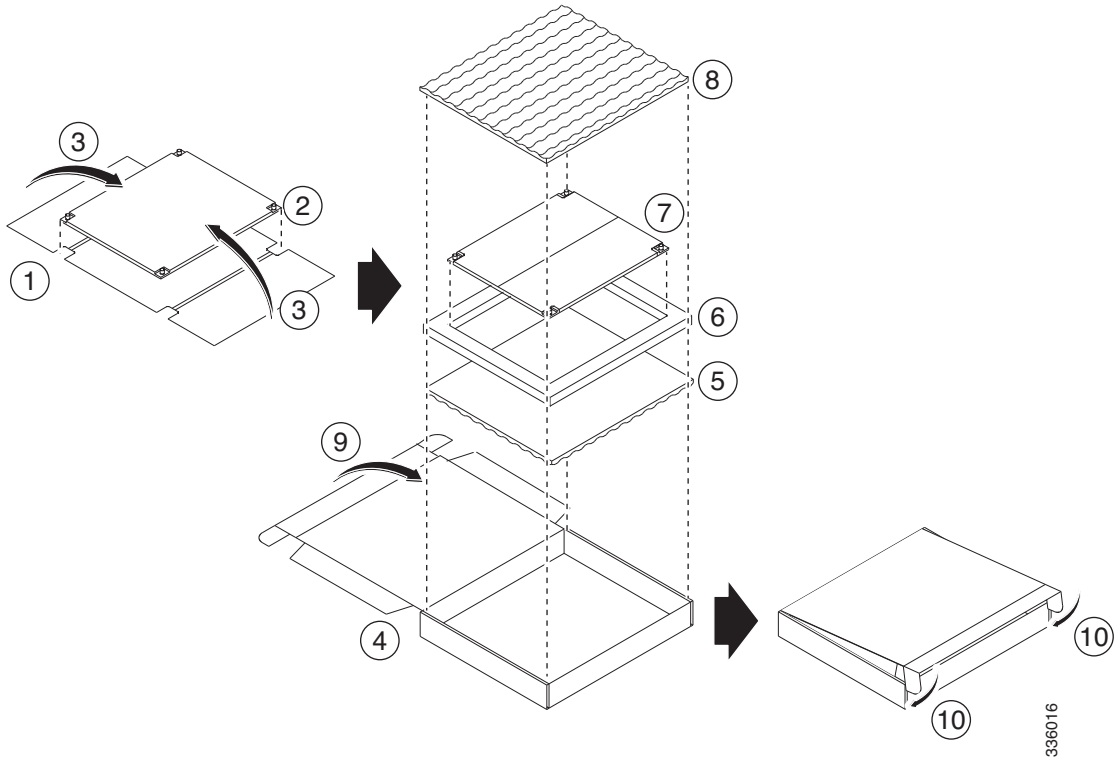
l. Fold the two larger flaps over the inner box (see Callout 11 in Figure E-1).

m. Tape the larger flaps together and to the box (see Callout 12 in Figure E-1).

Step 5 If there is an air filter attached to the chassis, remove and repack it as follows:

a. Open the air filter box, place a layer of padding in the bottom of the box, and place the four-sided padding in the box (see Callouts 4, 5, and 6 in Figure E-2).

Figure E-2 Packing the Air Filter for the Cisco Nexus 7004 Chassis



1	Cardboard trifold protector for air filter	**6**	Four-sided padding
2	Air filter centered on trifold	**7**	Air filter in trifold placedinside the four-sided padding in the air filter box
3	Two flaps folded over the air filter	**8**	Padding placed on top of air filter
4	Air filter box opened	**9**	Air filter box top folded over to close the box
5	Padding placed in the bottom of the air filter box	**10**	Two flaps on air filter box inserted into slots in the box walls.

b. Unscrew the eight M3 screws that fasten the air filter to the right side of the chassis.

c. Remove the air filter from the chassis and center it on the trifold piece of cardboard found with the packing materials (see Callouts 1 and 2 in Figure E-2).

d. Fold the two trifold flaps over the air filter (see Callout 3 in Figure E-2).

e. Place the protected air filter inside the four-sided padding in the air filter box (see Callout 7 in Figure E-2).

f. Place a layer of padding over the air filter in the air filter box (see Callout 8 in Figure E-2).

g. Close the air filter box (see Callout 9 in Figure E-2) and push two flaps on the box cover into slots in the box (see callout 10 in Figure E-2) .

Step 6 Remove the console and management Ethernet cables and any storage media from the supervisor modules.

Step 7 Remove all of the cables from the I/O modules.

Step 8 Remove the ground lug and cable from the chassis as follows

a. Unscrew the two M4 screws that fasten the ground lug to the chassis (for the location of the chassis grounding pad, see Figure 2-4 on page 2-10).

b. Place the screws in a bag for small parts.

Step 9 Remove the cable management frames as follows:

a. On one of the two cable management frames, remove the three M3 screws that fasten the frame to the chassis and pull the frame off of the chassis. For the locations of these screws, see Figure 2-5 on page 2-12.

b. Place the screws in the bag for small accessory kit parts.

c. Repeat Steps 9a and 9b for the other cable management frame.

Step 10 Prepare to remove the chassis from the rack by doing one of the following:

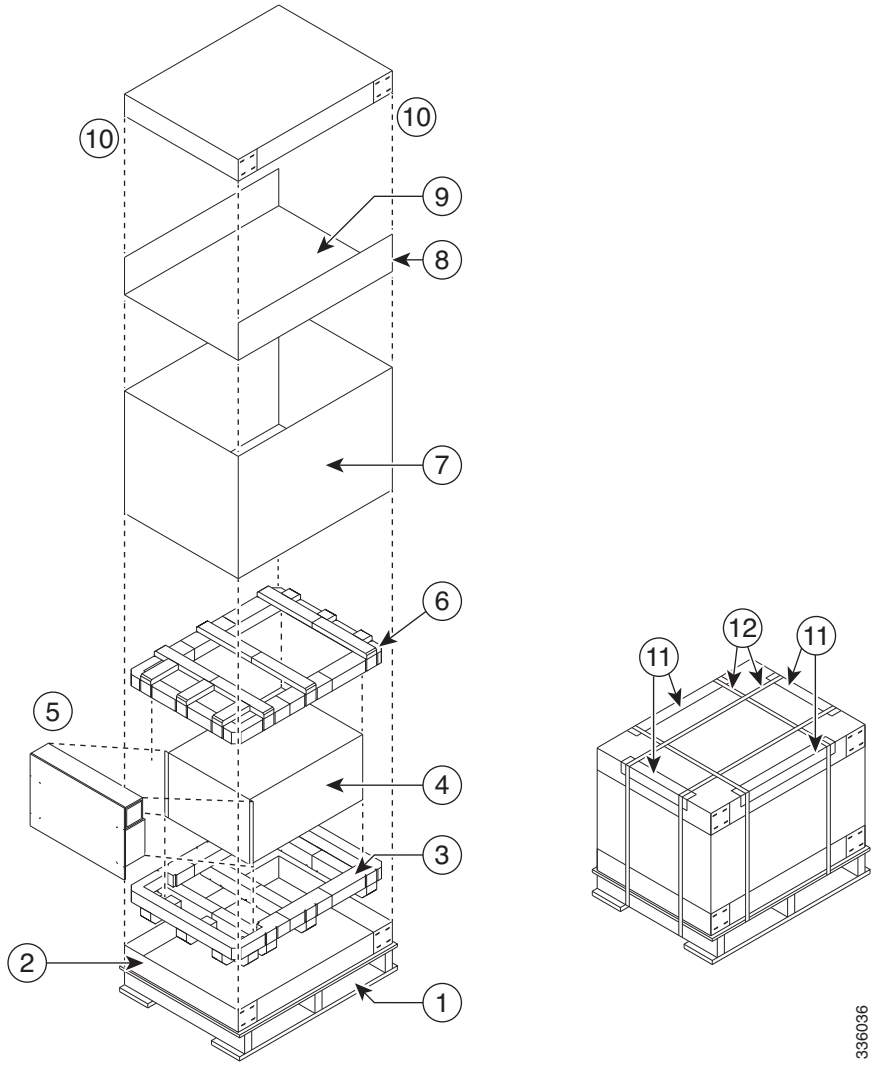
a. If you are going to lift the chassis off the rack, ensure that it weighs less than 120 pounds (54.4 kg) by removing the power supplies. To remove a power supply, move and hold its ejector lever to the left and pull the power supply part way out of the chassis. Place your other hand on it, pull it fully out of the chassis.

b. If you are using a mechanical lift to move the chassis (this is required if it weighs more than 120 pounds [54.4 kg]), position the lift under the chassis or, if the chassis is sitting on another chassis in the rack, position the lift immediately in front of the rack at the level of the chassis bottom or no more than 0.25 inches (0.6 cm) lower than the chassis.

Step 11 With the chassis supported below by a mechanical lift or by another chassis or by two people holding it, unscrew the ten M4 x 6 mm screws that fasten the chassis to the rack. Place the screws in the small parts bag for the accessory kit.

Step 12 Place the bottom of the packing box on the pallet with the open side facing up (see callouts 1 and 2 in Figure E-3).

Figure E-3 Packing the Cisco Nexus 7004 Chassis



1	Pallet laying flat on the floor	**7**	Four sided box placed around chassis and inside the walls of the box bottom piece
2	Box bottom with open side facing up	**8**	Trifold accessory tray placed inside box and on top of padding
3	Padding placed inside box bottom	**9**	Accessory kit placed in accessory tray
4	Chassis placed on padding and positioned with its rear against one side of the padding (including power supplies)	**10**	Box top placed over the four sided box with the box top walls outside the box
5	Cardboard insert placed in remaining open area of padding against front of chassis	**11**	Four edge protectors placed on the top outer edges of the box top
6	Padding placed on top of chassis	**12**	Four strapping tapes secure the box to the pallet

Step 13 Place one of the foam pads (Callout 3 in Figure E-3) inside the box bottom.

Step 14 Move the chassis from the rack and to its pallet in one of the following ways:

- If the chassis is sitting on a mechanical lift, use the mechanical lift to move the chassis from the rack to the pallet.
- If the chassis is sitting on top of another chassis, use two people to push the chassis all the way onto the mechanical lift placed in front of the chassis, and then use the mechanical lift to move the chassis to the pallet.
- If you are using two or more people to lift the chassis, lift the chassis out of the rack and move it to the pallet.

Step 15 If the chassis is on a mechanical lift, place the lift next to the pallet, position the bottom of the chassis no more than 0.25 inches [0.64 cm] above the top of the padding on the pallet, and use two persons to push or lift the chassis onto the padding. Make sure that the rear of the chassis is placed against one of the padding walls (that leaves an open area in the padding in front of the chassis).

Step 16 If you removed the power supplies before moving the chassis, replace each power supply in the chassis as follows:

a. Have two people tilt the front of the chassis up about 2 inches (5 cm).

b. Holding the bottom of the power supply with one hand and its front handle with the other hand, align the power supply to an open power supply bay and push the power supply fully into the slot until its latch clicks.

c. Repeat steps 17b for each power supply that you need to put back in the chassis.

d. Place the chassis back down on the padding.

Step 17 Place the cardboard insert in the remaining open area in the padding and in front of the chassis (see Callout 5 in Figure E-3).

Step 18 Place the foam padding on top of the chassis (see Callout 6 in Figure E-3).

Step 19 Place the four-sided box around the chassis and the top pallet. (see Callout 7 in Figure E-3).

Step 20 Place the accessory tray inside the four-sided box and on top of the padding (see Callout 8 in Figure E-3).

Step 21 Place the accessory kit and the front door kit in the accessory tray (see Callout 9 in Figure E-3).

Step 22 Place the cardboard top on the chassis box (see callout 10 in Figure E-3).

Step 23 Place four edge protectors (Callout 11 in Figure E-3) along the top edges of the cardboard top where you will be placing the packing straps.

Step 24 Fasten the top of the box to the box and pallet with two packing straps (see Callout 12 in Figure E-3).

Repacking the Cisco Nexus 7009 Switch

Before you remove a Cisco Nexus 7009 switch chassis from a rack, lay its two pallets (two pallets bolted together) on the floor and set its packing materials nearby. If you do not have the original packing materials, order another set of these materials (part number N7K-C7009-SHPPKG=).

Caution Do not subject the pallet, switch, or package to water or moisture.

To repack the Cisco Nexus 7009 switch, follow these steps:

Step 1 Turn the power switch on each power supply to standby (labelled as STBY) and verify that the OUTPUT LED is not lit.

Step 2 For each AC power supply, remove the power cords as follows:

a. Remove one or two power cables from the power source and verify that all of the power supply LEDs are off.

b. If you are removing a 6-kW power supply, unscrew the screw on the cable retention device that holds the power plug onto the power supply and pull each power-cable plug off the power supply.

Note For a 7.5-kW power supply, you cannot remove the power cords from it because the cables are permanently attached.

Step 3 For each DC power supply, shut off the input power and remove the power cords as follows:

a. Turn the power switch on each power supply to standby (labelled as STBY) and verify that the OUTPUT LEDs are off.

b. Turn off the DC input power by manually turning off each input circuit at its circuit breaker.

Warning **Before performing any of the following procedures, ensure that power is removed from the DC circuit.** Statement 1003

c. Verify that the input power is completely off by making sure that all of the LEDs on the DC power supplies are off.

d. Detach each of the power cables from the powered down DC power source or DC power interface unit (PIU).

Warning **Hazardous voltage or energy may be present on DC power terminals. Always replace cover when terminals are not in service. Be sure uninsulated conductors are not accessible when cover is in place.** Statement 1075

e. For each of the power plugs attached to the DC power supply, completely unscrew the two screws that hold it to the power supply and unplug it.

f. Disconnect the grounding lug from the lower front side of the power supply by unscrewing its two M6 nuts and pulling the grounding lug off of the power supply. For the location of the grounding pad, see Figure 6-2 on page 6-11.

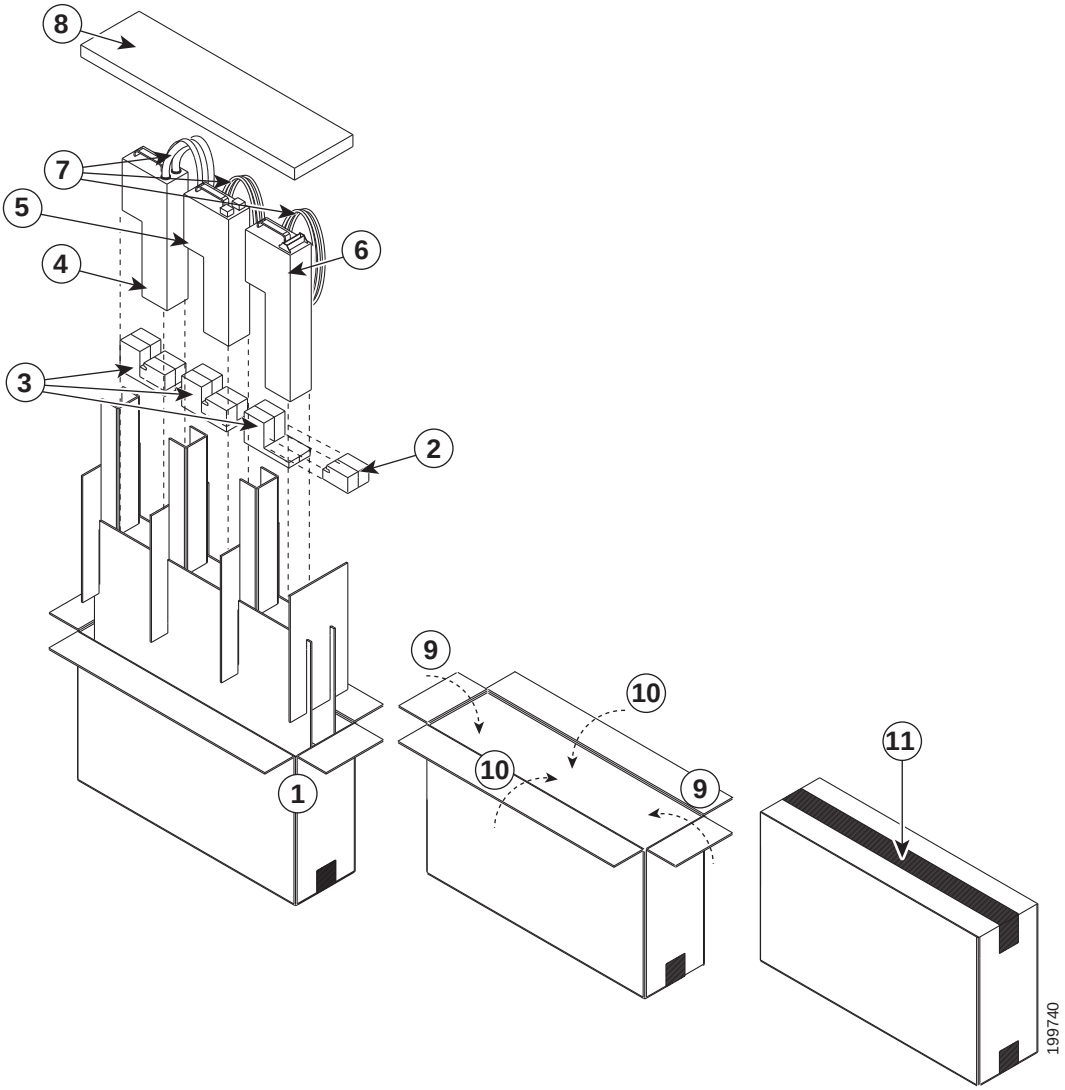
g. Place the power cords in the accessory kit box for this switch.

Step 4 Remove each power supply unit and repack it as follows:

Note These instructions are for the multi-unit power supply box that comes with newer Cisco Nexus 7010 switches. If you have the single-unit box for the 6-kW AC power supply unit, see Figure E-15 on page E-24 for packing instructions. If you have the single-unit box for the 6-kW DC power supply unit, see Figure 10-3 on page 10-13 for packing instructions.

a. Open the box for the power supply units and make sure that the cardboard holders are set up inside the box (see Callout 1 in Figure E-4).

Figure E-4 Packing Power Supply Units in a Multi-Unit Box



1	Opened packing box with cardboard holders	**7**	Power cables coiled and placed in the slot next to the power supply
2	Bottom pad with detachable portion removed for DC power supply	**8**	Top pad placed above the power supplies
3	Bottom pad, with uneven side up, placed in slot	**9**	Two narrow flaps folded over the top of the box
4	7.5-kW AC power supply unit (N7K-AC-7.5KW-INT or N7K-AC-7.5KW-US), placed in a slot with a full bottom pad (detachable portion still attached)	**10**	Two wide flaps folded over the narrow flaps
5	6-kW AC power supply unit (N7K-AC-6.0KW), placed in a slot with a full bottom pad (detachable portion still attached)	**11**	Two wide flaps taped together and to the box
6	6-kW DC power supply unit (N7K-DC-6.0KW), placed in a slot that has a bottom pad minus its detachable portion (to accommodate the longer power supply unit)		

b. If you are packing a DC power supply unit, remove the detachable portion from the bottom pad (see Callout 2 in Figure E-4). This detachable portion of the pad is included only when packing the shorter AC power supply units.

c. Insert the bottom pad, uneven side facing up, into the slot that you are filling (see Callout 3 in Figure E-4).

d. Unscrew the four captive screws on the power supply so that they no longer connect with the chassis.

e. With one hand on the handle of the power supply, pull the unit partially out of the chassis.

f. Place your other hand underneath the power supply to support it, and then pull it fully out of the chassis.

g. Place the power supply in its ESD packing bag and insert the bagged power supply in one of the three larger slots in the packing box (see Callouts 4, 5, and 6 in Figure E-4).

Note For easier handling of a multi-unit box, be sure to arrange the power supplies so their weight is balanced in the box. If you are packing only one unit, place it in the large slot in the middle of the box. If you are packing two units, place them in the large slots at each end of the box.

h. Coil the power cables and insert them in the slots next to the power supply (see Callout 7 in Figure E-4).

i. If there is another power supply to pack, repeat Steps 4a through 4h.

j. Place the top padding above the power supplies (see Callout 8 in Figure E-4).

k. Fold the two narrow flaps of the box over the padding (see Callout 9 in Figure E-4).

l. Fold the two wide flaps over the narrow flaps (see Callout 10 in Figure E-4).

m. Tape the wide flaps together and to the box (see Callout 11 in Figure E-4) with packing tape.

Warning **When installing or replacing the unit, the ground connection must always be made first and disconnected last.** Statement 1046

Step 5 Disconnect the switch from the console and the network as follows:

a. For each supervisor module, disconnect the cables connected to the console, Com/AUX, Management, and CMP Management ports.

Note The CMP feature is available only on Supervisor 1 modules.

b. Disconnect all of the cables from each of the I/O modules.

Step 6 Disconnect the grounding lug from the front of the chassis as follows:

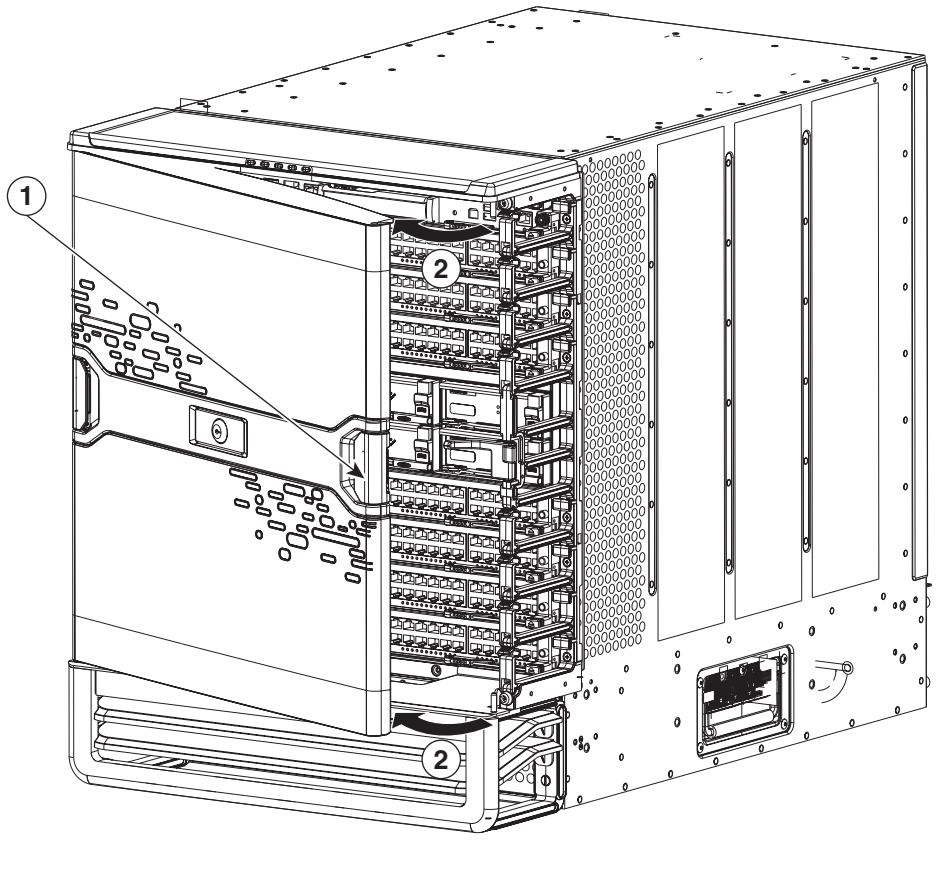
a. Unscrew the two M4 screws that hold each ground lug to the chassis. For the location of the grounding pad on the chassis, see Figure 3-12 on page 3-22.

b. Remove the grounding lug from the chassis and place the two screws in the accessory kit.

Step 7 If the chassis includes the optional front door and air-intake frame, remove and repack them as follows:

a. Open the door by pulling one of its latch handles out until it clicks (the handle clicks when you pull it out about 30 degrees) and rotate the door away from the chassis (see Figure E-5).

Figure E-5 Removing One Side of the Front Door



1	Pull out either door handle.	**2**	Fully rotate the door away from the chassis.

b. Press the locking button on the back side of the door (behind the opened latch handle) so that the latch handle flattens to the front side of the door.

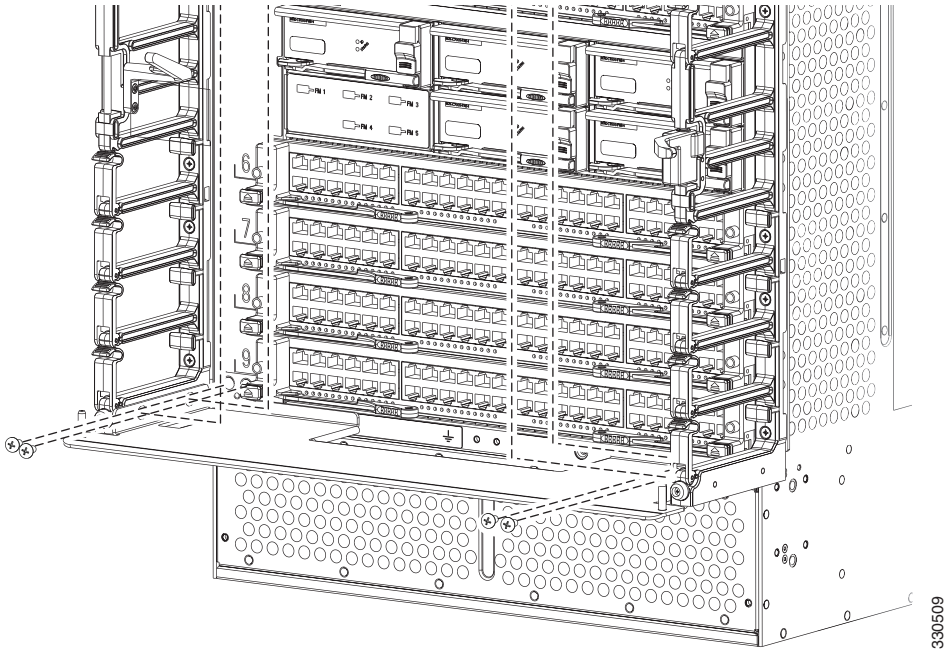
c. Hold the opened side of the door with one hand and use your other hand to open the latch handle on the hinged side of the door until the handle clicks. Use both hands to remove the door from the chassis.

d. Press the locking button on the inside surface of the door behind the opened latch to flatten the latch handle to the front side of the door.

e. Wrap the door in the bubble wrap included in the front-door and air-intake-frame kit. Set this by the kit for packing later in this process.

f. Remove the bottom hinge bracket by removing four screws that attach it to the chassis and four screws that attach it to the right and left cable management frames (two screws for each frame) as shown in Figure E-6. Place the bracket with the front door wrapped in bubble wrap and put the screws in a bag for small door parts.

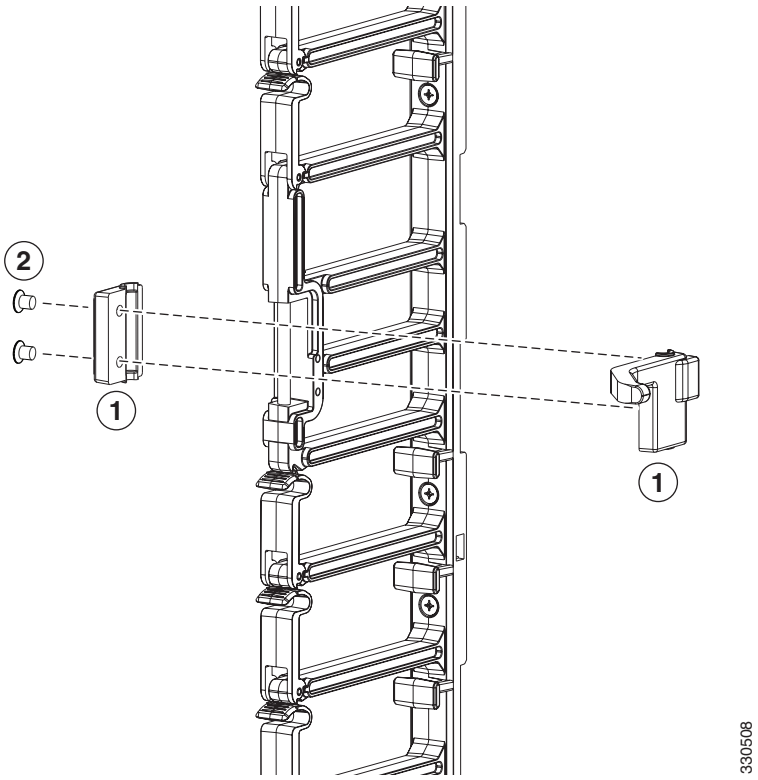
Figure E-6 Removing the Bottom Hinge Bracket from the Chassis



1	Remove the four screws (two on each side of the chassis) that hold the bracket to the chassis.	**2**	Remove the four screws (two screws on each side of the bracket) that hold the bracket to each side frame.

g. Remove the door stop from the right cable management frame by loosening and removing its two M4 screws (see Figure E-7). Pull the two pieces of the door stop off the cable management frame and put the two pieces and two screws in the small parts bag.

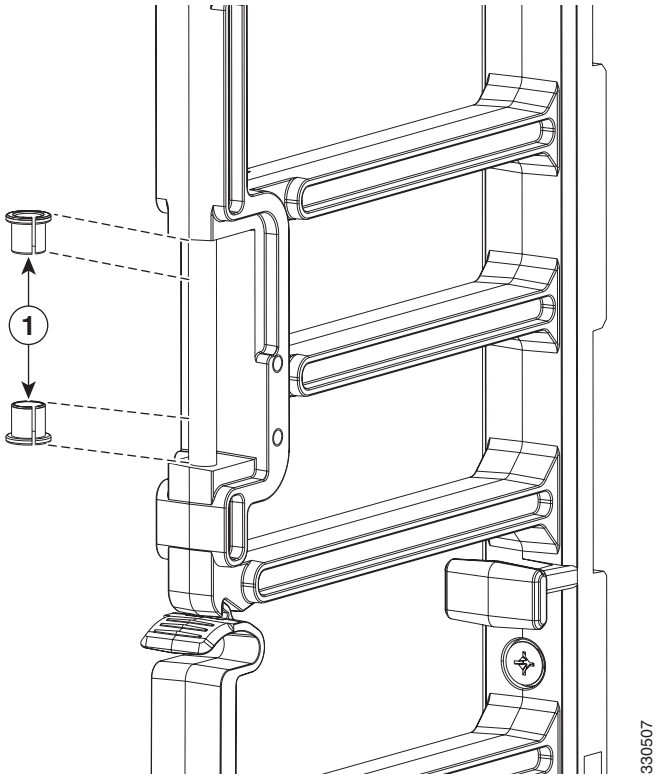
Figure E-7 Removing the Door Stop from the Right Cable Management Frame



1	Two parts to the right door stop	**2**	Two M4 screws removed to disassemble the door stop.

h. Pull off the two bushings from the post that the right door stop was attached to (see Figure E-8). Put the bushings in the small parts bag.

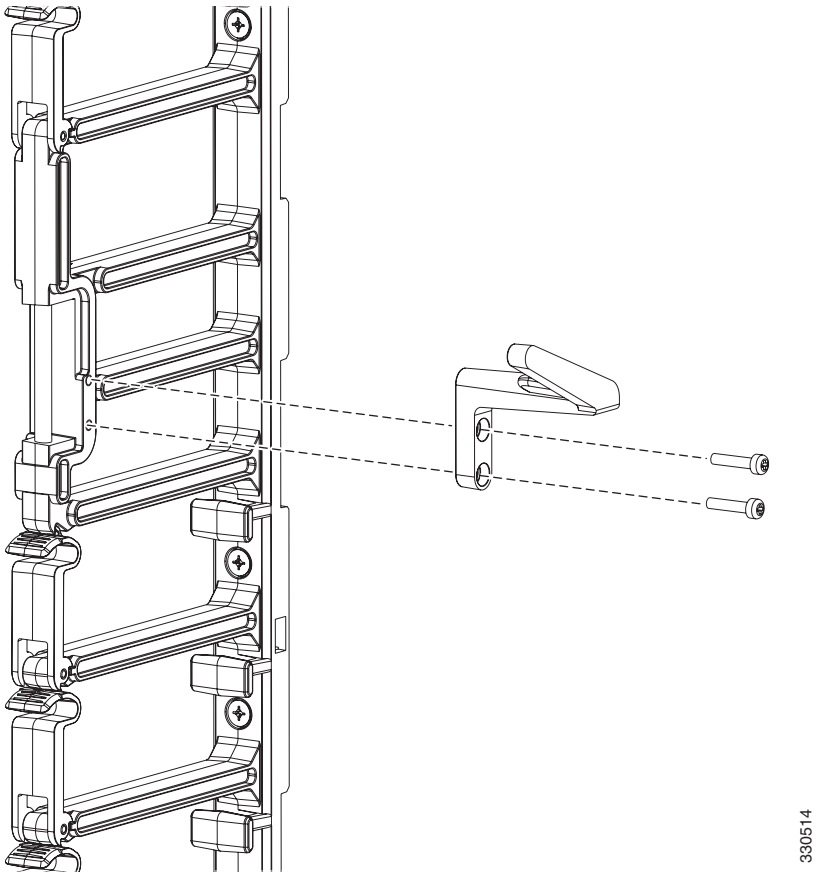
Figure E-8 Removing the Bushings from the Right Cable Management Frame



1	Bushings removed from right cable management frame		

i. Remove the door stop on the left cable management frame by loosening and removing its two M3 screws (see Figure E-9). Place the door stop and screws in the small parts bag.

Figure E-9 Removing the Door Stop from the Left Cable Management Frame

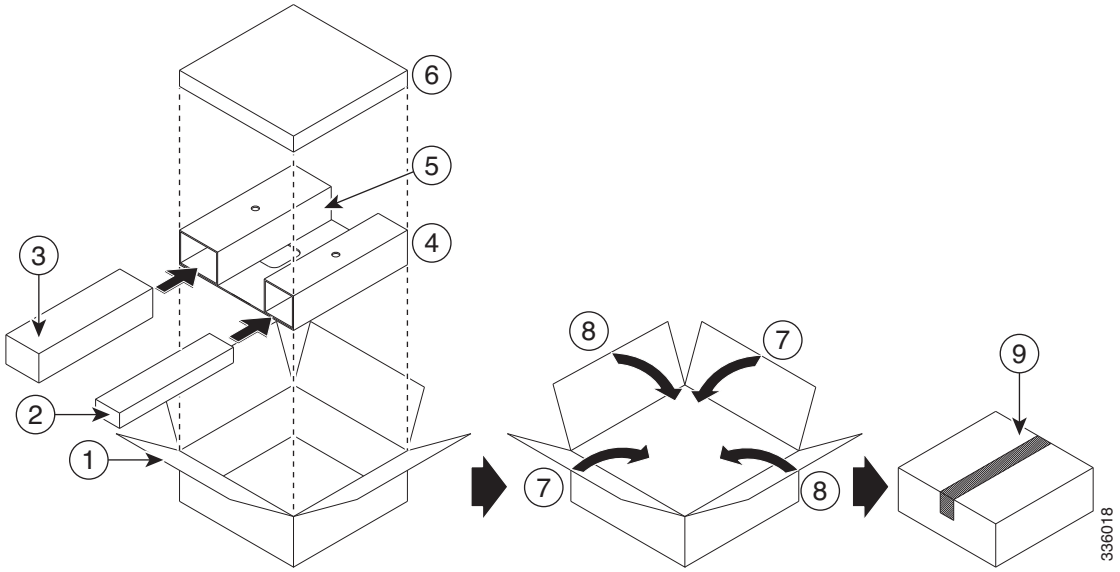


1	Door stop for the left cable managment frame	**2**	Two M3 screws that hold the door stop to the cable management frame.

j. Remove the air-intake frame by unscrewing its two captive screws (one screw on each side) and pulling the frame off the chassis.

k. Open the box for the front door and air-intake frame kit (see Callout 1 in Figure E-10).

Figure E-10 Repacking the Front Door and Air Intake Frame



1	Box for the front door and air intake frame	**6**	Front door wrapped in bubble wrap
2	Hinge bracket for the front door	**7**	Shorter box flaps folded over the front door
3	Air-intake frame	**8**	Longer box flaps folded over the shorter flaps
4	Protective cardboard insert with slots available for the hinge bracket and air-intake frame	**9**	Tape securing the box flaps together and to the box
5	Small parts bag placed in open slot		

l. Slide the air-intake frame and the hinge bracket inside separate slots of the protective cardboard insert (see Callouts 2, 3, and 4 in Figure E-10), and place the cardboard insert in the bottom of the box.

m. Place the small parts bag in the open slot of the cardboard insert (see Callout 5 in Figure E-10).

n. Place the front door, which is wrapped in bubblewrap, inside the box (see callout 6 in Figure E-10).

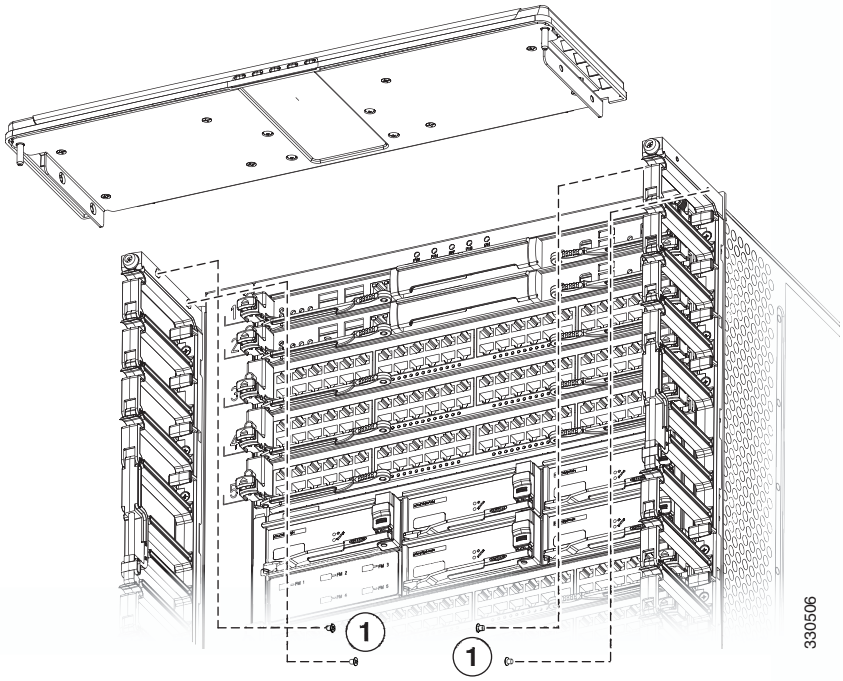
o. Fold the flaps of the box on top of the front door (see Callouts 7 and 8 in Figure E-10).

p. Secure the top two flaps together and to the box using packing tape (see Callout 9 in Figure E-10).

Step 8 Remove and repack the cable management frames as follows:

a. Remove the top cable management frame by unscrewing its four M4 screws (two on each side as shown in Figure E-11) and pulling the frame off the chassis. Place the screws in a bag for small accessory kit parts.

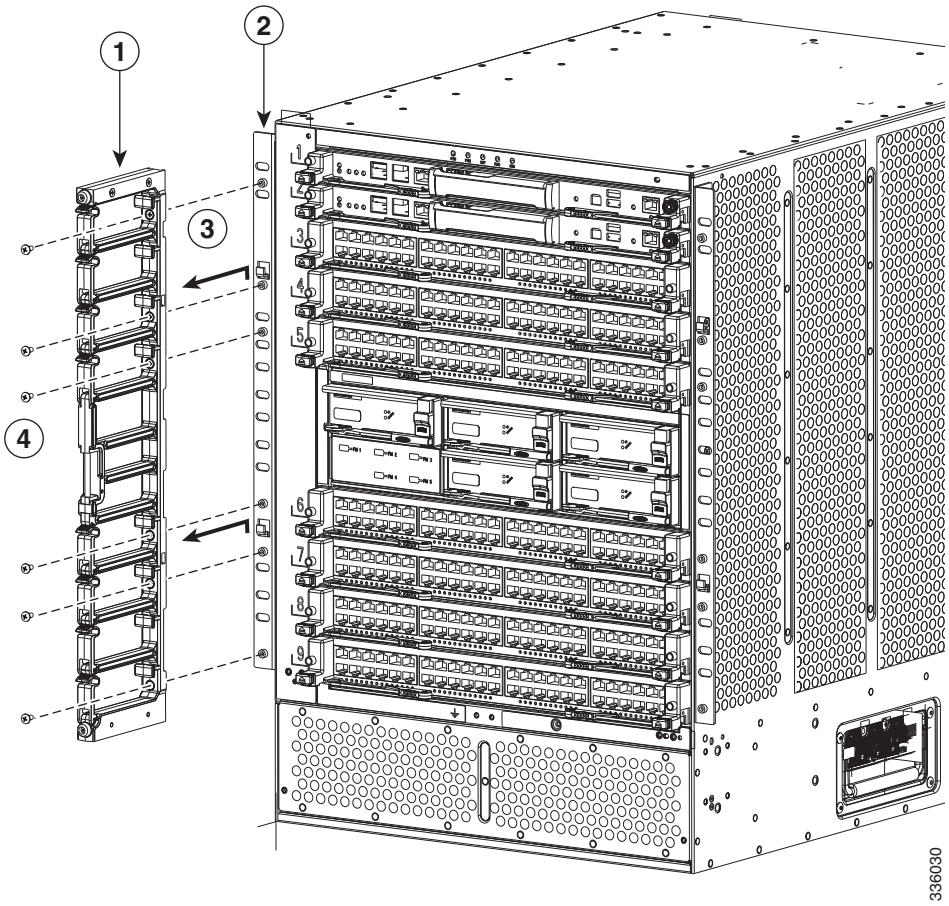
Figure E-11 Removing the Top Cable Management Frame



1	Four M4 pan-head screws that attach the top frame to each side frame (two screws for each side frame)		

b. Remove one of the side cable managment frames by unscrewing its six M4 screws, and lifting the frame up and away from the chassis. Place the screws in a bag for small accessory kit parts (see Figure E-12).

Figure E-12 Removing a Side Cable Management Frame



1	Cable management frame	**3**	Frame removed by pulling up and then away from the chassis
2	Front-mount bracket	**4**	Six M4 screws to be removed.

c. Remove the other cable management frame by repeating Step 7b.

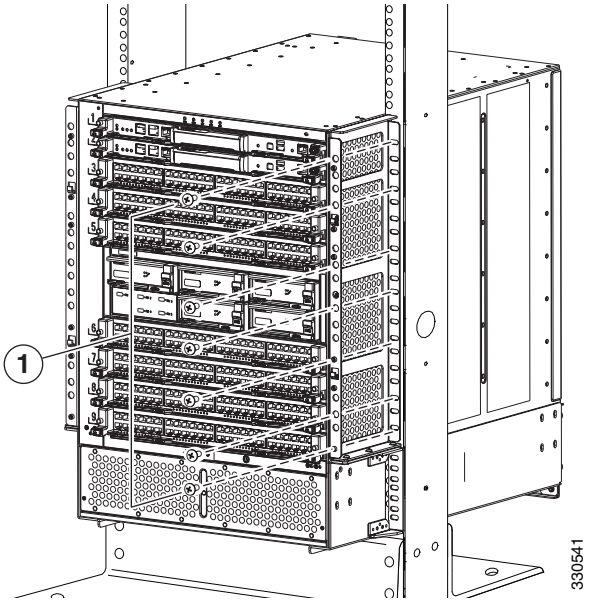
Step 9 Disconnect the ground cable from the chassis by loosening and removing its two M4 screws. Place the screws in a small parts bag for the accessory kit. For a location of the grounding pad, see Figure 3-12 on page 3-22.

Step 10 Remove the chassis from the rack by following these steps:

a. Unscrew 12 screws holding the chassis to each side of the rack (6 screws on each side). Place the screws in the small parts bag for the accessory kit.

Caution Do not remove the six screws used to hold the two bottom support brackets to the rack. They are required to hold the chassis in place until you remove it from the rack.

Figure E-13 Screws to Remove to Detach the Chassis from the Rack (Center-Mount Bracket Shown)



1	Six screws to be removed from each side of the chassis		

b. Place a mechanical lift in front of the rack and elevate its platform to the bottom of the chassis (or no more than 0.25 inches [0.6 cm] below the bottom of the chassis).

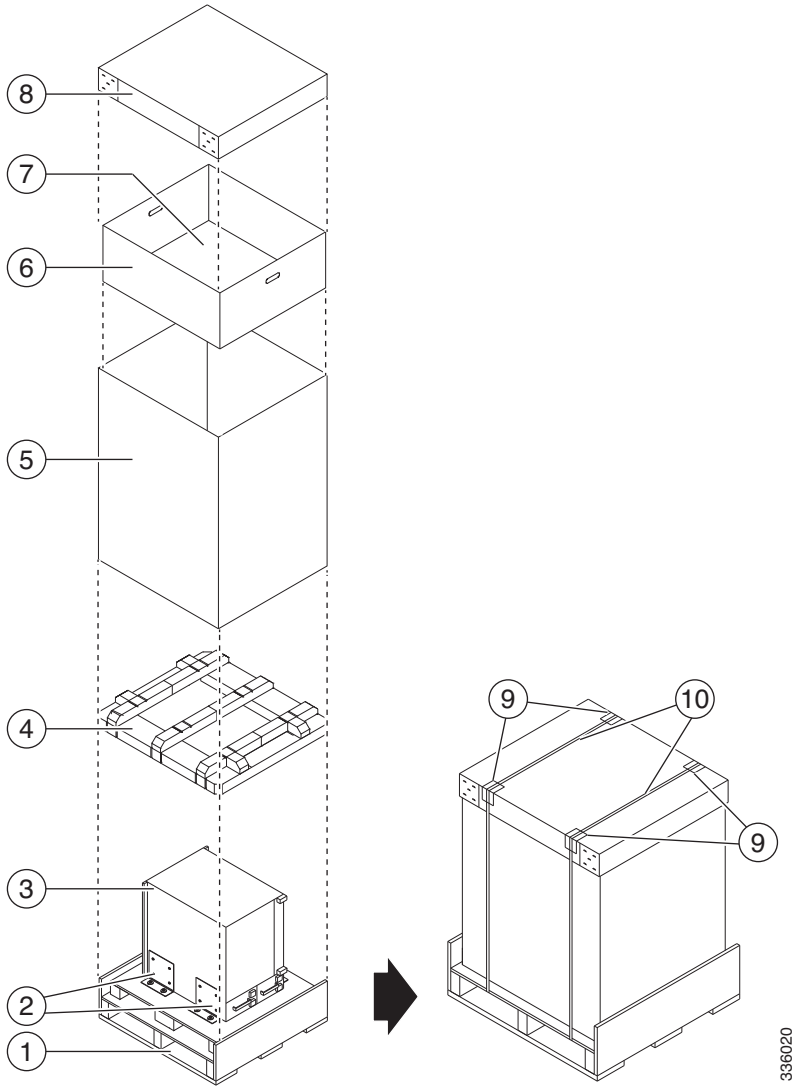
c. Use two persons to push the chassis fully onto the mechanical lift.

d. Use the mechanical lift to move the chassis to its pallet. Position the lift next to the pallet and elevate the bottom of the chassis to the level of the top of the pallet (or no more than 0.25 inches [0.6 cm] above the pallet).

e. Use two persons to push the chassis fully onto the pallet, and center the chassis on the pallet.

Step 11 Attach two angle brackets to the raised portion of the pallet between the chassis and the pallet edge. Do not tighten the screws that hold these brackets to the pallet—you will need to adjust their placement after you place the chassis on the pallet (see Callout 2 in Figure E-3).

Figure E-14 Packing the Cisco Nexus 7009 Chassis



1	Pallet with smaller platform on top	**6**	Accessories tray placed on top of chassis padding
2	Angle brackets (four, two on each side)	**7**	Accessory kit and front door kit placed in box
3	Chassis centered on pallet	**8**	Cardboard top placed on top
4	Padding on top of chassis	**9**	Cardboard edge protectors (four) placed on top of box top
5	Four-sided box placed around chassis and top layer of pallet	**10**	Packing straps (two)

Step 12 Attach two more angle brackets to the pallet on the other side of the chassis.

Step 13 Attach each of the four brackets to the chassis using two screws and tighten each screw.

Step 14 Tighten the two screws that hold each of the four brackets so that the chassis cannot move on the pallet.

Step 15 Place the foam padding on top of the chassis (see Callout 4 in Figure E-3).

Step 16 Place the four sided box around the chassis and the top layer of the pallet. (see Callout 5 in Figure E-3).

Step 17 Place the accessories tray inside the chassis box and on top of the chassis padding (see Callout 6 in Figure E-3).

Step 18 Place the accessory kit and the front-door kit in the accessories box (see Callout 7 in Figure E-3).

Step 19 Place the cardboard top on the chassis box (see callout 8 in Figure E-3).

Step 20 Place four edge protectors along the top edges of the cardboard top where you will be placing the packing straps (see Callout 9 in Figure E-3).

Step 21 Fasten the top of the box to the chassis box and pallet with two packing straps (see Callout 10 in Figure E-3).

Repacking the Cisco Nexus 7010 Switch

If you do not have the original packing materials for the Cisco Nexus 7010 switch, you must order another set of these materials (order part number is N7K-C7010-SHPPKG=).

Caution Do not subject the pallet, switch, or package to water or moisture.

To repack the Cisco Nexus 7010 switch, follow these steps:

Step 1 Turn the power switch on each power supply to standby (STBY). The OUTPUT LED turns off.

Step 2 For each AC power supply , remove the power cords as follows:

a. Remove the one or two power plugs from the power source. All of the power supply LEDs turn off.

b. If you are removing a 6-kW AC power supply, unscrew the screw on the cable retention device and pull the one or two plugs off the power supply.

Note For a 7.5-kW power supply, you cannot remove the power cords from them because they are permanently attached.

Step 3 For each DC power supply, shut off the input power and remove the power cords as follows:

a. Turn off the DC input power by manually turning off each input circuit at its circuit breaker.

Warning **Before performing any of the following procedures, ensure that power is removed from the DC circuit.** Statement 1003

b. Verify that the input power is completely off by making sure that all of the LEDs on the DC power supplies are off.

c. Detach each of the power cables from the powered down DC power source or DC power interface unit (PIU).

Warning **Hazardous voltage or energy may be present on DC power terminals. Always replace cover when terminals are not in service. Be sure uninsulated conductors are not accessible when cover is in place.** Statement 1075

d. For each of the power plugs attached to the DC power supply, completely unscrew the two screws that hold it to the power supply and unplug it.

e. Disconnect the grounding lug from the lower front side of the power supply unit by unscrewing its two M6 nuts and pulling the grounding lug off of the power supply unit. For the location of the grounding pad, see Figure 6-2 on page 6-11.

f. Place the power cords for 6-kW power supplies in the accessory kit (the power cords for the 7.5 kW power supplies are attached to and packed with the power supply.

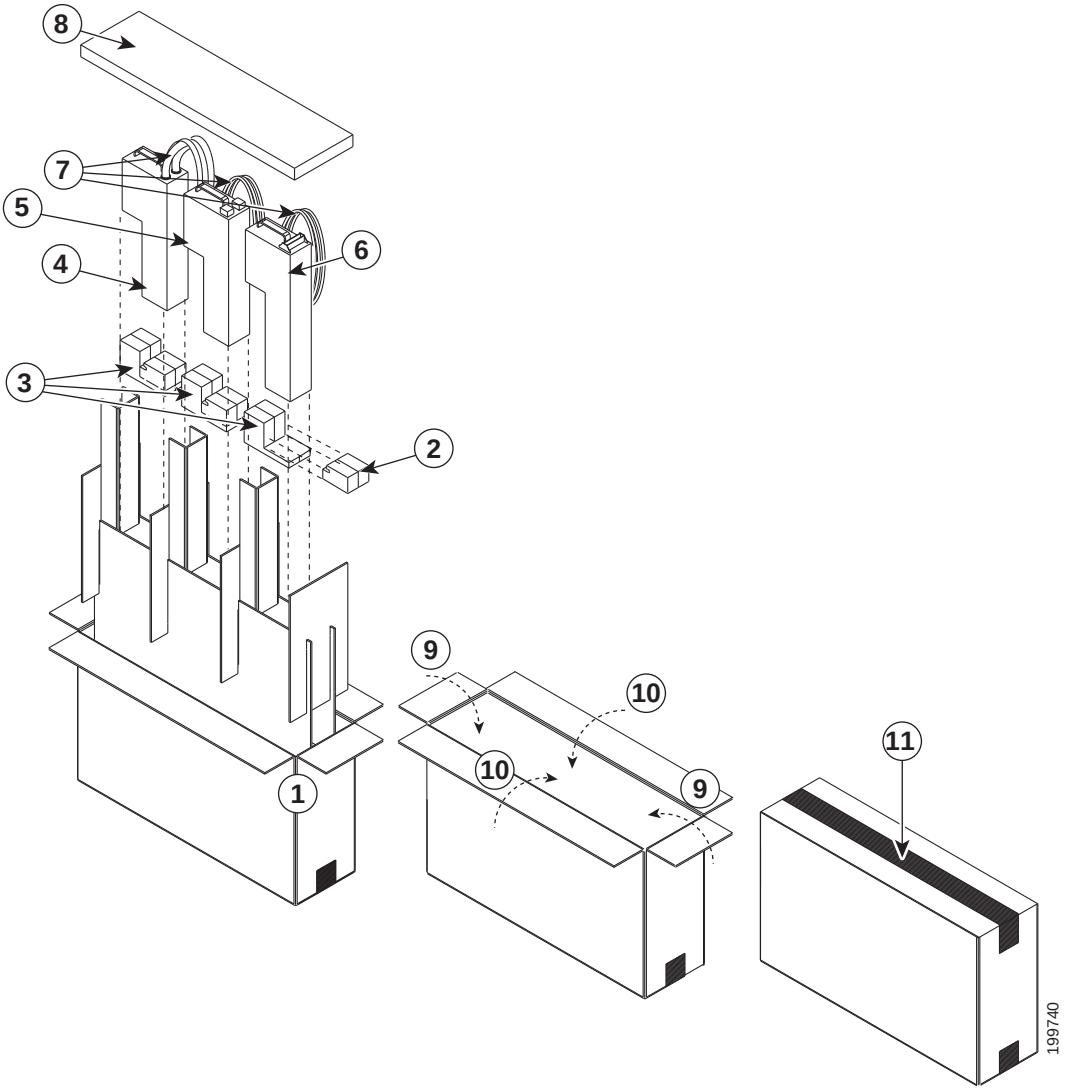
Warning **When installing or replacing the unit, the ground connection must always be made first and disconnected last.** Statement 1046

Step 4 Remove each power supply unit and repack it as follows:

Note These instructions are for the multi-unit power supply box that comes with newer Cisco Nexus 7010 switches. If you have the single-unit box for the 6-kW AC power supply unit, see Figure E-15 on page E-24 for packing instructions. If you have the single-unit box for the 6-kW DC power supply unit, see Figure 10-3 on page 10-13 for packing instructions.

a. Open the box for the power supply units and make sure that the cardboard holders are set up inside the box (see Callout 1 in Figure E-15).

Figure E-15 Packing Power Supply Units in a Multi-Unit Box



1	Open the box and make sure that the cardboard holders are set up.	**7**	Coil the one or two power cables and place them in the slot next to the power supply unit.
2	If you are packing a DC power supply unit, pull the detachable portion from the bottom pad.	**8**	After all of the power supply units have been placed in their slots, place the top pad above the power supply units.
3	Place the bottom pad, with its uneven side up, at the bottom of the slot that you are filling with the power supply unit.	**9**	Fold the two narrow flaps over the top of the box.
4	For a 7.5-kW AC power supply unit (N7K-AC-7.5KW-INT or N7K-AC-7.5KW-US), place it in a slot with a full bottom pad (detachable portion still attached).	**10**	Fold the two wide flaps over the folded narrow flaps.
5	For a 6-kW AC power supply unit (N7K-AC-6.0KW), place it in a slot with a full bottom pad (detachable portion still attached).	**11**	Tape the two wide flaps together and to the box with packing tape.
6	For a 6-kW DC power supply unit (N7K-DC-6.0KW), place it in a slot that has a bottom pad minus its detachable portion (to accommodate the longer power supply unit).		

b. If you are packing a DC power supply unit, remove the detachable portion from the bottom pad (see Callout 2 in Figure E-15). This detachable portion of the pad is included only when packing the shorter AC power supply units.

c. Insert the bottom pad, uneven side facing up, into the slot that you are filling (see Callout 3 in Figure E-15).

d. Unscrew the four captive screws on the power supply unit so that they no longer connect with the chassis.

e. With one hand on the handle of the power supply unit, pull the unit partially out of the chassis.

f. Place your other hand underneath the power supply unit to support the unit, and then pull the unit fully out of the chassis.

g. Place the power supply unit in its ESD packing bag and insert the bagged power supply unit in one of the three larger slots in the packing box (see Callouts 4, 5, and 6 in Figure E-15).

Note For easier handling of a multi-unit box, be sure to arrange the power supply units so their weight is balanced in the box. If you are packing only one unit, place it in the large slot in the middle of the box. If you are packing two units, place them in the large slots at each end of the box.

h. Coil the power cables and insert them in the slots next to the power supply unit (see Callout 7 in Figure E-15).

i. If there is another power supply unit to pack, repeat Steps 4a through 4h.

j. Place the top padding above the power supply units (see Callout 8 in Figure E-15).

k. Fold the two narrow flaps of the box over the padding (see Callout 9 in Figure E-15).

l. Fold the two wide flaps over the narrow flaps (see Callout 10 in Figure E-15).

m. Tape the wide flaps together and to the box (see Callout 11 in Figure E-15) with packing tape.

Step 5 Disconnect the switch from the console and the network as follows:

a. On each supervisor module, disconnect the cables connected to the Console, Com/AUX, Management, and CMP Management ports.

Note The CMP feature is available on only Supervisor 1 modules.

b. Disconnect all of the cables from each of the I/O modules.

Step 6 Disconnect the one or two chassis grounding connections as follows:

a. Unscrew the two M4 screws that hold each ground lug to the chassis. For the locations of the two grounding pads on the Cisco Nexus 7010 switch, see Figure 4-6 on page 4-13 and Figure 4-7 on page 4-14.

b. Remove the grounding lug from the chassis and place the screws in the accessory kit.

Step 7 If the chassis includes an optional air filter, remove it as follows:

a. On the lower left side and right side of the air filter, loosen the captive screw (one on each side) until it no longer connects with the chassis.

b. On the upper left side and right side of the air filter, simultaneously pull out the two spring pins (one on each side) and then pull the air filter away from the EMI frame and chassis.

Step 8 If the chassis includes the optional midframe doors, remove the doors and their frames as follows:

a. Remove the EMI panel, which holds the lower side frame pieces, by loosening the four captive screws on the EMI frame until they no longer connect with the chassis.

b. Remove each of the two side frames from the EMI panel by loosening and removing the two screws that hold each side frame piece to the EMI panel.

c. Reattach the EMI panel to the chassis by placing the EMI panel over the air intake area and aligning its captive screws to their holes in the chassis. Securely tighten each of the captive screws.

d. Remove each of the two front doors by loosening and removing the four screws that hold each door frame to the chassis.

e. Remove the bottom frame by loosening and removing the three screws on the frame.

Step 9 Loosen and remove the 6 screws that hold each side of the chassis (12 screws total) to the vertical mounting rails on the rack or cabinet.

Step 10 Position a mechanical lift in front of the chassis and raise its platform to the bottom of the chassis (no more than 0.25 inches (0.6 cm) below the bottom of the chassis), so that you can push the chassis onto the lift platform.

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

Step 11 Lay the shipping pallet flat on the floor. This pallet includes a raised portion that is bolted to the larger pallet. Make sure that the raised portion is on top.

Caution You need four persons for the following step.

Step 12 Use at least four persons to push the chassis onto the mechanical lift.

Caution Be sure to push the chassis only on its frame. Do not push on any of its modules or use the handles on any modules—these handles are used only for removing or installing these modules. Do not use the handles on the side of the chassis to move or lift the chassis (the handles are not rated for lifting over 200 pounds [91 kg]). The chassis handles are only for adjusting the position of the chassis in the rack or cabinet.

Step 13 After you securely position the chassis on the mechanical lift, use the mechanical lift to move the chassis to its pallet.

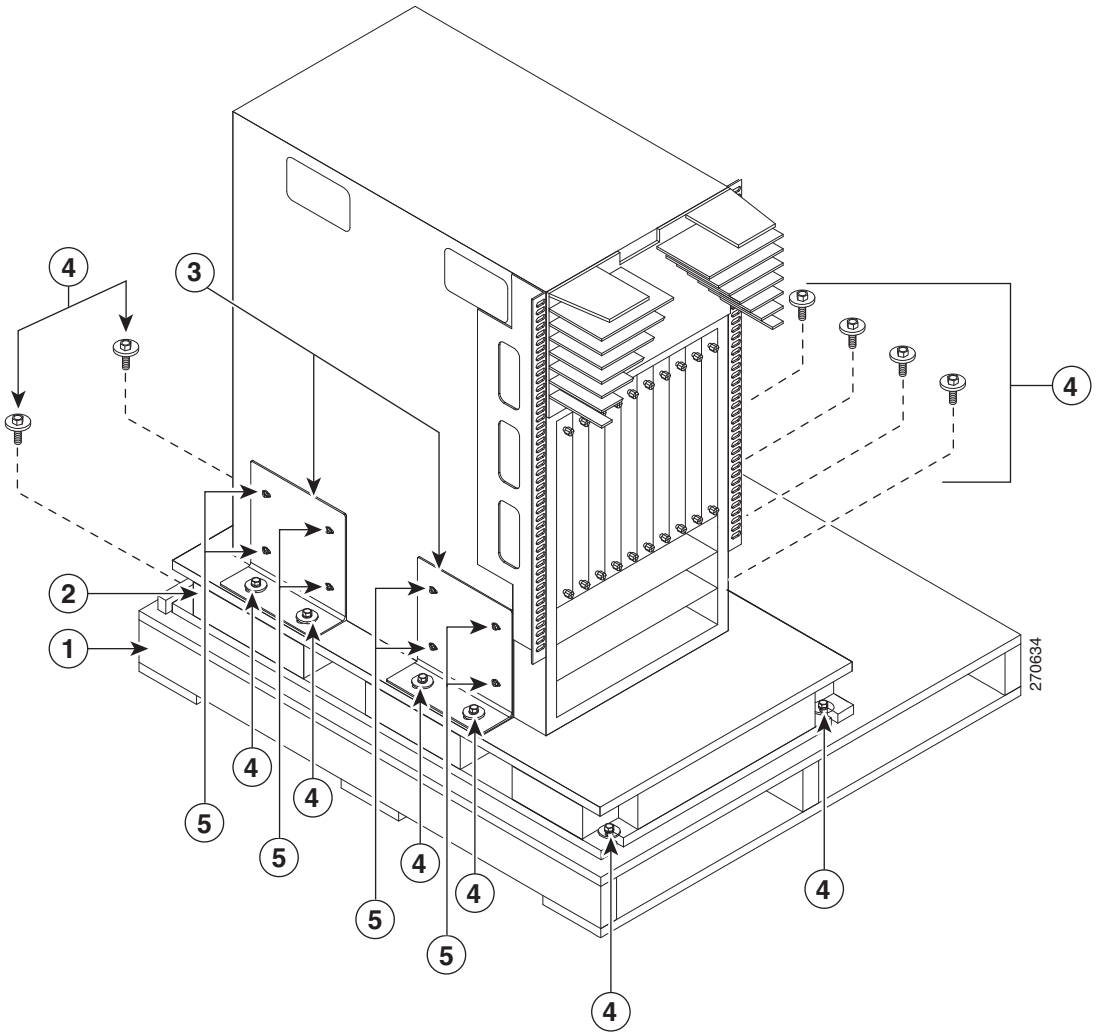
Step 14 Lower the chassis to the level of the pallet or no more than 0.25 inches (0.6 cm) above the pallet.

Caution You need four persons for the following step.

Step 15 Use at least four persons to push the chassis onto the raised portion of the pallet. Position the chassis so that it is 4 inches (10.2 cm) away from the side of the common edge of the pallet and its raised portion.

Step 16 Attach two angle brackets to the raised portion of the pallet between the chassis and the pallet edge. Do not tighten the screws that hold these brackets to the pallet—you will need to adjust their placement after you place the chassis on the pallet. See Figure E-16.

Figure E-16 Attaching the Chassis to the Shipping Pallet



1	Lower pallet	**4**	Bolts holding brackets to the upper pallet
2	Raised portion of the pallet	**5**	Screws holding the chassis to the brackets
3	Mounting brackets (two shown and two hidden on the other side of the chassis)		

Step 17 Align the screw holes in the side of the chassis with the screw holes in the vertical sides of the two angle brackets. Fasten the two angle brackets to the chassis by securely tightening the four screws for each bracket. See Figure E-16.

Step 18 Attach two more angle brackets to the pallet on the other side of the chassis. Make sure that the four screw holes on the vertical side of each bracket align with four holes in the chassis.

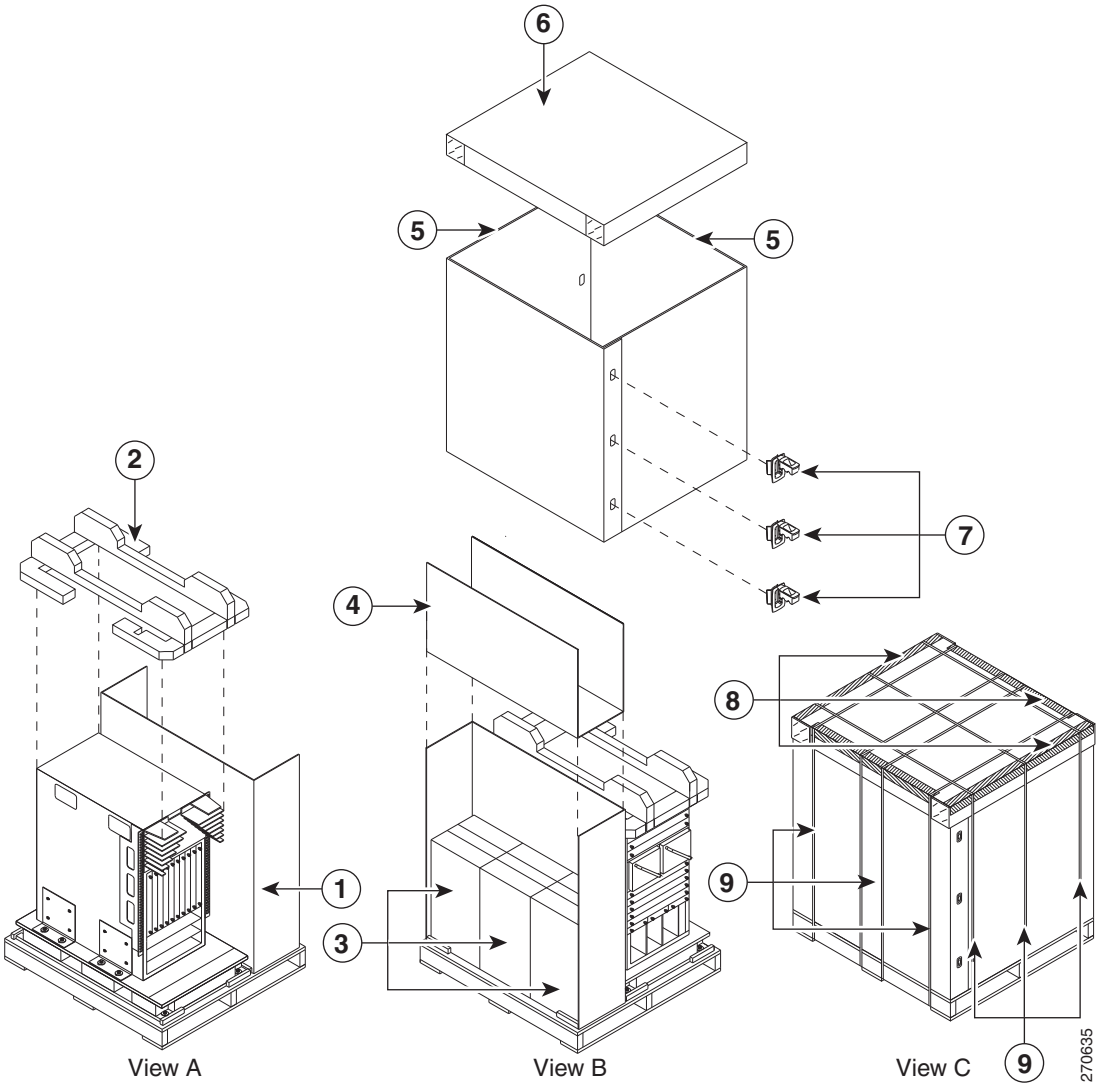
Step 19 Use four screws to securely attach each of the additional two brackets to the chassis.

Step 20 Securely fasten the two bolts on each of the four angle brackets to the pallet.

Step 21 Place the packing bag over the chassis.

Step 22 Place the chassis packing cushion on top of the bagged chassis as shown in View A in Figure E-17.

Figure E-17 Packing the System Components



1	Three-segment divider	**6**	Corrugated cardboard lid
2	Polyethylene cushion	**7**	Corro clips
3	Power supply box (one box for three power supply units or three boxes for three units)	**8**	Edge protectors
4	Three-segment divider	**9**	Packing straps
5	Two J-box halves		

Step 23 Place the larger of the two three-segment dividers beside the chassis (see Callout 1 in Figure E-17).

Step 24 Place the multi-unit power supply box (or three single-unit power supply boxes [one or more can be empty]) in the empty area beside the chassis (see Callout 3 in Figure E-17).

Step 25 Place the smaller three-segment divider in the empty area above the power supply boxes (see Callout 4 in Figure E-17).

Step 26 Remove each of the two bottom-support rails from the rack or cabinet by loosening the six screws that secure it to the vertical mounting rails on the rack or cabinet.

Step 27 Reassemble the accessory kit by placing the following components in the accessory kit box:

- Bottom-support rails (two) and mounting screws (20)
- Console connector cables and adapters
- Ground lugs and mounting screws (two per lug)
- Power cables (one or two for each power supply)

Step 28 Place the accessory kit box on top of the cushion that is located on top of the chassis.

Step 29 If your system included the optional midframe doors or air filter, pack those items in their original shipping boxes and place the boxes on top of the power supply boxes.

Step 30 Place one J-box half on the bottom pallet along two sides of the pallet (see Callout 5 in Figure E-17).

Step 31 Place the other J-box half on the other two sides (see Callout 5 in Figure E-17).

Step 32 Connect the two J-box pieces with six corro clips (three on each seam) (see Callout 7 in Figure E-17).

Step 33 Place the corrugated cardboard lid on top of the package (see Callout 6 in Figure E-17).

Step 34 Place each of the four edge protectors on one of the top edges of the lid (see Callout 8 in Figure E-17).

Step 35 Secure the package to the pallet using at least seven packing straps (three in one direction and four in the other direction) (see Callout 9 in Figure E-17).

Repacking the Cisco Nexus 7018 Switch

If you do not have the original packing materials for the Cisco Nexus 7018 switch that you are going to repack, you must order another set of these materials (order part number is N7K-C7018-SHPPKG=).

Caution Do not subject the pallet, system, or package to water or moisture.

To repack the Cisco Nexus 7018 system, follow these steps:

Step 1 Turn the power switch on each power supply unit to STBY. The OUTPUT LED turns off.

Step 2 For each AC power supply unit, remove the power cords as follows:

a. Remove the power plugs from the power source. If there are two power cables coming from the power supply unit, remove two power plugs. Otherwise remove one power plug.

b. If you are removing a 6-kW AC power supply unit, unscrew the screw on the cable retention device and pull one or two plugs off the power supply unit.

Note For a 7.5-kW power supply unit, you cannot remove the power cords from them because they are permanently attached.

Step 3 For each DC power supply unit, shut off the input power and remove the power cords as follows:

a. Shut off the input power by manually turning off each input circuit at its circuit breaker.

Warning **Before performing any of the following procedures, ensure that power is removed from the DC circuit.** Statement 1003

b. Verify that the input power is completely off by making sure that all of the LEDs on the DC power supply units are off.

c. Remove the set of power cables from the DC power source or the DC PIU.

Warning **Hazardous voltage or energy may be present on DC power terminals. Always replace cover when terminals are not in service. Be sure uninsulated conductors are not accessible when cover is in place.** Statement 1075

d. Unscrew the two screws that secure each of the power plugs to the power supply unit.

e. Unplug each of the power plugs from the power supply unit.

f. Disconnect the power supply grounding cable by unscrewing its two M6 nuts and removing the grounding lug from the power supply unit. For the location of the DC power supply unit grounding pad, see Figure 6-2 on page 6-11.

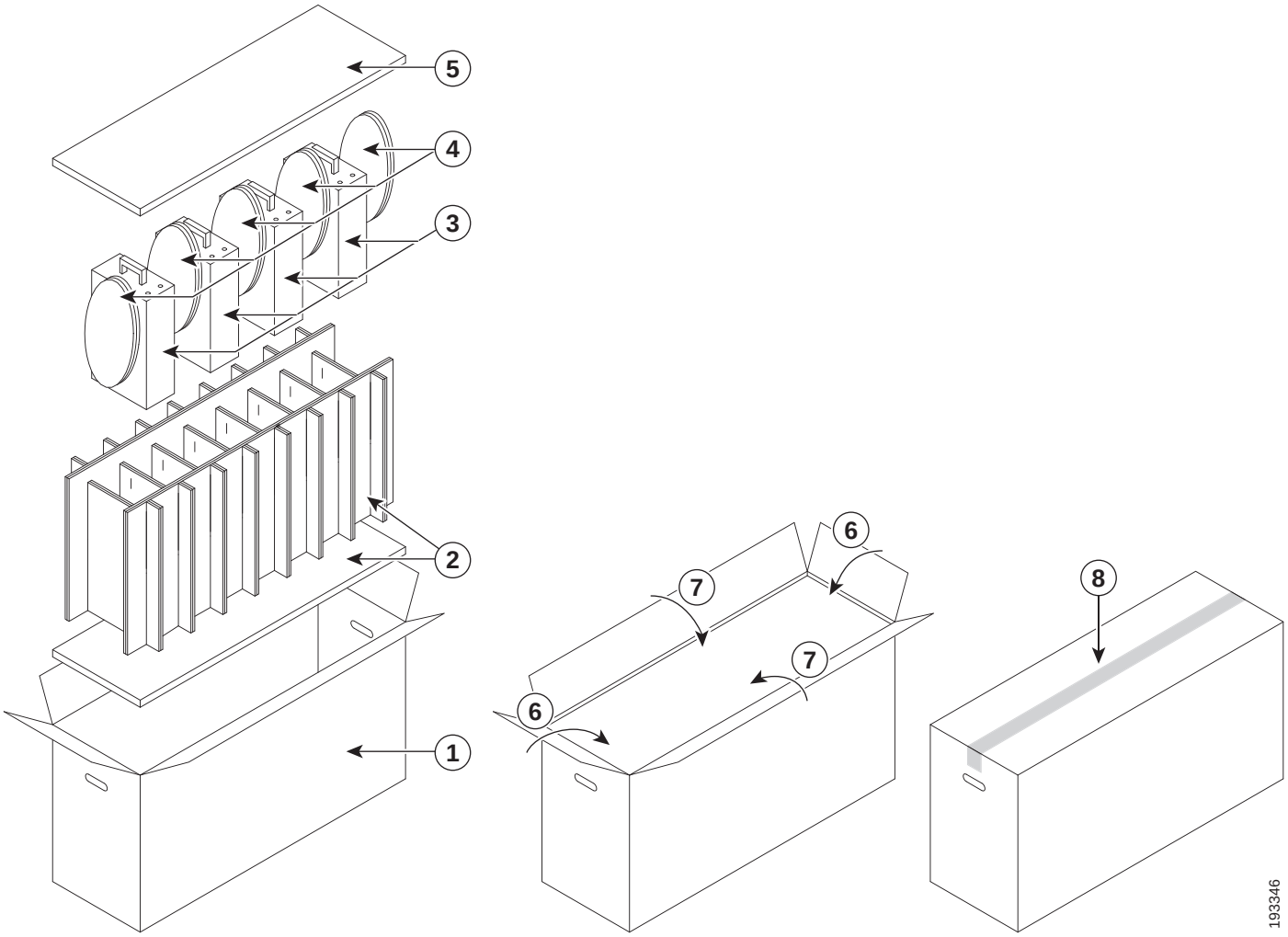
Warning **When installing or replacing the unit, the ground connection must always be made first and disconnected last.** Statement 1046

Step 4 For each AC power supply unit, remove the power supply unit and repack it as follows:

Note These instructions are for the multi-unit power supply box that comes with newer Cisco Nexus 7018 switches. If you have the single-unit box for the 6-kW AC power supply unit, see Figure 10-1 on page 10-5 for packing instructions.

a. Open the box for the power supply units and make sure that the cardboard holders are set up inside the box (see Callout 1 in Figure E-18).

Figure E-18 Packing AC Power Supply Units in a Cisco Nexus 7018 Multi-Unit Box



1	Open the power supply box.	**5**	Place the top pad on top of the power supply units.
2	Make sure that the bottom pad and cardboard holders are in place in the box.	**6**	Fold the narrow flap over the top of the top pad.
3	Place AC power supply units in alternating slots (leave at least one slot empty between power supply units).	**7**	Fold the wide flaps over the folded narrow flaps.
4	Coil the power cords and place them in the slots next to their power supply units.	**8**	Tape the wide flaps together and to the box with packing tape.

b. Make sure there is a packing cushion below the cardboard holder (see Callout 2 in Figure E-18).

c. Loosen the four captive screws on the power supply unit so that they no longer connect with the chassis.

d. With one hand on the handle of the power supply unit, pull the unit partially out of the chassis.

e. Place your other hand underneath the power supply unit to support the unit, and then pull the unit fully out of the chassis.

f. Place the power supply unit in an ESD packing bag and insert the bagged power supply unit in one of the larger slots in the packing box (see Callout 3 in Figure E-18).

Note For easier handling of a multi-unit box, arrange the power supply units so their weight is balanced in the box. If you are packing only one unit, place it in the middle of the box. If you are packing two units, place them in the large slots at each end of the box. If you are packing three units, place one in the middle of the box and the other two in slots at either end of the box.

g. Coil the power cables and insert them in the slots next to the power supply unit (see Callout 4 in Figure E-18).

h. If there is another AC power supply unit to repack, repeat Steps 4b through 4g.

i. Place the packing cushion above the power supply units (see Callout 5 in Figure E-18.

j. Fold the narrow flaps of the box over the top pad (see Callout 6 in Figure E-18).

k. Fold the wide flaps over the folded narrow flaps (see Callout 7 in Figure E-18).

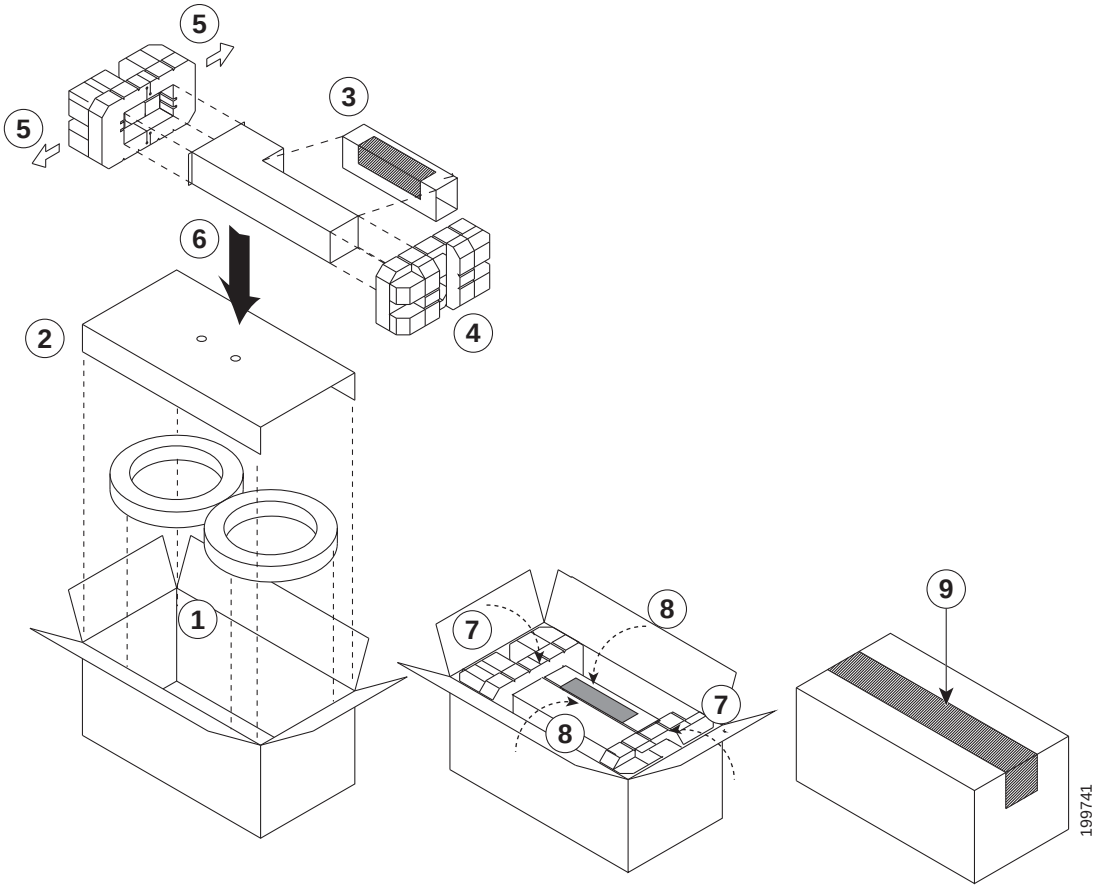
l. Tape the wide flaps together and to the box (see Callout 8 in Figure E-18).

Step 5 For the DC power supply units, repack them as follows:

Caution Before you remove a DC power supply unit, make sure that the power is turned off at the source and no LEDs are lit.

a. Open the four-unit packing box and place one or two coiled power cables on the bottom of the box (see Callout 1 in Figure E-19).

Figure E-19 Packing a 6-kW DC Power Supply Unit in a Single-Unit Box



1	Coil the power cables and place them on the bottom of the opened box.	**6**	Place the padded power supply unit inside the box and on top of the trifold.
2	Place the trifold cover over the coiled cables.	**7**	Fold the narrow flaps over the power supply unit pads.
3	Place the power supply unit in its ESD bag and hold the filler box outside the bag in the notched portion of the power supply unit.	**8**	Fold the wide flaps over the power supply unit.
4	Place the nonexpanding end pad over the back end of the power supply unit and filler box.	**9**	Tape the wide flaps together and to the box with packing tape.
5	Pull the two sides of the expandable end pad apart, fit the end pad over the front of the power supply unit, and press the two sides together snuggly over the front of the power supply unit.		

b. Fold the trifold cover at its seams and place it over the coiled power cables (see Callout 2 in Figure E-19).

c. Loosen the four captive screws on the power supply unit so that they no longer connect with the chassis.

d. With one hand on the handle of the power supply unit, pull the unit partially out of the chassis.

e. Place your other hand underneath the power supply unit to support the unit, and then pull the unit fully out of the chassis.

f. Place the power supply unit in an ESD packing bag and insert the bagged power supply unit in one of the larger slots in the packing box (see Callout 3 in Figure E-19).

Note For easier handling of a multi-unit box, arrange the power supply units so their weight is balanced in the box. If you are packing only one unit, place it in the middle of the box. If you are packing two units, place them in the large slots at each end of the box. If you are packing three units, place one in the middle of the box and the other two in slots at either end of the box. Always leave empty slots between power supply units so that you can pack their cables.

g. Put the DC power supply unit in an ESD bag and place the filler box in the cutout portion of the power supply unit (see Callout 3 in Figure E-19).

h. Insert the back end of the power supply unit and filler box into a foam block (see Callout 4 in Figure E-19).

i. Expand the other foam block by pulling its two sides apart, and fit the block around the front of the power supply unit before bringing the two sides together again (see Callout 5 in Figure E-19).

j. Place the power supply unit and its foam blocks in the box (see Callout 6 in Figure E-19).

k. Fold the narrow flaps over the power supply unit (see Callout 7 in Figure E-19).

l. Fold the wide flaps over the narrow flaps (see Callout 8 in Figure E-19).

m. Tape the wide flaps together and to the box with packing tape (see Callout 8 in Figure E-19).

Step 6 Disconnect the switch from the console and the network as follows:

a. On each supervisor module, disconnect the cables connected to the Console, Com/AUX, Management, and CMP Management ports.

b. Disconnect all of the cables from each of the I/O modules.

Step 7 Disconnect the one or two chassis grounding connections as follows:

a. Unscrew the two M4 screws that hold each ground lug to the chassis. For the locations of the two grounding pads on the Cisco Nexus 7010 switch, see Figure 4-6 on page 4-13 and Figure 4-7 on page 4-14.

b. Place the screws in the accessory kit.

Step 8 Disconnect the switch from the network as follows:

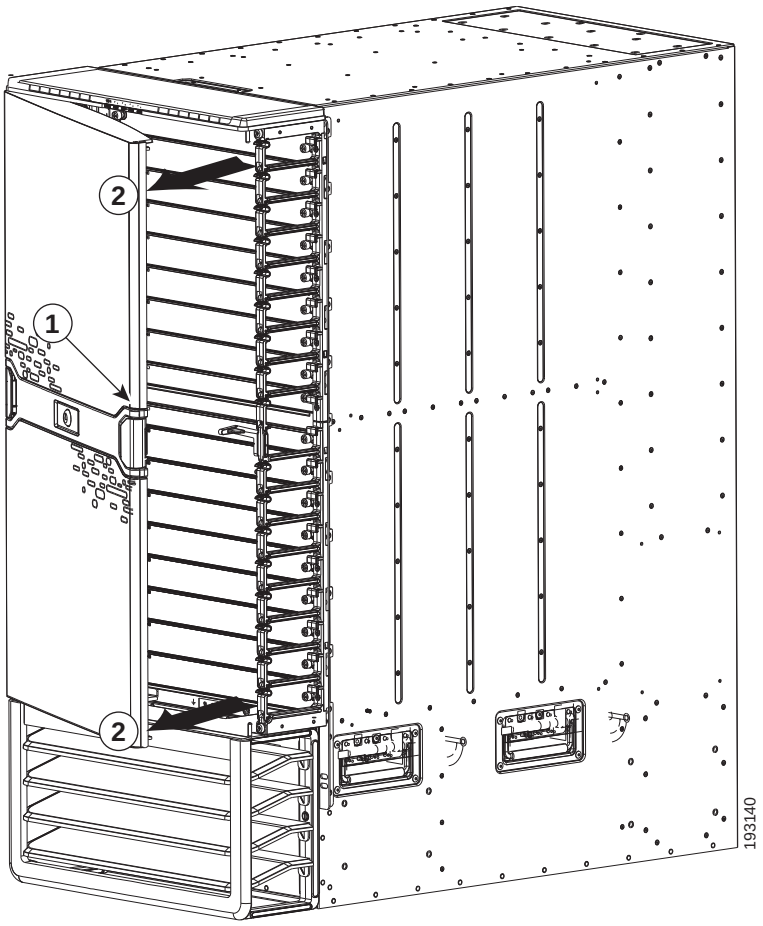
a. Disconnect the cables that attach the Management and CMP processors on each supervisor module to a console.

b. Disconnect all of the I/O cables from the I/O modules.

Step 9 If the chassis includes the optional front door and air-intake frame, remove them as follows:

a. Open the door by pulling one of its latch handles out until it clicks (the handle clicks when you pull it out about 30 degrees) and rotate the door away from the chassis (see Figure E-20).

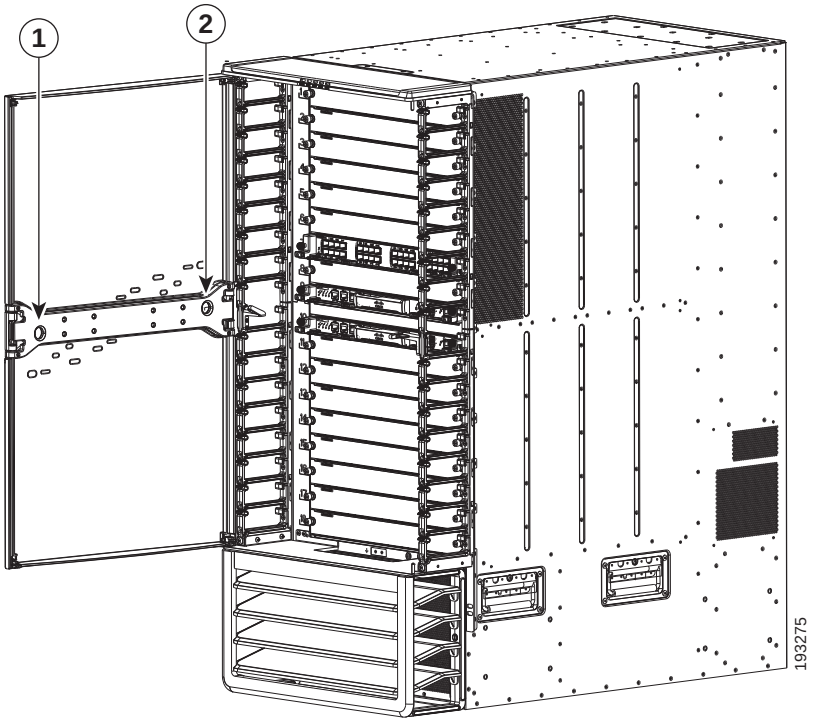
Figure E-20 Removing One Side of the Front Door



1	Open the latch handle until it clicks.	**2**	Swing open the door.

b. Press the locking button on the back side of the door (behind the opened latch handle) so that the latch handle flattens to the front side of the door (see Figure E-21).

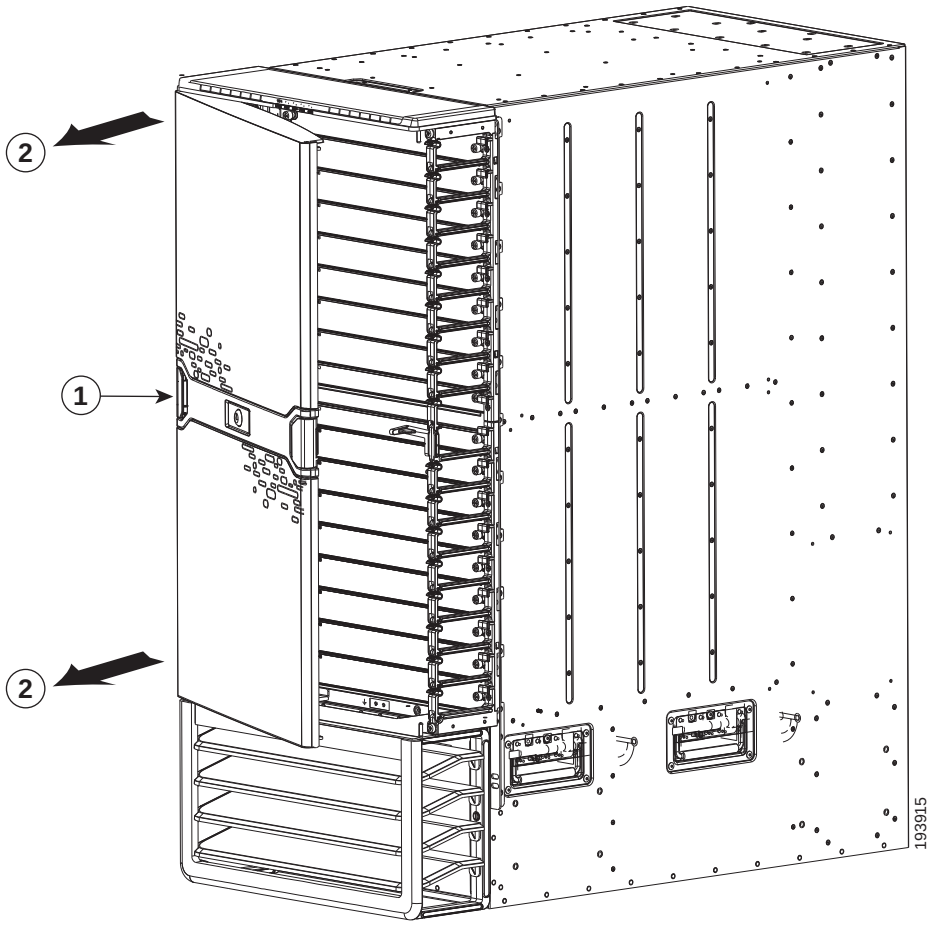
Figure E-21 Location of the Latch Locking Button



1	Locking button for the right latch	**2**	Locking button for the left latch

c. Hold the opened side of the door with one hand and use your other hand to open the latch handle on the hinged side of the door until the handle clicks (see Callout 1 in Figure E-22). Use both hands to remove the door from the chassis.

Figure E-22 Removing the Front Door

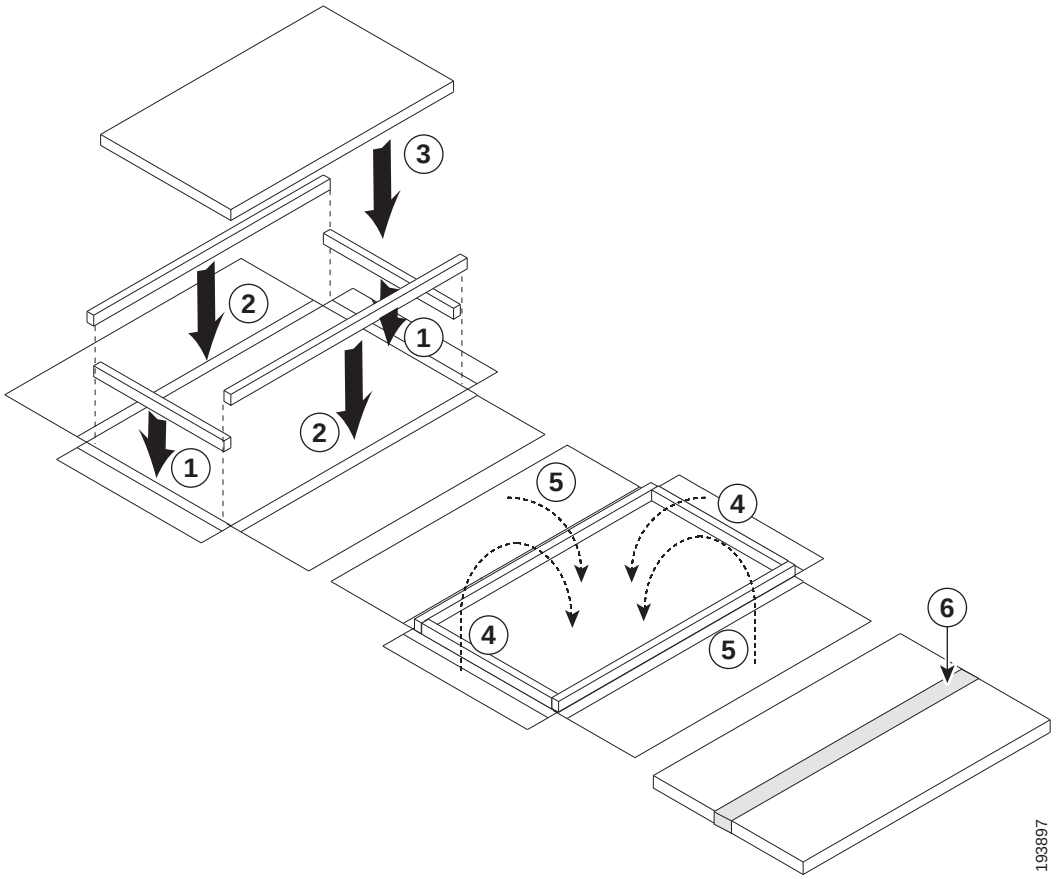


1	Open the latch handle until it clicks.	**2**	Pull the door off the chassis.

d. Press the locking button on the inside surface of the door behind the opened latch to flatten the latch handle to the front side of the door (see Figure E-21).

e. Open the box for the front door. You can find this box in the box that contains the front door and air intake frame kit. Make sure that four side cushions are aligned to the edges of the center panel of the box (see Callouts 1 and 2 in Figure E-23).

Figure E-23 Packing the Front Door



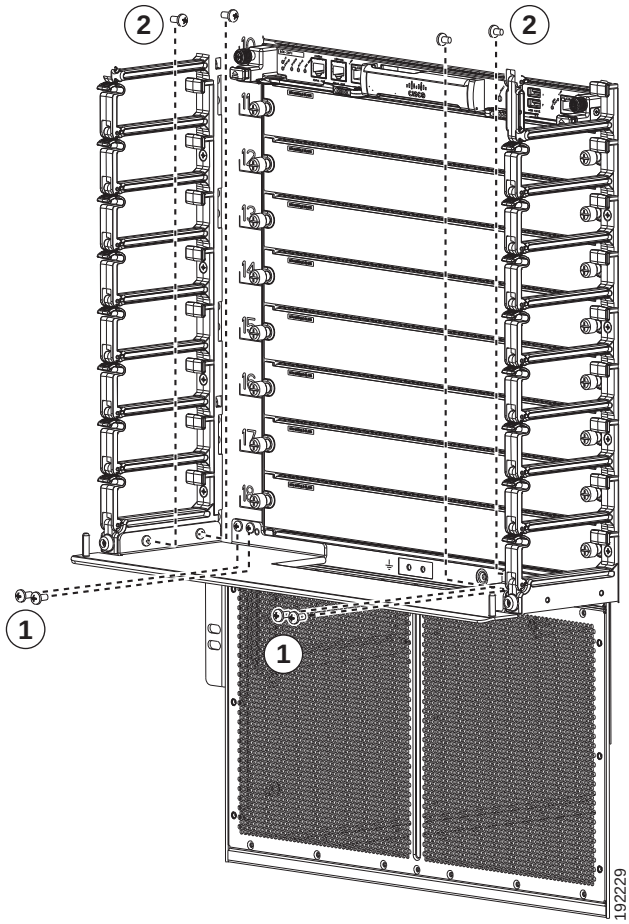
1	Align the two shorter side cushions to the shorter inside crease in the center panel of the box.	**4**	Fold the two short flaps up along the end side cushions and then fold them over the top of the front door.
2	Align the two longer side cushions to the longer inside crease in the center panel of the box.	**5**	Fold the two long flaps up along the side cushions and then fold them over the top of the side flaps and door.
3	Place the door in the open space between the side cushions.	**6**	Tape the two long flaps together and to the box with packing tape.

f. Fold the box flaps over the door and tape them in place.

g. Loosen and remove the eight screws holding the bottom hinge bracket for the door. Four of the screws are attached to the right and left side of the cable management frame (two screws on each side) and four of the screws are attached to the chassis (see Figure E-24). Place the screws in a small parts bag.

Note Do not remove the top cover at this time. The top cover is part of the cable management frame.

Figure E-24 Removing the Bottom Hinge Bracket



1	Remove four M4x8 pan-headed screws from the chassis.	**2**	Remove four M4x8 screws from the cable management assemblies (two screws on each side).

h. Remove the bracket from the chassis and place it in the opened box for that bracket.

i. Fold the box flaps over the bracket and tape them together and to the box.

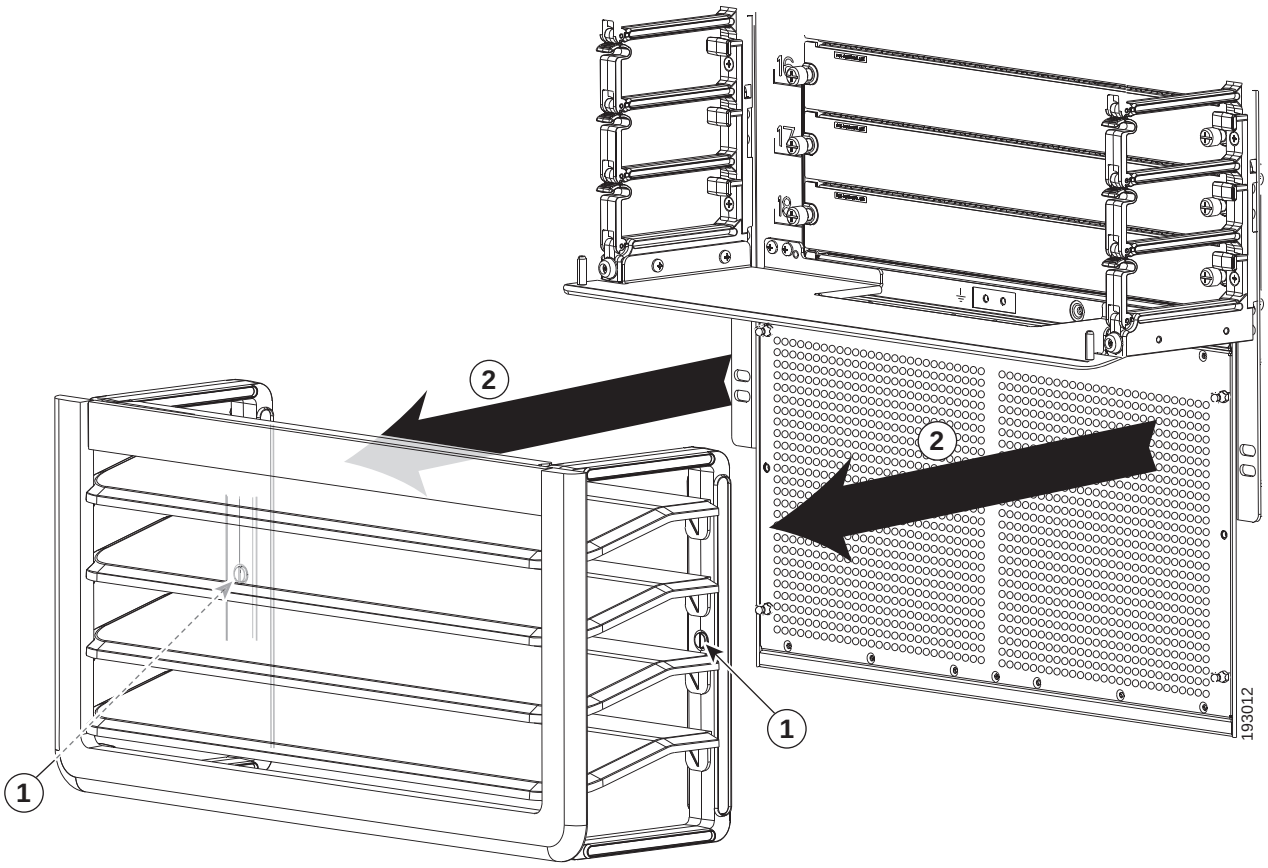
j. Loosen and remove the two M3x10 screws that hold the right door stopper to the right cable management frame. Place the two screws and the door stopper in the small parts bag for the door.

k. Loosen and remove the two M3x10 screws that hold the left door stopper to the left cable management frame. Place the two screws and the door stopper in the small parts bag for the door.

l. Fold the short box flaps over the top, fold the long box flaps over the short flaps, and then tape the long flaps together and to the box with packing tape.

m. Loosen the two captive screws on the air intake frame (there is one captive screw on each side) so that they are no longer in contact with the chassis (see Callout 1 in Figure E-25).

Figure E-25 Removing the Air Intake Assembly

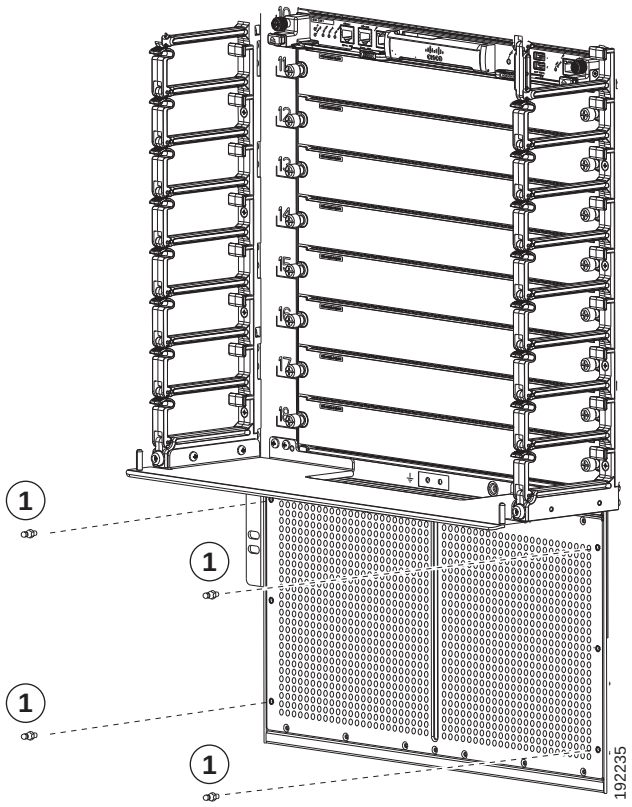


1	Loosen two captive screws until they are clear of the chassis.	**2**	Remove the air intake assembly from the chassis.

n. Pull the air intake assembly off the chassis.

o. Loosen and remove the four ball-point studs shown in Figure E-26.

Figure E-26 Removing the Ball-Point Alignment Studs



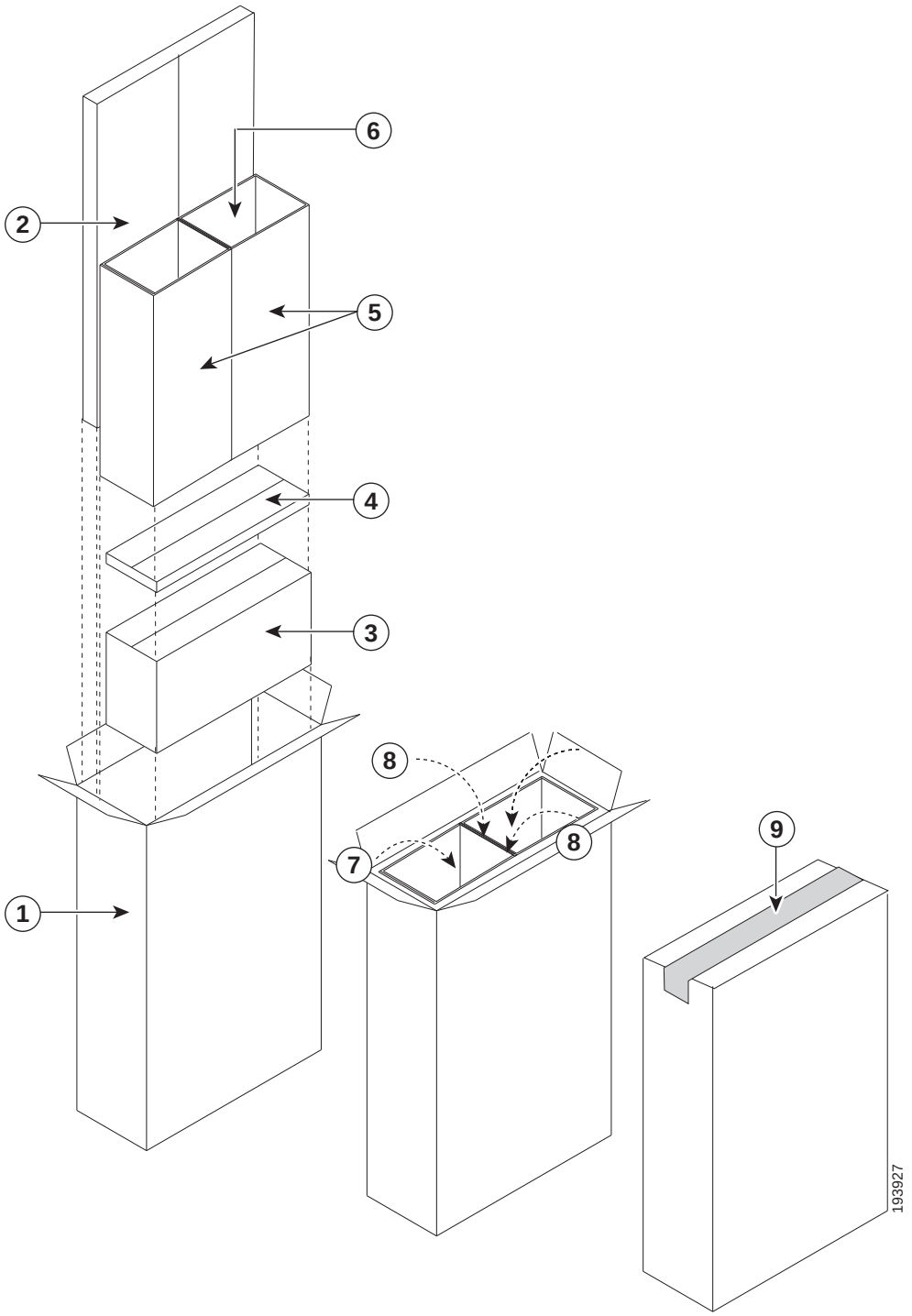
1	Ball-Point Studs		

p. Repack the air intake frame in its original packing box and put the ball-point alignment screws in the small parts bag for the door.

q. Fold the two short box flaps over the air intake frame, fold the two long box flaps over the short flaps, and then tape the long flaps together and to the box with packing tape.

r. Open the box for the front door and air intake frame kit and insert the components (see Callout 1 in Figure E-27).

Figure E-27 Packaging the Front Door and Air Intake Frame Kit

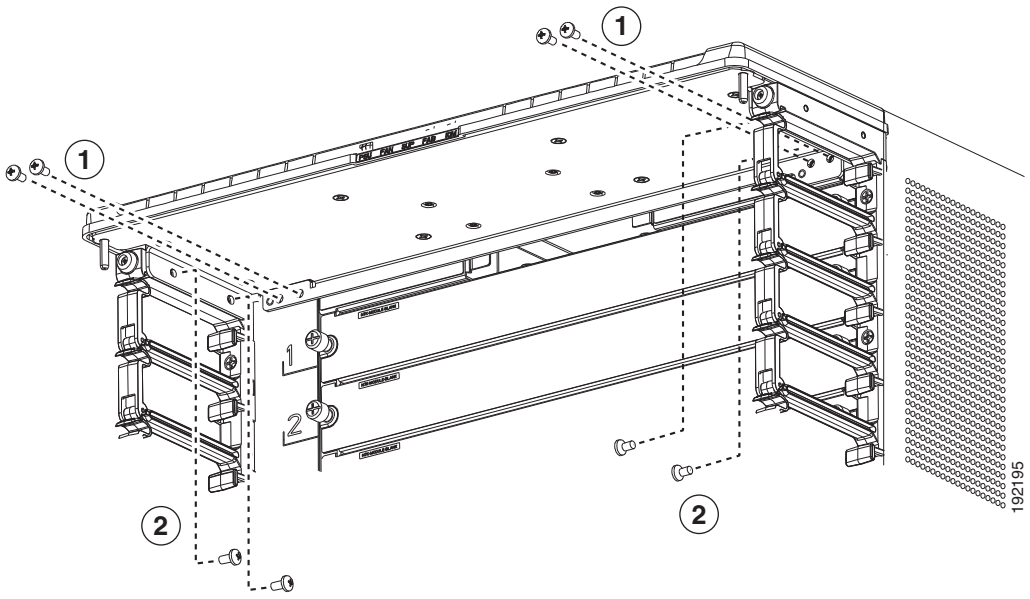


1	Open the box.	**6**	Place the bag of small parts bag in one of the filler boxes
2	Insert the front door box into the main box.	**7**	Fold the two short flaps over the top of the box.
3	Insert the air intake frame box next to the front door box and at the bottom of the main box.	**8**	Fold the two long flaps over the top of the short flaps.
4	Place the bottom hinge bracket box on top of the air intake frame box.	**9**	Tape the tow long flaps together and to the box with packing tape.
5	Place two filler boxes on top of the bottom hinge bracket box.		

Step 10 Remove and repack the cable management system by following these steps:

a. Loosen and remove the eight M4x8 pan-head screws that fasten the top cover to the upper cable management assemblies and chassis (see Figure E-28).

Figure E-28 Detaching the Top Cover from the Upper-Cable-Management Assemblies and Chassis



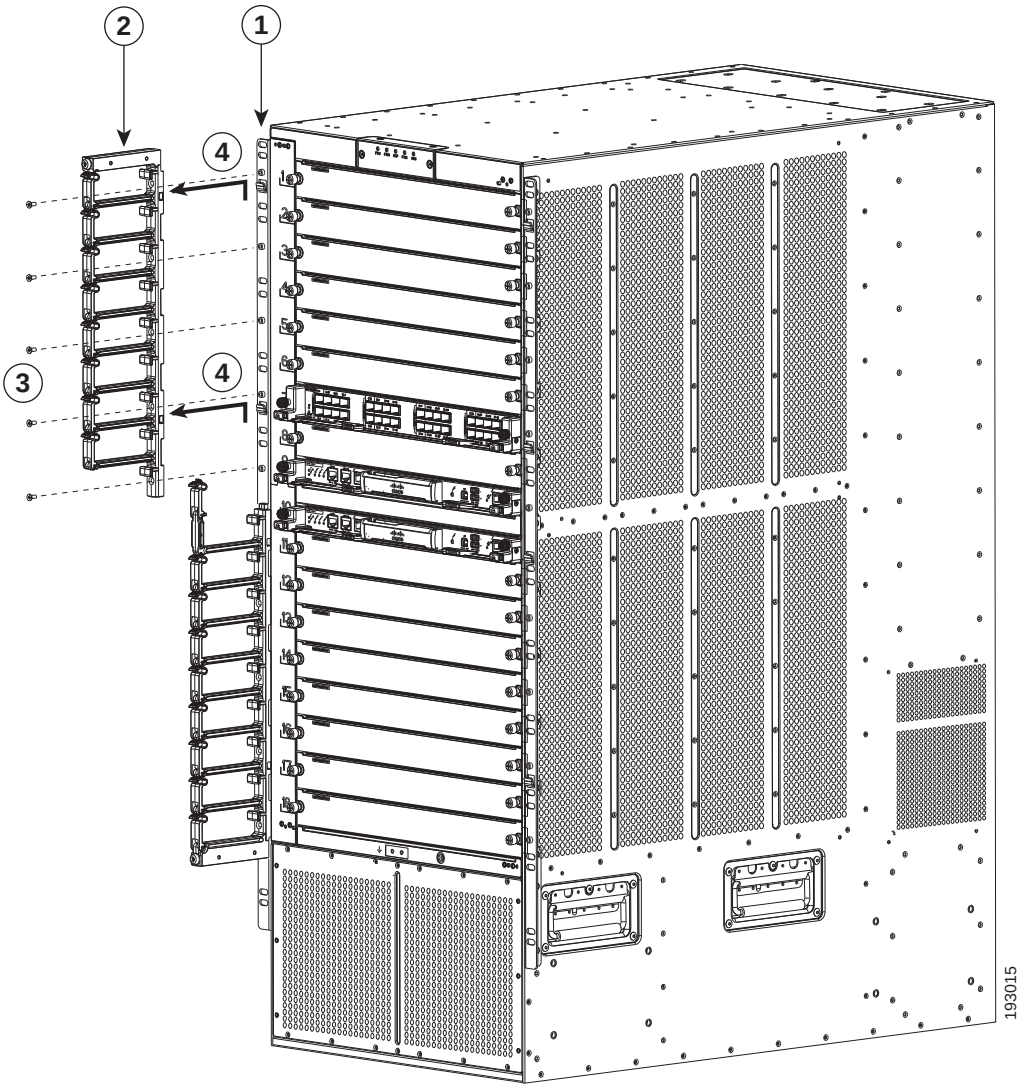
1	Four M4x8 pan-head screws fastened to the chassis	**2**	Four M4x8 pan-head screws fastened to the two upper cable management assemblies

b. Remove the top cover from the chassis and the two upper cable management assemblies.

c. For the upper cable management assembly on the left, loosen and remove five M4x10 screws, and then lift off the assembly as shown in Figure E-29.

d. Repeat Step 3c for the upper cable management assembly on the right side.

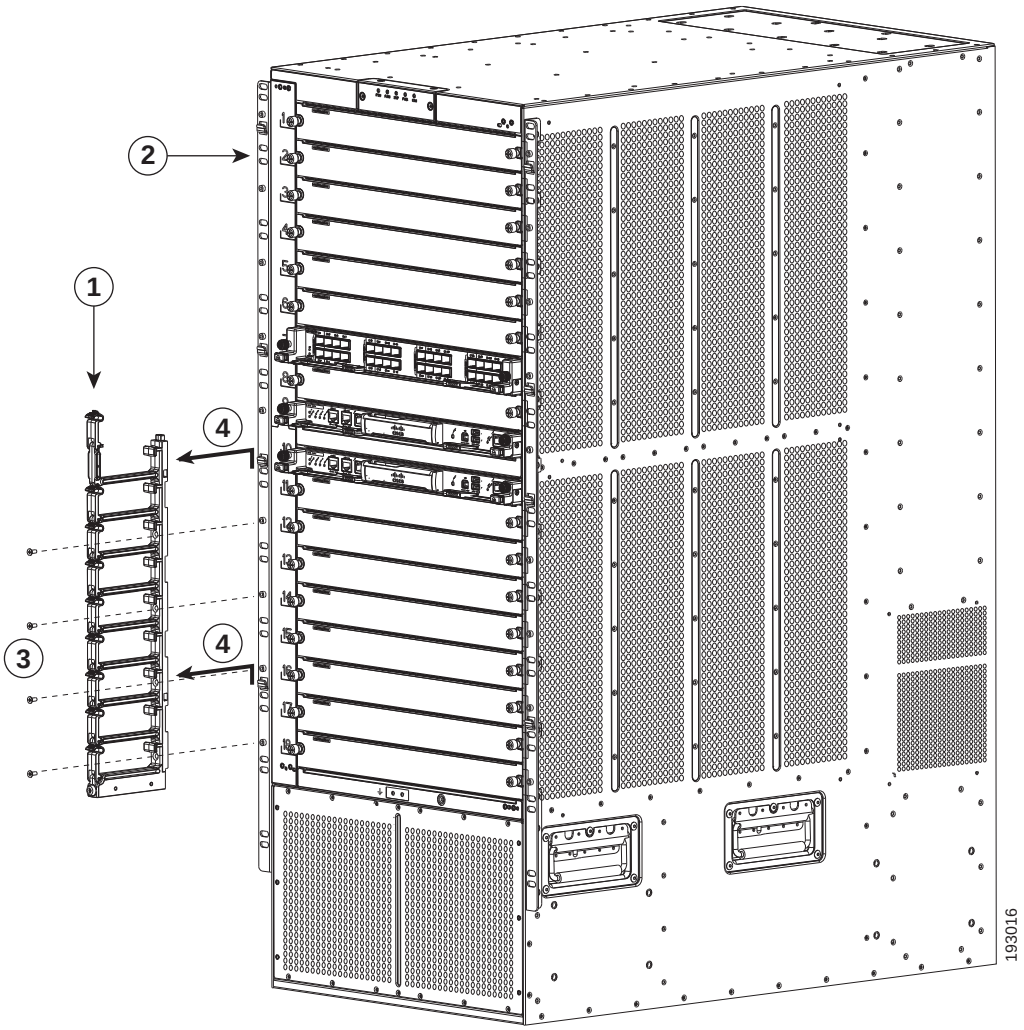
Figure E-29 Removing an Upper-Cable-Management Assembly



1	Rack-mount bracket.	**3**	Loosen and remove five M4x10 screws.
2	Upper cable management assembly.	**4**	Lift the upper cable management assembly off the rack-mount bracket hooks.

e. For the lower cable management assembly on the left, loosen and remove four M4x10 screws, and then lift off the assembly as shown in Figure E-30.

Figure E-30 Removing a Lower Cable Management Assembly



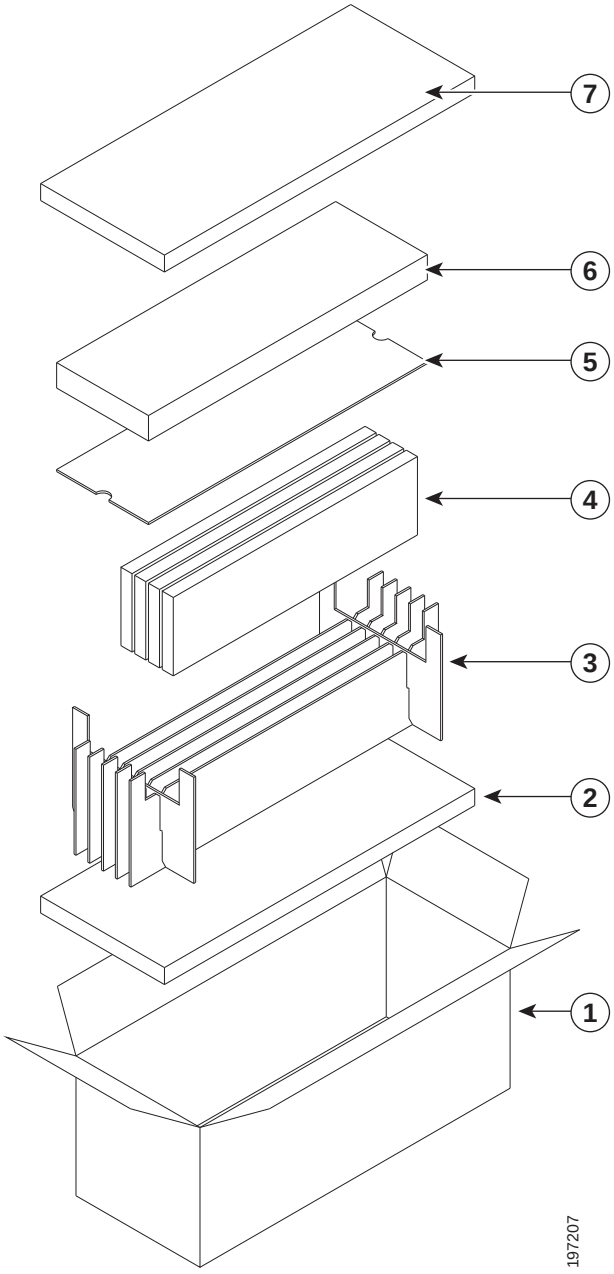
1	Lower cable management assembly.	**3**	Loosen and remove four M4x10 screws.
2	Left rack-mount bracket.	**4**	Lift the lower cable management assembly off the rack-mount bracket hooks.

f. Repeat Step 3e for the lower cable management assembly on the right side.

g. Open the box for the cable management frames and remove the packing materials.

h. Place the packing cushion and cardboard dividers in the box as shown with Callouts 2 and 3 in Figure E-31.

Figure E-31 Packing the Cisco Nexus 7018 Cable Management System



1	Open the cable management box.	**5**	Place the flat cardboard divider on top of the cable management frames.
2	Insert a packing cushion at the bottom of the box.	**6**	Place the top-cover box.
3	Insert the cable management frame dividers.	**7**	Insert a packing cushion above the top-cover box.
4	Insert each of four cable management frames in an open divider slot.		

i. Insert each of the four cable management frames into one of the open slots in the cardboard dividers.

j. Place the flat cardboard divider on top of the packed cable management frames (see Callout 5 in Figure E-31).

k. Open the box for the top cover, place the top cover in the box, close the box, and place the box on top of the flat cardboard piece, which covers the packed cable management frames (see Callout 6 in Figure E-31).

l. Place the remaining packing cushion on top of the top cover box, close the box for the cable management frames, and tape it shut.

Step 11 If you need to make the chassis as light as possible for moving, remove the fan trays as follows:

a. Place an antistatic mat or antistatic foam where you can place two fan trays.

b. Choose a place that prevents damage to the fan trays while they are outside the chassis.

c. Unpack and place the replacement fan tray on the antistatic mat or antistatic foam.

d. Loosen the four captive screws on the fan tray that you are replacing by turning them counterclockwise until they are free of the chassis.

e. Grasp the fan tray handle with one hand and pull the fan tray part way out of its slot on the chassis.

f. If the fan tray power connector does not easily unseat from the backplane, rock it gently.

g. Place a hand under the bottom side of the fan tray to support it and pull the fan tray out of the chassis.

h. Place the fan tray on an antistatic pad or repack it in its original packing materials.

Step 12 Disconnect each system ground by loosening and removing the two M4 screws that attach the grounding cable to the chassis.

Step 13 Loosen and remove the 9 screws that hold each side of the chassis (18 screws total) to the vertical mounting rails on the rack or cabinet.

Step 14 Position a mechanical lift in front of the chassis and raise its platform to the bottom of the chassis (or no more than 0.25 inches (0.6 cm) below the bottom of the chassis), so that you can push the chassis onto the lift platform.

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

Step 15 Lay the shipping pallet flat on the floor. This pallet includes a raised portion that is bolted to the larger pallet. Make sure that the raised portion is on top.

Caution You need two persons for the following step.

Step 16 Use at least two persons to push the chassis onto the mechanical lift.

Caution Be sure to push the chassis only on its frame. Do not push on any of its modules or use the handles on any modules—these handles are used only for removing or installing these modules. Do not use the handles on the side of the chassis to move or lift the chassis (the handles are not rated for lifting over 200 pounds [91 kg]). The chassis handles are only for adjusting the position of the chassis in the rack or cabinet.

Step 17 After you securely position the chassis on the mechanical lift, use the mechanical lift to move the chassis to its pallet.

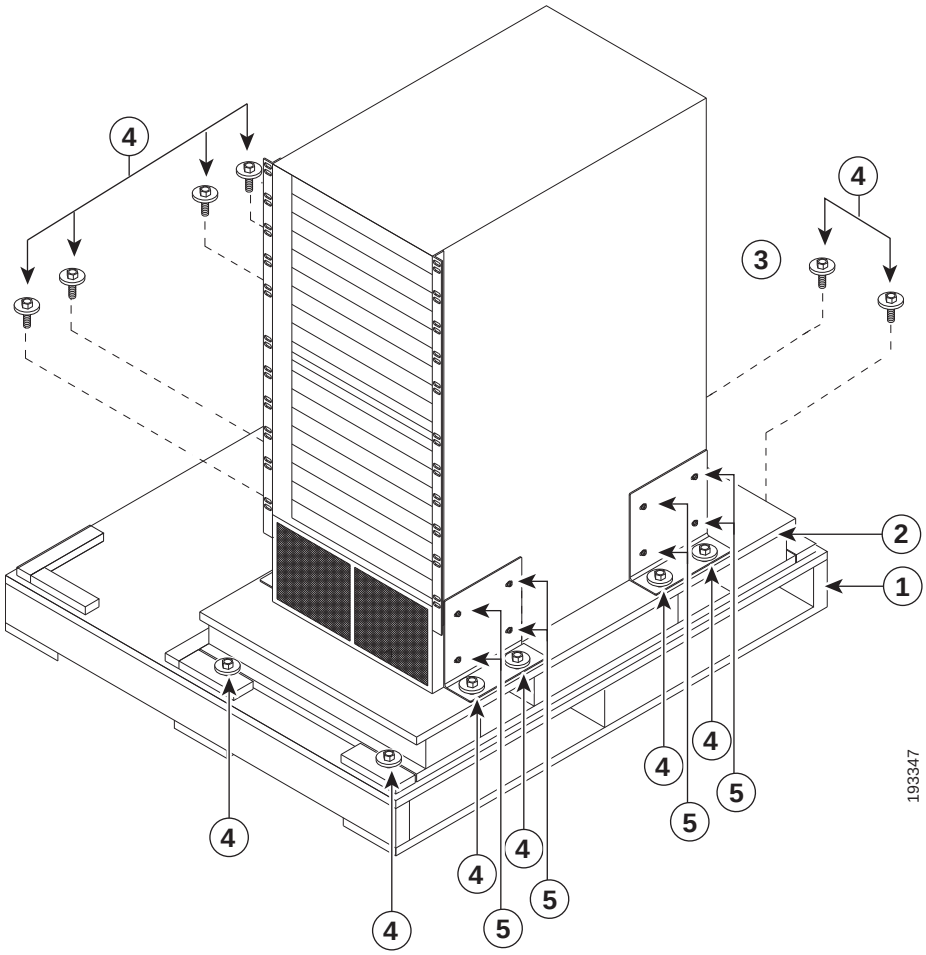
Step 18 Lower the chassis to the level of the pallet or no more than 0.25 inches (0.6 cm) above the pallet.

Caution You need two persons for the following step.

Step 19 Use at least two persons to push the chassis onto the raised portion of the pallet. Position the chassis so that it is 4 inches (10.2 cm) away from the side of the common edge of the pallet and its raised portion.

Step 20 Attach two angle brackets to the raised portion of the pallet between the chassis and the pallet edge. Do not tighten the screws that hold these brackets to the pallet—you will need to adjust their placement after you place the chassis on the pallet. See Figure E-32.

Figure E-32 Attaching the Chassis to the Shipping Pallet



1	Lower pallet	**4**	Bolts holding brackets to the upper pallet
2	Raised portion of the pallet	**5**	Screws holding the chassis to the brackets
3	Mounting brackets (two shown and two are on the other side of the chassis)		

Step 21 Align the screw holes in the side of the chassis with the screw holes in the vertical sides of the two angle brackets. Fasten the two angle brackets to the chassis by securely tightening the four screws for each bracket. See Figure E-32.

Step 22 Attach two more angle brackets to the pallet on the other side of the chassis. Make sure that the four screw holes on the vertical side of each bracket align with four holes in the chassis.

Step 23 Use four screws to securely attach each of the additional two brackets to the chassis.

Step 24 Securely fasten the two bolts on each of the four angle brackets to the pallet.

Step 25 If you removed the fan trays, replace them in the chassis as follows:

a. Hold the fan tray handle with one hand and use your other hand to hold the bottom of the fan tray.

b. Position the back of the fan tray to the open fan tray slot and slide the fan tray all the way into the slot until the electrical connector seats in the backplane and the captive screws are aligned to their holes in the chassis.

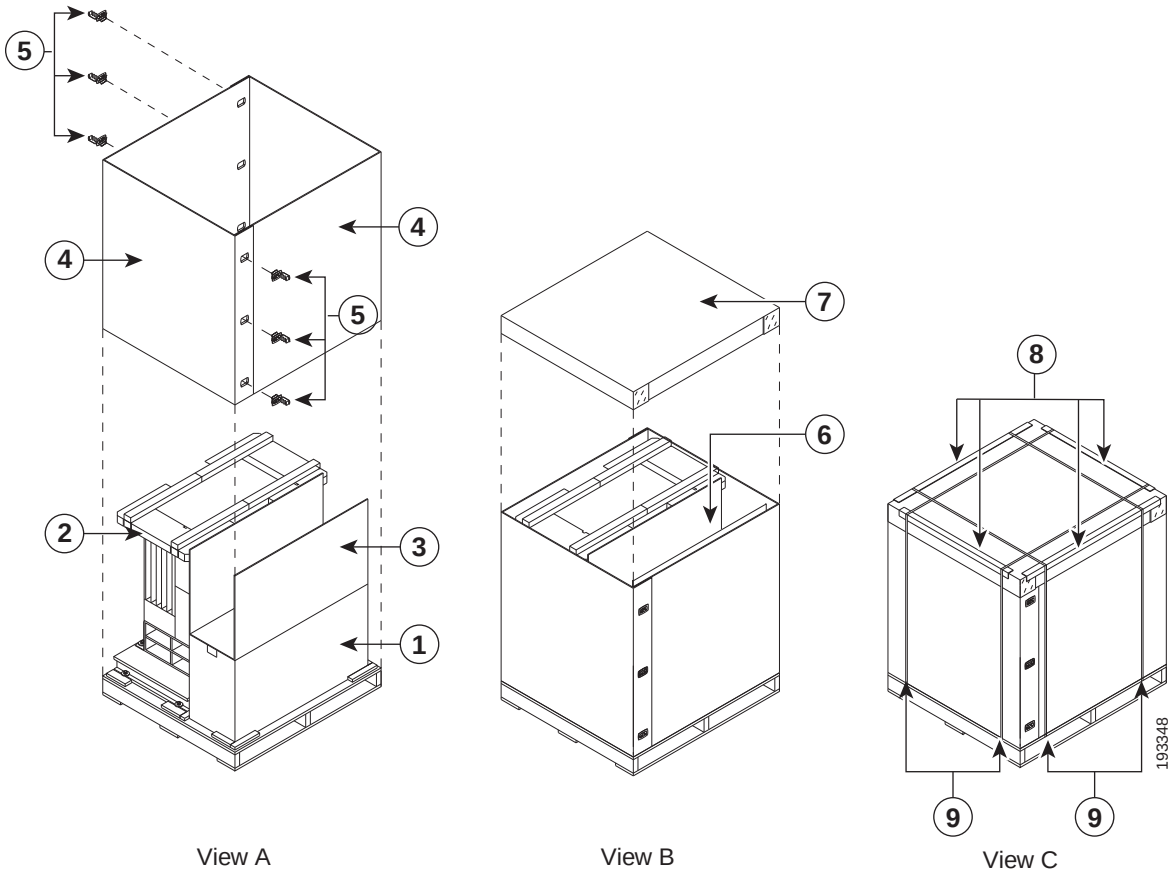
c. Tighten the captive screws to 8 in-lb (0.9 N·m) of torque.

d. Repeat Steps 25a to 25c to replace the other fan tray.

Step 26 Place the packing bag over the chassis.

Step 27 Place the chassis packing cushion on top of the bagged chassis as shown in View A in Figure E-33.

Figure E-33 Packing the System Components



1	Power supply box.	**6**	Insert accessory kit, cable management frame kit, and the optional front door and air intake frame kit.
2	Polyethylene cushion.	**7**	Corrugated cardboard lid.
3	Three-segment divider.	**8**	Edge protectors.
4	Two J-box halves.	**9**	Packing straps.
5	Corro clips.		

Step 28 Place the power supply box in the non raised area beside the chassis as shown in View A in Figure E-33 on page E-50.

Step 29 Place the three-segment divider in the non-raised area above the power supply box as shown in View A in Figure E-33.

Step 30 Remove each of the two bottom-support rails from the rack or cabinet by loosening the eight screws that secure each of them to the vertical mounting rails on the rack or cabinet.

Step 31 Reassemble the accessory kit by placing the following components in the accessory kit box:

- Bottom-support rails (two) and mounting screws (34)
- Console connector cables and adapters
- Ground lugs (do not include the ground cable) and mounting screws (two per lug)
- Power cables (one or two for each 6-kW power supply unit)

Step 32 Place one J-box half on the bottom pallet along two sides of the pallet as shown in View A of Figure E-33.

Step 33 Place the other J-box half on the other two sides as shown in View A of Figure E-33.

Step 34 Connect the two J-box pieces with six corro clips (three on each seam) as shown in View A of Figure E-33.

Step 35 If your system included the optional front door and air intake frame, pack those items in their original packing materials and place them in the open area above the power supply box.

Step 36 Place the corrugated cardboard lid on top of the package as shown in View B of Figure E-33.

Step 37 Place each of the four edge protectors on one of the top edges of the lid (see View C of Figure E-33).

Step 38 Secure the package to the pallet using at least four packing straps (two in one direction and two in the other direction) as shown in View C of Figure E-33.

Site Preparation and Maintenance Records

This appendix provides a site planning list to use when preparing your site for the Cisco Nexus 7000 Series switch and includes these sections:

Site Preparation Checklist

Planning the location and layout of your equipment rack or cabinet is essential for successful switch operation, ventilation, and accessibility.

Table F-1 lists the site planning tasks that we recommend that you complete before you install the Cisco Nexus 7000 Series switch. Your completion of each task ensures a successful switch installation.

Table F-1 Site Planning Checklist

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	

Table F-1 Site Planning Checklist (continued)

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 gauge wire 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 (Table F-2) to record contact and site information.

Table F-2 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	

Table F-2 Contact and Site Information (continued)

ZIP code	
Country	

Chassis and Module Information

Use the following worksheets (Table F-3, Table F-5, Table F-6, and Table F-7) to record information about the chassis and modules.

Contract Number

Chassis serial number

Product number

Table F-3 Network-Related Information

Switch IP address	
Switch IP netmask	
Hostname	
Domain name	
IP broadcast address	
Gateway/router address	
DNS address	

Table F-4 Module Information for the Cisco Nexus 7004 Chassis

Slot	Module Type	Module Serial Number	Notes
1	Supervisor		
2	Supervisor		
3			
4			

Table F-5 Module Information for the Cisco Nexus 7009 Chassis

Slot	Module Type	Module Serial Number	Notes
1	Supervisor		
2	Supervisor		
3			
4			
5			
6			

Table F-5 Module Information for the Cisco Nexus 7009 Chassis (continued)

Slot	Module Type	Module Serial Number	Notes
7			
8			
9			

Table F-6 Module Information for the Cisco Nexus 7010 Chassis

Slot	Module Type	Module Serial Number	Notes
1			
2			
3			
4			
5	Supervisor		
6	Supervisor		
7			
8			
9			
10			

Table F-7 Module Information for the Cisco Nexus 7018 Chassis

Slot	Module Type	Module Serial Number	Notes
1			
2			
3			
4			
5			
6			
7			
8			
9	Supervisor		
10	Supervisor		
11			
12			
13			
14			
15			

Table F-7 Module Information for the Cisco Nexus 7018 Chassis (continued)

Slot	Module Type	Module Serial Number	Notes
16			
17			
18			