Catalyst 6500 Series Distributed Forwarding Card 3 for WS-X67xx Modules Installation Note

This publication describes the procedures for installing and removing the Distributed Forwarding Card 3 (DFC3) daughter card on the WS-X67xx Ethernet modules. The publication covers the following products:

- WS-F6700-DFC3A(=)
- WS-F6700-DFC3B(=)
- WS-F6700-DFC3BXL(=)
- WS-F6700-DFC3C(=)
- WS-F6700-DFC3CXL(=)

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Note Throughout this publication, unless otherwise noted, the term DFC3 daughter card refers to the DFC3A, DFC3B, DFC3BXL, DFC3C, and DFC3CXL daughter cards.

Contents

This publication contains these sections:

Overview

This section provides an overview and specifications of the DFC daughter cards. The DFC daughter card is an optional daughter card for the WS-X67xx series, CEF720-based line cards. The DFC3 provides localized forwarding decisions for each line card and scales the aggregate system performance. Table 1 lists the specifications for the WS-F6700-DFC daughter cards.

Table 1   *DFC Daughter Card Specifications*

DFC Daughter Card	Module Support	Minimum Software Support	Power Requirement @42 VDC
DFC3A	• WS-X6704-10GE • WS-X6724-SFP • WS-X6748-SFP • WS-X6748-GE-TX	• Supervisor Engine 720-10GE—12.2(33)SXH • Supervisor Engine 720—12.2(17a)SX **Note** Use with Cisco IOS Release 12.2(33)SXH or later requires switching module ROMMON version 12.2(18r)S1 or later.	3.00 A
DFC3B DFC3BXL	• WS-X6704-10GE • WS-X6724-SFP • WS-X6748-SFP • WS-X6748-GE-TX	• Supervisor Engine 720-10GE—12.2(33)SXH • Supervisor Engine 720—12.2(17d)SXB6 **Note** Use with Cisco IOS Release 12.2(33)SXH or later requires switching module ROMMON version 12.2(18r)S1 or later.	DFC3B: 2.70 A DFC3BXL: 3.30 A
DFC3C DFC3CXL	• WS-X6704-10GE • WS-X6724-SFP • WS-X6748-SFP • WS-X6748-GE-TX • WS-X6708-10GE • WS-X6716-10GE	• Supervisor Engine 720-10GE—12.2(33)SXH • Supervisor Engine 720 and all WS-X6700 series Ethernet modules—12.2(33)SXH • Supervisor Engine 720 and WS-X6708-10GE Ethernet module—12.2(18)SXF5 **Note** Use with Cisco IOS Release 12.2(33)SXH or later requires switching module ROMMON version 12.2(18r)S1 or later.	DFC3C: 1.65 A DFC3CXL: 2.35 A

Safety Overview

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

Statement 1071—Warning Definition

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。

주의   중요 안전 지침

이 경고 기호는 위험을 나타냅니다. 작업자가 신체 부상을 일으킬 수 있는 위험한 환경에 있습니다. 장비에 작업을 수행하기 전에 전기 회로와 관련된 위험을 숙지하고 표준 작업 관례를 숙지하여 사고를 방지하십시오. 각 경고의 마지막 부분에 있는 경고문 번호를 참조하여 이 장치와 함께 제공되는 번역된 안전 경고문에서 해당 번역문을 찾으십시오.

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 آخر 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

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

Opozorilo POMEMBNI VARNOSTNI NAPOTKI

Ta opozorilni simbol pomeni nevarnost. Nahajate se v situaciji, kjer lahko pride do telesnih poškodb. Preden pričnete z delom na napravi, se morate zavedati nevarnosti udara električnega toka, ter tudi poznati preventivne ukrepe za preprečevanje takšnih nevarnosti. Uporabite obrazložitveno številko na koncu posameznega opozorila, da najdete opis nevarnosti v priloženem varnostnem priročniku.

SHRANITE TE NAPOTKE!

警告 重要安全性指示
此警告符號代表危險，表示可能造成人身傷害。使用任何設備前，請留心電路相關危險，並熟悉避免意外的標準作法。您可以使用每項警告後的聲明編號，查詢本裝置隨附之安全性警告譯文中的翻譯。
請妥善保留此指示

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

Warning Hazardous voltage or energy is present on the backplane when the system is operating. Use caution when servicing. Statement 1034

Required Tools and Parts

These parts are included in the DFC3 daughter card upgrade kit:

- DFC3A, DFC3B, DFC3BXL, DFC3C, or DFC3CXL daughter card
- Installation bracket and mounting hardware (mounts over the male standoffs at the rear of the DFC daughter card)
- One disposable grounding wrist strap
- One 1-GB (MEM-XCEF720-1GB) memory upgrade

These tools and supplies are required to remove and install the DFC3 daughter card:

- Antistatic mat or foam pad to support the removed module and an antistatic bag to store the removed Central Forwarding Card (CFC) or DFC daughter card
- Your own ESD-prevention equipment or the disposable grounding wrist strap included in the upgrade kit
- Number 1 Phillips-head screwdriver for the DFC daughter card installation hardware

Removing a CFC or DFC Daughter Card

If your Ethernet module has either a CFC or a DFC daughter card installed, you must remove the old CFC or DFC daughter card before installing the new DFC daughter card. The folowing procedures are provided:

Note An additional procedure for removing DFC3 daughter cards is provided for daughter cards installed on early versions of the WS-X6748-GE-TX Ethernet module that are equipped with stiffener brackets.
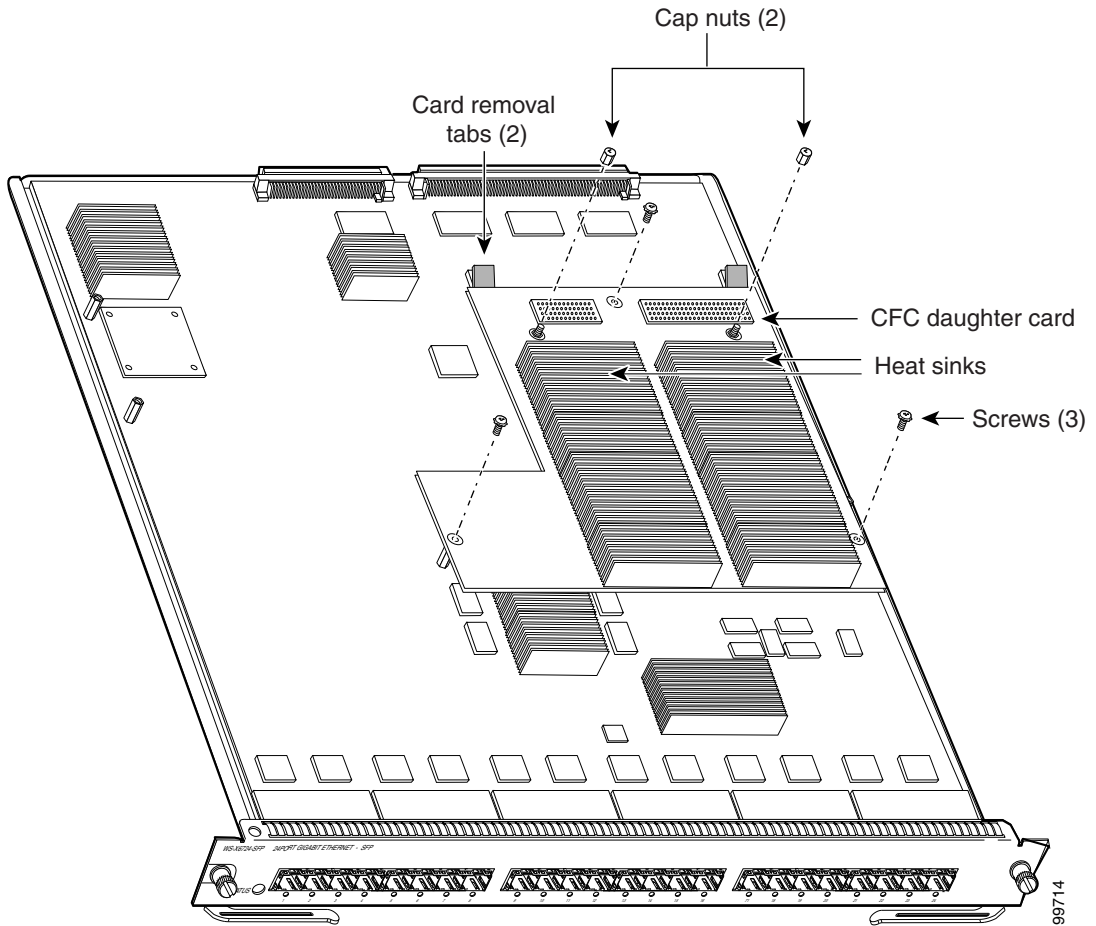
Removing the CFC Daughter Card

Warning **During this procedure, wear grounding wrist straps to avoid ESD damage to the card. Do not directly touch the backplane with your hand or any metal tool, or you could shock yourself.** Statement 94

To remove a CFC daughter card, follow these steps:

Step 1 Attach an ESD grounding strap to your wrist and to ground.

If you are unsure about the correct way to attach an ESD grounding strap, refer to the "Attaching Your ESD Grounding Strap" section on page 42 for instructions.

Step 2 Remove the Ethernet module from the Catalyst 6500 series switch.

If you are unsure about the correct procedure for removing a module from the switch chassis, refer to the "Removing and Installing Ethernet Modules in the Chassis" section on page 34 for removal instructions.

Step 3 Place the Ethernet module on an antistatic mat with the front of the module facing toward you.

Step 4 Use a Phillips-head screwdriver to remove the installation hardware, which consists of three securing screws and the two cap nuts. (See Figure 1.)

Figure 1 *CFC Daughter Card Installation Hardware*

Cap nuts (2)

Card removal
tabs (2)

CFC daughter card

Heat sinks

Screws (3)

99714

Step 5   To unseat the CFC daughter card from the Ethernet module, hold each tab at the rear of the CFC daughter card between your thumb and index finger, and gently press down on both tabs until the connectors are unseated. (See Figure 2.)

⚠

Caution   Do not apply too much pressure on the tabs because you might cause damage to the module.

Figure 2   *Unseating the CFC Daughter Card Connectors*

Heat sinks
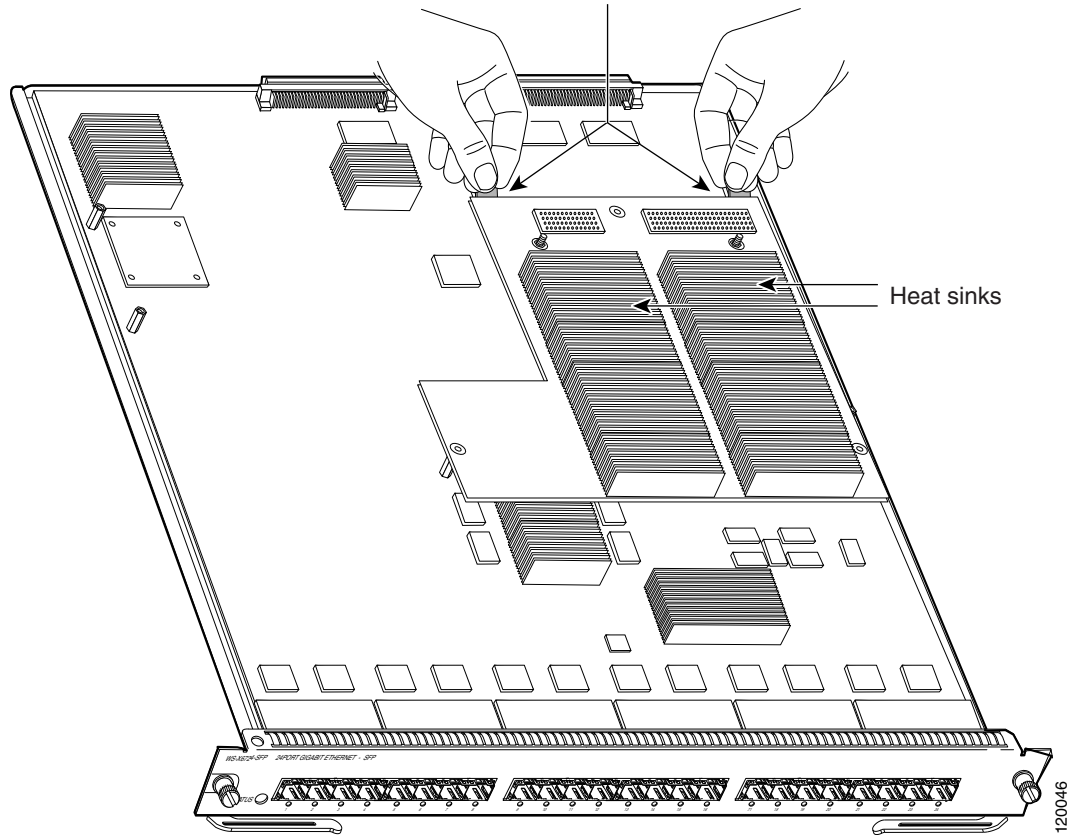
Step 6   Gently lift the CFC daughter card with both hands and remove the CFC daughter card from the module.

Step 7   Place the CFC daughter card on an antistatic mat, antistatic foam pad, or in an antistatic bag.

Step 8   Proceed to the "Installing the DFC3B and DFC3C Daughter Cards" section on page 23.

Removing the DFC3 Daughter Card

This section contains two DFC3 daughter card removal procedures. The first procedure describes how to remove the DFC3 daughter card from modules that are not equipped with a stiffener bracket. The second procedure describes how to remove the DFC daughter card from early versions of the WS-X6748-GE-TX Ethernet module that are equipped with a stiffener bracket.

Note   Only some versions of the WS-X6748-GE-TX Ethernet module are equipped with a stiffener bracket.

Removing the DFC3 Daughter Card from Modules without Stiffener Brackets

Warning   **During this procedure, wear grounding wrist straps to avoid ESD damage to the card. Do not directly touch the backplane with your hand or any metal tool, or you could shock yourself.** Statement 94

To remove the DFC3 daughter card from modules that are not equipped with a stiffener bracket, follow these steps:

Step 1   Attach an ESD grounding strap to your wrist and to ground.

If you are unsure about the correct way to attach an ESD grounding strap, refer to the "Attaching Your ESD Grounding Strap" section on page 42 for instructions.

Step 2   Remove the Ethernet module from the chassis.

If you are unsure about the correct procedure for removing a module from the switch chassis, refer to the "Removing an Ethernet Module from the Chassis" section on page 34 for removal instructions.

Step 3   Place the Ethernet module on an antistatic mat with the front of the module facing toward you.

Step 4   If your DFC daughter card has a small metal installation bracket as shown in Figure 3, use a No.1 Phillips-head screwdriver to remove the two cap nuts and the one screw securing the bracket. Set them aside with the bracket. If there is no bracket, just remove the two cap nuts and the one screw.

**Step 5**   Remove the remaining installation hardware. (See Figure 3.)

Note   The installation hardware shown in Figure 3 is for a DFC3B or DFC3BXL daughter card. The installation hardware for a DFC3C or a DFC3CXL daughter card consists of 6 screws, 2 cap nuts, and 1 standoff.

Figure 3   Removing the DFC Daughter Card Installation Hardware

Installation bracket. May or may not be present.

154456
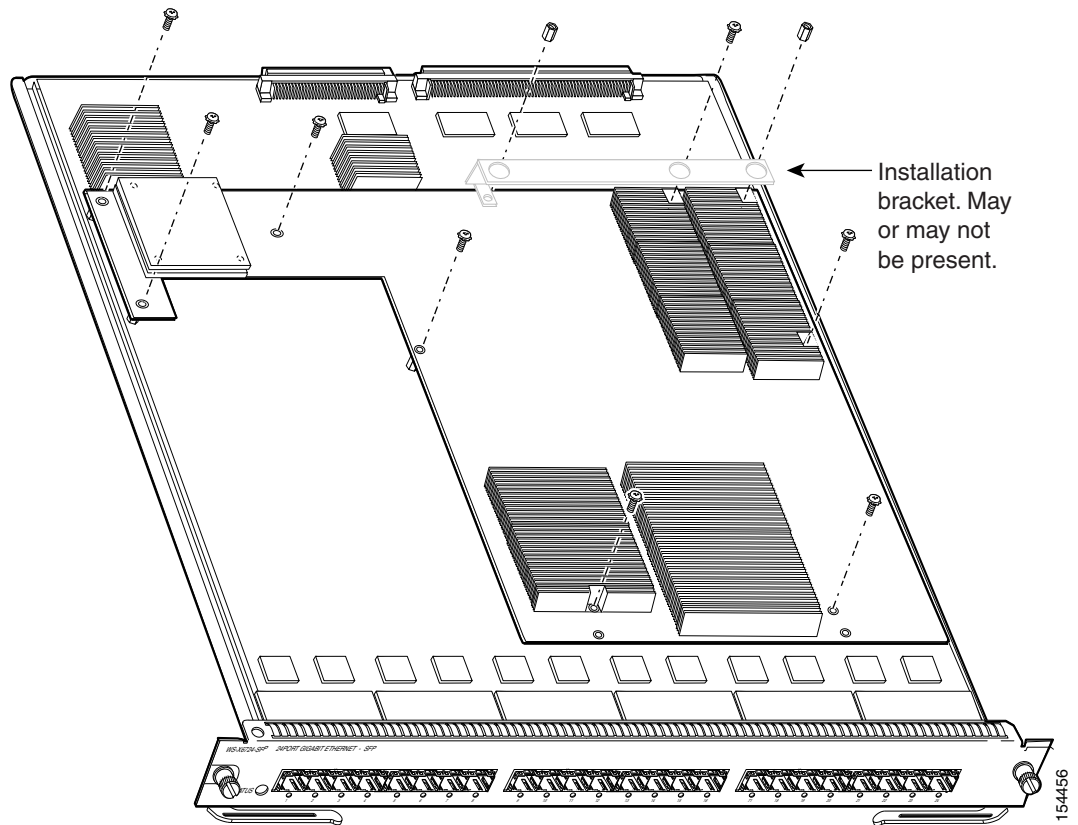
Step 6   Partially reinstall the cap nut, rotating about 3 turns so that there is a space of about 1/8 inch (3 mm) between the bottom of the cap nut and the top of the DFC3 daughter card, as shown in Figure 4. The cap nut acts as a stop when you unseat the daughter card connector so that the DFC3 daughter card does not move horizontally and cause damage to the base board.
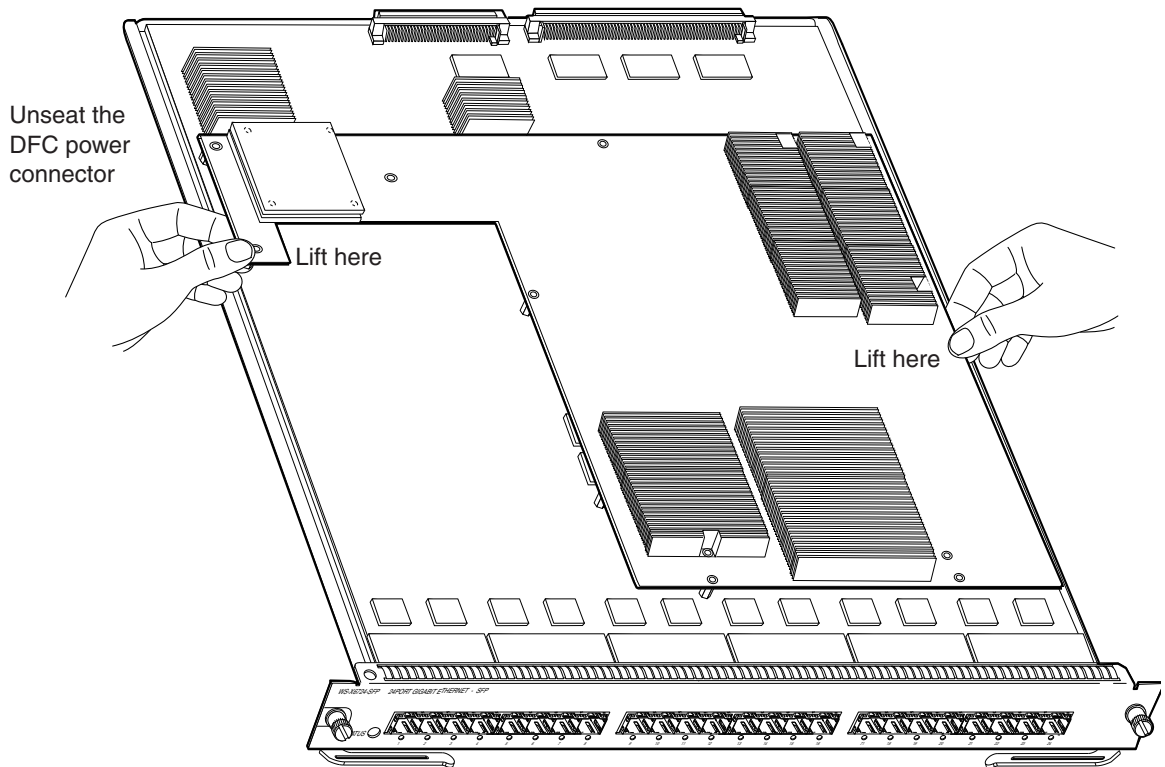
Figure 4   *Partially Installing the Cap Nut*
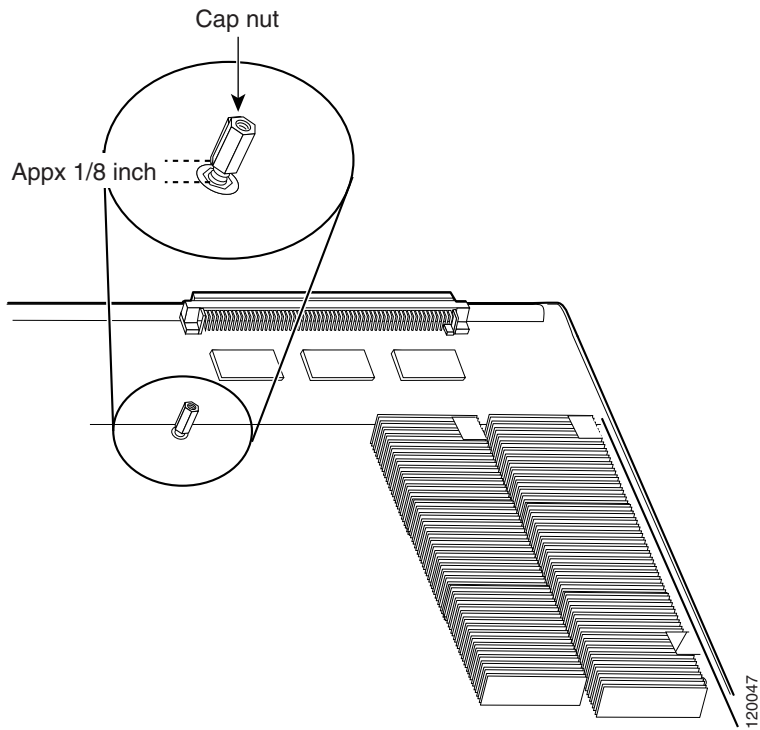
Step 7   With your left hand, lift slightly at the location shown in Figure 5. While lifting with your left hand, rock the DFC3 daughter card up and down with your right hand, no more than half an inch in either direction, to unseat the DFC3 daughter card from the module.

Figure 5   *Unseat the DFC3 Daughter Card from the Module*

Lift here

Rock up
and down

120048

Step 8   Remove the one cap nut.

Step 9   Holding the DFC3 daughter card with both hands, gently lift it straight up from the module. (See
Figure 6.) Immediately place the DFC3 daughter card on an antistatic mat, antistatic foam pad, or in an
antistatic bag.

Figure 6   Removing the DFC3 Daughter Card from the Module

Unseat the
DFC power
connector

Lift here

Lift here

Removing the DFC3 Daughter Card from WS-X6748-GE-TX Modules Equipped with a Stiffener Bracket

Some early versions of the WS-X6748-GE-TX Ethernet modules have a stiffener bracket mounted across the top front part of the module. A modified procedure to remove the DFC daughter card from WS-X6748-GE-TX Ethernet modules equipped with a stiffener bracket is included.

⚠
Warning   **During this procedure, wear grounding wrist straps to avoid ESD damage to the card. Do not directly touch the backplane with your hand or any metal tool, or you could shock yourself.** Statement 94

To remove a DFC3 daughter card from a WS-X6748-GE-TX Ethernet module that is equipped with a stiffener bracket, follow these steps:

Step 1 Attach an ESD grounding strap to your wrist and to ground.

If you are unsure about the correct way to attach an ESD grounding strap, refer to the "Attaching Your ESD Grounding Strap" section on page 42 for instructions.

Step 2 Remove the WS-X6748-GE-TX Ethernet module from the Catalyst 6500 series switch.

If you are unsure about the correct procedure for removing a module from the switch chassis, refer to the "Removing and Installing Ethernet Modules in the Chassis" section on page 34 for removal instructions.

Step 3 Place the module on an antistatic mat or antistatic foam with the front of the module facing toward you.

Step 4 If your DFC daughter card has a small metal installation bracket as shown in Figure 7, use a No.1 Phillips-head screwdriver to remove the two cap nuts and the one screw securing the bracket. Set them aside with the bracket. If there is no installation bracket, remove the two cap nuts and the one screw.

Step 5 Use a Phillips-head screwdriver to remove the remaining installation hardware. (See Figure 7.)

Figure 7   *Removing the Installation Hardware (DFC3B/DFC3BXL Shown) (WS-X6748-GE-TX Equipped with a Front Stiffener Bracket)*

Installation bracket. May or may not be present

Stiffener bracket

Stiffener bracket tabs, DFC daughter card mounted underneath tabs.

130149

✎
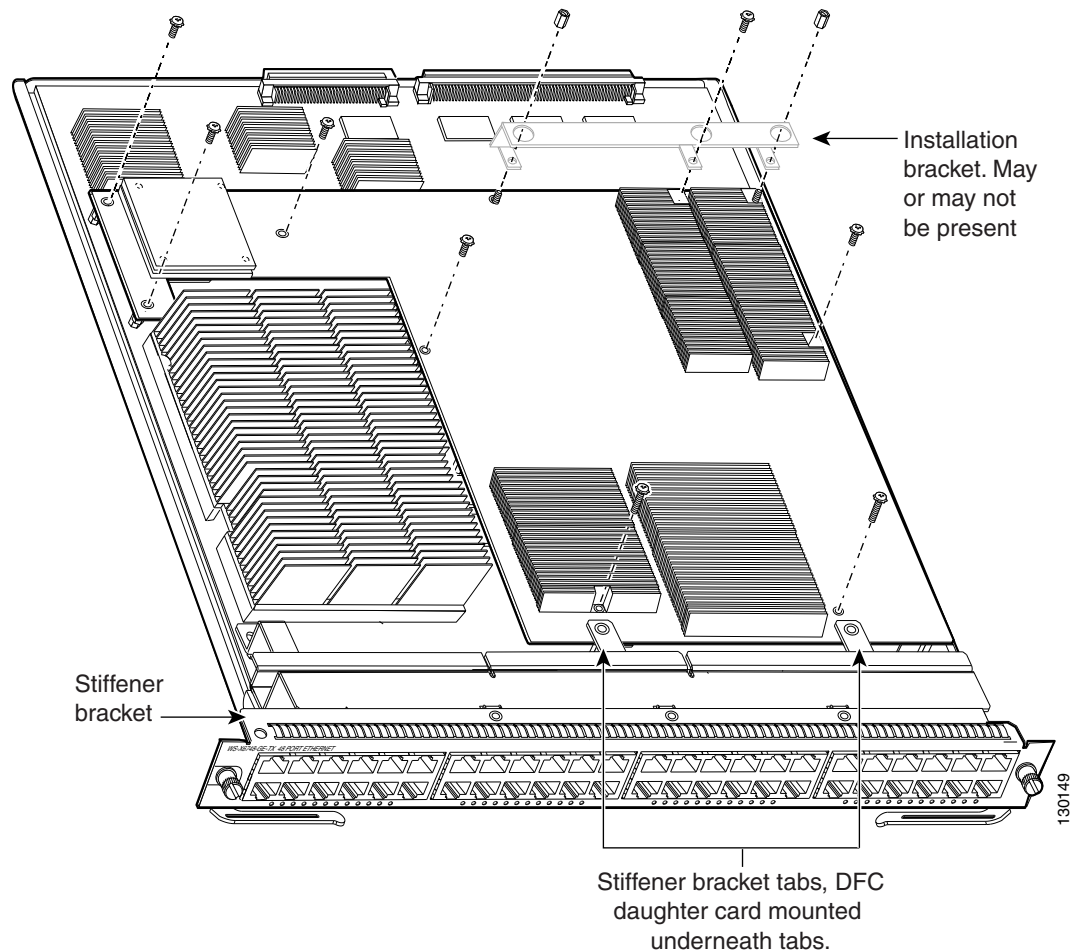
Note The two screws securing the DFC3 daughter card that pass through the front stiffener bracket tabs are longer than the remaining DFC installation screws.

Step 6 With your left hand, lift slightly at the location shown in Figure 8, and gently rock the DFC3 daughter card up and down to unseat the daughter card from the module connectors.

Figure 8 *Unseating the DFC Connectors (WS-X6748-GE-TX Equipped with a Front Stiffener Bracket)*

Lift here

Lift here
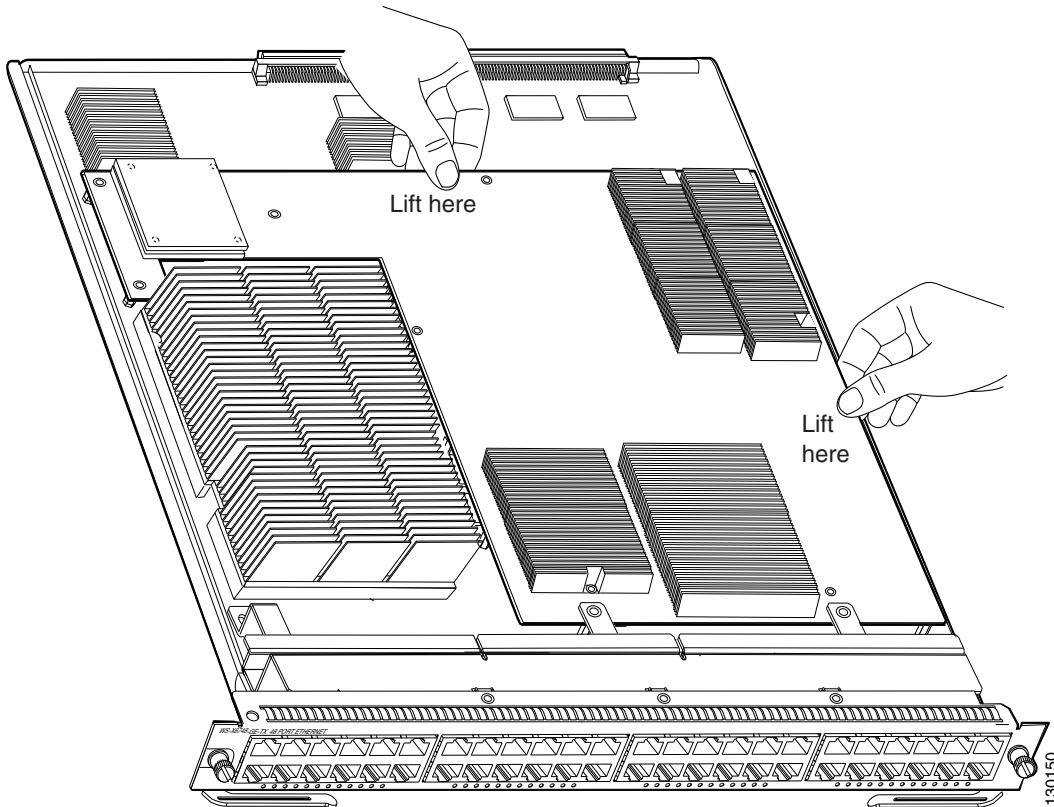
Step 7 Holding the DFC3 daughter card with both hands, carefully lift the back end of the DFC3 daughter card up slightly to clear the module connectors, and then carefully slide the DFC3 daughter card out from under the two front stiffener bracket tabs. Lift the DFC3 daughter card straight up from the module (see Figure 9) and immediately place the removed DFC3 daughter card on an antistatic mat, antistatic foam pad, or in an antistatic bag.

Figure 9   Removing the DFC3 Daughter Card (WS-X6748-GE-TX Equipped with a Front Stiffener Bracket)

Lift here to
unseat DFC
power connector

Stiffener
bracket

Stiffener bracket tabs

130151
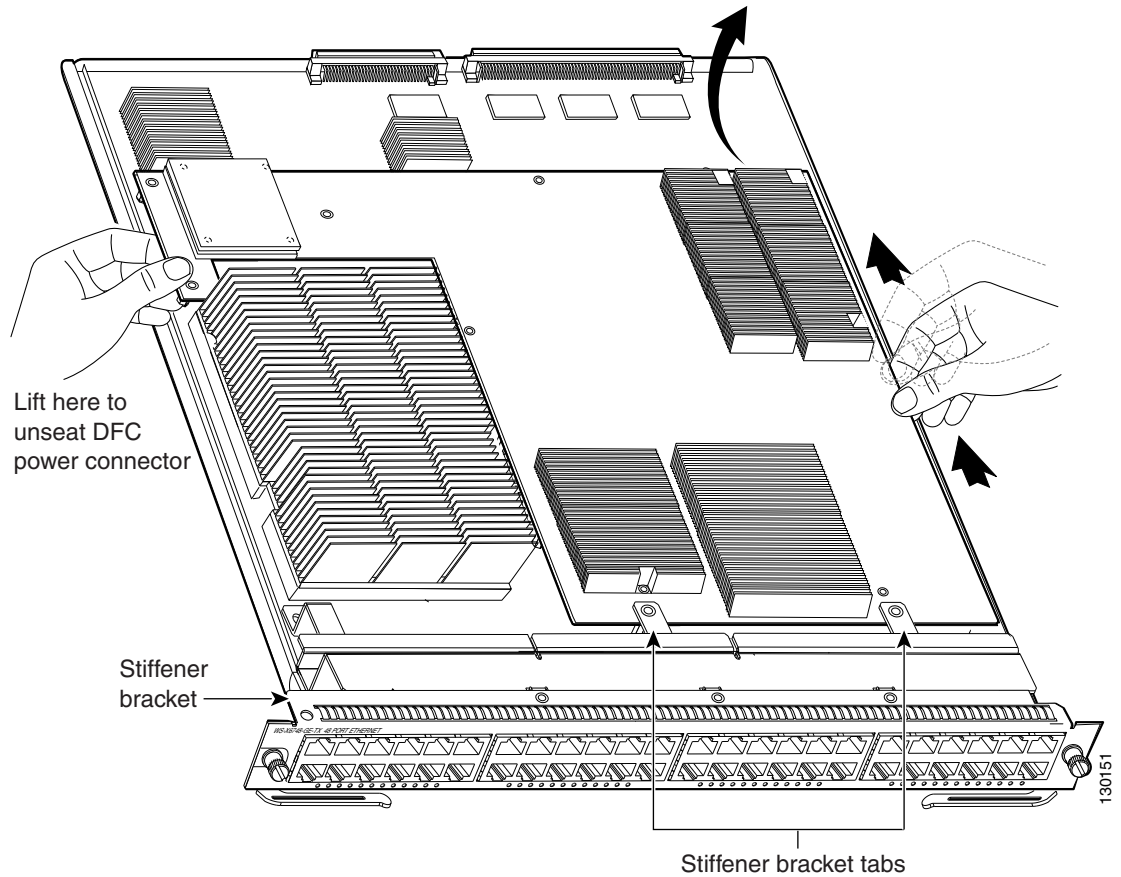
Upgrading the Ethernet Module Memory

When you upgrade your Ethernet module with either a DFC3BXL or DFC3CXL daughter card, you must also install a 1-GB memory upgrade (part number MEM-XCEF720-1GB) on the Ethernet module. This 1-GB memory upgrade is included with your DFC3BXL or DFC3CXL upgrade kit and installs on the Ethernet module in a small-outline dual-inline memory module (SODIMM) chip socket located underneath the DFC daughter card.

Note   You must perform the memory upgrade procedure after you remove the CFC or the DFC daughter card from the Ethernet module and before you install either the DFC3BXL or DFC3CXL daughter card upgrade.

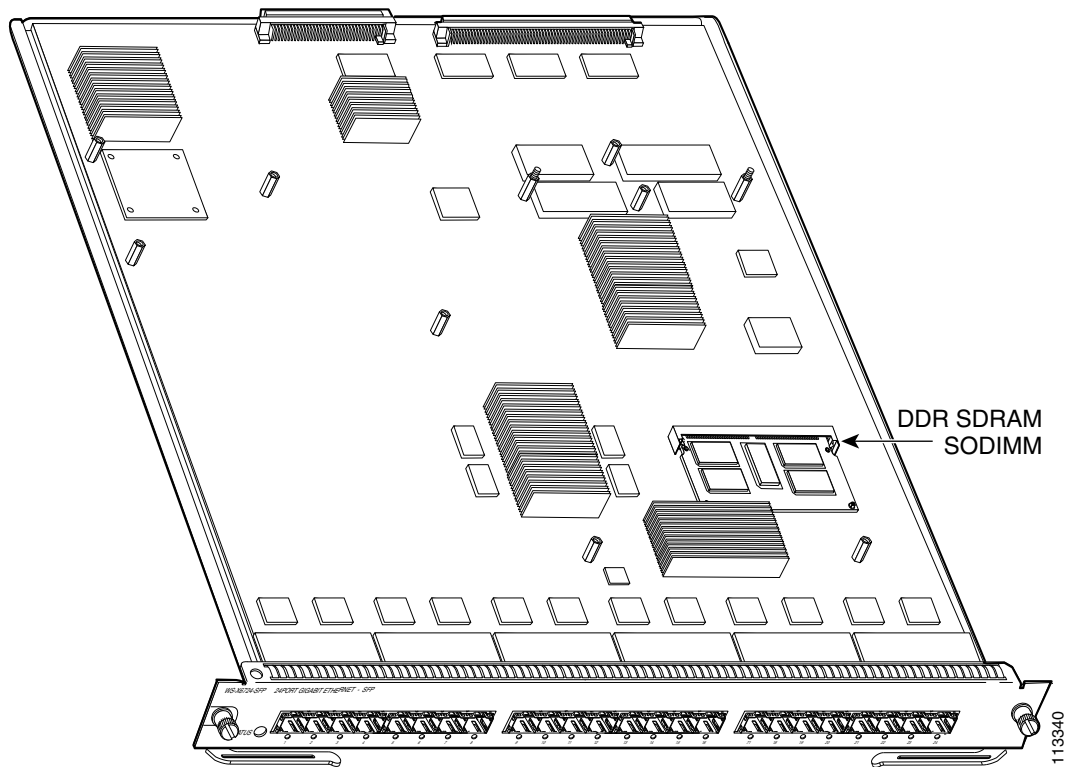# Removing the Memory Module

⚠️

Warning **During this procedure, wear grounding wrist straps to avoid ESD damage to the card. Do not directly touch the backplane with your hand or any metal tool, or you could shock yourself.** Statement 94

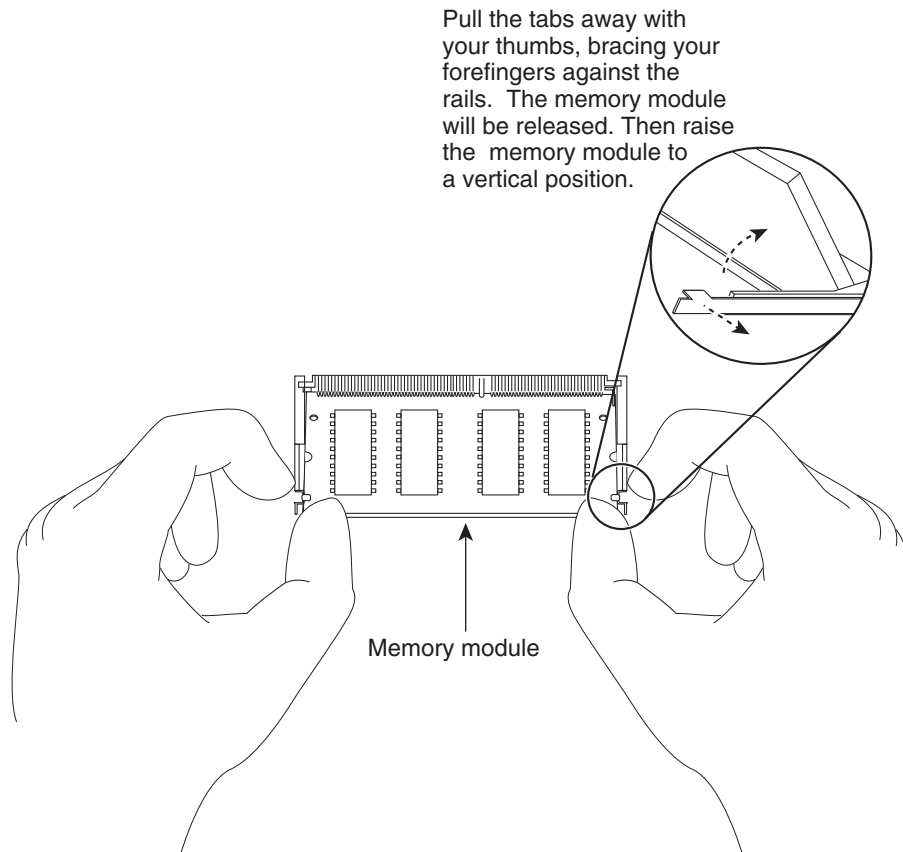To remove the existing memory module from the Ethernet module, follow these steps:

Step 1 Attach an ESD grounding strap to your wrist and to ground.

If you are unsure about the correct way to attach an ESD grounding strap, refer to the "Attaching Your ESD Grounding Strap" section on page 42 for instructions.

Step 2 Locate the memory module on the Ethernet module. (See Figure 10.)

Figure 10 *Location of the Memory Module on a WS-X67xx Module*

Step 3 Release the two spring clips on either side of the memory module to release it from the socket. (See Figure 11.)

Figure 11   Releasing the Memory Module Spring Clips

Pull the tabs away with your thumbs, bracing your forefingers against the rails. The memory module will be released. Then raise the memory module to a vertical position.

Memory module

51543

Step 4 Grasp the edges of the memory module with your thumb and forefinger, and gently pull the memory module completely out of the socket.

⚠

Caution Memory modules are sensitive components that are susceptible to ESD damage. To prevent ESD damage, handle the memory module by the edges only; avoid touching the memory chips, pins, or traces (the metal *fingers* along the connector edge of the memory module). (See Figure 12.)

Figure 12   Handling a Memory Module

51544
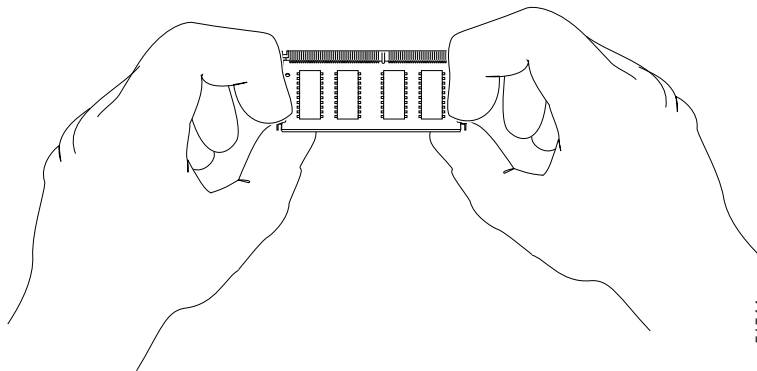
Step 5   Immediately place the old memory module in an antistatic bag to protect it from ESD damage.

Installing the 1-GB Memory Module Upgrade

⚠
Caution   Memory modules have sensitive components that are susceptible to ESD damage. To prevent ESD damage, handle memory modules by the edges only; avoid touching the memory chips, pins, or traces (the metal *fingers* along the connector edge of the SODIMM). (See Figure 12.)

To install the 1-GB memory module on the Ethernet module, follow these steps:

Step 1   Verify that an ESD grounding strap is still securely attached to your wrist and to a proper earth ground.

If you are unsure about the correct way to attach an ESD grounding strap, refer to the "Attaching Your ESD Grounding Strap" section on page 42 for instructions.

Step 2   Remove the 1-GB memory module from the antistatic shipping bag.

Step 3   Hold the sides of the 1-GB memory module between your thumbs and forefingers with the component side up and with the connector edge (the metal fingers) facing away from you. (See Figure 12.)

Step 4   Tilt the 1-GB memory module to approximately the same angle as the socket, and insert the connector edge of the memory module into the socket.

⚠
Caution   When inserting the memory module, use firm but not excessive pressure. If you damage a socket, you will have to return the Ethernet module to the factory for repair.

Step 5   Press the front edge of the 1-GB memory module down until both spring clips on the socket engage the sides of the memory module securing the memory module in place. (See Figure 13.)

Figure 13   Installing the SODIMM
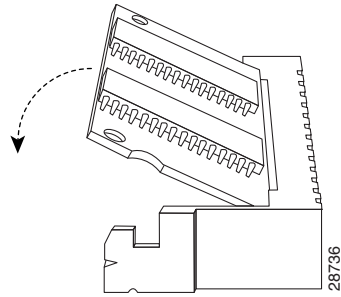
Step 6   After the memory module is installed, check that both spring clips are fully engaged. If they are not, the memory module is not seated properly. If the memory module appears misaligned, carefully remove it and reseat it in the socket. Push the memory module firmly back into the socket until the spring clips snap into place.

Installing the DFC3B and DFC3C Daughter Cards

This section contains two DFC3 installation procedures:

The first procedure describes how to install the DFC3 daughter card on Ethernet modules that are not equipped with a stiffener bracket. The second procedure describes how to install the DFC daughter cards on early versions of the WS-X6748-GE-TX Ethernet module that are equipped with stiffener brackets.

Note   If you are installing either a DFC3BXL or DFC3CXL daughter card, you must also upgrade the Ethernet module memory to 1 GB. You must perform this memory upgrade procedure before you install the DFC3BXL or DFC3CXL daughter card.

Note   Not all WS-X6748-GE-TX Ethernet modules will have the stiffener bracket installed.

Installing the DFC3B, DFC3BXL, DFC3C, and DFC3CXL Daughter Cards on Ethernet Modules without Stiffener Brackets

⚠️
Warning   **During this procedure, wear grounding wrist straps to avoid ESD damage to the card. Do not directly touch the backplane with your hand or any metal tool, or you could shock yourself.** Statement 94

To install the DFC daughter cards on Ethernet modules that do not have stiffener brackets, follow these steps:

Step 1   Attach an ESD grounding strap to your wrist and to ground.

If you are unsure about the correct way to attach an ESD grounding strap, refer to the "Attaching Your ESD Grounding Strap" section on page 42 for instructions.

Step 2   Remove the new DFC3 daughter card from the antistatic bag and the installation hardware from the packaging.

✎
Note   The DFC3 daughter card is designed to be installed on different modules; therefore, there may be more mounting holes on the DFC3 daughter card than there are standoffs on the module. Not all mounting holes on the DFC3 daughter card are used in all installations. Visually verify that there are standoffs beneath the mounting holes before installing the installation hardware.
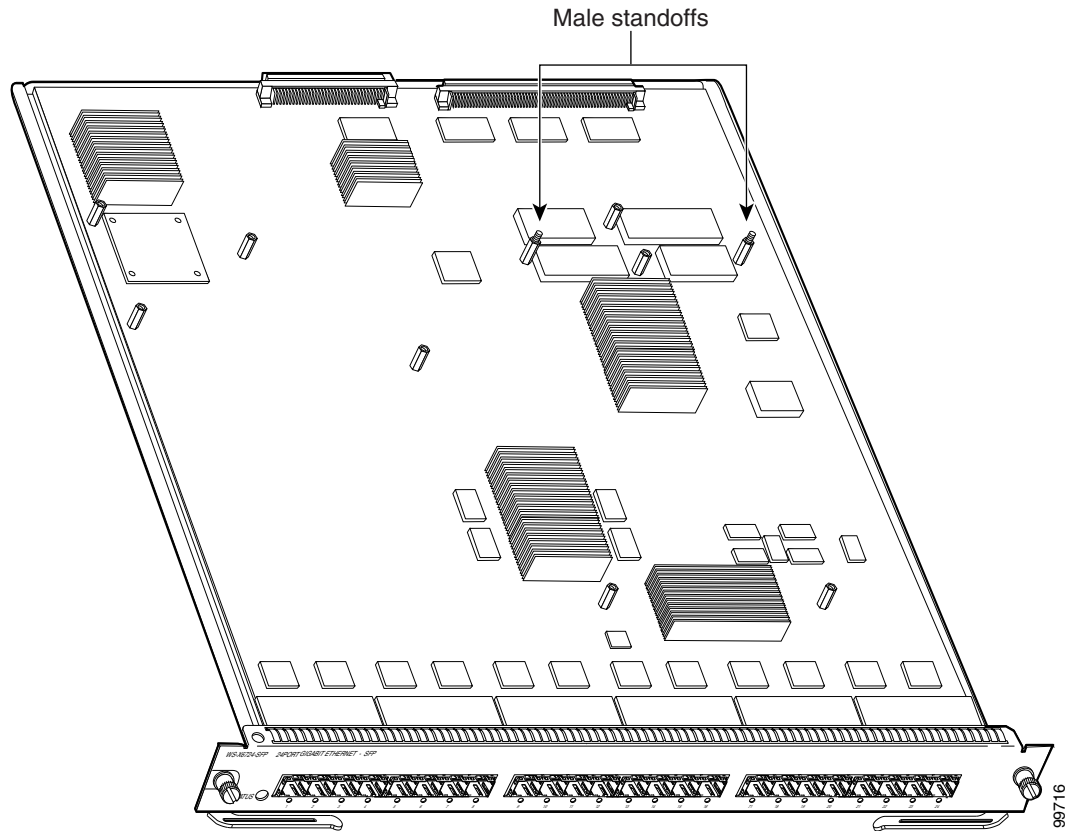
Step 3   Align the mounting holes on the DFC3 daughter card (see Figure 14) with the male standoffs on the module. (See Figure 15.) Make sure that the remaining mounting holes on the DFC3 daughter card are aligned with the remaining standoffs on the module.

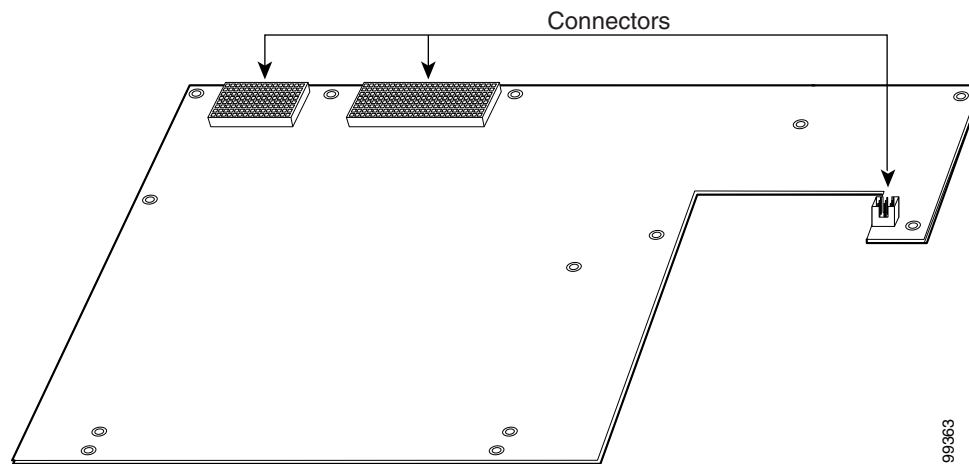*Figure 14*   *Mounting Holes on the DFC3 Daughter Card*
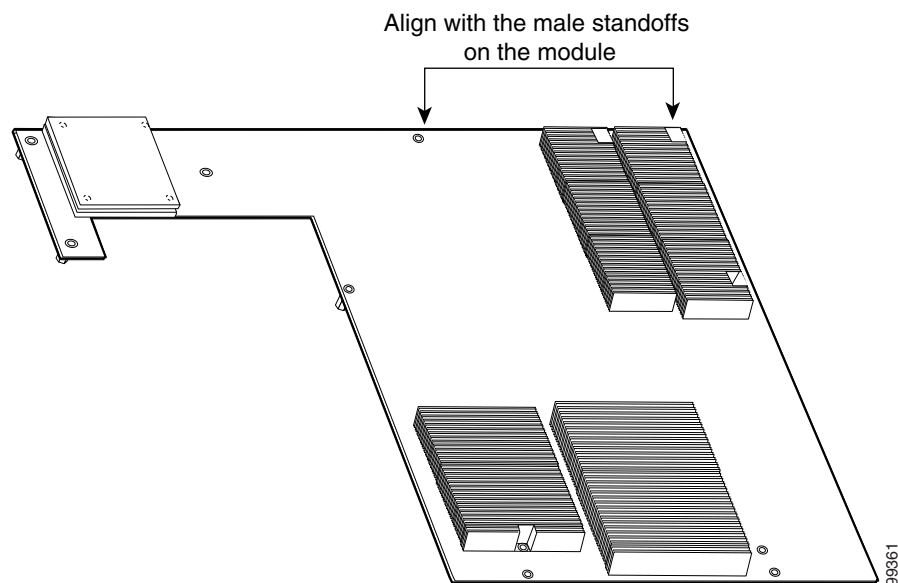
Figure 15   *Male Standoff Locations on the WS-X67xx Modules*

Step 4   Ensure that the connectors on the DFC3 are aligned with the connectors on the module. Figure 16 shows the connectors on the underside of the DFC3.
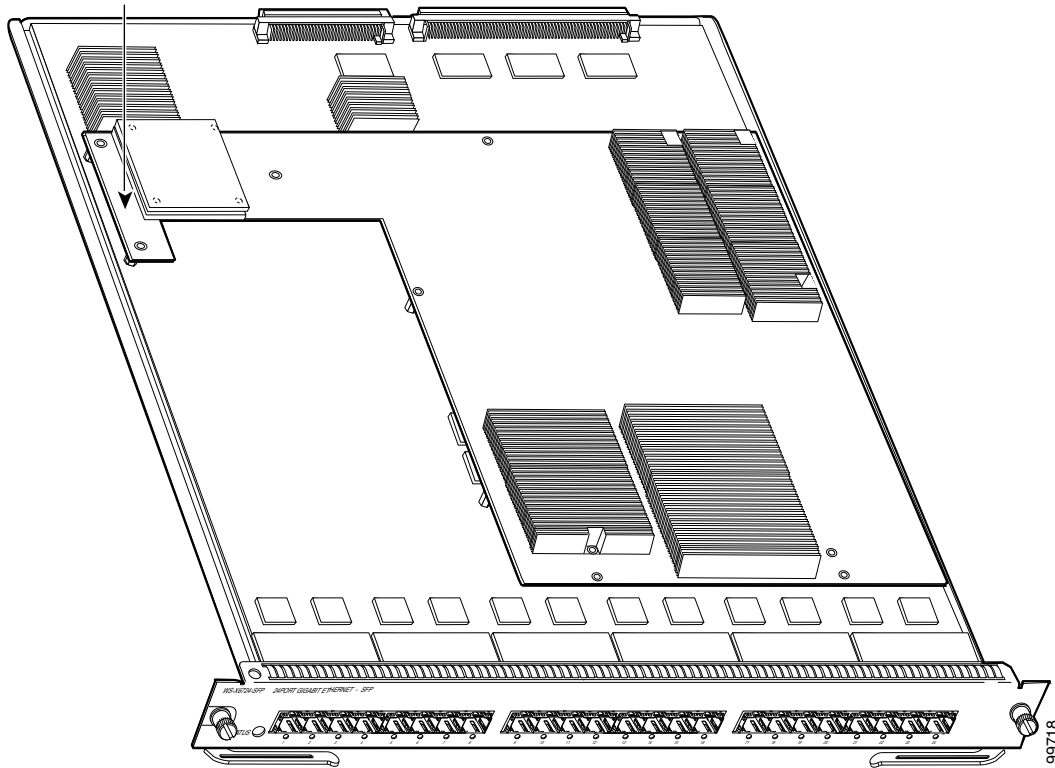
Figure 16   *DFC3 Daughter Card Connectors (Underside of DFC Daughter Card Shown)*

Step 5   Apply pressure to the area shown in Figure 17 to seat the power connector.

Figure 17   Seating the Power Connector

Apply pressure here to seat power connector

⚠
Caution   Use care not to damage the connectors on the module. If you damage a connector, you will need to return the module to Cisco for repair.

Step 6   Position the installation bracket over the two male standoffs at the back of the DFC daughter card. Apply pressure only to the top of the bracket to fully seat the DFC3 daughter card on the module as shown in Figure 18.

⚠
Caution   When seating the DFC daughter card, do not apply pressure to any other location on the DFC daughter card, especially the heat sinks. If you exert pressure on the heat sinks, they can break off of the components they are attached to.

Figure 18   Seating the DFC3 Daughter Card on the Module

Apply pressure to bracket.
to seat DFC connectors.
Do not press on heat sinks.
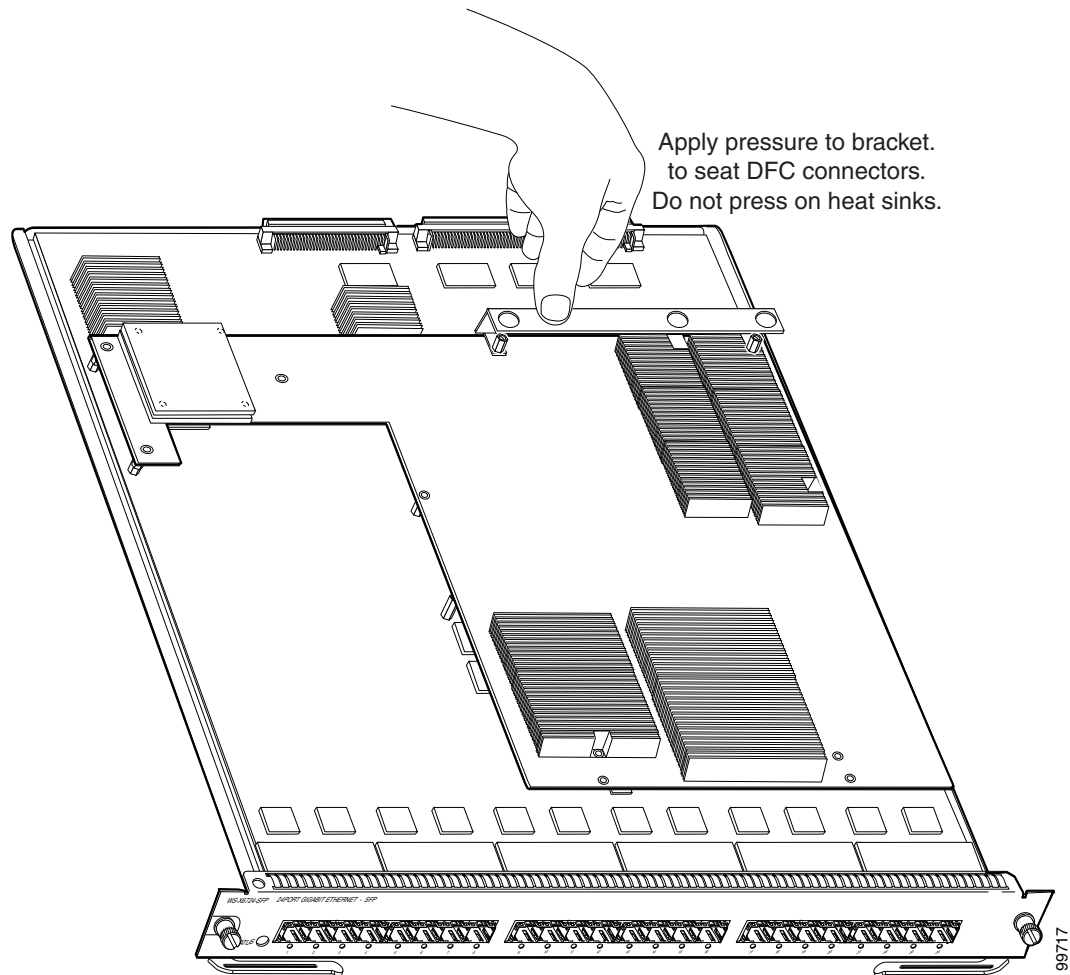
Step 7 Use a Phillips-head screwdriver to install the installation hardware:

a. For the DCFCB and the DFC3BXL daughter cards, install the 8 screws and the 2 standoffs. (See Figure 19.)

b. For the DFC3C and the DFC3CXL daughter cards, install the 6 screws, 2 cap nuts, and the 1 standoff. (See Figure 20.)

⚠

Caution You *must* install all of the installation hardware. The screws provide grounding between the DFC3 daughter card and the module. Failure to install all of the screws will invalidate the safety approvals and create a risk of fire and electrical hazard.
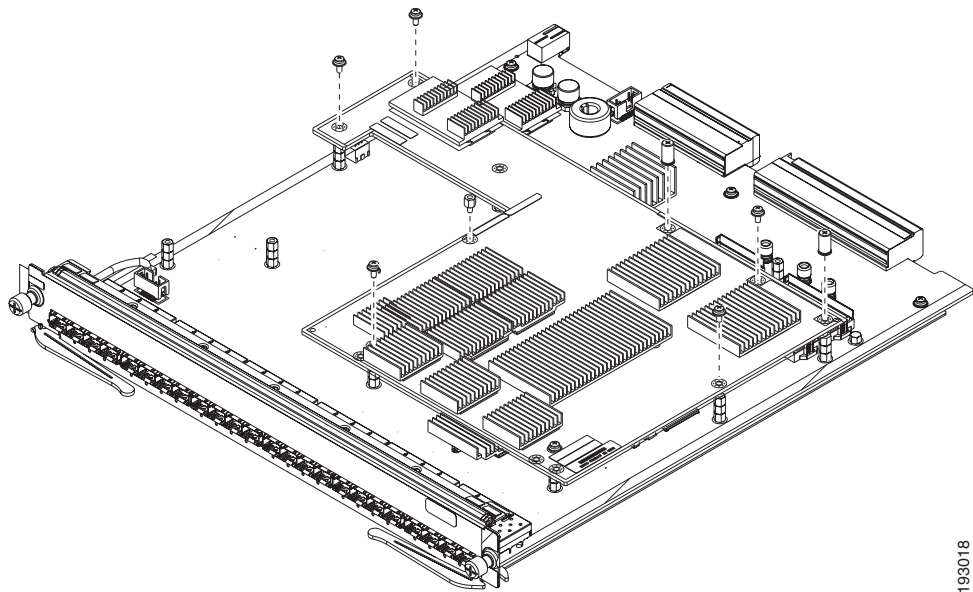
Note You should visually verify that there are standoffs beneath the mounting holes before installing the installation hardware.

Figure 19   *Installing the Installation Hardware (DFC3B and DFC3BXL)*
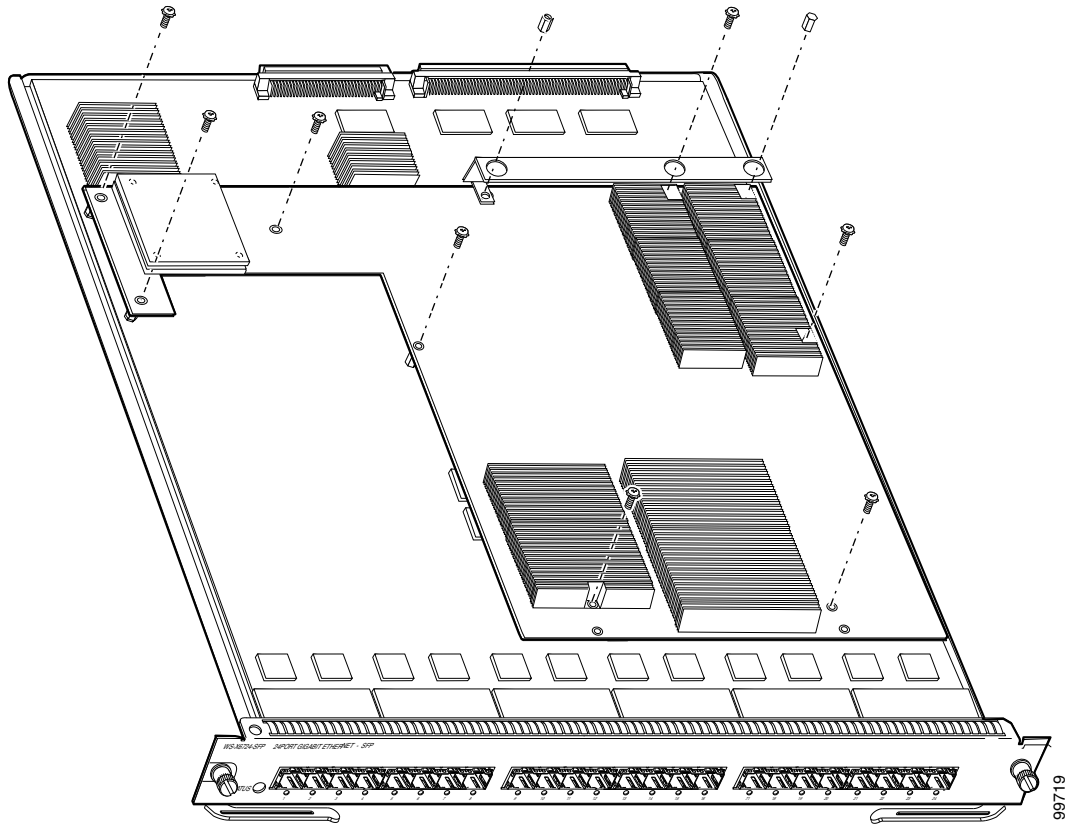
Figure 20   *Installing the Installation Hardware (DFC3C and DFC3CXL)*

Step 8 Reinstall the Ethernet module in the chassis.

If you are unsure about the correct procedure for installing an Ethernet module in the switch chassis, refer to the "Removing and Installing Ethernet Modules in the Chassis" section on page 34 for installation instructions.

Installing the DFC3B, DFC3BXL DFC3C, and DFC3CXL Daughter Cards on Ethernet Modules Equipped with a Stiffener Bracket

Some early versions of the WS-X6748-GE-TX Ethernet module have a stiffener bracket mounted across the top front part of the module. This stiffener bracket requires a modified procedure to install the DFC3 daughter card.

⚠ **Warning** **During this procedure, wear grounding wrist straps to avoid ESD damage to the card. Do not directly touch the backplane with your hand or any metal tool, or you could shock yourself.** Statement 94

To install the DFC daughter card on an early version of the WS-X6748-GE-TX Ethernet module that is equipped with a stiffener bracket, follow these steps:

Step 1 Attach an ESD grounding strap to your wrist and to ground.

If you are unsure about the correct way to attach an ESD grounding strap, refer to "Attaching Your ESD Grounding Strap" section on page 42 for instructions.

Step 2 Remove the new DFC3 daughter card from the antistatic bag and the installation hardware from the bag.

✎ **Note** The DFC3 daughter card is designed to be installed on different modules; therefore, there may be more mounting holes on the DFC3 daughter card than there are standoffs on the module. Not all mounting holes on the DFC3 daughter card are used in all installations. Visually verify that there are standoffs beneath the mounting holes before installing the installation hardware.

Step 3 Position the DFC3 daughter card over the Ethernet module, and slightly tilt the DFC3 daughter card so that the back end will clear the module connectors.

Step 4 Carefully slide the DFC3 under the two stiffener bracket tabs. (See Figure 21.) Verify that the DFC daughter card is under the two stiffener bracket tabs.

⚠ **Caution** You must position the DFC daughter card *under* the two stiffener bracket tabs. If you install the DFC daughter card above the two stiffener bracket tabs, you can permanently damage the DFC daughter card.

Step 5 Align the mounting holes on the DFC3 daughter card with the male standoffs on the module. (See Figure 21.) Make sure that the remaining mounting holes on the DFC3 daughter card are aligned with the remaining standoffs.

✎ **Note** You should visually verify that there are standoffs beneath the mounting holes before installing the installation hardware.

Step 6   Press down on the edge of the DFC3 daughter card (see Figure 21) to seat the DFC3 daughter card power connector to the module power connector.

Figure 21   *Seating the DFC Daughter Card Power Connector (WS-X6748-GE-TX Equipped with a Front Stiffener Bracket)*

Apply pressure to seat DFC daughter card power connector

Stiffener bracket

Stiffener bracket tabs. DFC daughter card slides underneath tabs.

130152
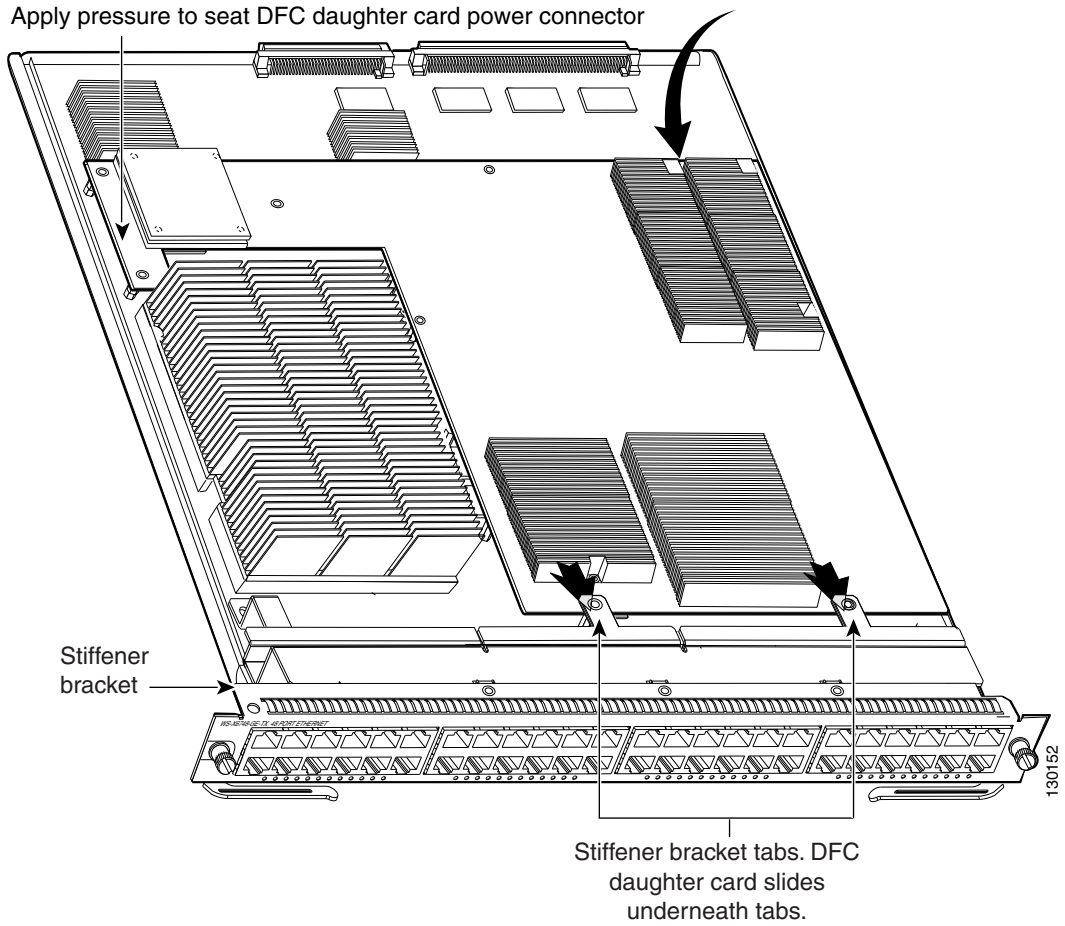
Step 7   Position the installation bracket over the two standoffs and press down only on the top of the bracket to seat the DFC3 daughter card connectors on the module connectors. (See Figure 22.)

⚠️

Caution   When seating the DFC3 daughter card on the module connectors, *DO NOT* touch or apply any pressure to the heat sinks. Press down only on the installation bracket.

*Figure 22*   *Seating the DFC3 on the Module (WS-X6748-GE-TX Equipped with a Front Stiffener Bracket)*

Apply pressure to seat DFC connectors. Do not press on heat sinks
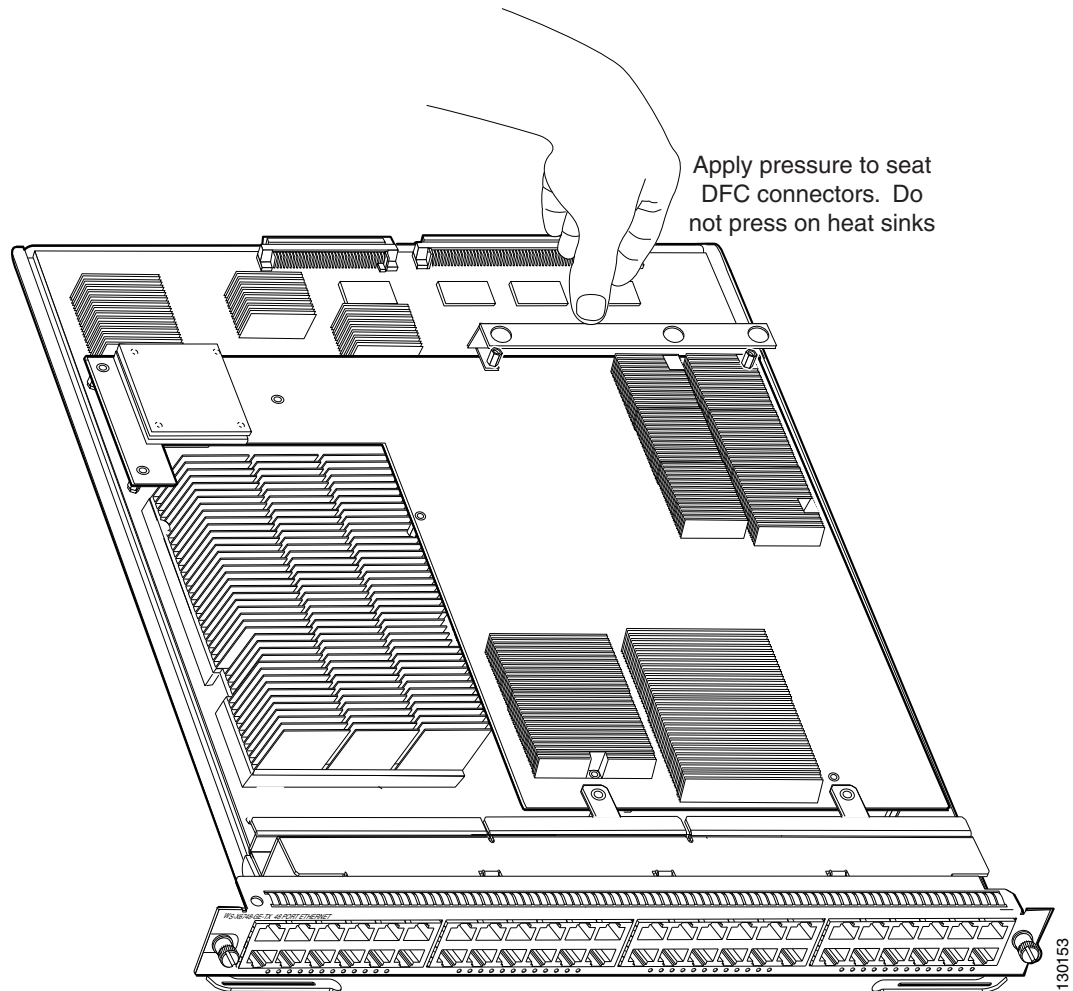
Step 8   Secure the DFC3 daughter card to the module through the stiffener bracket with the two long screws that you previously removed.

Step 9   Install the remainder of the screws and the cap nuts to fully attach the DFC3 daughter card to the module:

   a.   For the DFC3B and DFC3BXL daughter cards, install the remaining 6 screws and 2 cap nuts. (See Figure 23.)

   b.   For the DFC3C and DFC3CXL daughter cards, install the remaining 4 screws, 2 cap nuts, and 1 standoff. (See Figure 24.)

⚠

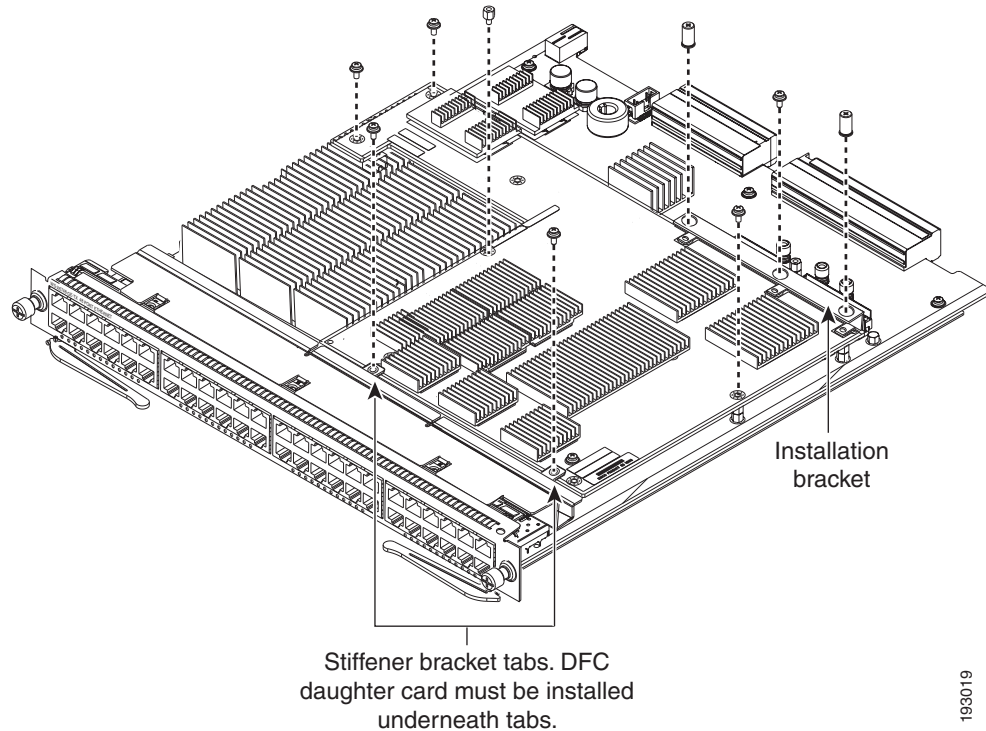**Caution**   Do not overtighten the installation hardware because you will damage the board.

Figure 23   *Installing the DFC3B and DFC3BXL Installation Hardware (WS-X6748-GE-TX Equipped with a Front Stiffener Bracket)*

Installation bracket

Stiffener bracket

Stiffener bracket tabs. DFC daughter card must be installed underneath tabs.

154457
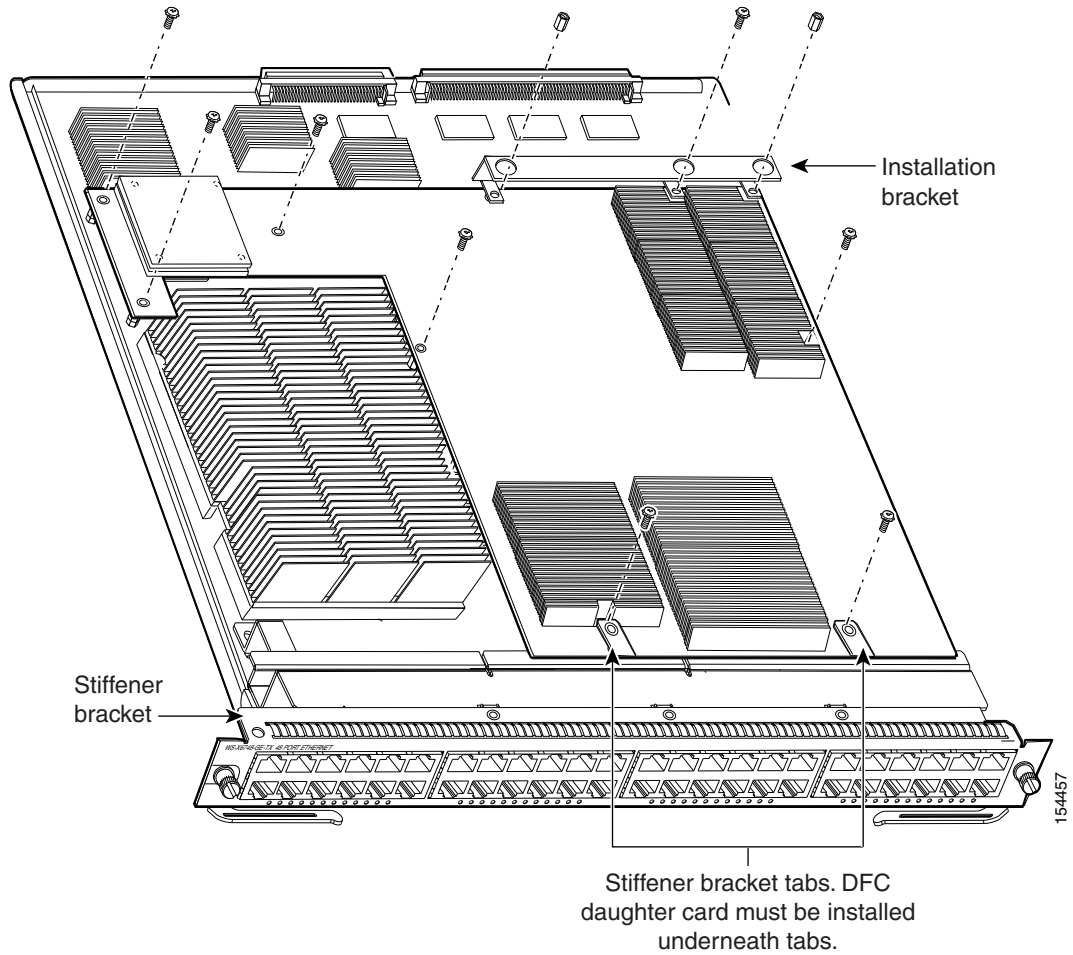
Figure 24   *Installing the DFC3C and DFC3CXL Installation Hardware (WS-X6748-GE-TX Equipped with a Front Stiffener Bracket)*

Installation bracket

Stiffener bracket tabs. DFC daughter card must be installed underneath tabs.

193019

⚠

Caution   You *must* install all of the installation hardware. The screws provide grounding between the DFC3 daughter card and the module. Failure to install all of the screws invalidates the safety approvals and presents a risk of fire and electrical hazard.

Step 10   Reinstall the Ethernet module in the chassis.

If you are unsure about the correct procedure for installing the Ethernet module in the switch chassis, refer to the "Installing an Ethernet Module in the Chassis" section on page 35 for installation instructions.

Removing and Installing Ethernet Modules in the Chassis

This section describes how to correctly remove and install an Ethernet module in a Catalyst 6500 series switch chassis slot.

⚠️ **Caution** During this procedure, wear grounding wrist straps to avoid ESD damage to the card.

⚠️ **Warning** **Invisible laser radiation may be emitted from disconnected fibers or connectors. Do not stare into beams or view directly with optical instruments.** Statement 272

Removing an Ethernet Module from the Chassis

To remove an Ethernet module from the chassis, perform these steps:

Step 1 Disconnect any network interface cables attached to the Ethernet module.

Step 2 Attach an ESD grounding strap to your wrist and to a proper ground.

If you are unsure about the correct way to attach an ESD grounding strap, refer to the "Attaching Your ESD Grounding Strap" section on page 42 for instructions.

Step 3 Verify that the captive installation screws on all of the modules in the chassis are tight. This step ensures that the space created by the removed module is maintained.

✎ **Note** If the captive installation screws are loose, the electromagnetic interference (EMI) gaskets on the installed modules expand and push the modules toward the open slot, which reduces the opening size and makes it difficult to reinstall the module.

Step 4 Loosen the two captive installation screws on the Ethernet module.

Step 5 Depending on the orientation of the slots in the chassis (horizontal or vertical), perform one of the following two sets of substeps:

Horizontal slots

a. Place your thumbs on the left and right ejector levers located on the left and right sides of the module faceplate, and simultaneously rotate the levers outward to unseat the Ethernet module from the chassis backplane connector.

b. Grasp the front edge of the Ethernet module and slide the module part of the way out of the slot. Place your other hand under the Ethernet module to support the weight of the module. Do not touch the module circuitry.

c. Place the removed Ethernet module on a properly grounded antistatic mat or antistatic foam.

Vertical slots

a. Place your thumbs on the ejector levers located at the top and bottom of the Ethernet module, and simultaneously rotate the levers outward to unseat the Ethernet module from the chassis backplane connector.

b. Grasp the front edge of the Ethernet module and slide the module part of the way out of the slot. Place your other hand under the Ethernet module to support the weight of the module. Do not touch the module circuitry.

c. Place the removed Ethernet module on a properly grounded antistatic mat or antistatic foam.

Installing an Ethernet Module in the Chassis

⚠️
Caution To prevent ESD damage, handle modules by the carrier edges only and wear grounding wrist straps.

⚠️
Warning **Invisible laser radiation may be emitted from disconnected fibers or connectors. Do not stare into beams or view directly with optical instruments.** Statement 1051

To install a module in the chassis, perform these steps:

Step 1 Verify that an ESD grounding strap is attached to your wrist and to proper ground.

If you are unsure about the correct way to attach an ESD grounding strap, refer to the "Attaching Your ESD Grounding Strap" section on page 42 for instructions.

Step 2 Verify that the captive installation screws are tightened on all of the modules installed in the chassis. This step assures that the EMI gaskets on all of the installed modules are fully compressed in order to maximize the opening space for the Ethernet module.

✎
Note If the captive installation screws are loose, the electromagnetic interference (EMI) gaskets on the installed modules expand and push the modules toward the open slot, which reduces the opening size and makes it difficult to reinstall the module.

Step 3   Fully open both ejector levers on the Ethernet module. (See Figure 25.)

Step 4   Depending on the orientation of the slots in the chassis (horizontal or vertical), perform one of the following two sets of substeps:

Horizontal slots

a. Position the Ethernet module in the slot. (See Figure 25.) Make sure that you align the edges of the module carrier with the slot guides on each side of the slot.

b. Carefully slide the Ethernet module into the slot until the EMI gasket along the top edge of the module makes contact with the module in the slot above it and both ejector levers have engaged and closed to approximately 45 degrees with respect to the Ethernet module faceplate. (See Figure 26.)

c. Using the thumb and forefinger of each hand, grasp the two ejector levers and press down to create a small (0.040 inch [1 mm]) gap between the module's EMI gasket and the module above it. (See Figure 26.)

⚠️
Caution   Do not press down too hard on the levers because they can bend and be damaged.

d. While gently pressing down, simultaneously close the left and right ejector levers to fully seat the Ethernet module in the chassis backplane connector. The ejector levers are fully closed when they are flush with the module faceplate. (See Figure 27.)

✎
Note   Failure to fully seat the module in the chassis backplane connector can result in error messages.

e. Tighten the two captive installation screws on the Ethernet module.

✎
Note   Make sure that the ejector levers are fully closed before tightening the captive installation screws.

f. Verify that the Ethernet module STATUS LED is lit. Check the STATUS LED periodically. If the STATUS LED changes from orange to green, the module has successfully completed the boot process and is now online. If the STATUS LED remains orange or turns red, the module has not successfully completed the boot process and may have encountered an error.

Figure 25   Positioning the Module in a Horizontal Slot Chassis
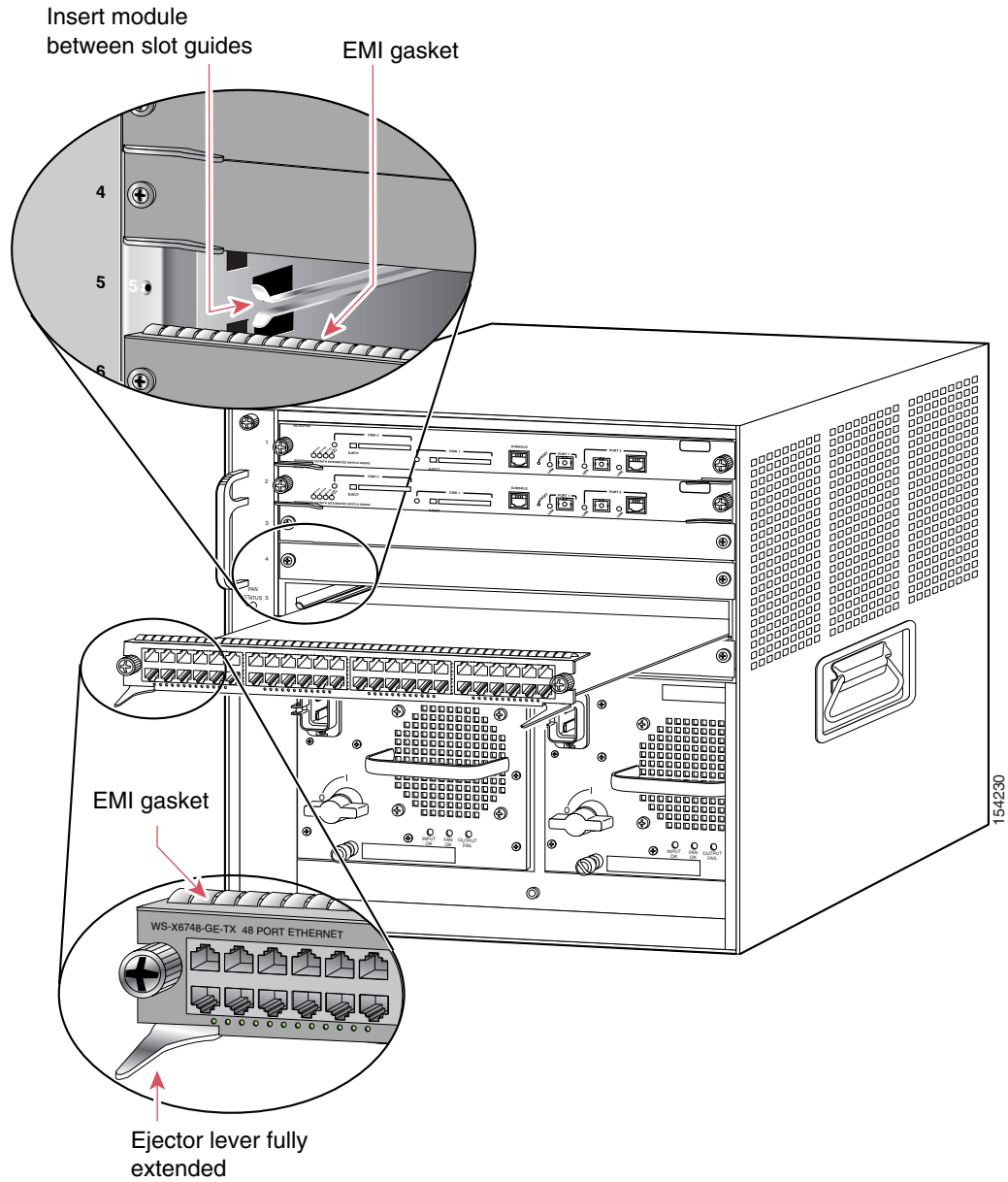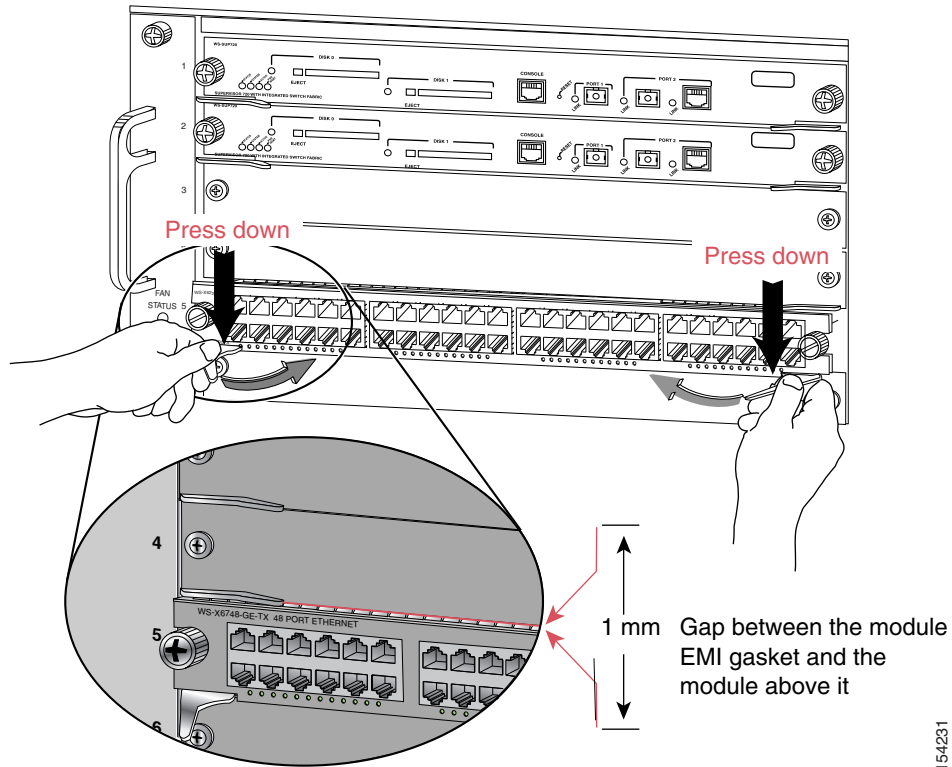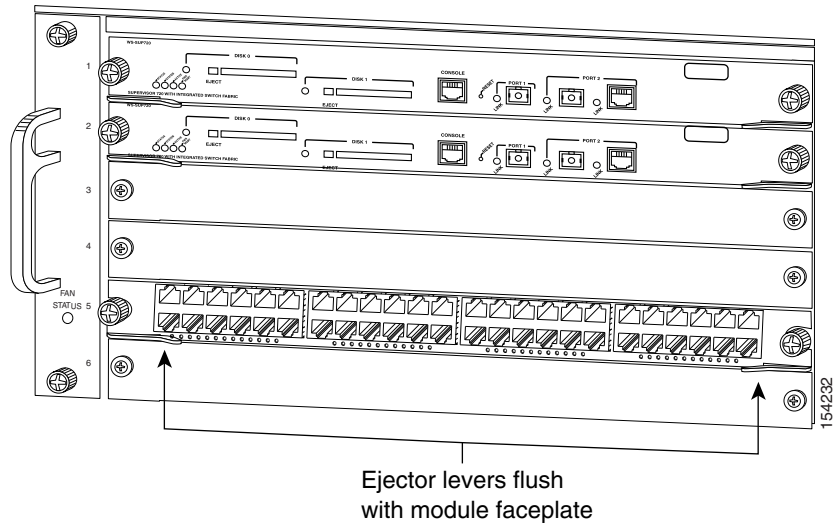
Insert module
between slot guides

EMI gasket

EMI gasket

WS-X6748-GE-TX   48 PORT ETHERNET

Ejector lever fully
extended

154230

Figure 26   Clearing the EMI Gasket in a Horizontal Slot Chassis

Press down

Press down

WS-X6748-GE-TX 48 PORT ETHERNET

1 mm   Gap between the module
EMI gasket and the
module above it

154231

Figure 27   Ejector Lever Closure in a Horizontal Slot Chassis

154232

Ejector levers flush
with module faceplate

Vertical slots

a. Position the Ethernet module in the slot. (See Figure 28.) Make sure that you align the edges of the module carrier with the slot guides on the top and bottom of the chassis slot.

b. Carefully slide the Ethernet module into the slot until the EMI gasket along the right edge of the module faceplate makes contact with the module in the slot adjacent to it and both ejector levers have closed to approximately 45 degrees with respect to the Ethernet module faceplate. (See Figure 29.)

c. Using the thumb and forefinger of each hand, grasp the two ejector levers and exert a slight pressure to the left, deflecting the module approximately 0.040 inches (1 mm) to create a small gap between the module's EMI gasket and the module adjacent to it. (See Figure 29.)

⚠

Caution Do not exert too much pressure on the ejector levers because they can bend and be damaged.

d. While gently pressing on the ejector levers, simultaneously close them to fully seat the Ethernet module in the chassis backplane connector. The ejector levers are fully closed when they are flush with the Ethernet module faceplate. (See Figure 30.)

e. Tighten the two captive installation screws on the Ethernet module.

✎

Note Make sure that the ejector levers are fully closed before tightening the captive installation screws.

f. Verify that the Ethernet module STATUS LED is lit. Check the STATUS LED periodically. If the STATUS LED changes from orange to green, the module has successfully completed the boot process and is now online. If the STATUS LED remains orange or turns red, the module has not successfully completed the boot process and may have encountered an error.

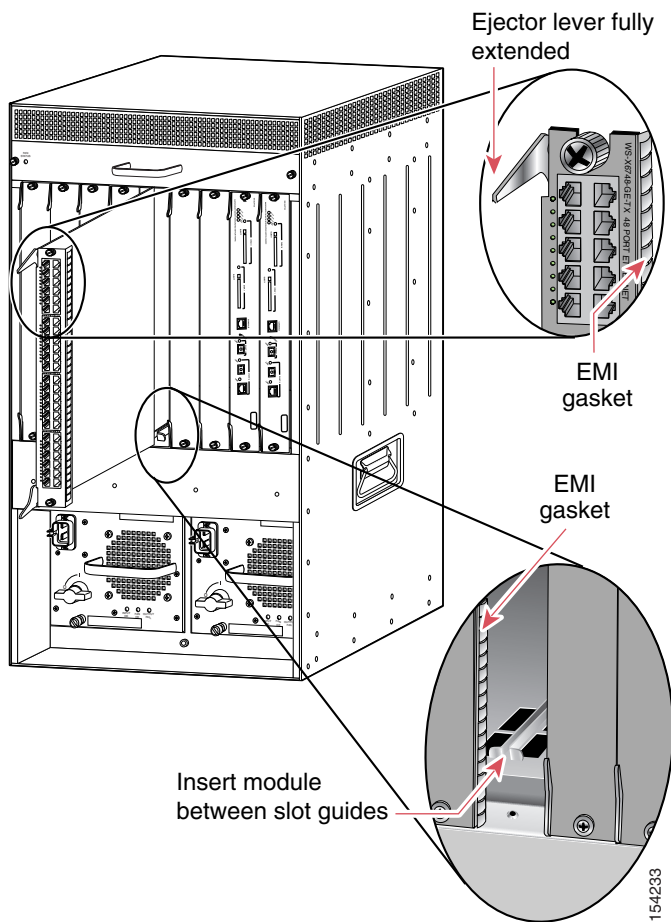*Figure 28   Positioning the Module in a Vertical Slot Chassis*

Ejector lever fully
extended

EMI
gasket

EMI
gasket

Insert module
between slot guides

154233

Figure 29   Clearing the EMI Gasket in a Vertical Slot Chassis

Gap between the module
EMI gasket and the
module above it

◄── 1 mm ──►

Press left

Press left

154234

WS-X67 48-GE-TX 48 PORT ETHERNET
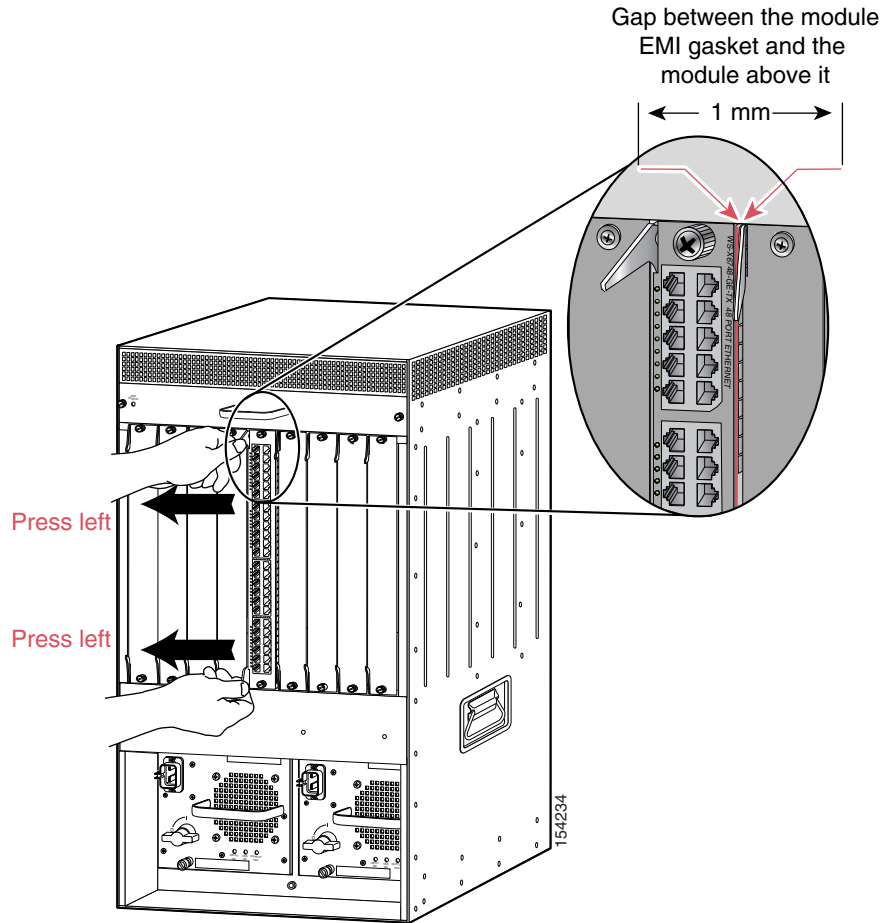
Figure 30   Ejector Lever Closure in a Vertical Slot Chassis

All ejector levers flush
with module faceplate
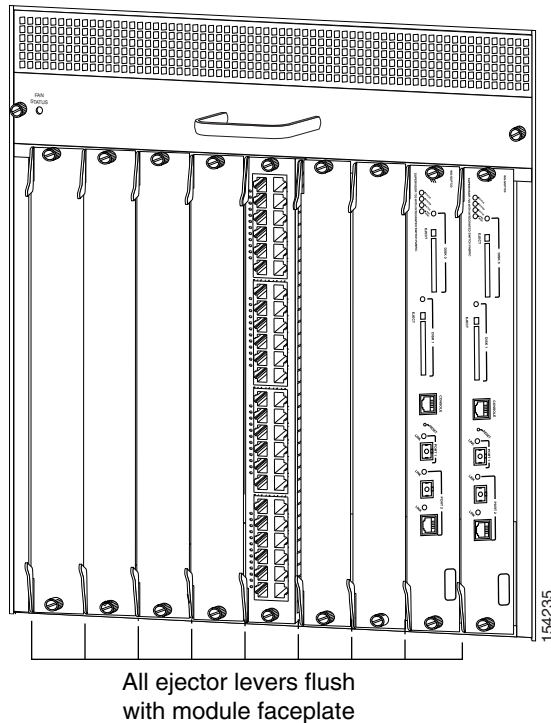
Attaching Your ESD Grounding Strap

Electrostatic discharge (ESD) damage, which can occur when modules or other FRUs are improperly handled, results in intermittent or complete failures. Modules consist of printed circuit boards that are fixed in metal carriers. Electromagnetic interference (EMI) shielding and connectors are integral components of the carrier. Although the metal carrier helps to protect the board from ESD, always use an ESD grounding strap attached to a properly grounded bare metal surface when handling modules.

Follow these guidelines for preventing ESD damage:

- Always use an ESD wrist strap and ensure that it makes maximum contact with bare skin. ESD grounding straps are available with banana plugs, metal spring clips, or alligator clips. All Catalyst 6500 series chassis are equipped with a banana plug connector (identified by the ground symbol next to the connector) somewhere on the chassis front panel.

  – If you have an older Catalyst 6500 series chassis equipped with a plastic banana plug connector, we recommend that you use either the supplied ESD grounding wrist strap (with a metal clip) or an ESD grounding wrist strap equipped with an alligator clip.

  – If you have a newer Catalyst 6500 series chassis that has a bare metal hole as the banana plug connector (also identified by the ground symbol next to the connector), we recommend that you use a personal ESD grounding strap equipped with a banana plug.

- If you choose to use the disposable ESD wrist strap supplied with the chassis or an ESD wrist strap equipped with an alligator clip, you must attach the system ground lug to the chassis in order to provide a proper grounding point for the ESD wrist strap.

✎
Note   This system ground is also referred to as the network equipment building system (NEBS) ground.

   • If your chassis does not have the system ground attached, you must install the system ground lug. Refer to the online *Catalyst 6500 Series Switches Installation Guide* for the procedure.

✎
Note   You do not need to attach a supplemental system ground wire to the system ground lug; the lug provides a direct path to the bare metal of the chassis.

After you install the system ground lug, follow these steps to correctly attach the ESD wrist strap:

Step 1   Attach the ESD wrist strap to bare skin as follows:

   a.   If you are using the ESD wrist strap supplied with the FRUs, open the wrist strap package and unwrap the ESD wrist strap. Place the black conductive loop over your wrist and tighten the strap so that it makes good contact with your bare skin.

   b.   If you are using an ESD wrist strap equipped with an alligator clip, open the package and remove the ESD wrist strap. Locate the end of the wrist strap that attaches to your body and secure it to your bare skin.

Step 2   Grasp the spring or alligator clip on the ESD wrist strap and momentarily touch the clip to a bare metal spot (unpainted surface) on the rack. We recommend that you touch the clip to an unpainted rack rail so that any built-up static charge is then safely dissipated to the entire rack.

Step 3   Attach either the spring clip or the alligator clip to the ground lug screw as follows (See Figure 31):

   a.   If you are using the ESD wrist strap that is supplied with the FRUs, squeeze the spring clip jaws open, position the spring clip to one side of the system ground lug screw head, and slide the spring clip over the lug screw head so that the spring clip jaws close behind the lug screw head.

✎
Note   The spring clip jaws do not open wide enough to fit directly over the head of the lug screw or the lug barrel.

   b.   If you are using an ESD wrist strap that is equipped with an alligator clip, attach the alligator clip directly over the head of the system ground lug screw or to the system ground lug barrel.

Figure 31   *Attaching the ESD Wrist Strap Clip to the System Ground Lug Screw*
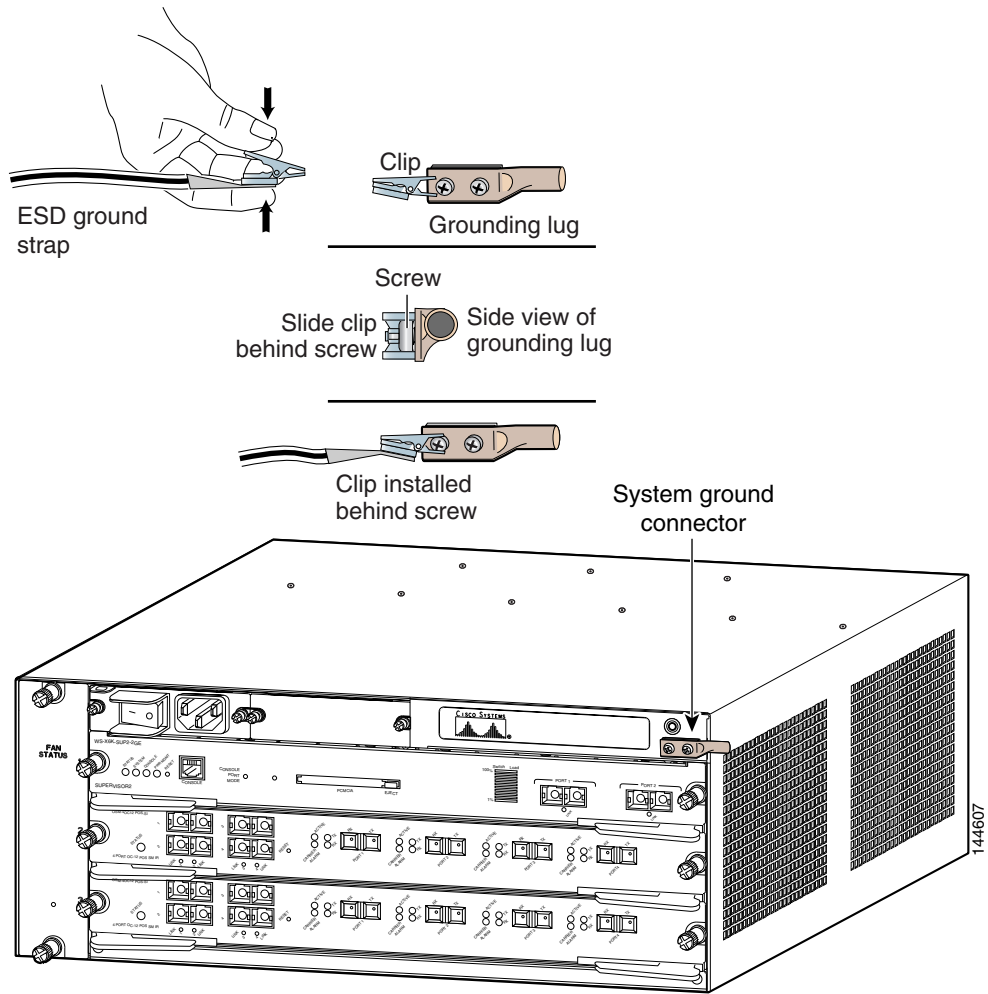
When handling modules, follow these additional guidelines:

- Handle carriers by available handles or edges only; avoid touching the printed circuit boards or connectors.

- Place a removed component board-side-up on an antistatic surface or in a static-shielding container. If you plan to return the component to the factory, immediately place it in a static-shielding container.

- Never attempt to remove the printed circuit board from the metal carrier.

⚠
Caution   For safety, periodically check the resistance value of the antistatic strap. The measurement should be between 1 and 10 megohm (Mohm).

Obtaining Documentation and Submitting a Service Request

For information on obtaining documentation, submitting a service request, and gathering additional information, see the monthly *What's New in Cisco Product Documentation*, which also lists all new and revised Cisco technical documentation, at:

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