



CHAPTER 4

Installing and Removing a SIP

This chapter describes how to install or remove SIPs on the Cisco 7600 series routers. This chapter contains the following sections:

- [Handling SIPs, page 4-1](#)
- [Online Insertion and Removal, page 4-2](#)
- [SIP Installation and Removal, page 4-8](#)

Handling SIPs

Each SIP circuit board is mounted to a metal carrier and is sensitive to electrostatic discharge (ESD) damage. Before you begin installation, read [Chapter 4, “Preparing to Install a SIP or a Shared Port Adapter,”](#) for a list of parts and tools required for installation.

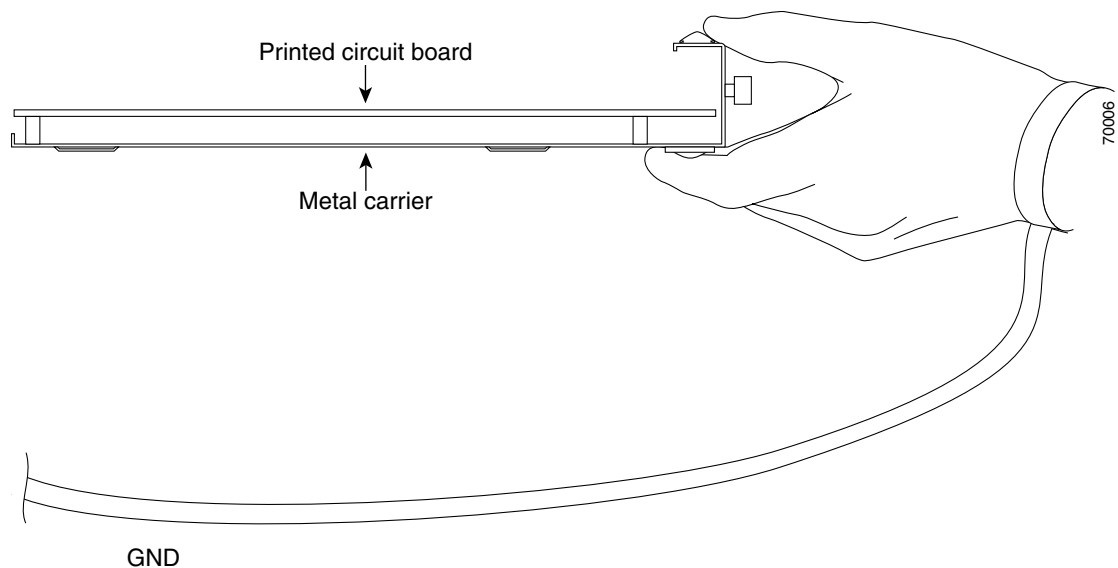


Caution

Always handle the SIP by the carrier edges and handle; never touch the SIP components or connector pins. (See [Figure 4-1.](#))

When a slot is not in use, a blank filler plate must be installed in the empty slot to allow the router or switch to conform to electromagnetic interference (EMI) emissions requirements and to allow proper airflow across the installed modules. If you plan to install a SIP in a slot that is not in use, you must first remove the blank filler plate.

Figure 4-1 Handling a SIP



Online Insertion and Removal

The Cisco 7600 series router supports online insertion and removal (OIR) of the SPA interface processor (SIP) or SPA services card (SSC), in addition to each of the shared port adapters (SPAs). Therefore, you can remove a SIP or SSC with its SPAs still intact, or you can remove a SPA independently from the SIP or SSC, leaving the SIP or SSC installed in the router.

This section includes the following topics on OIR support:

- [Preparing for Online Removal of a SIP or SSC, page 4-2](#)
- [Verifying Deactivation and Activation of a SIP or SSC, page 4-3](#)
- [Preparing for Online Removal of a SPA, page 4-4](#)
- [Verifying Deactivation and Activation of a SPA, page 4-6](#)
- [Deactivation and Activation Configuration Examples, page 4-6](#)



Note

For simplicity, any reference to “SIP” in this section also applies to the SSC.

Preparing for Online Removal of a SIP or SSC

The Cisco 7600 series router supports OIR of the SIP and the SSC. To do this, you can power down a SIP (which automatically deactivates any installed SPAs) and remove the SIP with the SPAs still intact.

Although graceful deactivation of a SIP is preferred using the **no power enable module** command, the Cisco 7600 series router does support removal of the SIP without deactivating it first. If you plan to remove a SIP, you can deactivate the SIP first, using the **no power enable module** global configuration command. When you deactivate a SIP using this command, it automatically deactivates each of the SPAs that are installed in that SIP. Therefore, it is not necessary to deactivate each of the SPAs prior to deactivating the SIP.

Either a blank filler plate or a functional SPA should reside in every subslot of a SIP during normal operation.

For more information about the recommended procedures for physical removal of the SIP, refer to the Cisco 7600 Series Router SIP, SSC, and SPA Hardware Installation Guide.

Deactivating a SIP or SSC

To deactivate a SIP or SSC and its installed SPAs prior to removal of the SIP, use the following command in global configuration mode:

Command	Purpose
Router(config)# no power enable module <i>slot</i>	Shuts down any installed interfaces, and deactivates the SIP in the specified slot, where: <ul style="list-style-type: none"> <i>slot</i>—Specifies the chassis slot number where the SIP is installed.

For more information about chassis slot numbering, refer to the “Identifying Slots and Subslots for SIPs, SSCs, and SPAs” section in this guide.

Reactivating a SIP or SSC

Once you deactivate a SIP or SSC, whether or not you have performed an OIR, you must use the **power enable module** global configuration command to reactivate the SIP.

If you did not issue a command to deactivate the SPAs installed in a SIP, but you did deactivate the SIP using the **no power enable module** command, then you do not need to reactivate the SPAs after an OIR of the SIP. The installed SPAs automatically reactivate upon reactivation of the SIP in the router.

For example, consider the case where you remove a SIP from the router to replace it with another SIP. You reinstall the same SPAs into the new SIP. When you enter the **power enable module** command on the router, the SPAs will automatically reactivate with the new SIP.

To activate a SIP and its installed SPAs after the SIP has been deactivated, use the following command in global configuration mode:

Command	Purpose
Router(config)# power enable module <i>slot</i>	Activates the SIP in the specified slot and its installed SPAs, where: <ul style="list-style-type: none"> <i>slot</i>—Specifies the chassis slot number where the SIP is installed.

For more information about chassis slot numbering, refer to the “Identifying Slots and Subslots for SIPs, SSCs, and SPAs” section in this guide.

Verifying Deactivation and Activation of a SIP or SSC

To verify the deactivation of a SIP or SSC, enter the **show module** command in privileged EXEC configuration mode. Observe the Status field associated with the SIP that you want to verify.

The following example shows that the Cisco 7600 SIP-400 located in slot 13 is deactivated. This is indicated by its “PwrDown” status.

```
Router# show module 13
Mod Ports Card Type                               Model                               Serial No.
-----
13      0 4-subslot SPA Interface Processor-400 7600-SIP-400                       JAB0851042X

Mod MAC addresses                               Hw   Fw           Sw           Status
-----
13  00e0.aabb.cc00 to 00e0.aabb.cc3f  0.525 12.2 (PP_SPL_ 12.2 (PP_SPL_ Ok

Mod Online Diag Status
-----
13 PwrDown
```

To verify activation and proper operation of a SIP, enter the **show module** command and observe “Ok” in the Status field as shown in the following example:

```
Router# show module 2
Mod Ports Card Type                               Model                               Serial No.
-----
2       0 4-subslot SPA Interface Processor-200 7600-SIP-200                       JAB074905S1

Mod MAC addresses                               Hw   Fw           Sw           Status
-----
2  0000.0000.0000 to 0000.0000.003f  0.232 12.2 (2004082 12.2 (2004082 Ok

Mod Online Diag Status
-----
2 Pass
```

Preparing for Online Removal of a SPA

The Cisco 7600 series router supports OIR of a SPA independently of removing the SIP or SSC. This means that a SIP can remain installed in the router with one SPA remaining active, while you remove another SPA from one of the SIP subslots. If you are not planning to immediately replace a SPA into the SIP, then be sure to install a blank filler plate in the subslot. The SIP should always be fully installed with either functional SPAs or blank filler plates.

The interface configuration is retained (recalled) if a SIP or SPA is removed and then replaced with one of the same type. This is not the case if you replace a Cisco 7600 SIP-200 with a Cisco 7600 SIP-400 or vice versa.

If you are planning to remove a SIP along with its SPAs, then you do not need to follow the instructions in this section. To remove a SIP, see the [“Preparing for Online Removal of a SIP or SSC”](#) section on page 4-2.

Deactivating a SPA

Although graceful deactivation of a SPA is preferred using the **hw-module subslot shutdown** command, the Cisco 7600 series router does support removal of the SPA without deactivating it first. Before deactivating a SPA, ensure that the SIP is seated securely into the slot before pulling out the SPA itself.

**Note**

If you are preparing for an OIR of a SPA, it is not necessary to independently shut down each of the interfaces prior to deactivation of the SPA. The **hw-module subslot shutdown** command automatically stops traffic on the interfaces and deactivates them along with the SPA in preparation for OIR. In similar fashion, you do not need to independently restart any interfaces on a SPA after OIR of a SPA or SIP.

To deactivate a SPA and all of its interfaces prior to removal of the SPA, use the following command in global configuration mode:

Command	Purpose
Router(config)# hw-module subslot slot/subslot shutdown [powered unpowered]	Deactivates the SPA in the specified slot and subslot of the SIP, where: <ul style="list-style-type: none"> • <i>slot</i>—Specifies the chassis slot number where the SIP is installed. • <i>subslot</i>—Specifies subslot number on a SIP where a SPA is installed. • powered—(Optional) Shuts down the SPA and all of its interfaces, and leaves them in an administratively down state with power enabled. This is the default state. • unpowered—(Optional) Shuts down the SPA and all of its interfaces, and leaves them in an administratively down state without power.

For more information about chassis slot and SIP subslot numbering, refer to the “Identifying Slots and Subslots for SIPs, SSCs, and SPAs” section in this guide.

Reactivating a SPA

**Note**

You do not need to reactivate a SPA after an OIR of either the SIP or a SPA if you did not deactivate the SPA prior to removal. If the router is running, then the SPAs automatically start upon insertion into the SIP or with insertion of a SIP into the router.

If you deactivate a SPA using the **hw-module subslot shutdown** global configuration command and need to reactivate it without performing an OIR, you need to use the **no hw-module subslot shutdown** global configuration command to reactivate the SPA and its interfaces.

To activate a SPA and its interfaces after the SPA has been deactivated, use the following command in global configuration mode:

Command	Purpose
Router(config)# no hw-module subslot slot/subslot shutdown	<p>Activates the SPA and its interfaces in the specified slot and subslot of the SIP, where:</p> <ul style="list-style-type: none"> <i>slot</i>—Specifies the chassis slot number where the SIP is installed. <i>subslot</i>—Specifies subslot number on a SIP where a SPA is installed.

Verifying Deactivation and Activation of a SPA

When you deactivate a SPA, the corresponding interfaces are also deactivated. This means that these interfaces will no longer appear in the output of the **show interface** command.

To verify the deactivation of a SPA, enter the **show hw-module subslot all oir** command in privileged EXEC configuration mode. Observe the Operational Status field associated with the SPA that you want to verify.

In the following example, the SPA located in subslot 1 of the SIP in slot 2 of the router is administratively down from the **hw-module subslot shutdown** command:

```
Router# show hw-module subslot all oir
Module           Model                Operational Status
-----
subslot 2/0      SPA-4XOC3-POS        ok
subslot 2/1      SPA-4XOC3-ATM        admin down
```

To verify activation and proper operation of a SPA, enter the **show hw-module subslot all oir** command and observe “ok” in the Operational Status field as shown in the following example:

```
Router# show hw-module subslot all oir
Module           Model                Operational Status
-----
subslot 2/0      SPA-4XOC3-POS        ok
subslot 2/1      SPA-4XOC3-ATM        ok
```

Deactivation and Activation Configuration Examples

This section provides the following examples of deactivating and activating SIPs and SPAs:

- [Deactivation of a SIP Configuration Example, page 4-7](#)
- [Activation of a SIP Configuration Example, page 4-7](#)
- [Deactivation of a SPA Configuration Example, page 4-7](#)
- [Activation of a SPA Configuration Example, page 4-7](#)

Deactivation of a SIP Configuration Example

Deactivate a SIP when you want to perform OIR of the SIP. The following example deactivates the SIP that is installed in slot 5 of the router, its SPAs, and all of the interfaces. The corresponding console messages are shown:

```
Router# configure terminal
Router(config)# no power enable module 5
1w4d: %OIR-6-REMCARD: Card removed from slot 5, interfaces disabled
1w4d: %C6KPWR-SP-4-DISABLED: power to module in slot 5 set off (admin request)
```

Activation of a SIP Configuration Example

Activate a SIP if you have previously deactivated it. If you did not deactivate the SPAs, the SPAs automatically reactivate with reactivation of the SIP.

The following example activates the SIP that is installed in slot 5 of the router, its SPA, and all of the interfaces (as long as the **hw-module subslot shutdown** command was not issued to also deactivate the SPA):

```
Router# configure terminal
Router(config)# power enable module 5
```

Notice that there are no corresponding console messages shown with activation. If you re-enter the **power enable module** command, a message is displayed indicating that the module is already enabled:

```
Router(config)# power enable module 5
% module is already enabled
```

Deactivation of a SPA Configuration Example

Deactivate a SPA when you want to perform OIR of that SPA. The following example deactivates the SPA (and its interfaces) that is installed in subslot 0 of the SIP located in slot 2 of the router and removes power to the SPA. Notice that no corresponding console messages are shown:

```
Router# configure terminal
Router(config)# hw-module subslot 2/0 shutdown unpowered
```

Activation of a SPA Configuration Example

Activate a SPA if you have previously deactivated it. If you have not deactivated a SPA and its interfaces during OIR of a SIP, then the SPA is automatically reactivated upon reactivation of the SIP.

The following example activates the SPA that is installed in slot 2 of the router and all of its interfaces.

```
Router# configure terminal
Router(config)# no hw-module subslot 2/0 shutdown
Router#
```

SIP Installation and Removal

This section provides step-by-step instructions for installing and removing a SIP.



Note

To ensure compliance with electromagnetic interference (EMI) approvals by providing a tight EMI-preventive seal for the Cisco 7600 series routers, we recommend that you first install SIPs in the slots closest to the supervisor engine slots, and then work out to the slots furthest from the supervisor engine slots.



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 and remove a SIP, refer to [Figure 4-2](#) and do the following:

- Step 1** To insert the SIP, carefully align the edges of the SIP between the upper and lower edges of the module slot, as shown in C of [Figure 4-2](#).
- Step 2** Carefully slide the SIP halfway into the module slot and connect all cables to the SPA.
- Step 3** With the cables connected, carefully slide the SIP into the module slot until the SIP makes contact with the backplane.



Note

The SIP ejector levers must be positioned at a 45-degree angle before the SIP makes contact with the backplane.

- Step 4** Push the SIP ejector levers in until the SIP is fully seated in the router backplane.



Note

When the router chassis is fully populated, seating a SIP can be difficult. To properly seat the SIP and avoid physical damage, loosen the locking thumbscrews on the neighboring SIPs or line cards.



Caution

Use of excessive force can damage the router or SIP.

- Step 5** Tighten the locking thumbscrews on both sides of the SIP to a torque of between 8.3 and 11 inch-pounds (94 to 124 N-cm). Do not overtighten.
- Step 6** To remove the SIP, loosen the locking thumbscrews on both sides of the SIP, as shown in A of [Figure 4-2](#).
- Step 7** Pull out the SIP ejector levers, as shown in B of [Figure 4-2](#), and carefully slide the SIP halfway out of the module slot. If you are removing a blank filler plate, pull the blank filler plate completely out of the module slot.
- Step 8** With the SIP halfway out of the module slot, disconnect all cables from the SPA. After disconnecting the cables, pull the SIP out of the module slot.

Figure 4-2 illustrates how to install and remove a SIP in a Cisco 7600 series router.

Figure 4-2 SIP Installation and Removal

