



Removing and Installing Port Adapters

This chapter describes how to remove the PA-12E/2FE port adapter from supported platforms and also how to install a new or replacement port adapter. This chapter contains the following sections:

- [Handling Port Adapters, page 3-1](#)
- [Online Insertion and Removal, page 3-2](#)
- [Warnings and Cautions, page 3-3](#)
- [Port Adapter Slot Divider, page 3-3](#)
- [Port Adapter Removal and Installation, page 3-5](#)
- [Connecting a Port Adapter Interface Cable, page 3-9](#)

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



Note

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 you plan to install a new port adapter in a slot that is not in use, you must first remove the blank port adapter.



Caution

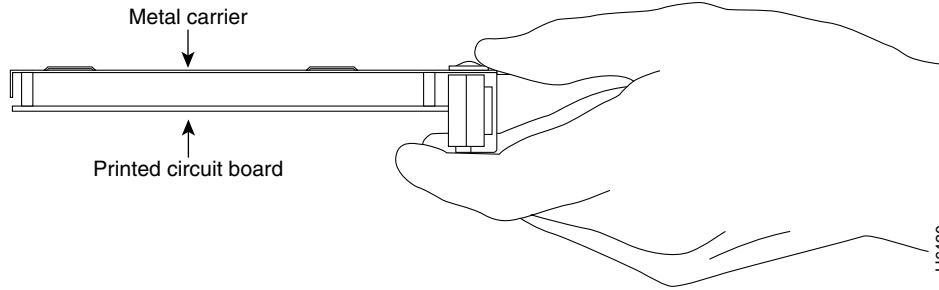
When powering off the router, wait a minimum of 30 seconds before powering it on again.

Handling Port Adapters



Caution

Always handle the port adapter by the carrier edges and handle; never touch the port adapter components or connector pins. (See [Figure 3-1](#).)

Figure 3-1 Handling a Port Adapter

Online Insertion and Removal

Several platforms support online insertion and removal (OIR) of port adapters; therefore, you do not have to power down routers when removing and replacing a PA-12E/2FE on a Cisco 7200 series or Cisco uBR7246 series router.

It is wise to gracefully shut down the system before removing a port adapter that has active traffic moving through it. Removing a module while traffic is flowing through the ports can cause system disruption. Once the module is inserted, the ports can be brought back up.



Note

As you disengage the module from the router or switch, online insertion and removal (OIR) administratively shuts down all active interfaces in the module.

OIR allows you to install and replace modules while the router is operating; you do not need to notify the software or shut down the system power, although you should not run traffic through the module you are removing while it is being removed. OIR is a method that is seamless to end users on the network, maintains all routing information, and preserves sessions.

The following is a functional description of OIR for background information only; for specific procedures for installing and replacing a module in a supported platform, refer to the [“Port Adapter Removal and Installation”](#) section on page 3-5.

Each module has a bus connector that connects it to the router. The connector has a set of tiered pins in three lengths that send specific signals to the system as they make contact with the module. The system assesses the signals it receives and the order in which it receives them to determine if a module is being removed from or introduced to the system. From these signals, the system determines whether to reinitialize a new interface or to shut down a disconnected interface.

Specifically, when you insert a module, the longest pins make contact with the module first, and the shortest pins make contact last. The system recognizes the signals and the sequence in which it receives them.

When you remove or insert a module, the pins send signals to notify the system of changes. The router then performs the following procedure:

1. Rapidly scans the system for configuration changes.
2. Initializes newly inserted port adapters or administratively shuts down any vacant interfaces.
3. Brings all previously configured interfaces on the module back to their previously installed state. Any newly inserted interface is put in the administratively shutdown state, as if it was present (but not configured) at boot time. If a similar module type is reinserted into a slot, its ports are configured and brought online up to the port count of the originally installed module of that type.

**Note**

Before you begin installation, read [Chapter 2, “Preparing for Installation,”](#) for a list of parts and tools required for installation.

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 required cables. Trying to do so disrupts normal operation of the router or switch.

**Note**

If a port adapter lever or other retaining mechanism does not move to the locked position, the port adapter is not completely seated in the midplane. Carefully pull the port adapter halfway out of the slot, reinsert it, and move the port adapter lever or other mechanism to the locked position.

**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, as shown in the cutaway in the following illustrations.

**Warning**

When performing the following procedures, wear a grounding wrist strap to avoid ESD damage to the card. Some platforms have an ESD connector for attaching the wrist strap. Do not directly touch the midplane or backplane with your hand or any metal tool, or you could shock yourself.

Port Adapter Slot Divider

If you are installing a dual-width port adapter in a Cisco 7200 series router or a Cisco uBR7246 router that has two single-width port adapters installed, then you need to perform the following procedure.

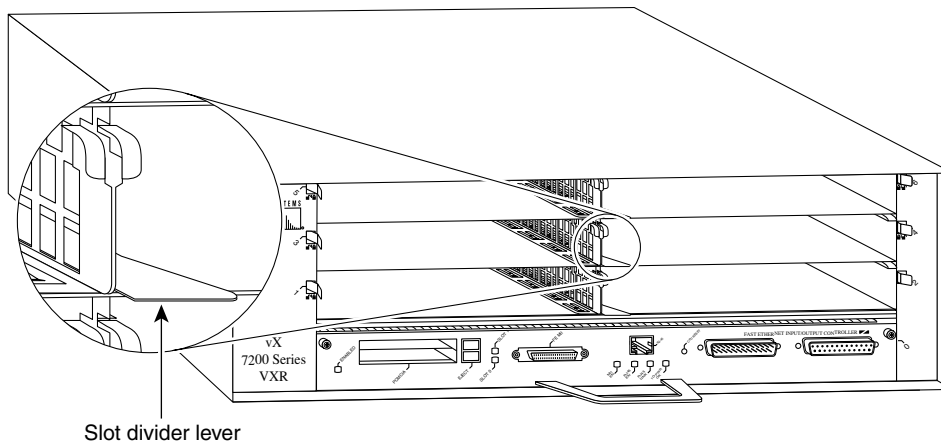
Cisco 7200 Series and Cisco uBR7246—Removing the Slot Divider

Step 1

Remove installed single-width port adapters from the slots on both sides of the port adapter slot divider.

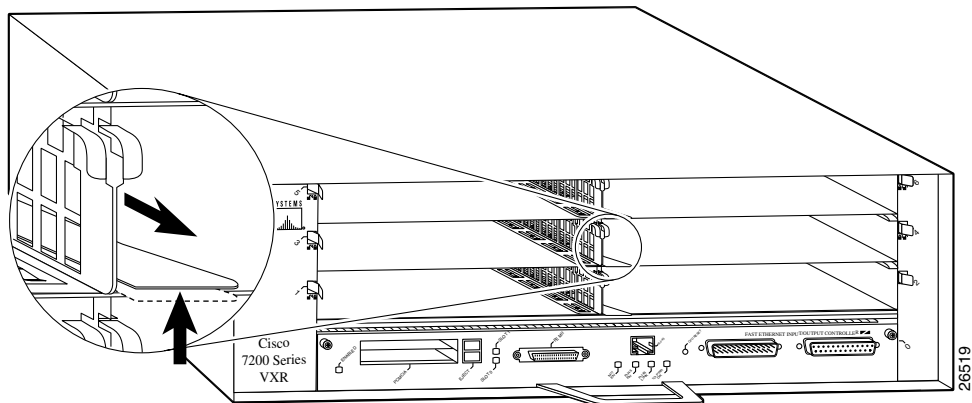
Step 2

With one hand, raise the slot divider lever to unlock the slot divider from the chassis.



Step 3

With the slot divider lever still raised, use your other hand to pull the slot divider from the chassis.



Step 4

Store the slot divider in a location where you can retrieve it for use later.

Port Adapter Removal and Installation

In this section, the illustrations that follow give step-by-step instruction on how to remove and install port adapters. This section contains the following illustrations:

- [Cisco 7200 Series—Removing and Installing a Port Adapter, page 3-6](#)
- [Cisco uBR7200 Series—Removing a Port Adapter, page 3-7](#)
- [Cisco uBR7200 Series—Installing a Port Adapter, page 3-8](#)

Cisco 7200 Series—Removing and Installing a Port Adapter

Step 1

To remove the port adapter, place the port adapter lever in the unlocked position. (See A.) The port adapter lever remains in the unlocked position.

Step 2

Grasp the handle of the port adapter and pull the port adapter from the router, about halfway out of its slot. If you are removing a blank port adapter, pull the blank port adapter completely out of the chassis slot.

Step 3

With the port adapter halfway out of the slot, disconnect all cables from the port adapter. After disconnecting the cables, pull the port adapter from its chassis slot.

Step 4

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

Step 5

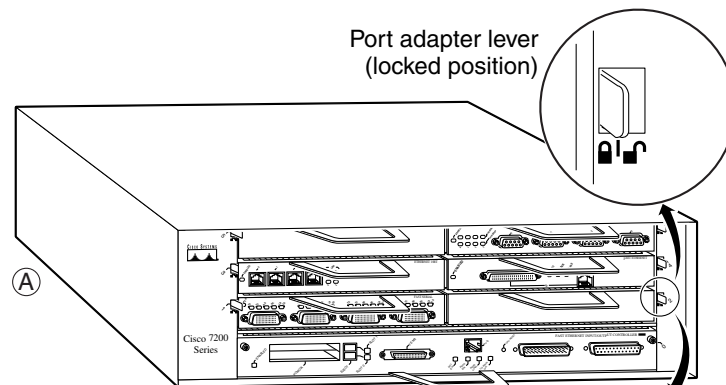
Carefully slide the new port adapter halfway into the port adapter slot. (See B.)

Step 6

With the port adapter halfway into the slot, connect all required cables to the port adapter. After connecting all required cables, carefully slide the port adapter all the way into the slot until the port adapter is seated in the router midplane.

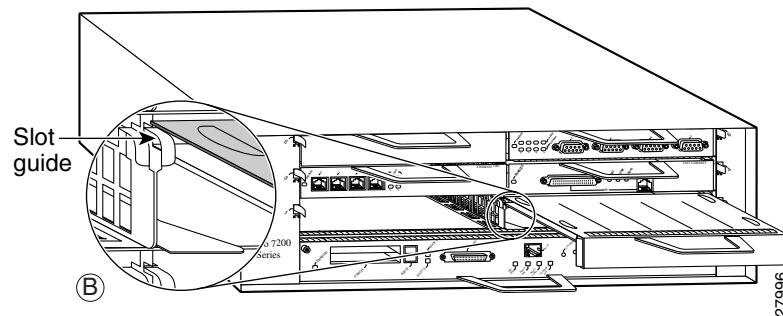
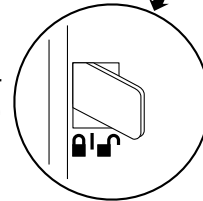
Step 7

After the port adapter is properly seated, lock the port adapter lever. (See A.)



Note: This adapter removal applies to any port or service adapter.

Port adapter lever (unlocked position)

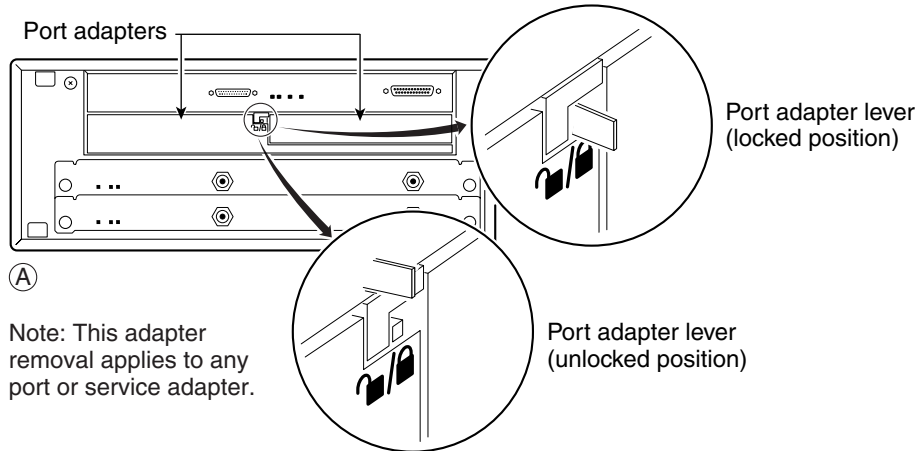


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Cisco uBR7200 Series—Removing a Port Adapter

Step 1

To remove the port adapter, unlock the port adapter retaining mechanism. The port adapter lever remains in the unlocked position.



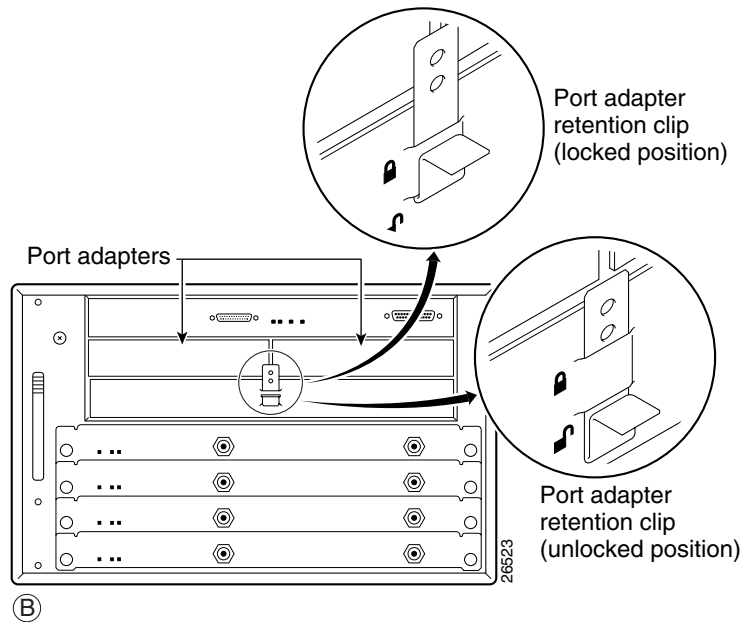
Place the port adapter lever (Cisco uBR7223, see A), or the port adapter retention clip (Cisco uBR7246 and Cisco uBR7246 VXR, see B) in the unlocked position. Either mechanism remains in the unlocked position.

Step 2

Grasp the handle of the port adapter and pull the port adapter from the router, about halfway out of its slot. If you are removing a blank port adapter, pull the blank port adapter completely out of the chassis slot.

Step 3

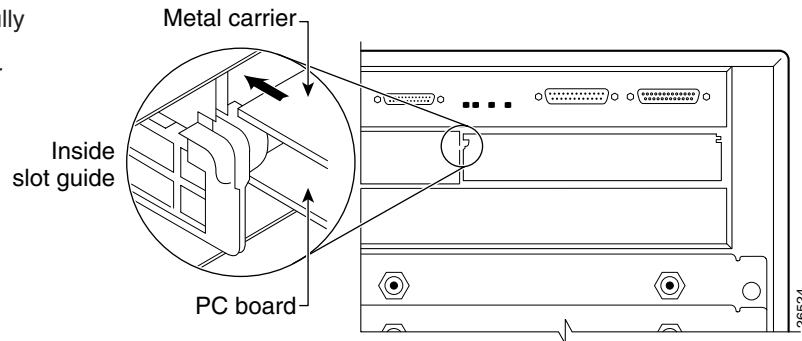
With the port adapter halfway out of the slot, disconnect all cables from the port adapter. After disconnecting the cables, pull the port adapter from its chassis slot.



Cisco uBR7200 Series—Installing a Port Adapter

Step 1

To insert the port adapter, carefully align the port adapter carrier between the upper and the lower edges of the port adapter slot.



Step 2

Carefully slide the new port adapter halfway into the port adapter slot.

Step 3

With the port adapter halfway into the slot, connect all required cables to the port adapter. After connecting all required cables, carefully slide the port adapter all the way into the slot until the port adapter is seated in the router midplane.

Step 4

After the port adapter is properly seated, lock the port adapter lever or retention clip, depending on your system. (See illustration on preceding page.)

Connecting a Port Adapter Interface Cable

On a single PA-12E/2FE, you can use up to 14 RJ-45 connections. (Category 3 and Category 5 UTP cables are not available from Cisco Systems; they are available from commercial cable vendors.)


Note

Use Category 3 unshielded twisted-pair (UTP) crossover cables when connecting 10-Mbps 12E/2FE interfaces (port 2 through port 13) to a hub. Use Category 3 UTP straight-through cables when connecting 10-Mbps 12E/2FE interfaces to an end station.

Use Category 5 UTP crossover cables when connecting 10/100-Mbps 12E/2FE interfaces (port 0 and port 1) to a hub. Use Category 5 UTP straight-through cables when connecting 10/100-Mbps 12E/2FE interfaces to an end station.

The 12E/2FE interfaces do not support VLAN trunking.

To connect an RJ-45 cable to the PA-12E/2FE, follow these steps:

Step 1

Attach the cable directly to the RJ-45 port on the PA-12E/2FE port adapter. (See [Figure 3-2](#).)

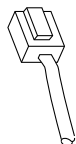
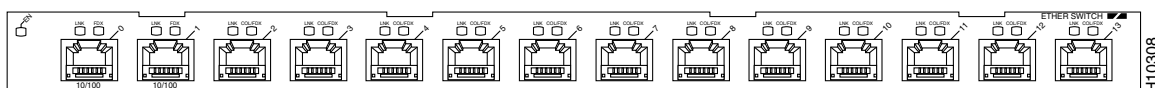
The PA-2E/2FE functions as a repeater or hub, and its interfaces connect to an end station or DTE.


Note

Port adapters have a handle attached, but this handle is not shown to allow a full detailed view of the faceplate.

When attaching the cable receptacle on the PA-12E/2FE, use the cable-management bracket that shipped with your router for extra strain relief.

Figure 3-2 Connecting 12E/2FE RJ-45 Cables



RJ-45 cable (up to 14)

To end station or DTE

Step 2

Attach the network end of your RJ-45 cable to your end station or DTE.

This completes the process for attaching 12E/2FE port adapter interface cables. Proceed to [Chapter 4](#), “Configuring the PA-12E/2FE.”

