



CHAPTER 1

Installing the FlexWAN and Enhanced FlexWAN Modules

This chapter contains the following sections:

- [Preparing to Install the FlexWAN or Enhanced FlexWAN Module, page 1-1](#)
- [Installing the FlexWAN and Enhanced FlexWAN Modules, page 1-3](#)
- [Installing a FlexWAN or Enhanced FlexWAN Module Port Adapter, page 1-6](#)

Preparing to Install the FlexWAN or Enhanced FlexWAN Module



Note

Before you can install the FlexWAN or Enhanced FlexWAN modules, you must install at least one supervisor engine in the chassis. Throughout this publication, the term *supervisor engine* refers to Supervisor 720 Engine.

The following tools and equipment are required to install the FlexWAN and Enhanced FlexWAN modules:

- 3/16-inch flat-blade screwdriver for the captive installation screws on the FlexWAN and Enhanced FlexWAN modules.
- Antistatic mat or antistatic foam.
- Your own electrostatic discharge (ESD)-prevention equipment or the disposable grounding wrist strap included with all upgrade kits, field-replaceable units (FRUs), and spares.

Preventing Electrostatic Discharge Damage

Electrostatic discharge (ESD) damage, which can occur when electronic cards or components are improperly handled, results in complete or intermittent failures. Port adapters and processor 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, use a preventive antistatic strap during handling.

Follow these guidelines for preventing ESD damage:

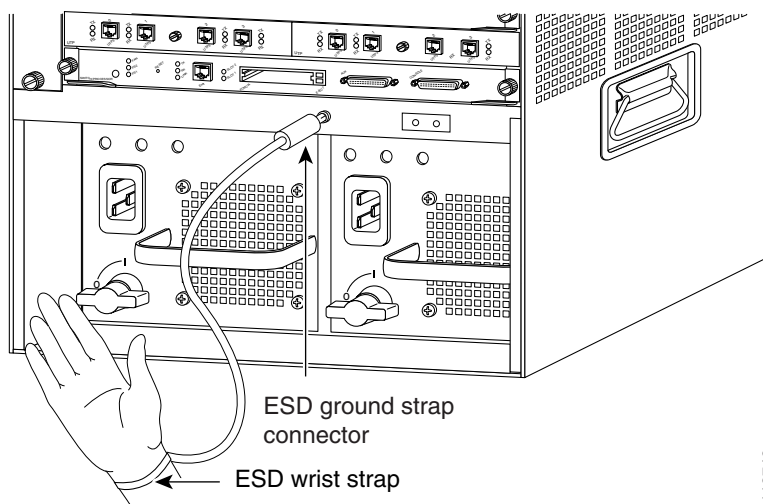
- Always use an ESD wrist or ankle strap, and ensure that it makes maximum contact with the skin. Make sure that the wrist or ankle strap is in contact with bare skin.
- Avoid contact between the printed circuit boards and clothing. The wrist strap only protects components from ESD voltages on the body; ESD voltages on clothing can still cause damage.
- The disposable ESD grounding strap supplied with field replaceable units (FRUs) has a metal clip at one end. Attach the metal clip (equipment end of the strap) to an unfinished (bare metal) chassis surface.
- The Catalyst 7600 series chassis also has a built-in ESD grounding connector. This is a banana plug connector and is identified by the ground symbol next to the connector. See [Figure 1-1](#) for an example of a chassis ESD wrist strap connection.
- When installing a component, use any available ejector levers or captive installation screws to properly seat the bus connectors in the backplane or midplane. These devices prevent accidental removal, provide proper grounding for the system, and help to ensure that bus connectors are properly seated.
- When removing a component, use any available ejector levers or captive installation screws to release the bus connectors from the backplane or midplane.
- 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 megohms (Mohm).

Figure 1-1 Example of Chassis ESD Wrist Strap Ground



Installing the FlexWAN and Enhanced FlexWAN Modules



Warning

Only trained and qualified personnel should be allowed to install or replace this equipment.

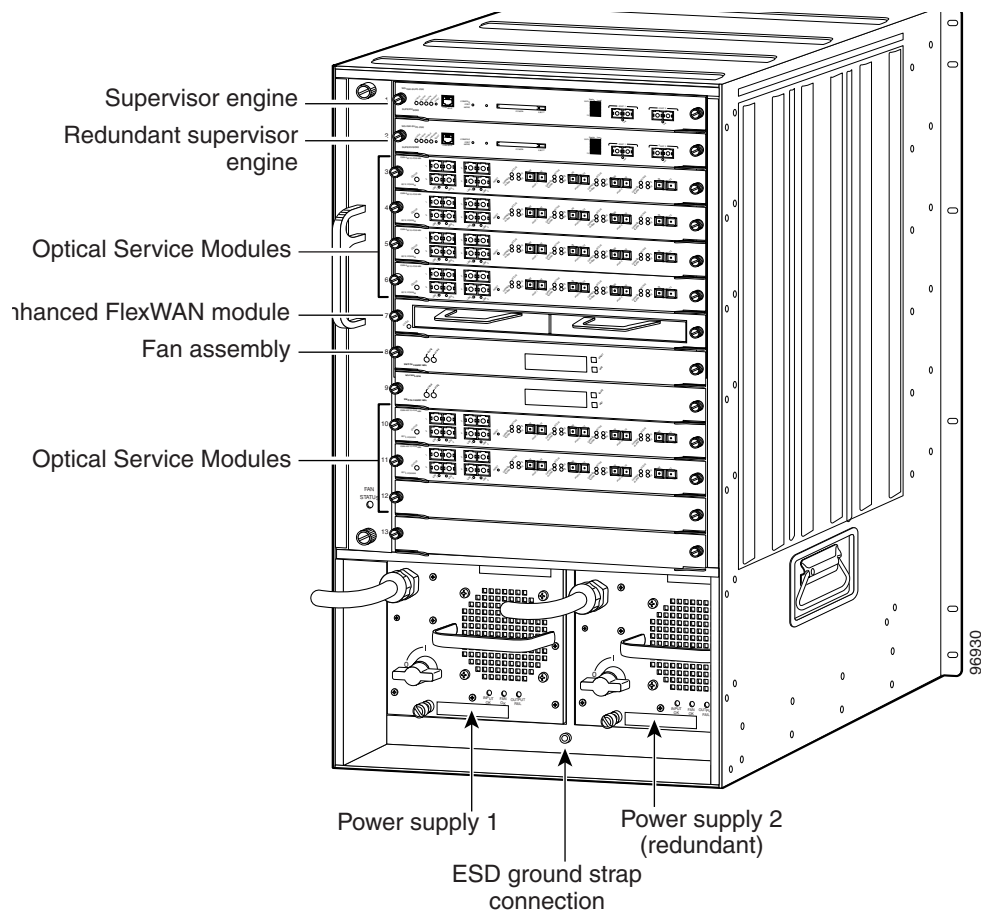
In the procedure that follows, the FlexWAN and Enhanced FlexWAN modules are installed into the horizontal slots of a Cisco 7613 router chassis. (see [Figure 1-2](#)).



Note

The FlexWAN and Enhanced FlexWAN modules are not supported without port adapters. You must install at least one port adapter before installing the module in the chassis.

Figure 1-2 Slots on the Cisco 7613 Router



To install the FlexWAN or Enhanced FlexWAN modules, follow these steps:

Step 1

Make sure that you take the necessary precautions to prevent ESD damage.

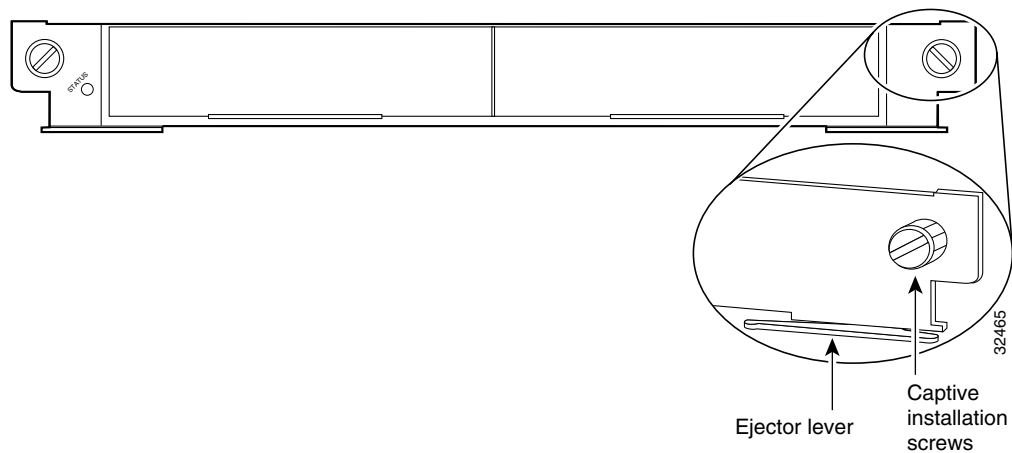


Caution

Handle modules by the carrier edges only. Always use an ESD wrist strap when handling modules or coming into contact with internal components.

- Step 2** Install port adapters on the FlexWAN or Enhanced FlexWAN module (see the “[Installing a FlexWAN or Enhanced FlexWAN Module Port Adapter](#)” section on page 1-6). Tighten any screws provided to secure the port adapter.
- Step 3** Choose a slot for the FlexWAN or Enhanced FlexWAN module.
- Step 4** Use a screwdriver to loosen the captive installation screws that secure the switching-module filler plate (or the existing switching module) from the desired slot, if present.
- Step 5** Remove the switching-module filler plate (or the existing switching module), if present.
- Step 6** Hold the module handle with one hand, and place your other hand under the carrier to support the module. Do not touch the printed circuit boards or connector pins.
- Step 7** Place the module in the slot. Align the notch on the sides of the module carrier with the groove in the slot.
- Step 8** Keep the modules at a 90-degree orientation to the backplane, and carefully slide the module into the slot until the module faceplate contacts the ejector levers (see [Figure 1-3](#)).

Figure 1-3 Ejector Levers and Captive Installation Screws



- Step 9** Use the thumb and forefinger of each hand and simultaneously push in the left and right levers to fully seat the module in the backplane connector.



Caution Always use the ejector levers when installing or removing modules. A module that is partially seated in the backplane causes the system to halt and subsequently crash.

- Step 10** Tighten the captive installation screws on the left and right ends of the module.
- Step 11** Enter the **show module** command to verify that the system acknowledges the new module and has brought it online.

The following example shows the output of the **show module** command:

```

Router# show module

Mod Ports Card Type                               Model                               Serial No.
-----
  5     2 Supervisor Engine 720 (Active)         WS-SUP720-BASE                     SAD0719027M
  6     0 2 port adapter Enhanced FlexWAN        WS-X6582-2PA                       SAD073103PD

Mod MAC addresses                               Hw   Fw           Sw           Status
-----
  5  000c.ce63.e290 to 000c.ce63.e293          2.1  7.7(1)       12.2(TETONS_ Ok
  6  00e0.aabb.cc00 to 00e0.aabb.cc3f          1.x  12.2(TETONS_ 12.2(TETONS_ Ok

Mod Sub-Module                               Model                               Serial                               Hw   Status
-----
  5 Policy Feature Card 3                     WS-F6K-PFC3A                       SAD072000G6                       1.1  Ok
  5 MSFC3 Daughterboard                      WS-SUP720                           SAD072001YS                       1.2  Ok

Mod Online Diag Status
-----
  5 Pass
  6 Pass
-----

```

**Note**

The *status* field in the output of the **show module** command indicates by “Ok” that the module is operational.

The **show module** command displays “Ok” status and “Mod Online Diag Status” only after the FlexWAN or Enhanced FlexWAN module has booted completely. While the FlexWAN or Enhanced FlexWAN module is booting (the STATUS LED is orange or red), the “Ok” status and the “Mod Online Diag Status” is unknown.

Step 12 After you install the FlexWAN or Enhanced FlexWAN modules, you must connect the port adapter cables and configure the port adapter interfaces.

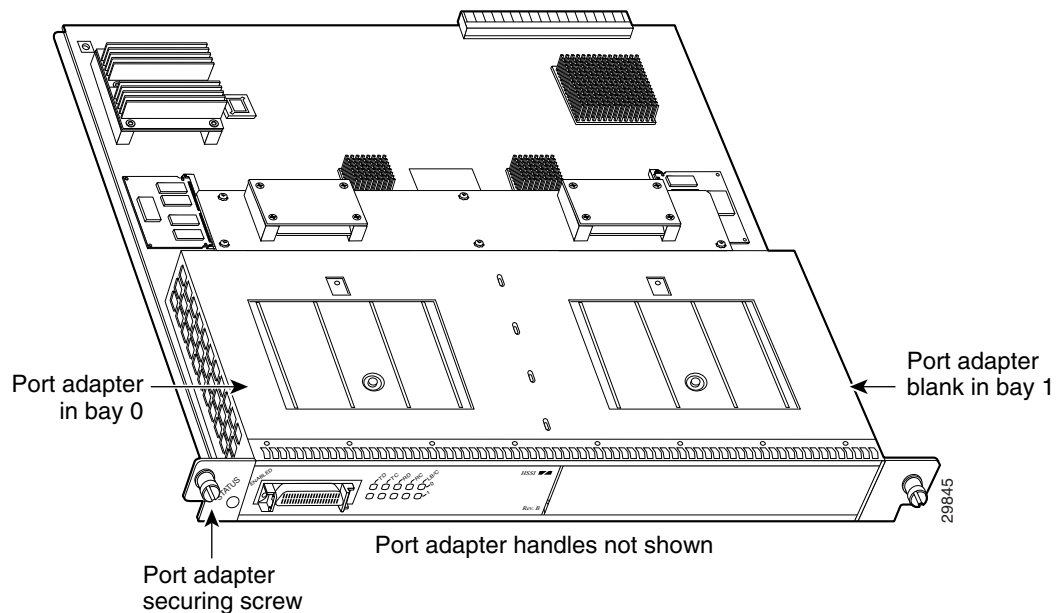
For complete cabling and configuration information for the port adapters, refer to the documentation that shipped with your port adapter.

Installing a FlexWAN or Enhanced FlexWAN Module Port Adapter

This section describes how to install a port adapter in the FlexWAN or Enhanced FlexWAN module in the Catalyst 6500 series switches or Cisco 7600 series routers.

You can install port adapters in either port adapter bay 0 or port adapter bay 1. [Figure 1-4](#) shows one PA-H port adapter installed in port adapter bay 0 on a FlexWAN or Enhanced FlexWAN module.

Figure 1-4 Port Adapter Installed in Bay 0



Required Tools and Equipment

You need the following tools and equipment to install a port adapter. If you need additional equipment, contact a service representative for ordering information.

- Any specific cables for your port adapter
- Number 2 Phillips screwdriver
- Your own electrostatic discharge (ESD)-prevention equipment or the disposable grounding wrist strap included with all upgrade kits, field-replaceable units (FRUs), and spares
- Antistatic mat
- Antistatic container

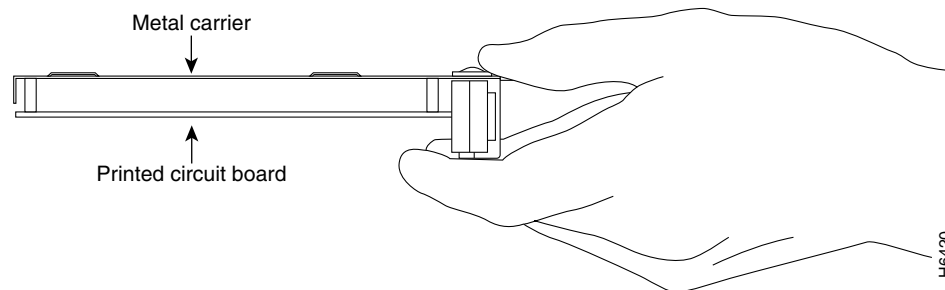
Handling Port Adapters

Each port adapter circuit board is mounted to a metal carrier and is sensitive to electrostatic discharge (ESD) damage.

**Caution**

Always handle the port adapter by the carrier edges and handle. Never touch the port adapter's components or connector pins.

Figure 1-5 Handling a Port Adapter

**Caution**

To prevent system problems, do not remove port adapters from the FlexWAN or Enhanced FlexWAN modules or attempt to install other port adapters on the modules when the module is operating.

Replacing Port Adapters

Although the FlexWAN or Enhanced FlexWAN module supports online insertion and removal, individual port adapters do not. To replace port adapters, you must first remove the module from the chassis, and then install or replace the port adapters as required.

When a Port Adapter Is Not in Use

When a port adapter slot is not in use, a blank port adapter must fill the empty slot to allow the router or switch to conform to electromagnetic interference (EMI) emissions requirements and to allow proper airflow across the port adapters.

If there is a blank port adapter on the FlexWAN or Enhanced FlexWAN module in which you want to install a new port adapter, you must first remove the module from the chassis, and then remove the blank port adapter.

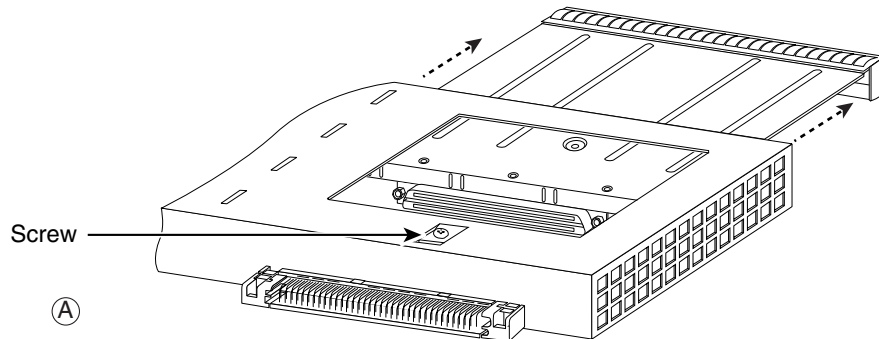
Installing a New Port Adapter in an Enhanced FlexWAN Module

This section describes how to first remove a port adapter from an Enhanced FlexWAN module, then how to install a new port adapter into its bay. (The procedure for the FlexWAN module is similar.)

Note: You must first remove the Enhanced FlexWAN Module from the chassis before removing a port adapter from the Enhanced FlexWAN Module.

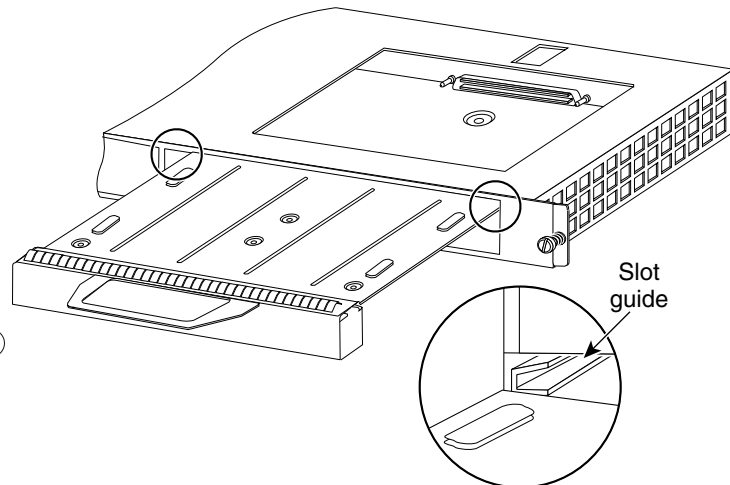
Step 1

To remove the port adapter, remove the screw that secures the port adapter (or blank port adapter). (See A.)



Step 2

With the screw removed, grasp the handle on the front of the port adapter (or blank port adapter) and carefully pull it out of its bay, away from the edge connector at the rear of the bay. (See A.)



Step 3

To install the port adapter, carefully align the port adapter carrier between the upper and the lower edges of the port adapter bay. (See B.)

Step 4

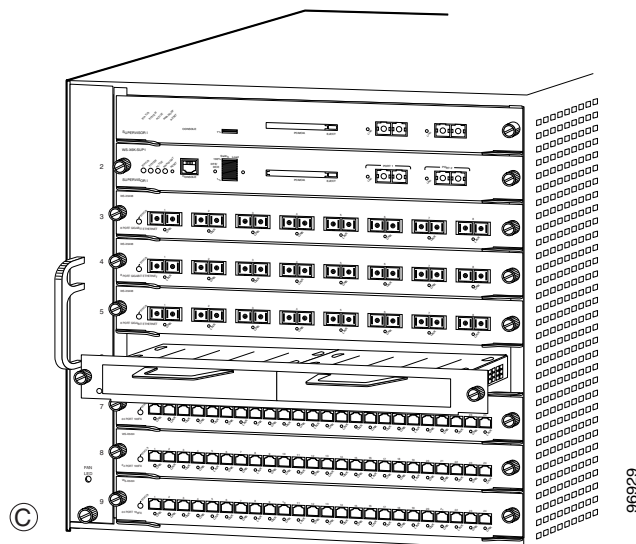
Carefully slide the new port adapter into the port adapter bay until the connector on the port adapter is completely seated in the connector at the rear of the port adapter slot. (See B.)

Step 5

Install the screw in the rear of the port adapter bay. Do not overtighten the screw. (See A.)

Step 6

Reinstall the Enhanced FlexWAN Module in the chassis, and tighten the captive installation screw on each side of the Enhanced FlexWAN Module faceplate. (See C.)



Warnings and Cautions

Observe the following warnings and cautions when installing or removing port adapters.

**Caution**

Do not slide a port adapter all the way into the slot until you have connected all the required cables.

**Caution**

To prevent jamming the carrier between the upper and the lower edges of the port adapter slot, and to ensure that the edge connector at the rear of the port adapter mates with the connection at the rear of the port adapter slot, make certain that the carrier is positioned correctly.

**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.

**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.

**Warning**

This equipment must be installed and maintained by service personnel as defined by AS/NZS 3260. Incorrectly connecting this equipment to a general-purpose outlet could be hazardous. The telecommunications lines must be disconnected 1) before unplugging the main power connector or 2) while the housing is open, or both.

