# Catalyst 6500 Series Distributed Forwarding Card 4 for WS-X68xx, WS-X69xx, and Select WS-X67xx Modules Installation Note

**Revised: January 2014**

**Product numbers:**

WS-F6K-DFC4-A(=)          WS-F6K-DFC4-AXL(=)

WS-F6K-DFC4-E(=)          WS-F6K-DFC4-EXL(=)

This publication contains the procedures for installing and removing the Distributed Forwarding Card 4 (DFC4) daughter card on the WS-X67xx Ethernet modules that support the DFC4.

**Note**  Throughout this publication, unless otherwise noted, the term DFC4 daughter card refers to the DFC4-A, DFC4-AXL, DFC4-E, and DFC4-EXL daughter cards.

# Contents

This publication contains these sections:

**Americas Headquarters:**
Cisco Systems, Inc., 170 West Tasman Drive, San Jose, CA 95134-1706 USA

# Overview

This section provides an overview and specifications of the DFC daughter cards. The DFC4 daughter card is shipped factory-installed on the WS-X69xx and the WS-X68xx series line cards (except for the WS-X6816-GBIC Ethernet module). Table 1 lists the WS-X68xx and the WS-X69xx Ethernet modules that ship with the DFC4 daughter cards. Certain WS-X67xx Ethernet modules can also be upgraded with the DFC4 daughter card. Table 2 lists the WS-X67xx Ethernet modules that can be upgraded in the field with the DFC4 daughter card.

**Note** Modules that are equipped with DFC4 daughter cards are only supported by the Supervisor Engine 2T with Cisco IOS software release 12.2(50)SY or later.

*Table 1  DFC4 Daughter Card Usage and Support on WS-X69xx and WS-X68xx Ethernet Modules*

| Base Ethernet Module | DFC Daughter Card Installed | Upgrade Information |
|---|---|---|
| WS-X6904-40G | WS-F6K-DFC4-E (module is labeled WS-X6904-40G-2T)<br><br>WS-F6K-DFC4-EXL (module is labeled WS-X6904-40G-2TXL) | The WS-X6904-40G module cannot be upgraded. |
| WS-X6908-10G | WS-F6K-DFC4-E (module is labeled WS-X6908-10G-2T)<br><br>WS-F6K-DFC4-EXL (module is labeled WS-X6908-10G-2TXL) | The WS-X6908-10G module cannot be upgraded. |
| WS-X6824-SFP | WS-F6K-DFC4-A (module is labeled WS-X6824-SFP-2T)<br><br>WS-F6K-DFC4-AXL (module is labeled WS-X6824-SFP-2TXL) | The WS-X6824-SFP module cannot be upgraded. |
| WS-X6848-SFP | WS-F6K-DFC4-A (module is labeled WS-X6848-SFP-2T)<br><br>WS-F6K-DFC4-AXL (Module is labeled WS-X6848-SFP-2TXL) | The WS-X6848-SFP module cannot be upgraded. |
| WS-X6848-GE-TX | WS-F6K-DFC4-A (module is labeled WS-X6848-TX-2T)<br><br>WS-F6K-DFC4-AXL (module is labeled WS-X6848-TX-2TXL) | The WS-X6848-TX module cannot be upgraded. |

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*Table 1        DFC4 Daughter Card Usage and Support on WS-X69xx and WS-X68xx Ethernet Modules*

| Base Ethernet Module | DFC Daughter Card Installed | Upgrade Information |
|---|---|---|
| WS-X6816-10GE | WS-F6K-DFC4-E (module is labeled WS-X6816-10G-2T)<br><br>WS-F6K-DFC4-EXL (module is labeled WS-X6816-10G-2TXL) | The WS-X6816-10G module cannot be upgraded. |
| WS-X6816-10T | WS-F6K-DFC4-E (module is labeled WS-X6816-10T-2T)<br><br>WS-F6K-DFC4-EXL (module is labeled WS-X6816-10T-2TXL) | The WS-X6816-10T module cannot be upgraded. |

*Table 2        WS-X67xx Ethernet Modules that support the DFC4 Daughter Card Upgrade*

| Base Ethernet Module | DFC Daughter Card Installed | Upgrade Information |
|---|---|---|
| WS-X6724-SFP | CFC, DFC3A, DFC3B, DFC3BXL, DFC3C, or DFC3XL | Can be upgraded with either a WS-F6K-DFC4-A or a WS-F6K-DFC4-AXL |
| WS-X6748-SFP | CFC, DFC3A, DFC3B, DFC3BXL, DFC3C, or DFC3XL | Can be upgraded with either a WS-F6K-DFC4-A or a WS-F6K-DFC4-AXL |
| WS-X6716-10GE | DFC3A, DFC3B, DFC3BXL, DFC3C, or DFC3XL | Can be upgraded with either a WS-F6K-DFC4-E or a WS-F6K-DFC4-EXL |
| WS-X6748-GE-TX | DFC3A, DFC3B, DFC3BXL, DFC3C, or DFC3XL | Can be upgraded with either a WS-F6K-DFC4-A or a WS-F6K-DFC4-AXL |
| WS-X6716-10T | DFC3A, DFC3B, DFC3BXL, DFC3C, or DFC3XL | Can be upgraded with either a WS-F6K-DFC4-E or a WS-F6K-DFC4-EXL |
| WS-X6704-10GE | DFC3A, DFC3B, DFC3BXL, DFC3C, or DFC3XL | Can be upgraded with either a WS-F6K-DFC4-A or a WS-F6K-DFC4-AXL |

# Required Tools and Parts

These parts are included in the DFC4 daughter card kit:

- DFC4-A, DFC4-AXL, DFC4-E, or DFC4-EXL daughter card
- One disposable grounding wrist strap

These tools and supplies are required to remove and install the DFC4 daughter card:

- Antistatic mat to support the removed module and an antistatic bag to store the removed 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

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# 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**

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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**

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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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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 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

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**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 כדי לאתר את התרגום באזהרות הבטיחות המתורגמות שמצורפות להתקן.

**שמור הוראות אלה**

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**

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**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

Catalyst 6500 Series Distributed Forwarding Card 4 for WS-X68xx, WS-X69xx, and Select WS-X67xx Modules Installation Note ■

OL-24918-02 **9**

# Removing a CFC or DFC3 Daughter Card

If you are upgrading one of the WS-X67xx Ethernet modules listed in Table 2 with a DFC4 daughter card, you must remove the CFC or the DFC3 daughter card before installing the new DFC4 daughter card. The following two procedures are provided:

**Note** Once you have replaced the DFC3 daughter card with a DFC4 daughter card, the module will only operate with the Supervisor Engine 2T.

## Removing the CFC Daughter Card

If your WS-X67xx Ethernet module is equipped with a CFC daughter card, you must remove it before you install the DFC4 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.

**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 28 for removal instructions.
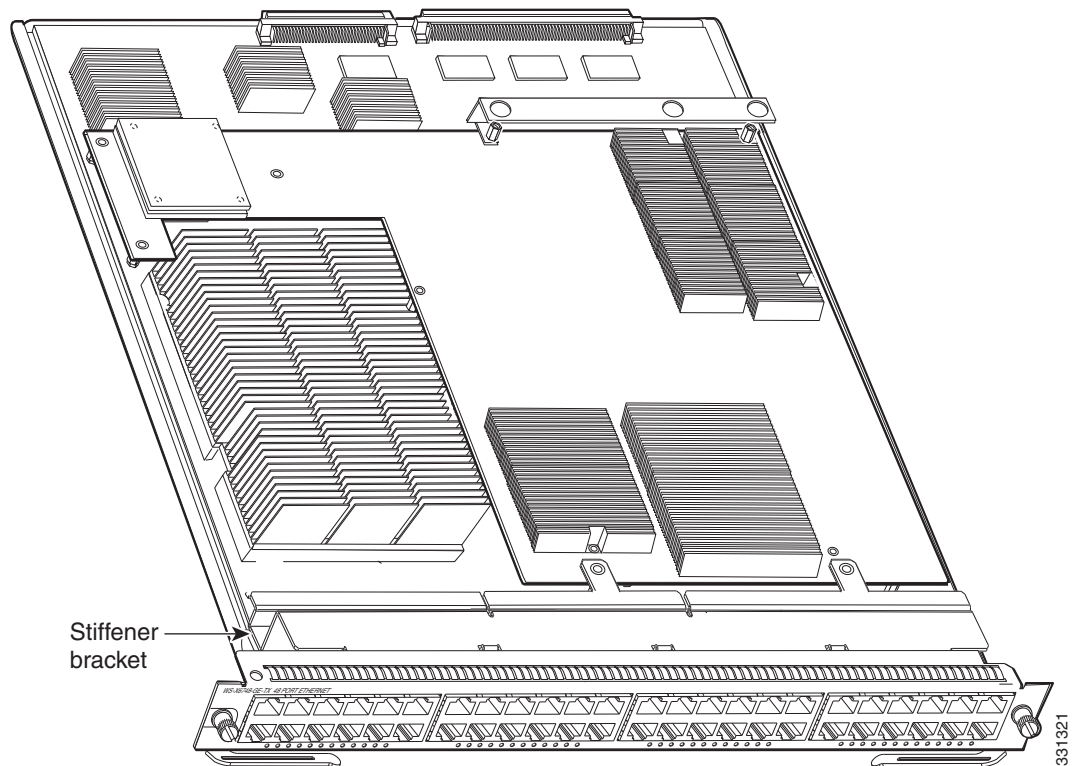
**Step 3** Place the Ethernet module on an antistatic mat with the front of the module facing toward you.

**Catalyst 6500 Series Distributed Forwarding Card 4 for WS-X68xx, WS-X69xx, and Select WS-X67xx Modules Installation Note**

**10**

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**Step 4** If you are upgrading a WS-X6748-GE-TX Ethernet module with a DFC4 daughter card and your WS-X4748-GE-TX module is equipped with a stiffener bracket that goes across the top of the heat sinks at the front of the module (see Figure 1), you must first remove the stiffener bracket before continuing with the CFC daughter card removal procedure. To remove the bracket, follow these substeps:

   **a.** Loosen and remove the six phillips-head screws that secure the bracket to the module.

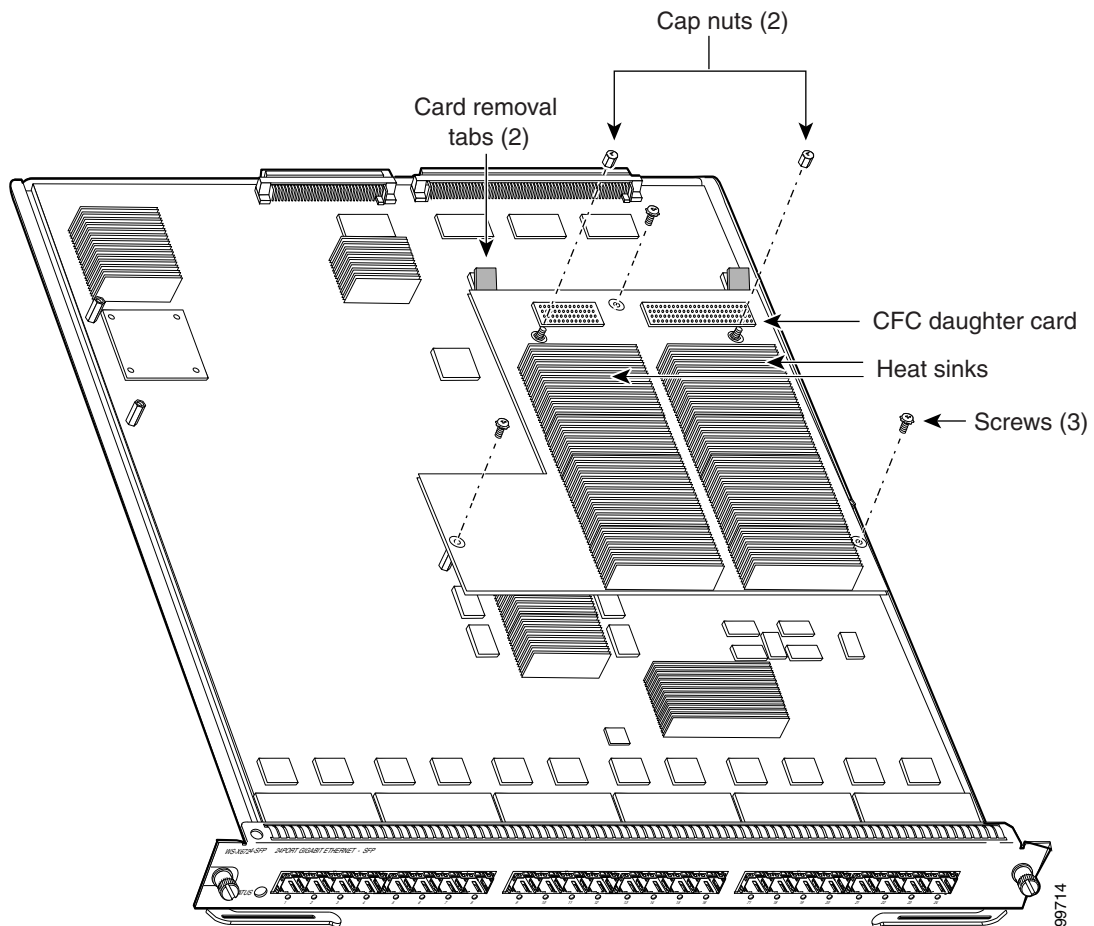   **b.** Carefully lift and remove the bracket from the module.

⚠
**Caution** Do not reinstall the stiffener bracket. After upgrading the WS-X6748-GE-TX Ethernet module with a DFC4 daughter card, the bracket can be discarded.

*Figure 1*       *WS-X6748-GE-TX Ethernet Module Equipped with a Stiffener Bracket*

Stiffener
bracket

**Catalyst 6500 Series Distributed Forwarding Card 4 for WS-X68xx, WS-X69xx, and Select WS-X67xx Modules Installation Note** ■

OL-24918-02     **11**

**Step 5** Use a Phillips-head screwdriver to remove the installation hardware, which consists of three securing screws and the two cap nuts. (See Figure 2.)

*Figure 2* *CFC Daughter Card Installation Hardware*

Cap nuts (2)

Card removal tabs (2)

CFC daughter card

Heat sinks

Screws (3)

99714

■ **Catalyst 6500 Series Distributed Forwarding Card 4 for WS-X68xx, WS-X69xx, and Select WS-X67xx Modules Installation Note**

**12**

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**Step 6**  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 3.)

⚠

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

*Figure 3*        *Unseating the CFC Daughter Card Connectors*



Heat sinks
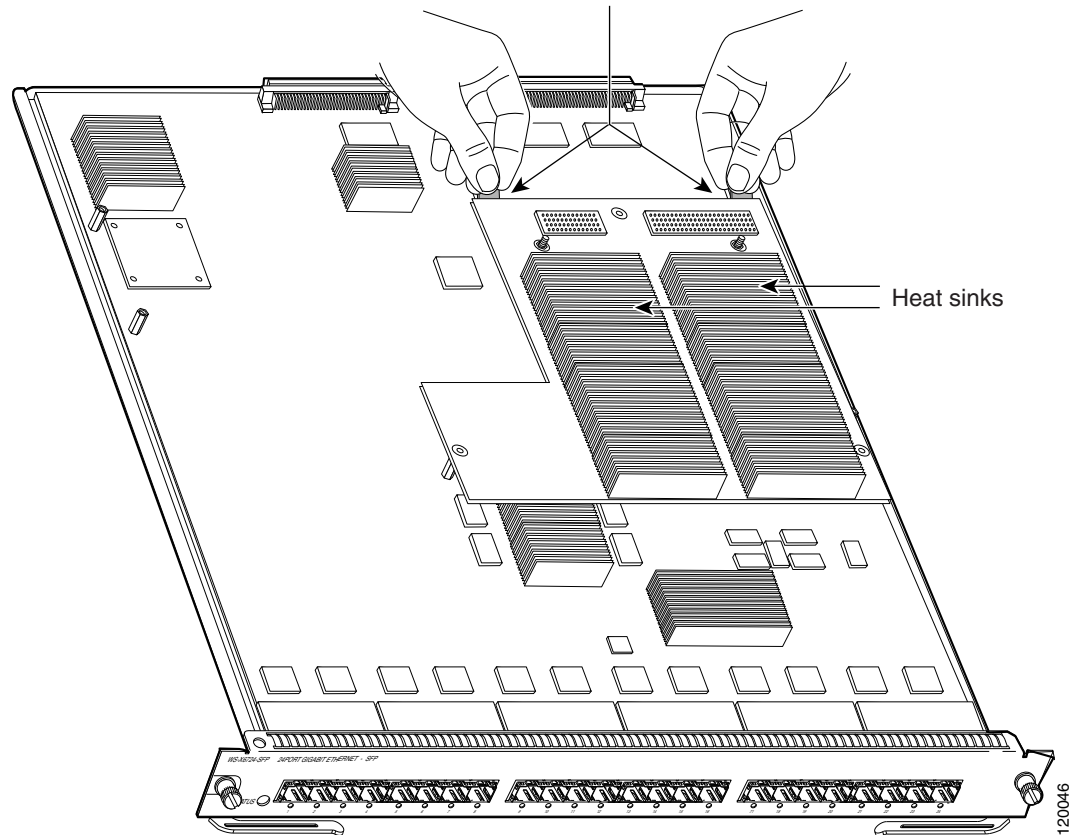
**Step 7**  Gently lift the CFC daughter card with both hands and remove the CFC daughter card from the module and immediately place the CFC daughter card in an antistatic bag.

**Step 8**  Proceed to the "Installing a DFC4 Daughter Card" section on page 23.

**Catalyst 6500 Series Distributed Forwarding Card 4 for WS-X68xx, WS-X69xx, and Select WS-X67xx Modules Installation Note** ■

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# Removing the DFC3 Daughter Card

If your WS-X67xx Ethernet module is equipped with a DFC3 daughter card, you must remove it before you install the DFC4 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 the DFC3 daughter card from modules, follow these steps:

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

**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 28 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 you are upgrading a WS-X6748-GE-TX Ethernet module with a DFC4 daughter card and your WS-X4748-GE-TX module is equipped with a stiffener bracket that goes across the top of the heat sinks at the front of the module (see Figure 1), you must first remove the stiffener bracket before continuing with the CFC daughter card removal procedure. To remove the bracket, follow these substeps:

    **a.** Loosen and remove the six phillips-head screws that secure the bracket to the module.

    **b.** Carefully lift and remove the bracket from the module.

**Caution** Do not reinstall the stiffener bracket. After upgrading the WS-X6748-GE-TX Ethernet module with a DFC4 daughter card, the bracket can be discarded.

**Step 5** If your DFC daughter card has a small metal installation bracket as shown in Figure 4, use a No.1 Phillips-head screwdriver to remove the two cap nuts and the one screw securing the bracket. Set them aside along with the bracket. If there is no bracket, just remove the two cap nuts and the one screw.
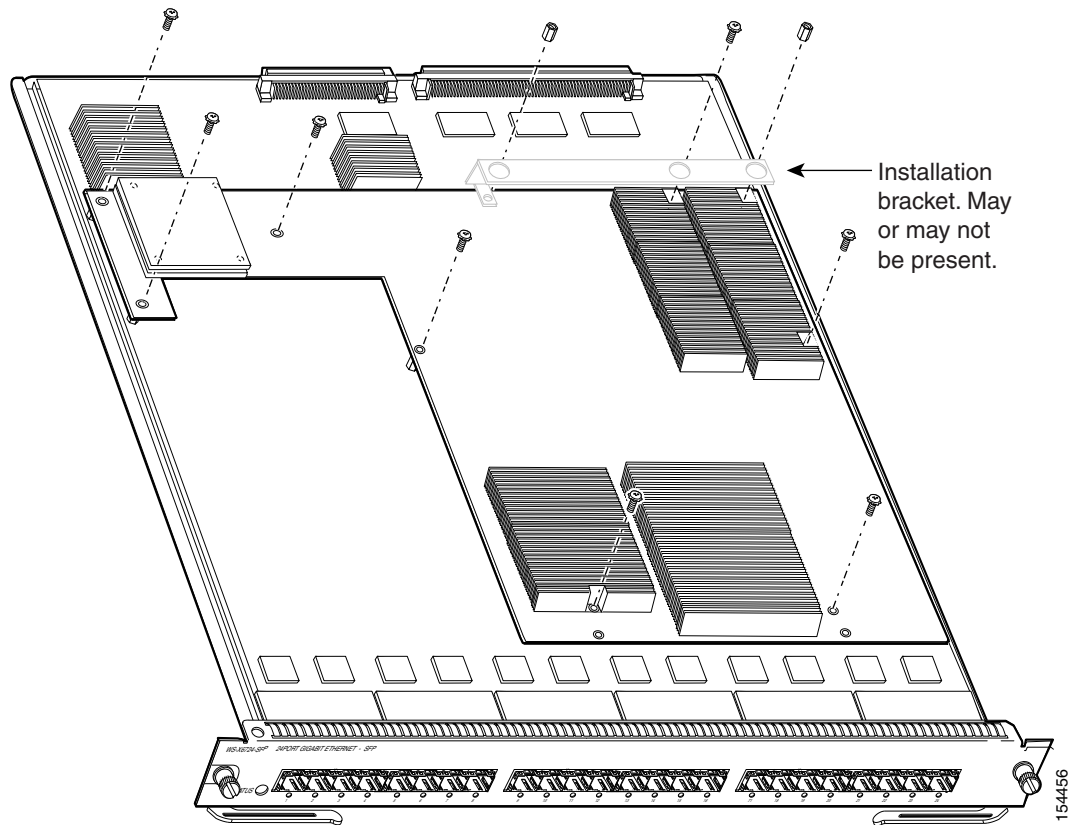
**Step 6** Remove the remaining installation hardware. (See Figure 4.)

**Note** The installation hardware shown in Figure 4 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.

**Catalyst 6500 Series Distributed Forwarding Card 4 for WS-X68xx, WS-X69xx, and Select WS-X67xx Modules Installation Note**

**14**

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*Figure 4*        *Removing the DFC3 Daughter Card Installation Hardware*



Installation bracket. May or may not be present.

**Step 7**    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 5. 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.

**Catalyst 6500 Series Distributed Forwarding Card 4 for WS-X68xx, WS-X69xx, and Select WS-X67xx Modules Installation Note** ■

OL-24918-02                                                                                                                    **15**

*Figure 5        Partially Installing the Cap Nut*
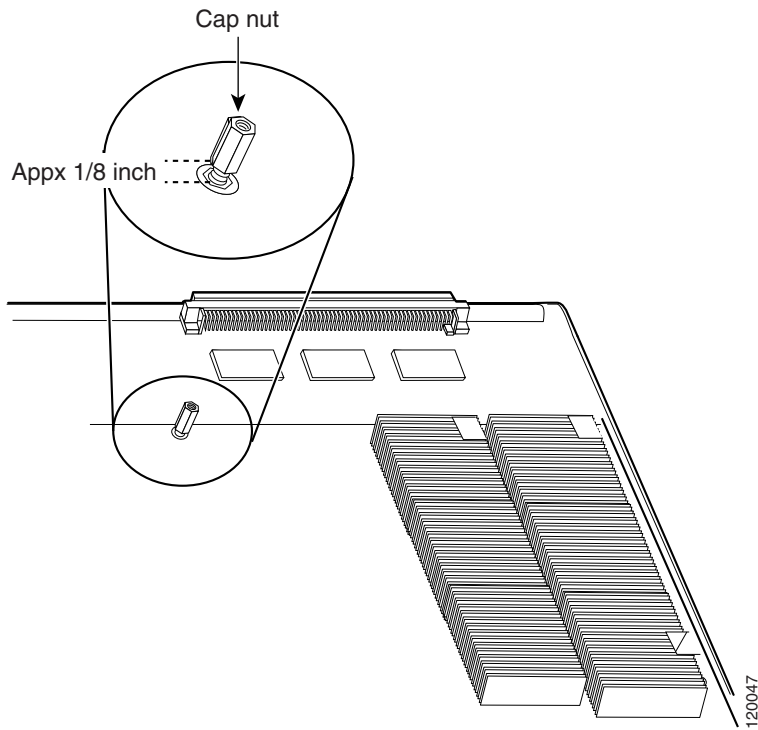


Step 8    With your left hand, lift slightly at the location shown in Figure 6. While lifting with your left hand, rock the DFC3 daughter card up and down with your right hand, no more than half an inch in either direction, to unseat the DFC3 daughter card from the module.
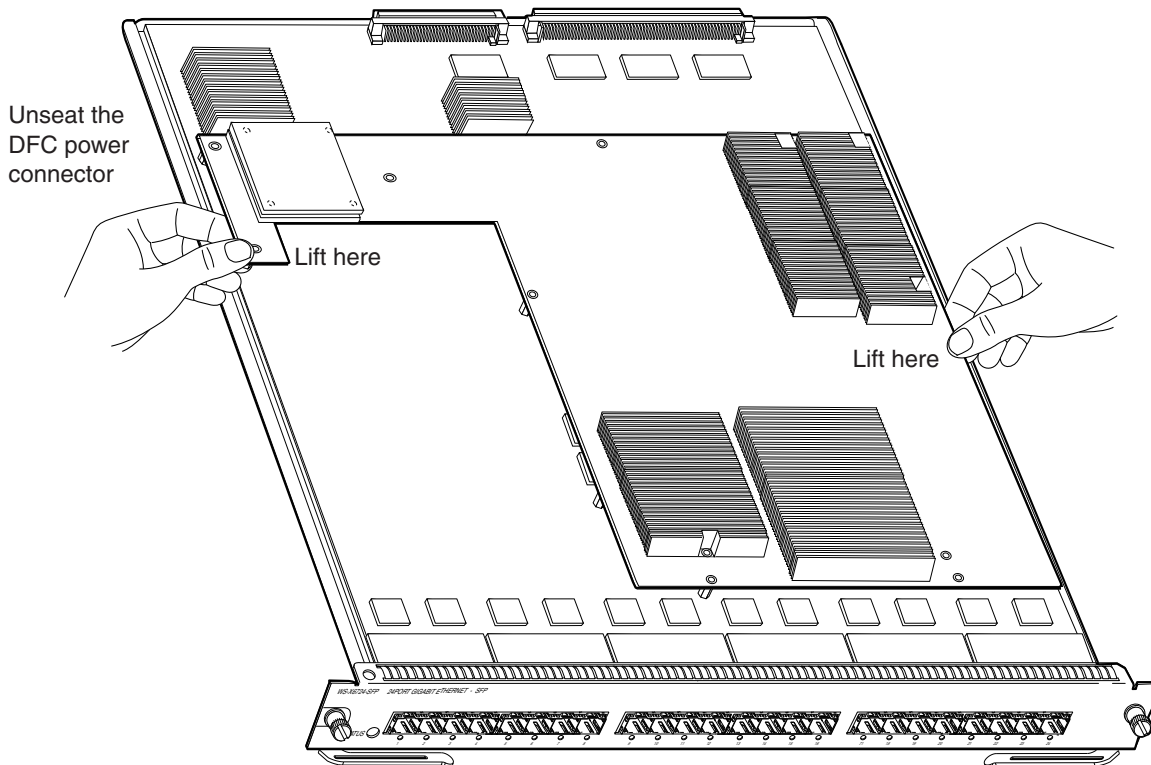
**Catalyst 6500 Series Distributed Forwarding Card 4 for WS-X68xx, WS-X69xx, and Select WS-X67xx Modules Installation Note**

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*Figure 6*         *Unseat the DFC3 Daughter Card from the Module*



Lift here

Rock up
and down

120048
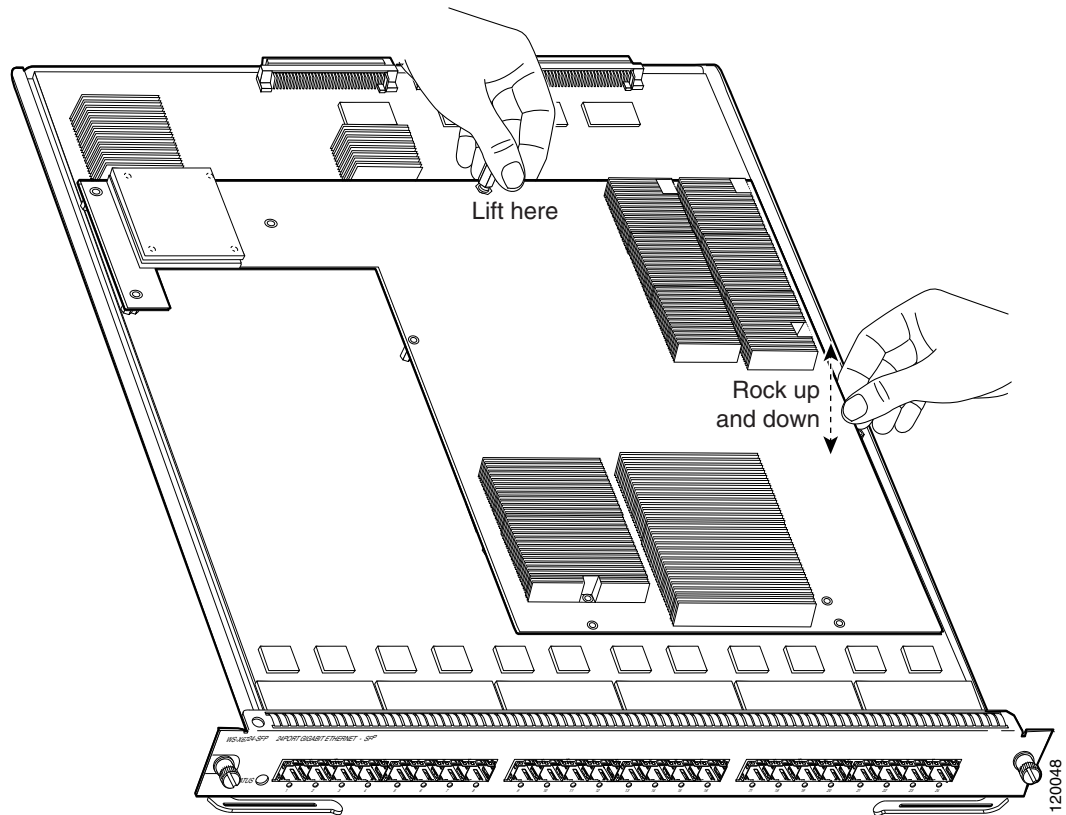
**Step 9**     Remove the one cap nut.

**Step 10**    Holding the DFC3 daughter card with both hands, gently lift it straight up from the module. (See Figure 7.) Immediately place the DFC3 daughter card in an antistatic bag.

**Catalyst 6500 Series Distributed Forwarding Card 4 for WS-X68xx, WS-X69xx, and Select WS-X67xx Modules Installation Note** ■

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***Figure 7***       ***Removing the DFC3 Daughter Card from the Module***



Unseat the
DFC power
connector

Lift here

Lift here

# Removing a DFC4 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 the DFC4 daughter card from an Ethernet module, follow these steps:

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

**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 28 for removal instructions.

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

**Step 4**     Remove the DFC4 daughter card mounting hardware. See Figure 8 for removing the WS-F6K-DFC4-E or WS-F6K-EXL daughter card mounting hardware. See Figure 9 for removing the WS-F6K-DFC4-A or WS-F6K-DFC4-AXL daughter card mounting hardware.
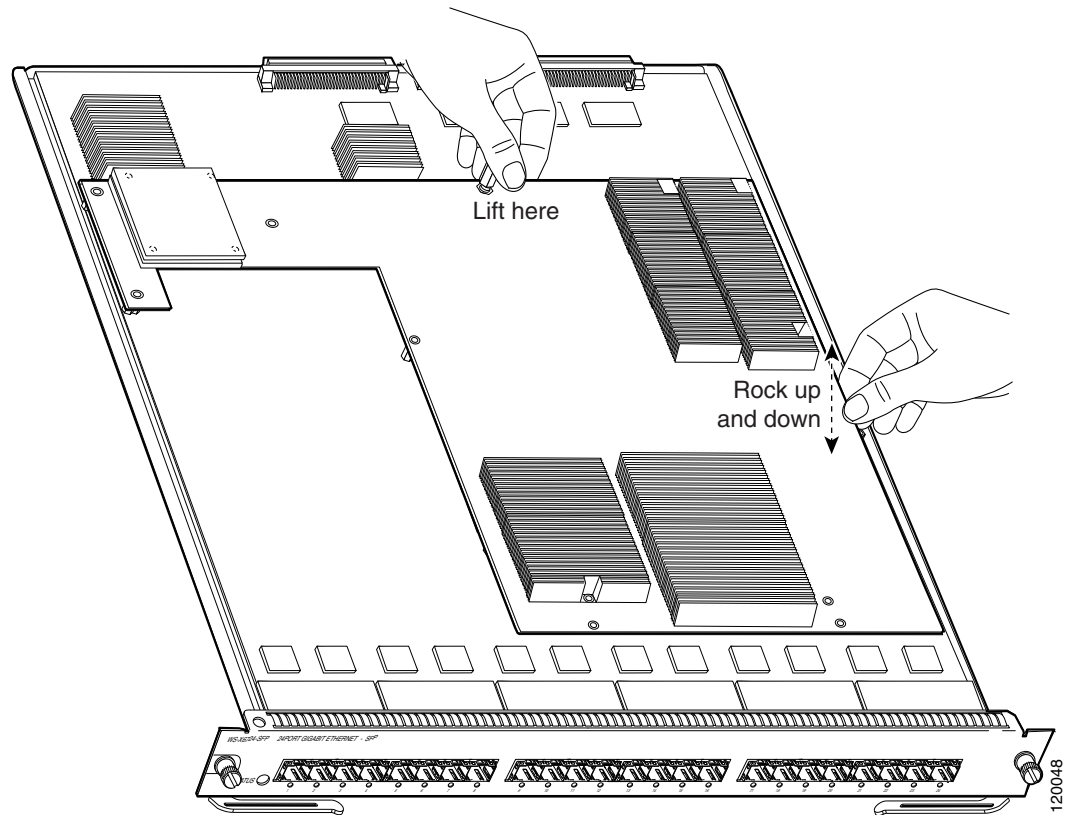
**Catalyst 6500 Series Distributed Forwarding Card 4 for WS-X68xx, WS-X69xx, and Select WS-X67xx Modules Installation Note**

**18**

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*Figure 8*        *Removing DFC4 Daughter Card Installation Hardware (WS-F6K-DFC4-A or -AXL)*



Installation bracket. May or may not be present.

154456

*Figure 9*        *Removing DFC4 Daughter Card Installation Hardware (WS-F6K-DFC4-E or -EXL)*



193018

**Catalyst 6500 Series Distributed Forwarding Card 4 for WS-X68xx, WS-X69xx, and Select WS-X67xx Modules Installation Note** ■

OL-24918-02        **19**

**Step 5** Partially reinstall a cap nut, rotating it 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 DFC4 daughter card, as shown in Figure 10. The cap nut acts as a stop when you unseat the daughter card connector so that the DFC4 daughter card does not move horizontally and cause damage to the Ethernet module.

*Figure 10        Partially Installing the Cap Nut*
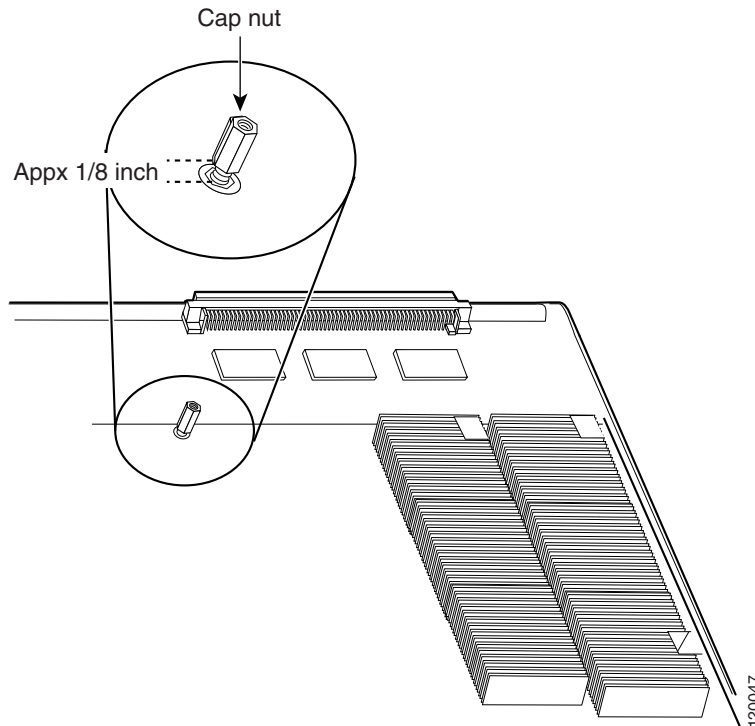


**Step 6** With your left hand, lift slightly at the location shown in Figure 11. While lifting with your left hand, rock the DFC4 daughter card up and down with your right hand, no more than half an inch in either direction, to unseat the DFC4 daughter card from the module.
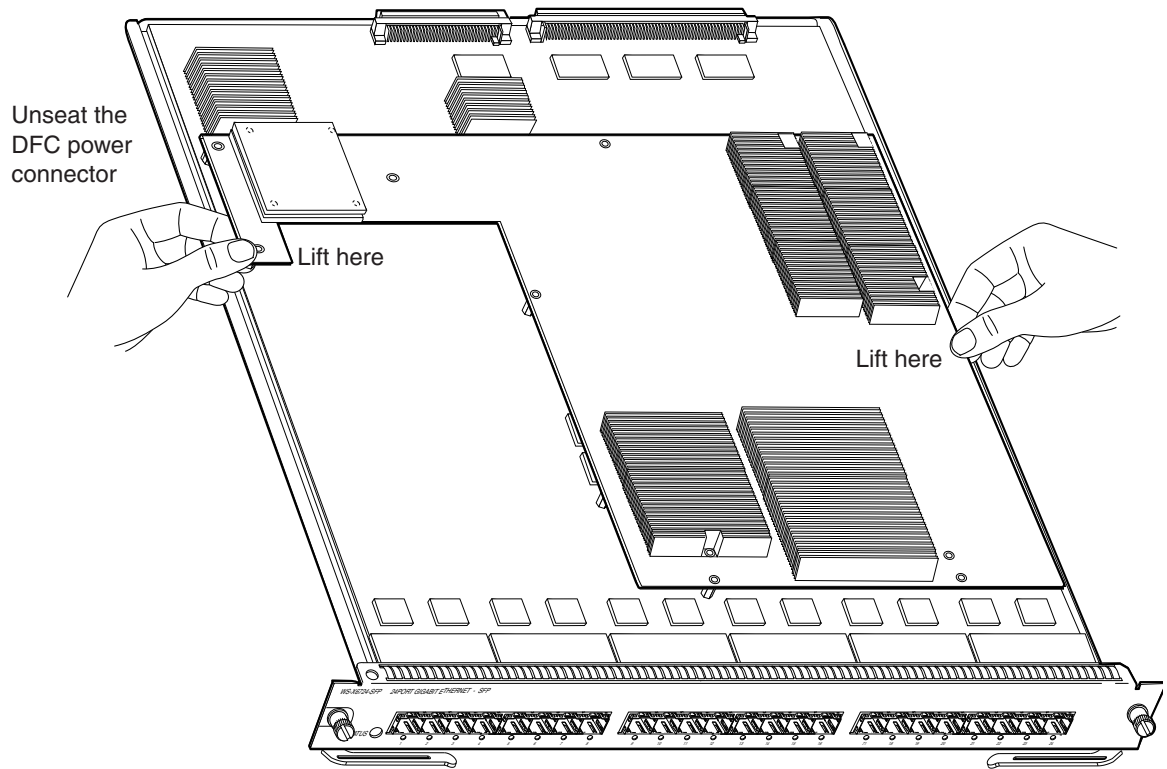
**Catalyst 6500 Series Distributed Forwarding Card 4 for WS-X68xx, WS-X69xx, and Select WS-X67xx Modules Installation Note**

**20**

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*Figure 11*      *Unseat the DFC4 Daughter Card from the Module*

Lift here

Rock up and down

120048

**Step 7**     Remove the one cap nut.

**Step 8**     Holding the DFC4 daughter card with both hands, gently lift it straight up from the module. (See Figure 12.) Immediately place the DFC4 daughter card on an antistatic mat or in an antistatic bag.

**Catalyst 6500 Series Distributed Forwarding Card 4 for WS-X68xx, WS-X69xx, and Select WS-X67xx Modules Installation Note** ■

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*Figure 12*       *Removing the DFC4 Daughter Card from the Module*

Unseat the
DFC power
connector

Lift here

Lift here

**Catalyst 6500 Series Distributed Forwarding Card 4 for WS-X68xx, WS-X69xx, and Select WS-X67xx Modules Installation Note**

**22**

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# Installing a DFC4 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 a DFC4 daughter card on an Ethernet module, follow these steps:

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

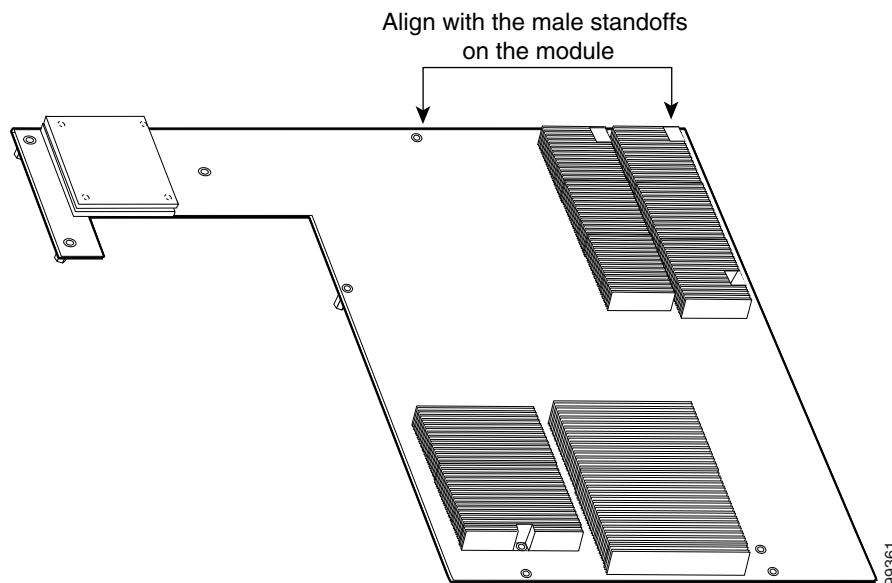**Step 2** Remove the new DFC4 daughter card and the mounting hardware from the packaging.
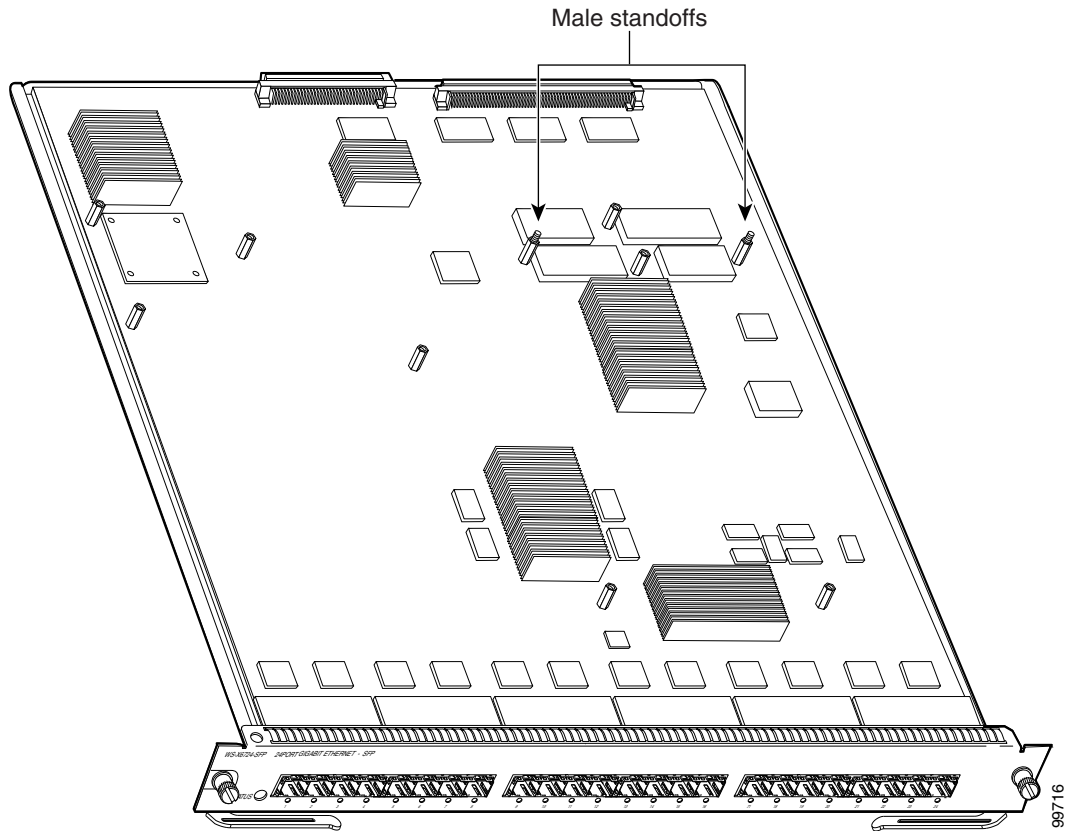
✎

**Note** The DFC4 daughter card is designed to be installed on different modules; therefore, there may be more mounting holes on the DFC4 daughter card than there are standoffs on the module. Not all mounting holes on the DFC4 daughter card are used in all installations. Visually verify that there are standoffs beneath the mounting holes before installing the mounting hardware.

**Step 3** Align the mounting holes on the DFC4 daughter card (see Figure 13) with the male standoffs on the module. (See Figure 14.) Make sure that the remaining mounting holes on the DFC4 daughter card are aligned with the remaining standoffs on the module.

*Figure 13        Mounting Holes on the DFC4 Daughter Card*



**Catalyst 6500 Series Distributed Forwarding Card 4 for WS-X68xx, WS-X69xx, and Select WS-X67xx Modules Installation Note**

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**23**

*Figure 14        Male Standoff Locations on the WS-X68xx Modules*

Male standoffs
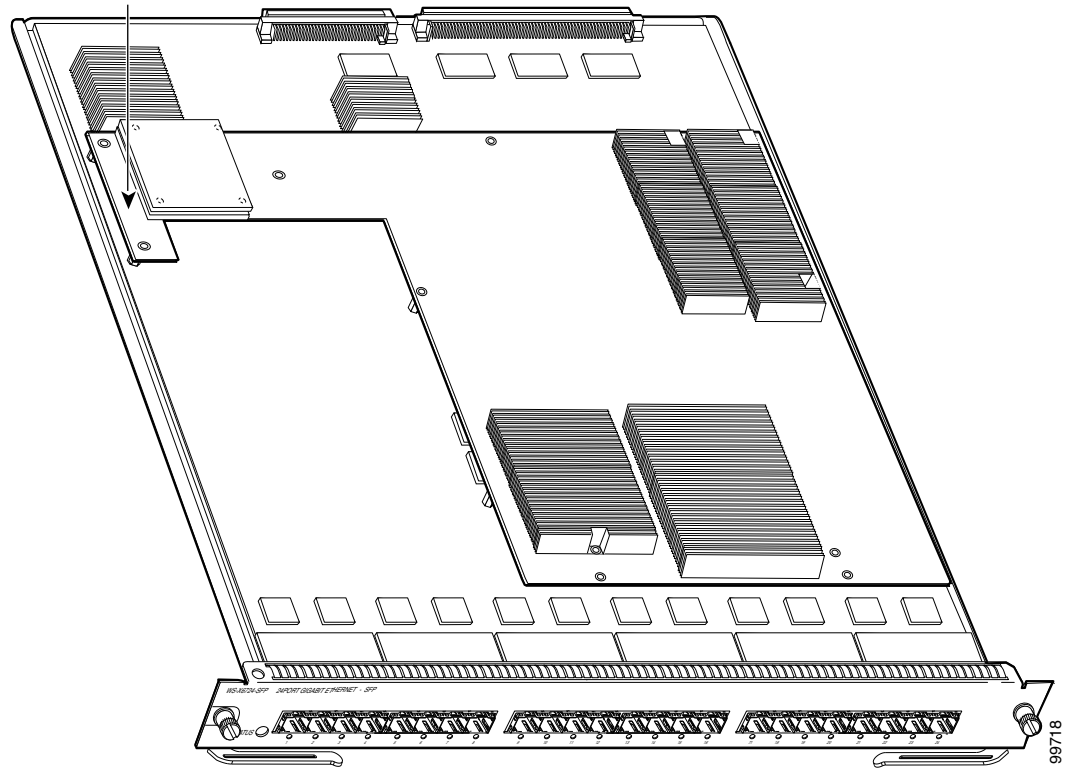
Step 4    Ensure that the connectors on the DFC4 daughter card are aligned with the connectors on the module. Apply pressure to the area shown in Figure 15 to seat the power connector.

**Catalyst 6500 Series Distributed Forwarding Card 4 for WS-X68xx, WS-X69xx, and Select WS-X67xx Modules Installation Note**

**24**

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***Figure 15***        ***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.
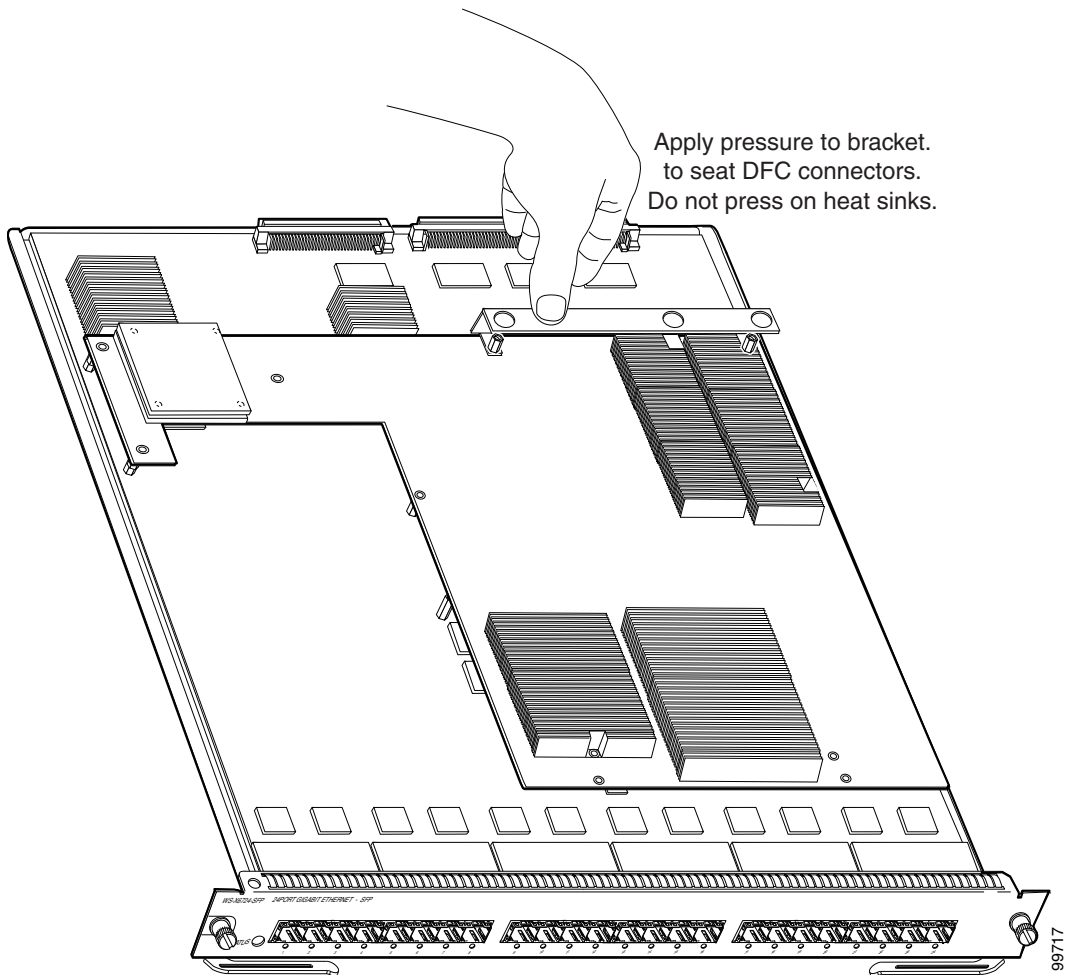
**Step 5**    Position the installation bracket over the two male standoffs at the back of the DFC4 daughter card. Apply pressure only to the top of the bracket to fully seat the DFC4 daughter card on the module as shown in Figure 16.

⚠️

**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.

**Catalyst 6500 Series Distributed Forwarding Card 4 for WS-X68xx, WS-X69xx, and Select WS-X67xx Modules Installation Note** ■

OL-24918-02      **25**

*Figure 16*      *Seating the DFC4 Daughter Card on the Module*



Apply pressure to bracket.
to seat DFC connectors.
Do not press on heat sinks.

**Step 6**   Use a Phillips-head screwdriver to install the installation hardware:

**a.** For the DFC4-A and the DFC4-AXL daughter cards, install the 9 screws and the 2 standoffs. (See Figure 17.)

**b.** For the DFC4-E and the DFC4-EXL daughter cards, install the 6 screws, 2 cap nuts, and 1 standoff. (See Figure 18.)
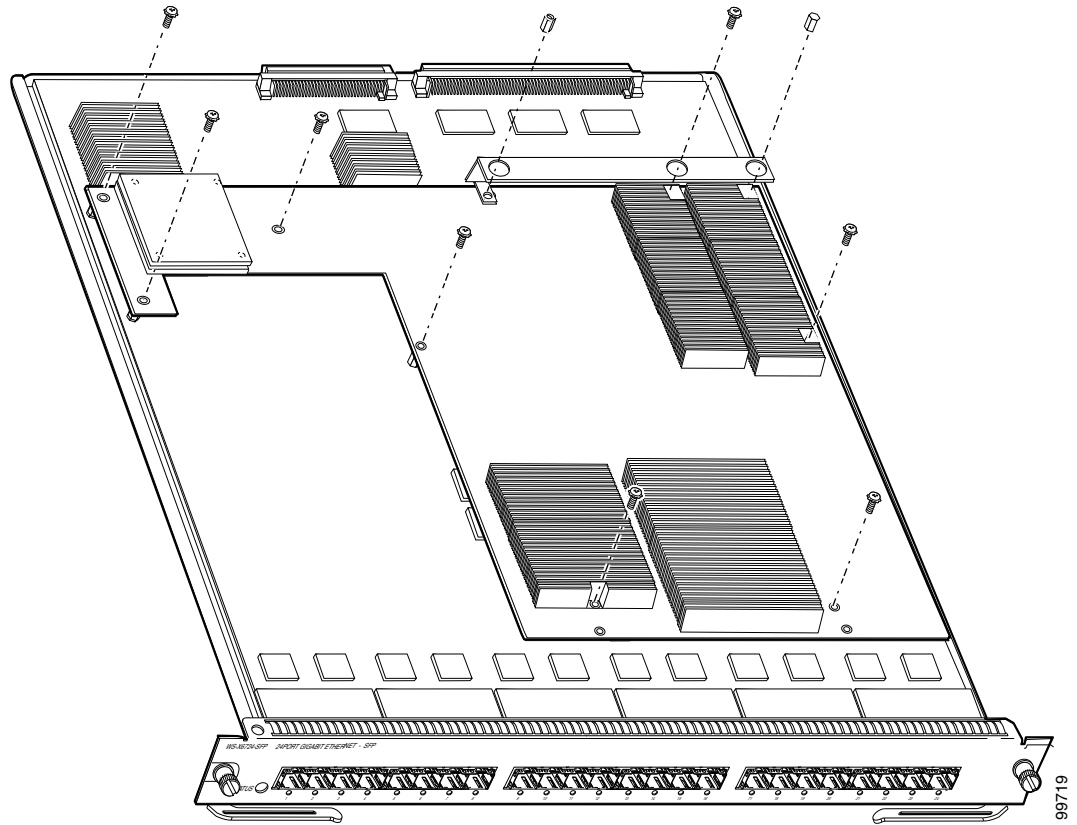
⚠️
**Caution**   You *must* install all of the installation hardware. The screws provide grounding between the DFC4 daughter card and the Ethernet module. Failure to install all of the screws will invalidate the safety approvals and create a risk of fire and electrical hazard.
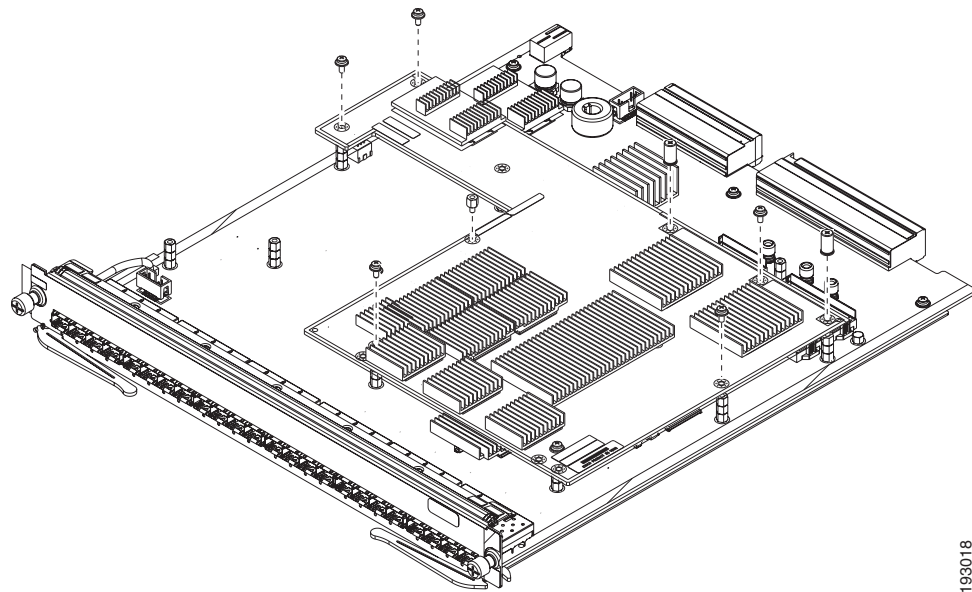
✎
**Note**   You should visually verify that there are standoffs beneath the mounting holes before installing the installation hardware.

**Catalyst 6500 Series Distributed Forwarding Card 4 for WS-X68xx, WS-X69xx, and Select WS-X67xx Modules Installation Note**

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*Figure 17*      *Installing the Mounting Hardware for a DFC4-A and DFC4-AXL Daughter Card*



*Figure 18*      *Installing the Mounting Hardware for a DFC4-E and DFC4-EXL Daughter Card*



**Catalyst 6500 Series Distributed Forwarding Card 4 for WS-X68xx, WS-X69xx, and Select WS-X67xx Modules Installation Note**

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⚠️ **Caution**  If you have upgraded a WS-X6748-GE-TX Ethernet module that was equipped with a stiffener bracket, verify that you did not reinstall the stiffener bracket on the module. The bracket can be discarded.

**Step 7**  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 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.

✎ **Note**  The WS-X68xx and the WS-X69xx Ethernet modules require that adjacent slots (above and below or to the left and to the right) that are empty have switching-module filler plates (Cisco part numbers WS-X6K-SLOT-CVR-E or SLOTBLANK-09). If either unused slot currently has a blank slot cover (Cisco part number WS-X6K-SLOT-CVR) installed, you must remove the blank slot cover and replace it with a switching-module filler plate for NEBS compliance.

⚠️ **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.

**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.

**Catalyst 6500 Series Distributed Forwarding Card 4 for WS-X68xx, WS-X69xx, and Select WS-X67xx Modules Installation Note**

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**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.

**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.

**Catalyst 6500 Series Distributed Forwarding Card 4 for WS-X68xx, WS-X69xx, and Select WS-X67xx Modules Installation Note** ■

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**Step 3** Fully open both ejector levers on the Ethernet module. (See Figure 19.)

**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 19.) 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 20.)

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 20.)

⚠
**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 21.)

✎
**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.

■ **Catalyst 6500 Series Distributed Forwarding Card 4 for WS-X68xx, WS-X69xx, and Select WS-X67xx Modules Installation Note**

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*Figure 19       Positioning the Module in a Horizontal Slot Chassis*



Insert module
between slot guides

EMI gasket

EMI gasket

Ejector lever fully
extended

WS-X6748-GE-TX  48 PORT ETHERNET

154230

**Catalyst 6500 Series Distributed Forwarding Card 4 for WS-X68xx, WS-X69xx, and Select WS-X67xx Modules Installation Note** ■

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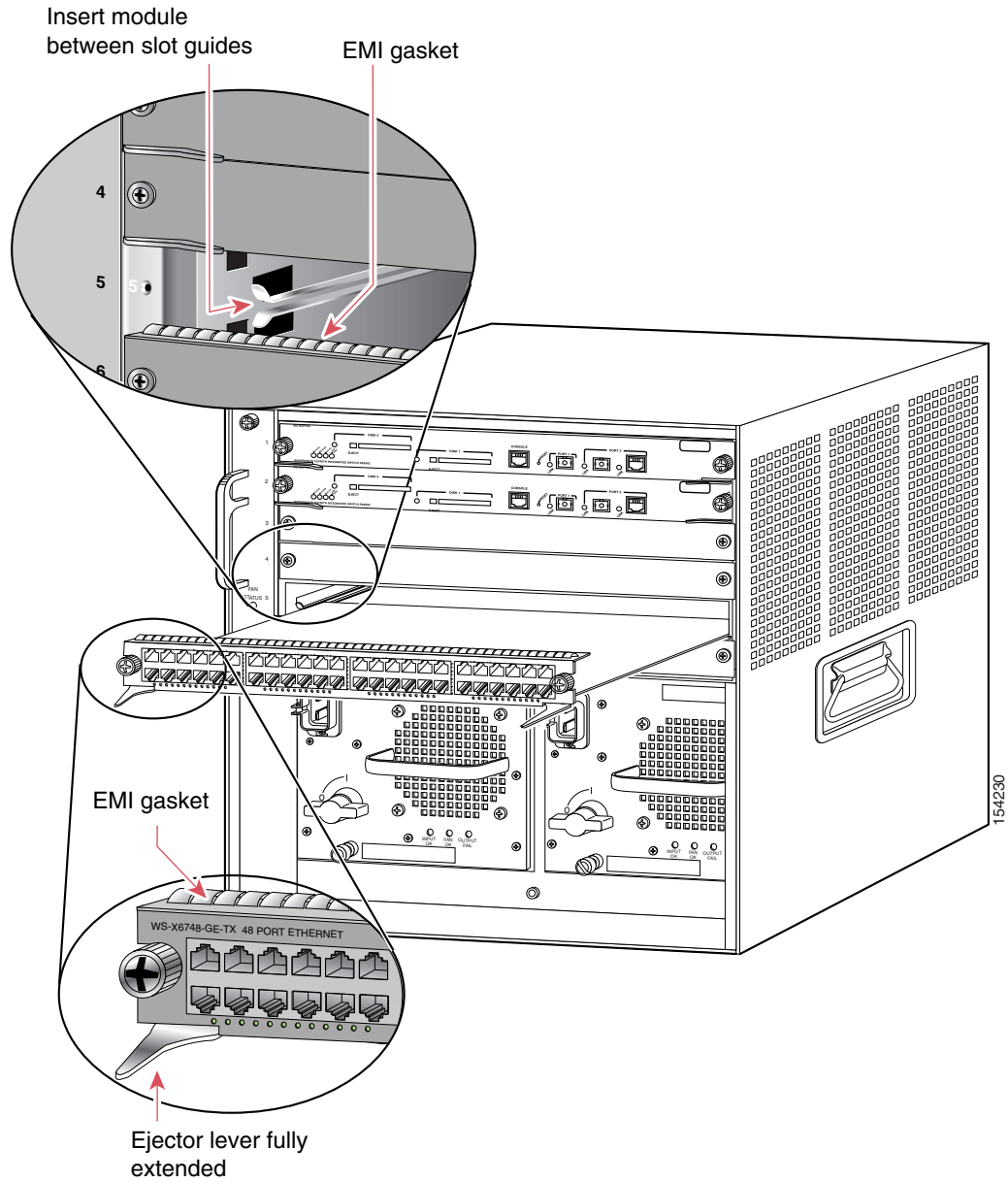
*Figure 20    Clearing the EMI Gasket in a Horizontal Slot Chassis*
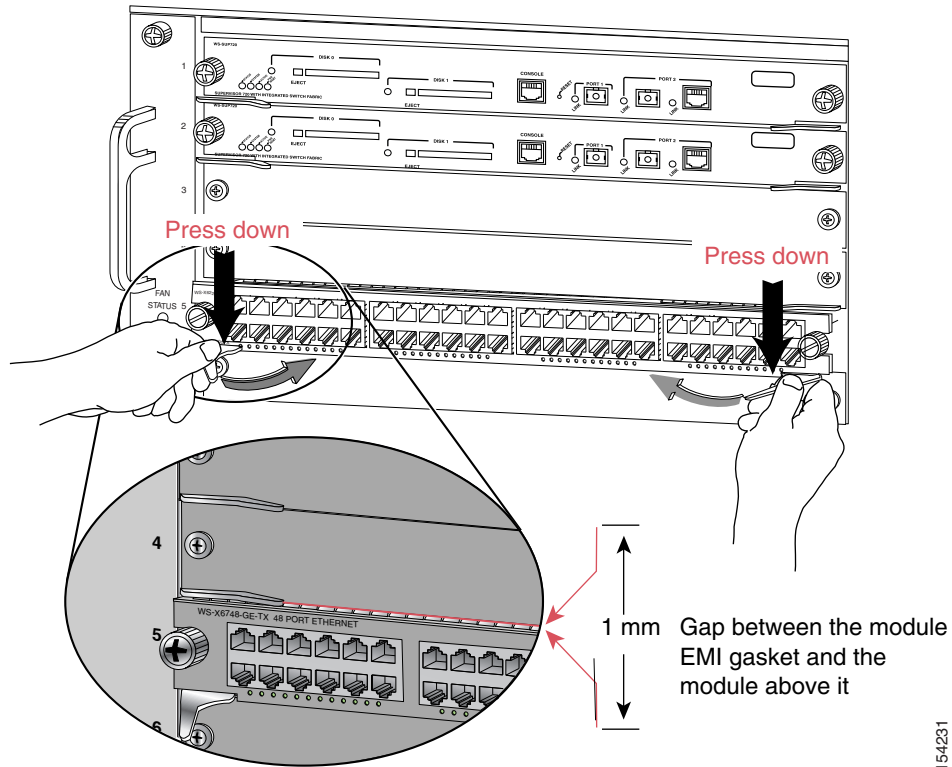


*Figure 21    Ejector Lever Closure in a Horizontal Slot Chassis*



**Catalyst 6500 Series Distributed Forwarding Card 4 for WS-X68xx, WS-X69xx, and Select WS-X67xx Modules Installation Note**

**32**
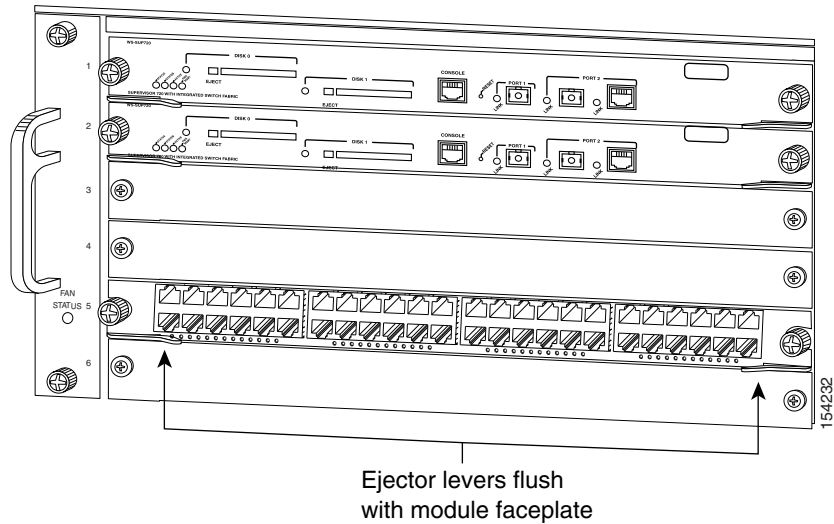
OL-24918-02

**Vertical slots**

a. Position the Ethernet module in the slot. (See Figure 22.) 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 23.)

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 23.)

⚠️ **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 24.)

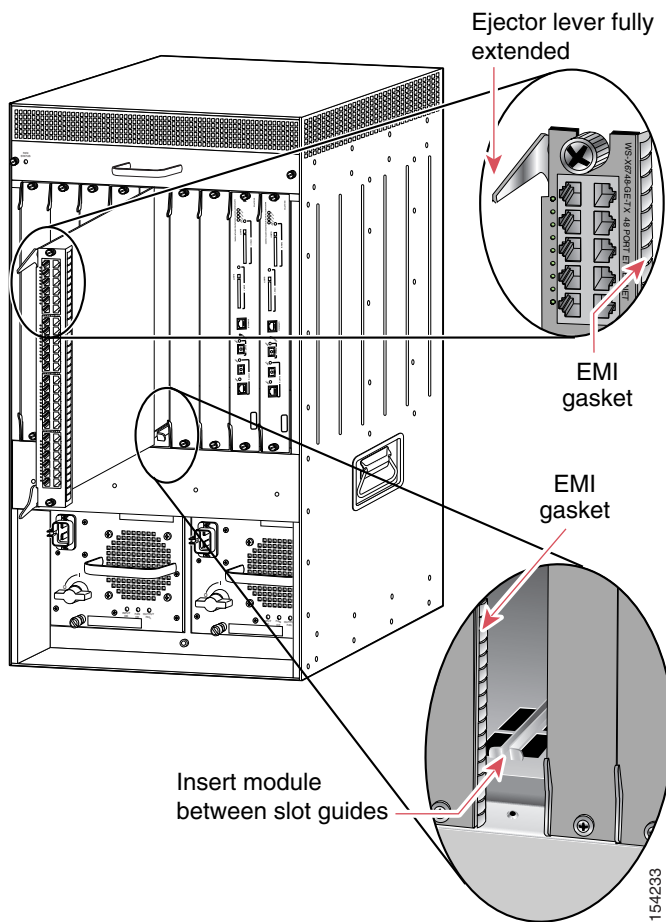e. Tighten the two captive installation screws on the Ethernet module.

✎ **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.

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*Figure 22     Positioning the Module in a Vertical Slot Chassis*

Ejector lever fully
extended

EMI
gasket

EMI
gasket

Insert module
between slot guides

154233

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*Figure 23     Clearing the EMI Gasket in a Vertical Slot Chassis*



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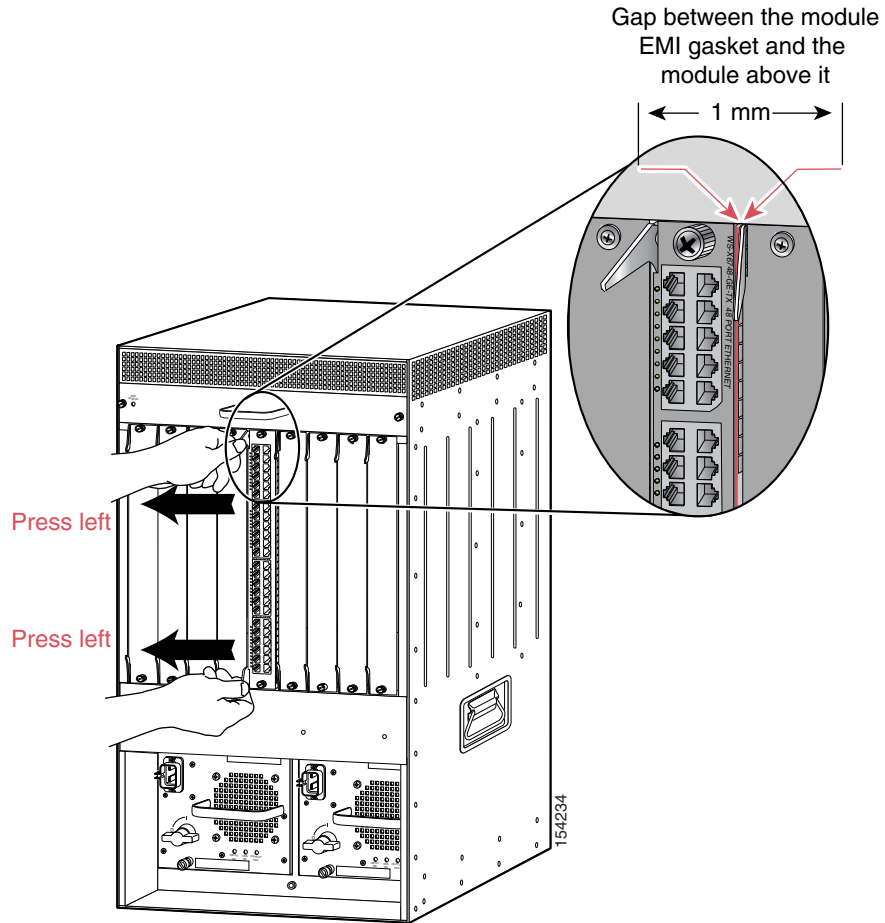
*Figure 24    Ejector Lever Closure in a Vertical Slot Chassis*



All ejector levers flush
with module faceplate
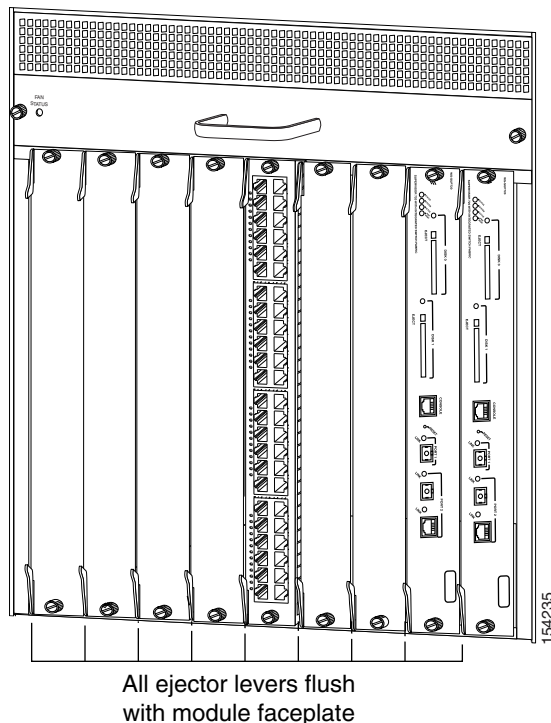
# Obtaining Documentation and Submitting a Service Request

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