Connecting the Cisco SM-X-PVDM Module

First Published: September 2015

The Cisco SM-X-PVDM module provides DSP for IP-based voice applications. This document describes how to install the module on the Cisco ISR 4300 and Cisco ISR 4400 Series Routers.
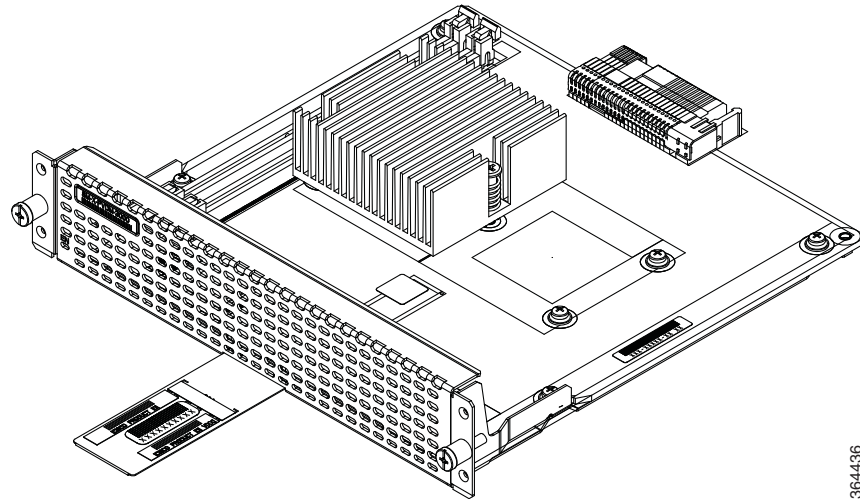
Contents

This guide contains the following sections:

About the Cisco SM-X-PVDM Module

The Cisco Service Module Packet Voice Digital Signal Processor Module (SM-X-PVDM) enables Cisco 4300 and Cisco 4400 Series Integrated Services Routers (ISRs) to provide rich-media capabilities, such as high-density voice connectivity, conferencing, transcoding, media optimization, transrating, and secure voice in Cisco Unified Communications Solutions.

Figure 1   Cisco SM-X-PVDM Service Module

The packet voice digital-signal-processor (DSP) service modules are available in four models, reflecting different channel capacities:

- SM-X-PVDM-500 (500 channels)

- SM-X-PVDM-1000 (1000 channels)

- SM-X-PVDM-2000 (2000 channels)

- SM-X-PVDM-3000 (3000 channels)

Figure 2 on page 2 shows the faceplate of the module, including the LED status indicator.

Service Module LEDs

The Cisco SM-X-PVDM service module includes a single indicator LED. The following figure shows the location of the LED; Table 1 on page 3 describes how the LED indicates the status of the module.

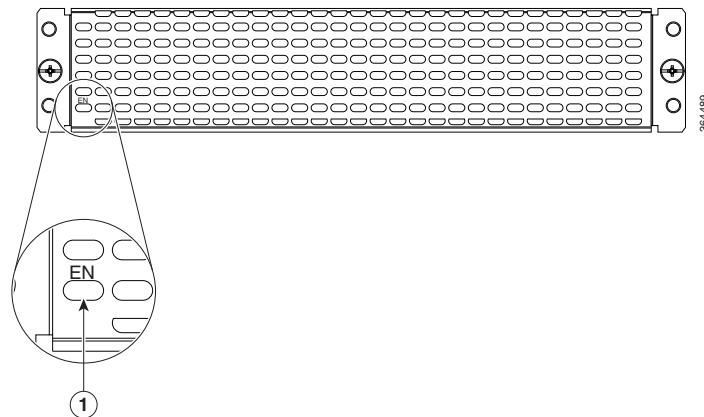**Figure 2   Cisco SM-X-PVDM "EN" LED**

Table 1   Cisco SM-X-PVDM LED Indicator

LED	Color	Description
EN	Solid green	Module has booted up and is functional
	Solid amber	Module is not functioning correctly

Service Module Ports and Interfaces

Cisco SM-X-PVDM service modules do not include any external ports or interfaces.

Platform Support and Supported Number of Modules

See the module data sheet for information about:

- Platforms that support Cisco SM-X-PVDM modules

- Number of channels supported

The data sheet is available here:

Cisco Fourth-Generation Packet Voice Digital Signal Processor Module for Cisco Unified Communications Solutions Data Sheet

Installing and Removing the Cisco SM-X-PVDM Module

Cautions / Warnings Before Installing or Removing the Module

Caution: Always wear an electrostatic discharge (ESD)-preventive wrist strap and ensure that it makes good contact with your skin when you remove or install a service module (SM). Connect the equipment end of the wrist strap to the metal part of the chassis.

Caution: Handle service modules (SMs) by the edges only. SMs are ESD-sensitive components and can be damaged by mishandling.

Software Requirements for the Cisco SM-X-PVDM Module

Cisco IOS XE Release 3.16.1S or later release is required to operate the Cisco SM-X-PVDM service module on a Cisco router.

To determine the version of Cisco IOS software that is running on your router, log in to the router and enter the **show version** command:

```
Router> show version

Cisco IOS XE Software, Version BLD_V155_3_S_XE316_THROTTLE_LATEST_20150419_100030-std
Cisco IOS Software, ISR Software (X86_64_LINUX_IOSD-UNIVERSALK9-M), Experimental Version
15.5(20150419:122416)
[v155_3_s_xe316_throttle-BLD-BLD_V155_3_S_XE316_THROTTLE_LATEST_20150419_100030-ios 176]
Copyright (c) 1986-2015 by Cisco Systems, Inc.
Compiled Sun 19-Apr-15 09:03 by ciscouser
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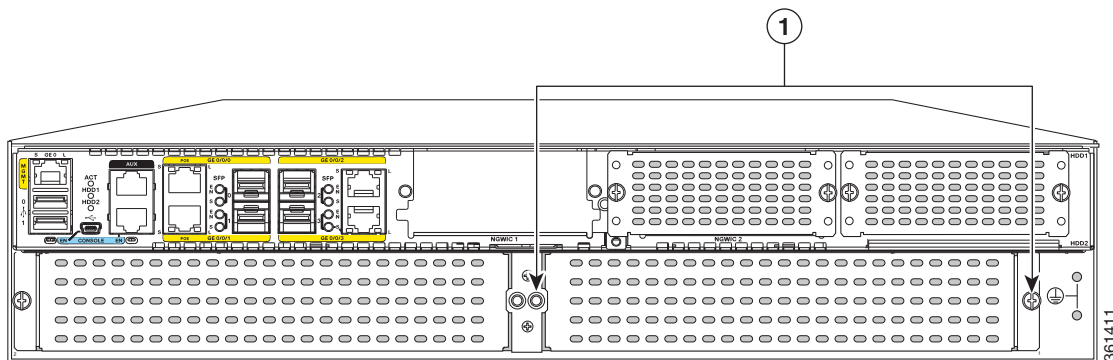
Installing the Cisco SM-X-PVDM Module in the Router

To install the Cisco SM-X-PVDM on a Cisco router, follow these steps:

1. Read the Safety Warnings, page 6 before you perform any module replacement.

2. Remove the blank faceplates installed over the slot you intend to use. (Figure 3 on page 4 shows the faceplate for the right-side module slot, but either slot can be used.)

   Note: Keep the faceplate. It will be required in the future if the module is removed from the router.

Figure 3   Enhanced Service Module (SM-X) Slots (router model shown: Cisco ISR 4451-X)

1	Mounting screws on the faceplate of the right module slot

3. Push the Cisco SM-X-PVDM into place until you feel the edge connector seat securely into the connector on the router backplane. The module faceplate should contact the chassis rear panel.

4. Using a Phillips or flat-blade screwdriver, tighten the captive mounting screws on the module faceplate.

Verifying Cisco SM-X-PVDM Installation in a Cisco Router

Use the following command to verify that the Cisco SM-X-PVDM has been installed correctly:

show diag subslot *subslot* **eeprom detail**

Example

In the following example, the Cisco SM-X-PVDM service module is recognized by the system.

```
router# show diag ?
  all      All related information
  chassis  Chassis related information
  slot     Slot location information for this command
  subslot  Subslot location information for this command

router# show diag subslot 1/0 eeprom detail
SPA EEPROM data for subslot 1/0:

          EEPROM version           : 4
          Compatible Type          : 0xFF
          Controller Type          : 3060
          Hardware Revision        : 1.0
          PCB Part Number          : 73-17413-01
          Board Revision           : 04
          Fab Version              : 02
          Fab Part Number          : 28-12636-01
          Deviation Number         : 0
          PCB Serial Number        : FOC11111116
          RMA Test History         : 00
          RMA Number               : 0-0-0-0
          Product Identifier (PID) : SM-X-PVDM-3000
          Version Identifier (VID) : V00
          CLEI Code                : TDBTDBTDBT
          Top Assy. Part Number    : 800-44730-01
          Environment Monitor Data : 30 0B E5 34 00 30
          Base MAC Address         : A4 3A 22 CA 63 63
          MAC Address block size   : 1
          Platform features        : 02 01 01 50 00 01 01 00
                                      01 03 00
          Manufacturing Test Data  : 00 00 00 00 00 00 00 00
```
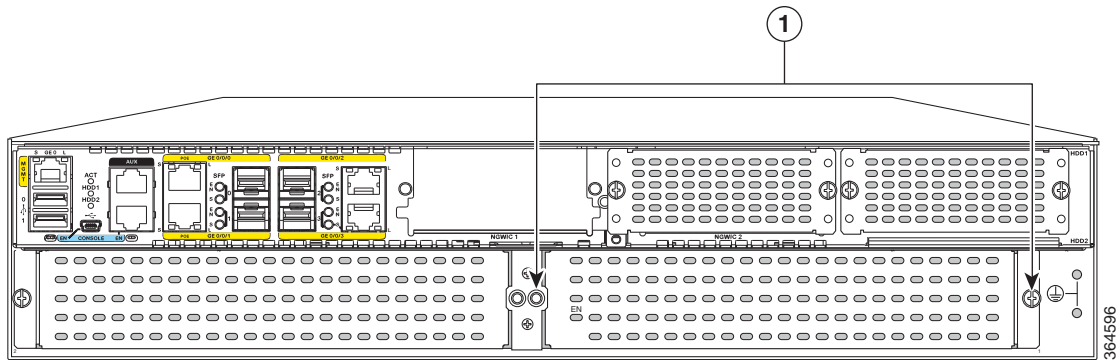
Removing the Cisco SM-X-PVDM Module from the Router

To remove the Cisco SM-X-PVDM from the Router, follow these steps:

1. Read the Safety Warnings, page 6 before you perform any module replacement.

2. Disconnect all active calls before removing the module.

3. Locate the service module (SM) to be removed.

4. Using a Phillips or flat-blade screwdriver, unscrew the captive mounting screws on the module faceplate. (Figure 4 on page 6 shows the module in the right-hand slot, but the module may be located in either slot.)

Figure 4   Removing the Module from the Router (router model shown: Cisco ISR 4451-X)

| 1 | Mounting screws on the module faceplate |

5. Pull the Cisco SM-X-PVDM out of the chassis.

6. Place the module in an antistatic bag to protect it from electrostatic discharge (ESD) damage.

7. Replace the blank faceplate for the chassis slot that held the module.

    Note: Do not operate the system without the faceplate in place. The faceplate is an integral part of the chassis, helping to: (a) prevent exposure to hazardous voltages and currents inside the chassis; (b) contain electromagnetic interference (EMI) that might disrupt other equipment; and (c) direct the flow of cooling air through the chassis.

Safety Warnings

Warning: Read the installation instructions before connecting the system to the power source. Statement 1004

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

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. Statement 1043

Warning: Before working on a system that has an on/off switch, turn OFF the power and unplug the power cord. Statement 1

Warning: This unit might have more than one power supply connection. All connections must be removed to de-energize the unit. Statement 1028

Warning: This equipment must be grounded. Never defeat the ground conductor or operate the equipment in the absence of a suitably installed ground conductor. Contact the appropriate electrical inspection authority or an electrician if you are uncertain that suitable grounding is available. Statement 1024

Warning: Hazardous network voltages are present in WAN ports regardless of whether power to the unit is OFF or ON. To avoid electric shock, use caution when working near WAN ports. When detaching cables, detach the end away from the unit first. Statement 1026

Warning: Before opening the unit, disconnect the telephone-network cables to avoid contact with telephone-network voltages. Statement 1041

Warning: Before working on equipment that is connected to power lines, remove jewelry (including rings, necklaces, and watches). Metal objects will heat up when connected to power and ground and can cause serious burns or weld the metal object to the terminals. Statement 43

Warning: **Do not use this product near water; for example, near a bath tub, wash bowl, kitchen sink or laundry tub, in a wet basement, or near a swimming pool.** Statement 1035

Warning: **To report a gas leak, do not use a telephone in the vicinity of the leak.** Statement 1039

Warning: **There is the danger of explosion if the battery is replaced incorrectly. Replace the battery only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.** Statement 1015

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

Warning: **The covers are an integral part of the safety design of the product. Do not operate the unit without the covers installed.** Statement 1077

Additional Resources

- Related Documentation, page 7

- Technical Assistance, page 7

- Conventions, page 8

- Obtaining Documentation and Submitting a Service Request, page 8

Related Documentation

- Installing and Upgrading Internal Modules and FRUs section in the Hardware Installation Guide for the Cisco 4000 Series Integrated Services Router

- Open source license

  http://www.cisco.com/c/dam/en/us/td/docs/routers/access/interfaces/sm/software/license/sm-x-pvdm-opensource.pdf

- Cisco Fourth-Generation Packet Voice Digital Signal Processor Module for Cisco Unified Communications Solutions Data Sheet

Technical Assistance

The Cisco Support and Documentation website provides online resources to download documentation, software, and tools. Use these resources to install and configure the software and to troubleshoot and resolve technical issues with Cisco products and technologies. Access to most tools on the Cisco Support and Documentation website requires a Cisco.com user ID and password.

http://www.cisco.com/cisco/web/support/index.html

Conventions

This document uses the following conventions.

Conventions	Indication
bold font	Commands and keywords and user-entered text appear in **bold** font.
italic font	Document titles, new or emphasized terms, and arguments for which you supply values are in *italic* font.
[ ]	Elements in square brackets are optional.
{x | y | z }	Required alternative keywords are grouped in braces and separated by vertical bars.
[x | y | z]	Optional alternative keywords are grouped in brackets and separated by vertical bars.
string	A nonquoted set of characters. Do not use quotation marks around the string or the string will include the quotation marks.
Courier font	Terminal sessions and information the system displays appear in courier font.
< >	Nonprinting characters such as passwords are in angle brackets.
[ ]	Default responses to system prompts are in square brackets.
!, #	An exclamation point (!) or a pound sign (#) at the beginning of a line of code indicates a comment line.

Note: Means *reader take note*. Notes contain helpful suggestions or references to material not covered in the manual.

Caution: Means *reader be careful.* In this situation, you might perform an action that could result in equipment damage or loss of data.

Warning: IMPORTANT SAFETY INSTRUCTIONS

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

Regulatory: Provided for additional information and to comply with regulatory and customer requirements.

Obtaining Documentation and Submitting a Service Request

For information on obtaining documentation, using the Cisco Bug Search Tool (BST), submitting a service request, and gathering additional information, see *What's New in Cisco Product Documentation* at:
http://www.cisco.com/c/en/us/td/docs/general/whatsnew/whatsnew.html.

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Additional Resources

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