Installation and Configuration Note for the Catalyst 4500 Series Supervisor Engine II-Plus TS

Product Numbers: WS-X4013+TS = Catalyst 4500 Series Supervisor Engine II-Plus TS

This publication describes how to install and verify the operation of the Catalyst 4500 series switch Supervisor Engine II-Plus TS. Refer to the software configuration guide for your switch to obtain configuration information for the supervisor engines and switching modules.

Contents

This document contains these sections:

CISCO SYSTEMS®

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

Safety Overview

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

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. Statement 1071

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 أخر كل تحذير لتحديد مكان ترجمته داخل تحذيرات الأمان المترجمة التي تأتي مع الجهاز. قم بحفظ هذه الإرشادات

Upozorenje　VAŽNE SIGURNOSNE NAPOMENE

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

SAČUVAJTE OVE UPUTE

Upozornění   **DŮLEŽITÉ BEZPEČNOSTNÍ POKYNY**

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

USCHOVEJTE TYTO POKYNY

Προειδοποίηση   ΣΗΜΑΝΤΙΚΕΣ ΟΔΗΓΙΕΣ ΑΣΦΑΛΕΙΑΣ

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

ΦΥΛΑΞΤΕ ΑΥΤΕΣ ΤΙΣ ΟΔΗΓΙΕΣ

אזהרה

הוראות בטיחות חשובות

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

שמור הוראות אלה

Opomena   ВАЖНИ БЕЗБЕДНОСНИ НАПАТСТВИЈА

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

ЧУВАЈТЕ ГИ ОВИЕ НАПАТСТВИЈА

Ostrzeżenie   WAŻNE INSTRUKCJE DOTYCZĄCE BEZPIECZEŃSTWA

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

NINIEJSZE INSTRUKCJE NALEŻY ZACHOWAĆ

Upozornenie   DÔLEŽITÉ BEZPEČNOSTNÉ POKYNY

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

USCHOVAJTE SI TENTO NÁVOD

Supervisor Engine II-Plus TS

This section describes the Catalyst 4500 series Supervisor Engine II-Plus TS (WS-X4013+ TS). This supervisor engine provides data path and data control for all network interfaces, and also provides 12 10/100/1000BASE-T IEEE 802.3af compliant Power over Ethernet (PoE) ports and 8 1000BASE-X SFP ports. A PoE-capable power supply is not needed to use PoE devices connected to the front panel ports on the Catalyst 4500 series Supervisor Engine II-Plus TS. A PoE-capable power supply would be needed to use PoE devices connected to modules in slot 2 and slot 3.
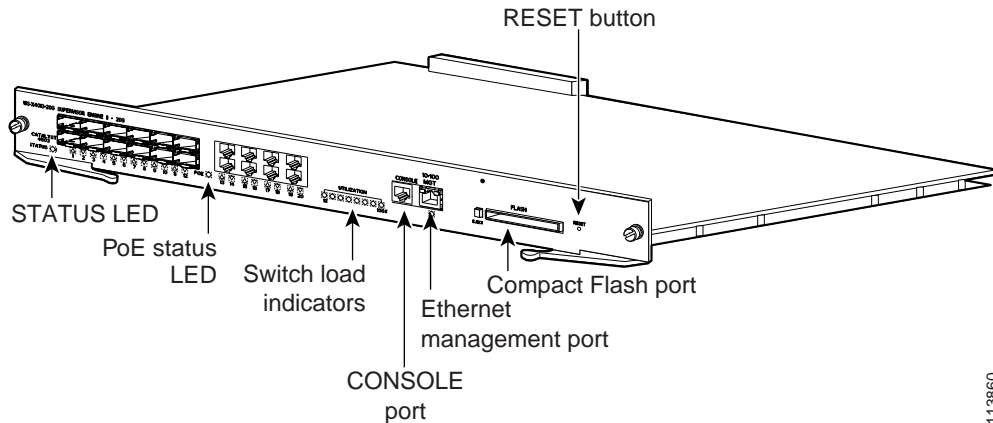
The Catalyst 4500 series Supervisor Engine II-Plus TS is only used in Catalyst 4503 switches. Install the Catalyst 4500 series Supervisor Engine II-Plus TS in slot 1.

The supervisor engine is hot swappable, but packets are not forwarded when the supervisor engine has been removed. When a supervisor engine is reinserted, the system reboots.

The Catalyst 4500 series Supervisor Engine II-Plus TS provides:

- 64-Gbps full-duplex switching, with an actual forwarding rate of 48 million packets-per-second
- 32K MAC addresses for Layer 2 switching
- 16K IP unicast adjacencies
- 2048 VLANs with 802.1Q VLAN tagging on all ports
- Cisco Inter Switch Link (ISL) tagging on all ports
- Support for Jumbo Frames on all non-blocking GE ports

Figure 1   Catalyst 4500 Series Supervisor Engine II-Plus TS (WS-X4013+TS)

The supervisor engine includes interfaces for SNMP, console, and Telnet and provides management functions such as environmental status monitoring.

There is a total of 158.4 Watts available for PoE. This allows any eight ports to be compliant to IEEE 802.3af with 15.4 Watts of supplied power, while the other four ports provide 6.3 Watts of supplied power.

The Catalyst 4500 series Supervisor Engine II-Plus TS has a standard serial console and a 10/100BASE-TX Ethernet management port.

The following sections describe the LEDs, connectors, and switches on the Catalyst 4500 series Supervisor Engine II-Plus TS:

- LEDs, page 9
- SFP Ports, page 9
- 10/100/1000 Ports, page 9
- Ethernet Management Port, page 9
- Console Port, page 10
- RESET Button, page 10
- Flash Port, page 10

LEDs

Table 1 describes the LEDs on the supervisor engine front panel.

Table 1   Supervisor Engine LEDs (WS-X4013+TS)

LED	LED Status	Description
STATUS		Indicates the results of a series of self-tests.
	Green	All diagnostic tests passed.
	Red	A test failed.
	Orange	System boot or diagnostic test is in progress.
	Off	Module is disabled.
UTILIZATION	Green 1–100%	If the switch is operational, this display indicates the current traffic load over the backplane (as an approximate percentage).
Link		Indicates the status of the 10/100BASE-T Ethernet management port or uplink ports.
	Green	The link is operational.
	Orange	The link is disabled by user.
	Flashing orange	The power-on self-test indicates a faulty port.
	Off	No signal is detected, or there is a link configuration failure.
PoE Status	Green	PoE is healthy.
	Off	No PoE power is available.
	Red	One or more ports are in power-deny mode.

SFP Ports

The Gigabit Ethernet SFP ports operate in full-duplex mode only. These ports use the 1000BASE-SX, 1000BASE-LX, Cisco Coarse Wave Division Multiplexing (CWDM) SFPs, 1000BASE-T SFP, and 1000BASE-ZX SFP. SFP connectors vary with interface type and may use multimode fiber (MMF), single-mode fiber (SMF) cable, or copper Ethernet cables. For further information on SFPs, see the "SFP Guidelines" section on page 16.

10/100/1000 Ports

The 10/100/1000 ports operate in full-duplex mode or in half-duplex mode. These ports use RJ-45 connectors.

Ethernet Management Port

The Ethernet management port is used (in ROMMON mode only) to recover a switch software image that has been corrupted or destroyed. This port is not active while the switch is operating normally.

Console Port

The Catalyst 4500 series Supervisor Engine II-Plus TS console port has an EIA/TIA-232 RJ-45 connector. The console port allows you to perform the following functions:

- Configure the switch from the CLI
- Monitor network statistics and errors
- Configure SNMP agent parameters

Note EIA/TIA-232 was known as recommended standard RS-232 before its acceptance as a standard by the Electronic Industries Alliance (EIA) and Telecommunications Industry Association (TIA).

RESET Button

The RESET button is used to restart the switch.

Note Use a paper clip or other small, pointed object to press the RESET button.

Flash Port

The Flash port accepts a Type 1 compact Flash card. You can use it for file transfer tasks such as loading a new software image. The Flash card is optional and can be obtained from Cisco resellers or directly from Cisco.

For more information, refer to *Using the Compact Flash on the Catalyst 4000 Family Supervisor Engine III and IV* at the following URL:

http://www.cisco.com/univercd/cc/td/doc/product/lan/cat4000/inst_nts/ol_2058.htm

Port Cabling Specifications

This section provides port cabling specifications.

The length of your networks and the distances between connections depend on the type of signal, the signal speed, and the transmission medium (the type of cabling used to transmit the signals). The distance and rate limits in this document are the IEEE-recommended maximum speeds and distances for signaling. Table 2 shows the transmission speed versus the distance.

Table 2   EIA/TIA-232 Transmission Speed in Contrast with Distance

Rate (bps)	Distance (ft)	Distance (m)
2400	200	60
4800	100	30
9600	50	15
19,200	25	7.6
38,400	12	3.7
56,000	8.6	2.6

Maximum Cable Distances

Table 3 shows the maximum cable distances for transceiver speed and cable type.

Table 3   Maximum Cable Distances

Transceiver Speed	Cable Type	Duplex Mode	Maximum Distance Between Stations
10 Mbps	Category 3 UTP	Half or full	328 ft (100 m)
10 Mbps	MMF	Half or full	1.2 mi (2 km)
100 Mbps	Category 5 UTP	Half or full	328 ft (100 m)
100 Mbps	MMF	Half	1312 ft (400 m)
100 Mbps	MMF	Full	1.2 mi (2 km)

Table 4 on page 17 provides cabling specifications for the SFPs that you install in the SFP port modules.

Installing and Removing the Supervisor Engine

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

All Catalyst 4500 series switches support hot swapping, which lets you install, remove, replace, and rearrange supervisor engines and switching modules without powering off the system. When the system detects that a switching module has been installed or removed, it runs diagnostic and discovery routines automatically, acknowledges the presence or absence of the module, and resumes system operation with no operator intervention.

This section contains the following subsections:

- Required Tools, page 11
- Installing the Supervisor Engine, page 12
- Removing the Supervisor Engine, page 13

Required Tools

You will need these tools to install a supervisor engine in a Catalyst 4500 series switch:

- Number 1 and number 2 Phillips screwdrivers for the captive installation screws on most modules
- 3/16-inch flat-blade screwdriver for the captive installation screws on other modules
- Antistatic mat or antistatic foam
- Wrist strap or other grounding device

Note Whenever you handle supervisor engines, use a wrist strap or other grounding device to prevent ESD damage.

Installing the Supervisor Engine

The Catalyst 4500 series Supervisor Engine II-Plus TS is only used in Catalyst 4503 switches. Install the Catalyst 4500 series Supervisor Engine II-Plus TS in slot 1.

⚠️

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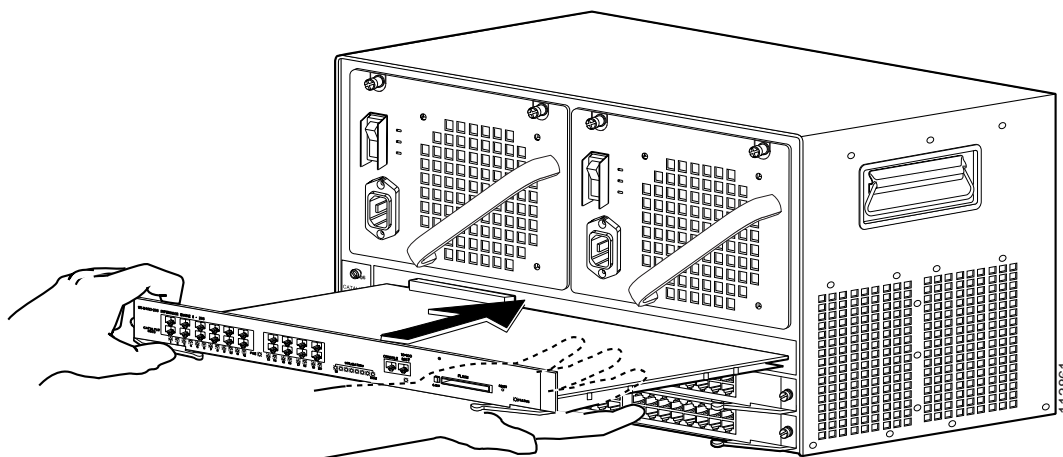
⚠️

Caution   To prevent ESD damage, handle supervisor engines by the carrier edges only.

To install a supervisor engine in a Catalyst 4503 switch, follow this procedure:

Step 1   Take the necessary precautions to prevent ESD damage.

Step 2   Ensure that you have enough clearance to accommodate any interface equipment that you will connect directly to the supervisor engine ports.

Step 3   Loosen the captive installation screws that secure the switching-module filler plate or the existing supervisor engine (whichever is present), and remove it.

Step 4   Remove the supervisor engine filler plate or the existing supervisor engine from slot 1. If a switching module filler plate was installed, save it for future use. If you are removing an existing supervisor engine, see the "Removing the Supervisor Engine" section on page 13.

Step 5   To install the new supervisor engine, grasp the switching module front panel with one hand and place your other hand under the carrier to support the supervisor engine, as shown in Figure 2. Do not touch the printed circuit boards or connector pins.

Step 6   Align the edges of the supervisor engine carrier with the slot guides on the sides of the switch chassis, as shown in Figure 2.

Figure 2   Installing the Supervisor Engine in the Chassis

Step 7   Pivot the two module ejector levers out and away from the faceplate.

Step 8   Carefully slide the supervisor engine into the slot until the notches on both ejector levers engage the chassis sides.

Step 9 Using the thumb and forefinger of each hand, simultaneously pivot in both ejector levers to fully seat the supervisor engine in the backplane connector.

⚠
Caution Always use the ejector levers when installing or removing a supervisor engine. A supervisor engine that is partially seated in the backplane will not function correctly.

Step 10 Use a screwdriver to tighten the captive installation screws on each end of the supervisor engine faceplate.

To check the status of the module, perform these steps:

Step 1 Ensure that the LED labeled Status is green (module operational).

Step 2 When the switch is online, enter the **show module** command. Verify that the system acknowledges the new module and that the module status is good.

Step 3 If the module is not operational, reseat it. If the module is still not operational, contact your customer service representative.

Removing the Supervisor Engine

⚠
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

⚠
Warning **Hazardous voltage or energy is present on the backplane when the system is operating. Use caution when servicing.** Statement 1034
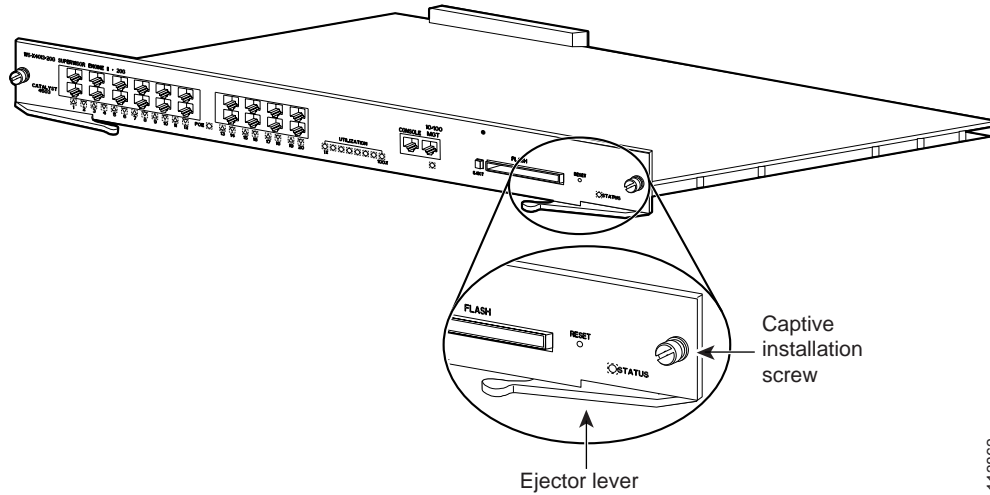
⚠
Caution To prevent ESD damage, handle supervisor engines by the carrier edges only.

To remove a supervisor engine from a Catalyst 4500 series switch, perform these steps:

Step 1 Disconnect any network interface cables attached to the ports on the supervisor engine that you intend to remove.

Step 2 Loosen the captive installation screws. (See Figure 3.)

Figure 3   Captive Installation Screws and Ejector Levers

Captive
installation
screw

Ejector lever

113862

Step 3   Grasp the left and right ejector levers, and simultaneously pivot the levers outward to release the supervisor engine from the backplane connector. Figure 3 shows a close-up of the right ejector lever.

Step 4   Grasp the front panel of the supervisor engine with one hand, and place your other hand under the carrier to support and guide it out of the slot. Do not touch the printed circuit boards or connector pins.

Step 5   Carefully pull the supervisor engine straight out of the slot, keeping your other hand under the carrier to guide it.

Step 6   Place the supervisor engine on an antistatic mat or antistatic foam, or immediately install it in another slot 1 in another chassis.

⚠

Warning   **Blank faceplates and cover panels serve three important functions: they prevent exposure to hazardous voltages and currents inside the chassis; they contain electromagnetic interference (EMI) that might disrupt other equipment; and they direct the flow of cooling air through the chassis. Do not operate the system unless all cards, faceplates, front covers, and rear covers are in place.** Statement 1029

Step 7   If the slot is to remain empty, install a switching-module filler plate (part number 800-00292-01).

⚠

Warning   **Ultimate disposal of this product should be handled according to all national laws and regulations.** Statement 1040

Attaching Module Interface Cables

Figure 4 shows the connector types used to attach interface cables to the supervisor engine.
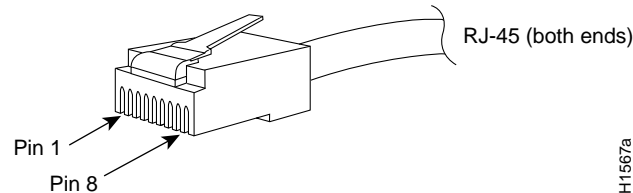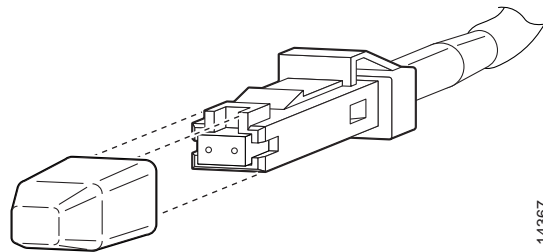
Figure 4   RJ-45 Connector

RJ-45 (both ends)

Pin 1

Pin 8

H1567a

Figure 5   MT-RJ Connector

14367

Note   Always keep caps and plugs on the fiber-optic connectors on the cable and the switch when they are not in use.

Warning   **Voltages that present a shock hazard may exist on Power over Ethernet (PoE) circuits if interconnections are made using uninsulated exposed metal contacts, conductors, or terminals. Avoid using such interconnection methods, unless the exposed metal parts are located within a restricted access location and users and service people who are authorized within the restricted access location are made aware of the hazard. A restricted access area can be accessed only through the use of a special tool, lock and key or other means of security.** Statement 1072

Warning   **To avoid electric shock, do not connect safety extra-low voltage (SELV) circuits to telephone-network voltage (TNV) circuits. LAN ports contain SELV circuits, and WAN ports contain TNV circuits. Some LAN and WAN ports both use RJ-45 connectors. Use caution when connecting cables.** Statement 1021

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

Configuring Your Supervisor Engine

For information and commands to configure your supervisor engine, refer to the *Software Configuration Guide* for your switch.

SFP Guidelines

SFP modules are hot-pluggable and field-replaceable, and you can insert them into the eight SFP module slots on the front panel of the Supervisor Engine II+TS. You can use the SFP modules for connections to other network devices.

You can use any combination of supported SFP modules. Use only Cisco SFP modules on your Cisco device. Each SFP module has an internal serial EEPROM that is encoded with security information. This encoding provides a way for Cisco to identify and validate that the SFP module meets the requirements for the device.

The following SFP media types are supported:

- 1000BASE-SX (GLC-SX-MM)
- 1000BASE-LX/LH (GLC-LH-SM)
- 1000BASE-ZX (GLC-ZX-SM)
- 1000BASE-T (GLC-T)
- CWDM (CWDM-SFP-xxxx)

Cisco 1000BASE-LX/LH interfaces fully comply with the IEEE 802.3z 1000BASE-LX standard. However, their higher optical quality allows them to reach 6.2 miles (10 km) over SMF cable instead of the 3.1 miles (5 km) specified in the standard.

If an LX/LH SFP designed for operation on an SMF cable is directly coupled to an MMF cable, an effect known as Differential Mode Delay (DMD) might occur. See the *Catalyst 4500 Series Module Installation Guide* for more information.

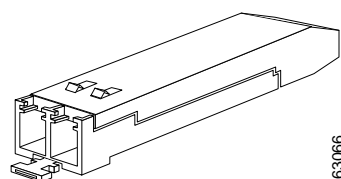This section describes the following topics:

Fiber-Optic SFP Modules

Some fiber-optic SFP modules use LC-type connectors, as shown in Figure 6.

Caution Protect your fiber-optic SFP modules by inserting clean dust plugs into the SFP modules after you remove the cables. Be sure to clean the optic surfaces of the fiber-optic cables with a soft antistatic cloth before you reconnect them to another SFP module. Avoid getting dust and other contaminants into the optical bores, as the optics do not work correctly when obstructed with dust.

Figure 6   LC Fiber-Optic SFP Module

LC SFPs provide duplex single-mode and multimode connections in supported devices. Table 4 lists the cable specifications for fiber-optic SFP module ports.

Table 4   Fiber-Optic SFP Module Port Cabling Specifications

SFP Module	Wavelength (nanometers)	Fiber Type	Core Size (micron)	Modal Bandwidth (MHz/km)	Cable Distance
1000BASE-SX	850	MMF	62.5 62.5 50.0 50.0	160 200 400 500	722 feet (220 m) 902 feet (275 m) 1640 feet (500 m) 1804 feet (550 m)
1000BASE-LX/LH	1300	MMF[1] SMF	62.5 50.0 50.0 9/10	500 400 500 —	1804 feet (550 m) 1804 feet (550 m) 1804 feet (550 m) 32,810 feet (10 km)
1000BASE-ZX	1550	SMF	9/10	—	43.4 to 62 miles (70 to 100 km)[2]

1. A mode-conditioning patch cord is required. Using an ordinary patch cord with MMF, 1000BASE-LX/LH SFP modules, and a short link distance can cause transceiver saturation, resulting in an elevated bit error rate (BER). When using the LX/LH SFP module with 62.5-micron diameter MMF, you must also install a mode-conditioning patch cord between the SFP module and the MMF cable on both the sending and receiving ends of the link. The mode-conditioning patch cord is required for link distances greater than 984 feet (300 m).

2. 1000BASE-ZX SFP modules can reach up to 62 miles (100 km) by using dispersion-shifted SMF or low-attenuation SMF; the distance depends on the fiber quality, the number of splices, and the connectors.
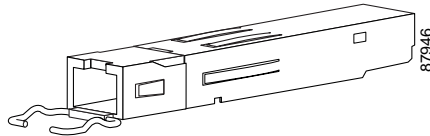
✎

Note When using shorter distances of single-mode fiber cable, you might need to insert an inline optical attenuator in the link to avoid overloading the receiver.

When the fiber-optic cable span is less than 15.43 miles (25 km), you should insert a 5-decibel (dB) or 10-dB inline optical attenuator between the fiber-optic cable plant and the receiving port on the 1000BASE-ZX SFP module at each end of the link.
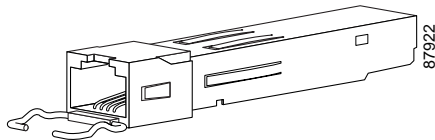
Fiber-optic SFP modules also use MT-RJ connectors, as shown in Figure 7.

Figure 7   MT-RJ Fiber-Optic SFP Module

1000BASE-T SFP Modules

Copper 1000BASE-T SFP modules use RJ-45 connectors, as shown in Figure 8.

Figure 8   1000BASE-T Copper SFP Module

1000BASE-T copper SFP modules used with the Catalyst 4500 series Supervisor Engine II-Plus TS operate only in 1000BASE-T mode, or at 1000 Mbps. Copper 1000BASE-T SFP modules use standard four twisted-pair, Category 5 cable at lengths up to 328.08 feet (100 meters).

CWDM SFPs

You can connect the CWDM SFPs to CWDM passive optical system optical add/drop multiplexer (OADM) or multiplexer/demultiplexer plug-in modules using single-mode fiber-optic cables with standard SC connectors. Figure 9 shows a CWDM SFP with the optical port dust plug removed. Figure 10 shows an SC-type connector.

Figure 9   CWDM SFP Module (Yellow-Coded CWDM-SFP-1550= Shown)
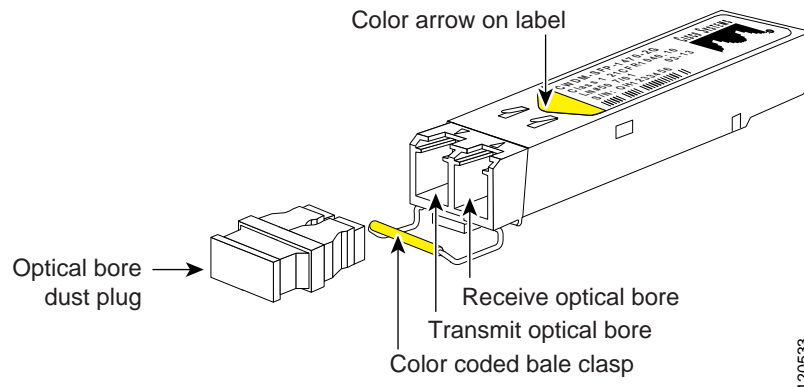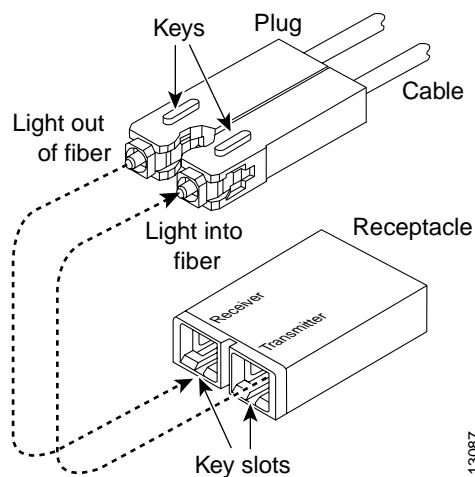

Figure 10   SC-Type Fiber-Optic Connector

CWDM SFPs come in eight wavelengths that range from 1470 nm to 1610 nm. Color markings on the devices identify the wavelength to which the Gigabit Ethernet channel is mapped. Table 5 lists the CWDM SFPs with their wavelengths and color codes.

Table 5   GBIC and SFP Wavelengths and Color Coding

SFP Product Number	Wavelength	Color Identifier
CWDM-SFP-1470=	Longwave 1470 nm laser, single mode	Gray
CWDM-SFP-1490=	Longwave 1490 nm laser, single mode	Violet
CWDM-SFP-1510=	Longwave 1510 nm laser, single mode	Blue
CWDM-SFP-1530=	Longwave 1530 nm laser, single mode	Green
CWDM-SFP-1550=	Longwave 1550 nm laser, single mode	Yellow
CWDM-SFP-1570=	Longwave 1570 nm laser, single mode	Orange
CWDM-SFP-1590=	Longwave 1590 nm laser, single mode	Red
CWDM-SFP-1610=	Longwave 1610 nm laser, single mode	Brown

Standards Compliance Specifications

When installed in a system, the Catalyst 4500 series modules comply with the standards listed in Table 6.

Table 6   Standards Compliance Specifications

Item	Specification
Compliance	CE[1] Marking
Safety	UL[2] 60950, CSA[3]-C22.2 No. 60950, EN[4] 60950, IEC[5] 60950, TS001[6], AS/NZS[7] 3260
EMC[8]	FCC[9] Part 15, Class A (CFR[10] 47) (USA), ICES[11]-003 Class A (Canada), EN 55022 Class A (Europe), CISPR22[12] Class A (International), AS/NZS 3548 Class A (Australia), and VCCI[13] Class A (Japan) with UTP[14]

1. CE = European Compliance
2. UL = Underwriters Laboratory
3. CSA = Canadian Standards Association
4. EN = European Norm
5. IEC = International Electrotechnical Commission
6. TS = technical specifications
7. AS/NZS = Australia Standards/New Zealand Standards
8. EMC = electromagnetic compatibility
9. FCC = U.S. Federal Communications Commission
10. CFR = Code of Federal Regulations
11. ICES = Interference-Causing Equipment Standard
12. CISPR = Comite International Special des Perturbation Radioelectriques
13. VCCI = Voluntary Control Council for Information Technology Equipment
14. UTP = unshielded twisted-pair

The Catalyst 4500 series modules have been found to comply with the limits for a Class A digital device per FCC (CFR 47) Part 15, ICES 003, EN55022, CISPR22, AS/NZS 3548, and VCCI with UTP cables, and complies with the limits for a Class B digital device per EN55022, CISPR22, AS/NZS 3548, and VCCI with shielded FTP cables.

Related Documentation

For more detailed installation and configuration information, refer to the following:

- *Catalyst 4000 Series Installation Guide*
- *Catalyst 4500 Series Installation Guide*
- *Catalyst 4500 Series Module Installation Guide*
- *Catalyst 4500 Series Supervisor Engine and Switching Modules Installation Note*
- *Cisco Small Form-Factor Pluggable Modules Installation Notes*
- *Cisco CWDM GBIC and CWDM SFP Installation Note*
- *Regulatory Compliance and Safety Information for the Catalyst 4500 Series Switches*

- *Software Configuration Guide—Catalyst 4500 Series, Catalyst 2948G, and Catalyst 2980G Switches*

- *Command Reference—Catalyst 4500 Series, Catalyst 2948G, and Catalyst 2980G Switches*

- *System Message Guide— Catalyst 4500 Series, Catalyst 2926G Series, Catalyst 2948G, and Catalyst 2980G Switches*

- *Layer 3 Services Software Configuration Guide*

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http://www.cisco.com

You can access international Cisco websites at this URL:

http://www.cisco.com/public/countries_languages.shtml

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San Jose, CA 95134-9883

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http://www.cisco.com/techsupport

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http://tools.cisco.com/RPF/register/register.do

Submitting a Service Request

Using the online TAC Service Request Tool is the fastest way to open S3 and S4 service requests. (S3 and S4 service requests are those in which your network is minimally impaired or for which you require product information.) After you describe your situation, the TAC Service Request Tool automatically provides recommended solutions. If your issue is not resolved using the recommended resources, your service request will be assigned to a Cisco TAC engineer. The TAC Service Request Tool is located at this URL:

http://www.cisco.com/techsupport/servicerequest

For S1 or S2 service requests or if you do not have Internet access, contact the Cisco TAC by telephone. (S1 or S2 service requests are those in which your production network is down or severely degraded.) Cisco TAC engineers are assigned immediately to S1 and S2 service requests to help keep your business operations running smoothly.

To open a service request by telephone, use one of the following numbers:

Asia-Pacific: +61 2 8446 7411 (Australia: 1 800 805 227)
EMEA: +32 2 704 55 55
USA: 1 800 553 2447

For a complete list of Cisco TAC contacts, go to this URL:

http://www.cisco.com/techsupport/contacts

Definitions of Service Request Severity

To ensure that all service requests are reported in a standard format, Cisco has established severity definitions.

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Severity 2 (S2)—Operation of an existing network is severely degraded, or significant aspects of your business operation are negatively affected by inadequate performance of Cisco products. You and Cisco will commit full-time resources during normal business hours to resolve the situation.

Severity 3 (S3)—Operational performance of your network is impaired, but most business operations remain functional. You and Cisco will commit resources during normal business hours to restore service to satisfactory levels.

Severity 4 (S4)—You require information or assistance with Cisco product capabilities, installation, or configuration. There is little or no effect on your business operations.

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    http://www.cisco.com/en/US/learning/index.html