



CHAPTER 2

SIP, SSC, and SPA Product Overview

This chapter provides an introduction to SPA interface processors (SIPs), SPA services cards (SSCs), and shared port adapters (SPAs). It includes the following sections:

- [Introduction to SIPs, SSCs, and SPAs, page 2-1](#)
- [SIP, SSC, and SPA Compatibility, page 2-3](#)
- [Modular Optics Compatibility, page 2-6](#)

For more hardware details for the specific SIPs, SSCs, and SPAs that are supported on the Cisco 7600 series router, refer to the companion publication, *Cisco 7600 Series Router SIP, SSC, and SPA Hardware Installation Guide*.

Introduction to SIPs, SSCs, and SPAs

SIPs, SSCs, and SPAs are a new carrier card and port adapter architecture to increase modularity, flexibility, and density across Cisco Systems routers for network connectivity. This section describes the SIPs, SSCs, and SPAs and provides some guidelines for their use.

SPA Interface Processors

The following list describes some of the general characteristics of a SIP:

- A SIP is a carrier card that inserts into a router slot like a line card. It provides no network connectivity on its own.
- A SIP contains one or more subslots, which are used to house one or more SPAs. The SPA provides interface ports for network connectivity.
- During normal operation the SIP should reside in the router fully populated either with functional SPAs in all subslots, or with a blank filler plate (SPA-BLANK=) inserted in all empty subslots.
- SIPs support online insertion and removal (OIR) with SPAs inserted in their subslots. SPAs also support OIR and can be inserted or removed independently from the SIP.

SPA Services Cards

The following list describes some of the general characteristics of an SSC:

- An SSC is a carrier card that inserts into a router slot like a line card. It provides no network connectivity.
- An SSC provides one or more subslots, which are used to house one or more SPAs. The supported SPAs do not provide interface ports for network connectivity, but provide certain services.
- During normal operation the SSC should reside in the router fully populated either with functional SPAs in all subslots, or with a blank filler plate (SPA-BLANK=) inserted in all empty subslots.
- SSCs support online insertion and removal (OIR) with SPAs inserted in their subslots. SPAs also support OIR and can be inserted or removed independently from the SSC.
- Cisco IOS Release 12.2(33) SRE adds support for Route Switch Processor 720 10GE to the Cisco 7600 SSC-400.

Shared Port Adapters

The following list describes some of the general characteristics of a SPA:

- A SPA is a modular type of port adapter that inserts into a subslot of a compatible SIP carrier card to provide network connectivity and increased interface port density. A SIP can hold one or more SPAs, depending on the SIP type.
- Some SPAs provide services rather than network connectivity, and insert into subslots of compatible SSCs. For example, the IPsec VPN SPA provides services such as IP Security (IPsec) encryption/decryption, generic routing encapsulation (GRE), and Internet Key Exchange (IKE) key generation.
- SPAs are available in the following sizes, as shown in [Figure 2-1](#) and [Figure 2-2](#):
 - Single-height SPA—Inserts into one SIP subslot.
 - Double-height SPA—Inserts into two single, vertically aligned SIP subslots.

Figure 2-1 Single-Height and Double-Height SPA Sizes

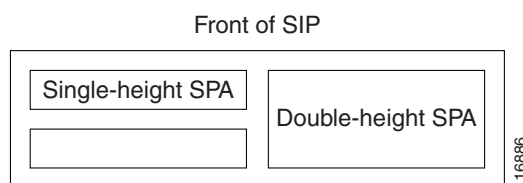
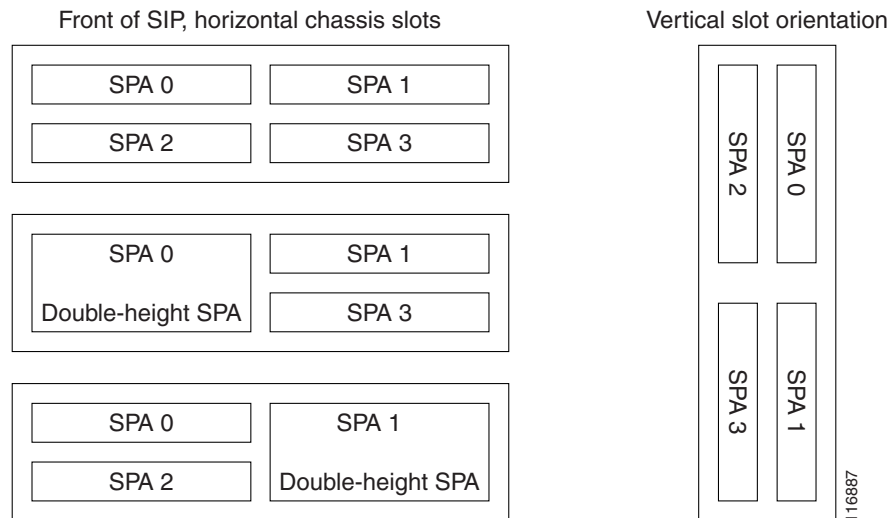


Figure 2-2 Horizontal and Vertical Chassis Slot Orientation for SPAs

- Each SPA provides a certain number of connectors, or ports, that are the interfaces to one or more networks. These interfaces can be individually configured using the Cisco IOS command-line interface (CLI).
- Either a blank filler plate or a functional SPA should reside in every subslot of an SIP during normal operation to maintain cooling integrity. Blank filler plates are available in single-height form only.
- SPAs support online insertion and removal (OIR). They can be inserted or removed independently from the SIP. SIPs also support online insertion and removal (OIR) with SPAs inserted in their subslots.

SIP, SSC, and SPA Compatibility

The following tables show SIP and SPA compatibility by SPA technology area on the Cisco 7600 series router.


Note

For more information about the introduction of support for different SIPs and SPAs, refer to the “Release History” sections in the overview chapters of this document

Table 2-1 SIP and SPA Compatibility Table for ATM SPAs

SPA	Product ID	SIP Type			
		Cisco 7600 SIP-200	Cisco 7600 SIP-400	Cisco 7600 SIP-600	Cisco 7600 SSC-400
2-Port and 4-Port OC-3c/STM-1 ATM SPA	SPA-2XOC3-ATM, SPA-4XOC3-ATM	Yes	Yes	No	No
1-Port OC-12c/STM-4 ATM SPA	SPA-1XOC12-ATM	No	Yes	No	No
1-Port Channelized OC-12/STM-4 SPA	SPA-1XCHOC12	No	Yes	No	No
1-Port OC-48c/STM-16 ATM SPA	SPA-1XOC48-ATM	No	Yes	No	No

Table 2-2 SIP and SPA Compatibility Table for Ethernet SPAs

SPA	Product ID	SIP Type			
		Cisco 7600 SIP-200	Cisco 7600 SIP-400	Cisco 7600 SIP-600	Cisco 7600 SSC-400
1-Port 10-Gigabit Ethernet SPA ¹	SPA-1XTENGE-XENP, SPA-1XTENGE-XFP,	No	No	Yes	No
	SPA-1X10GE-L-V2	No	Yes	Yes	No
2-Port Gigabit Ethernet SPA	SPA-2X1GE, SPA-2X1GE-V2	No	Yes	No	No
5-Port Gigabit Ethernet SPA	SPA-5X1GE	No	No	Yes	No
	SPA-5X1GE-V2	No	Yes	Yes	No
10-Port Gigabit Ethernet SPA	SPA-10X1GE, SPA-10X1GE-V2	No	No	Yes	No
4-Port and 8-Port Fast Ethernet SPA	SPA-4X1FE-TX-V2, SPA-8X1FE-TX-V2	Yes	Yes	No	No

1. Only one 1-Port 10-Gigabit Ethernet SPA can be installed in a SIP-400 at a time; no other SPAs can be installed in the same SIP-400.

Table 2-3 SIP and SPA Compatibility Table for the IPsec VPN SPA

SPA	Product ID	SIP Type			
		Cisco 7600 SIP-200	Cisco 7600 SIP-400	Cisco 7600 SIP-600	Cisco 7600 SSC-400
IPsec VPN SPA	SPA-IPSEC-2G	No	No	No	Yes

Certain restrictions apply while using the SIP-600 and the IPsec VPN SPA on the same chassis:

- The SIP-600 should not be installed in the same chassis with an IPsec VPN SPA when running SXF.
- The SIP-600 is not supported in 12.2(33)SRA.
- Starting with 12.2(33)SRB, the SIP-600 and IPsec VPN SPA can be present in the same chassis. However, SIP-600 subinterfaces cannot be used when VPN crypto-connect mode is configured.

Table 2-4 SIP and SPA Compatibility Table for POS SPAs

SPA	Product ID	SIP Type			
		Cisco 7600 SIP-200	Cisco 7600 SIP-400	Cisco 7600 SIP-600	Cisco 7600 SSC-400
2-Port and 4-Port OC-3c/STM-1 POS SPA	SPA-2XOC3-POS, SPA-4XOC3-POS	Yes	Yes	No	No
1-Port OC-12c/STM-4 POS SPA	SPA-1XOC12-POS	No	Yes	No	No
1-Port OC-48c/STM-16 POS SPA	SPA-1XOC48-POS/RPR	No	Yes	No	No
2-Port and 4-Port OC-48c/STM-16 POS SPA	SPA-2XOC48-POS/RPR, SPA-4XOC48-POS/RPR	No	No	Yes	No

Table 2-4 SIP and SPA Compatibility Table for POS SPAs (continued)

SPA	Product ID	SIP Type			
1-Port OC-192c/STM-64 POS/RPR SPA	SPA-OC192POS-LR, SPA-OC192POS-VSR, SPA-OC192POS-XFP	No	No	Yes	No
1-Port Channelized OC-12/STM-4 SPA	SPA-1XCHOC12/DS0	No	Yes	No	No

Table 2-5 SIP and SPA Compatibility Table for Serial SPAs

SPA	Product ID	SIP Type			
		Cisco 7600 SIP-200	Cisco 7600 SIP-400	Cisco 7600 SIP-600	Cisco 7600 SSC-400
1-Port Channelized OC-3/STM-1 SPA	SPA-1XCHSTM1/OC3	Yes	Yes	No	No
2-Port and 4-Port Channelized T3 SPA	SPA-2XCT3/DS0, SPA-4XCT3/DS0	Yes	Yes	No	No
2-Port and 4-Port Clear Channel T3/E3 SPA	SPA-2XT3/E3, SPA-4XT3/E3	Yes	Yes	No	No
8-Port Channelized T1/E1 SPA	SPA-8XCHT1/E1	Yes	Yes	No	No
1-Port Channelized OC-12/STM-4 SPA	SPA-1XCHOC12/DS0	No	Yes	No	No

Table 2-6 SIP and SPA Compatibility Table for CEoP SPAs

SPA	Product ID	SIP Type			
		Cisco 7600 SIP-200	Cisco 7600 SIP-400	Cisco 7600 SIP-600	Cisco 7600 SSC-400
1-Port Channelized OC-3 STM1 ATM CEoP SPA	SPA-1CHOC3-CE-ATM	No	Yes	No	No
24-Port Channelized T1/E1 ATM CEoP SPA	SPA-24CHT1-CE-ATM	No	Yes	No	No
2-Port Channelized T3/E3 ATM CEoP SPA	SPA-2CHT3-CE-ATM	No	Yes	No	No

Modular Optics Compatibility

Some SPAs implement small form-factor pluggable (SFP) optical transceivers to provide network connectivity. An SFP module is a transceiver device that mounts into the front panel to provide network connectivity.

Cisco Systems qualifies the SFP modules that can be used with SPAs.



Note

The SPAs will only accept the SFP modules listed as supported in this document. An SFP check is run every time an SFP module is inserted into a SPA and only SFP modules that pass this check will be usable.

Table 2-7 shows the types of optics modules that have been qualified for use with a SPA.

Table 2-7 SPA Optics Compatibility

SPA	Qualified Optics Modules (Cisco Part Numbers)
2-Port and 4-Port OC-3c/STM-1 ATM SPA	<ul style="list-style-type: none"> • SFP-OC3-MM • SFP-OC3-SR • SFP-OC3-IR1 • SFP-OC3-LR1 • SFP-OC3-LR2
1-Port OC-12c/STM-4 ATM SPA	<ul style="list-style-type: none"> • SFP-OC12-MM • SFP-OC12-SR • SFP-OC12-IR1 • SFP-OC12-LR1 • SFP-OC12-LR2
1-Port OC-48c/STM-16 ATM SPA	<ul style="list-style-type: none"> • SFP-OC48-IR1 • SFP-OC48-SR
1-Port 10-Gigabit Ethernet SPA	<ul style="list-style-type: none"> • XFP-10GLR-OC192SR • XFP-10GER-OC192IR • XFP-10GZR-OC192LR • XFP-10F-MM-SR (Supported only on SIP-400 and SIP-600 from Cisco IOS release 12.2(33)SRE) • X2-DWDM on on RSP720 • X2-10GB-LRM/ZR on RSP720
2-Port Gigabit Ethernet SPA	<ul style="list-style-type: none"> • SFP-GE-S • SFP-GE-L • SFP-GE-Z • SFP-GE-T

Table 2-7 SPA Optics Compatibility (continued)

SPA	Qualified Optics Modules (Cisco Part Numbers)
5-Port Gigabit Ethernet SPA	<ul style="list-style-type: none"> • SFP-GE-S • SFP-GE-L • SFP-GE-Z • SFP-GE-T
10-Port Gigabit Ethernet SPA	<ul style="list-style-type: none"> • SFP-GE-S • SFP-GE-L • SFP-GE-Z • SFP-GE-T
2-Port and 4-Port OC-3c/STM-1 POS SPA	<ul style="list-style-type: none"> • SFP-OC3-MM • SFP-OC3-SR • SFP-OC3-IR1 • SFP-OC3-LR1 • SFP-OC3-LR2
1-Port OC-12c/STM-4 POS SPA	<ul style="list-style-type: none"> • SFP-OC12-MM • SFP-OC12-SR • SFP-OC12-IR1 • SFP-OC12-LR1 • SFP-OC12-LR2
1-Port OC-48c/STM-16 POS SPA	<ul style="list-style-type: none"> • SFP-OC48-SR • SFP-OC48-IR1 • SFP-OC48-LR2
2-Port and 4-Port OC-48c/STM-16 POS SPA	<ul style="list-style-type: none"> • SFP-OC48-SR • SFP-OC48-IR1 • SFP-OC48-LR2
1-Port OC-192c/STM-64 POS/RPR XFP SPA	<ul style="list-style-type: none"> • XFP-10GLR-OC192SR • XFP-10GER-OC192IR • XFP-10GZR-OC192LR
1-Port Channelized OC-3/STM-1 SPA	<ul style="list-style-type: none"> • SFP-OC3-SR • SFP-OC3-IR1 • SFP-OC3-LR1 • SFP-OC3-LR2 • ONS-SC-155-EL • STM1E-SFP

Table 2-7 SPA Optics Compatibility (continued)

SPA	Qualified Optics Modules (Cisco Part Numbers)
1-Port Channelized OC-3 STM1 ATM CEoP SPA	<ul style="list-style-type: none"> • SFP-OC3-MM • SFP-OC3-SR • SFP-OC3-IR1 • SFP-OC3-LR1 • SFP-OC3-LR2 • ONS-SC-155-EL • STM1E-SFP
1-Port Channelized OC-12/STM-4 SPA (Supported on SIP-400 from 12.2(33)SRD 1)	<ul style="list-style-type: none"> • SFP-OC12-MM • SFP-OC12-SR • SFP-OC12-IR1 • SFP-OC12-LR1 • SFP-OC12-LR2