Cisco ASR 1000 Series Router SPA Interface Processors (SIPs)

This chapter describes the Cisco ASR 1000 Series Router SPA Interface Processors supported on the Cisco ASR 1000 Series Routers.

This chapter contains the following sections:

For detailed documentation on Cisco ASR 1000 SIPs and SPAs, see:

- Cisco ASR 1000 Series Aggregation Services Routers SIP and SPA Hardware Installation Guide
- Cisco ASR 1000 Series Aggregation Services Routers SIP and SPA Software Configuration Guide

Note Throughout this document, the term slot refers to the Cisco ASR 1000 Series Router chassis slot. The Cisco ASR 1000 Series Route Processor, Cisco ASR 1000 Series Embedded Services Processor, and Cisco ASR 1000 Series SPA Interface Processor (SIP), and power supplies plug into these slots. Shared port adapters plug into SIP bays.

Cisco ASR 1000 Series SPA Interface Processor

This section describes the Cisco SPA interface processors for the Cisco ASR 1006, Cisco ASR 1004, Cisco ASR 1002, and Cisco ASR 1013 routers. The Cisco ASR 1000 Series Routers support the following Cisco ASR 1000-SIPs:

- Cisco ASR 1000-SIP10—This SIP supports:
  - 4 half height (¼ Rate or full rate or combination) SPAs with up to 16 ports per SPA
  - 2 full height (¼ Rate or full rate or combination) SPAs with up to 32 ports per SPA
  - 2 half height and 1 full height comb in at on that does not exceed 64 ports
  - Up to 10 Gbps of oversubscription

- Cisco ASR 1000-SIP40—This SIP supports:
  - 4 half height (¼ Rate or full rate or combination) SPAs with up to 24 ports per SPA
  - 2 full height (¼ Rate or full rate or combination) SPAs with up to 48 ports per SPA
  - 2 half height and 1 full height combination that does not exceed 96 ports
  - Up to 40 Gbps aggregate bandwidth from the four SPA bays
  - ESI bandwidth of 11 to 46 Gbps
  - Ingress buffering at 128 MB and egress buffering at 6MB

For information about what hardware is supported and compatible and not compatible with the new ASR 1000 40G components and Cisco ASR 1013 Router, see Table 2-4 and Table 2-3 .

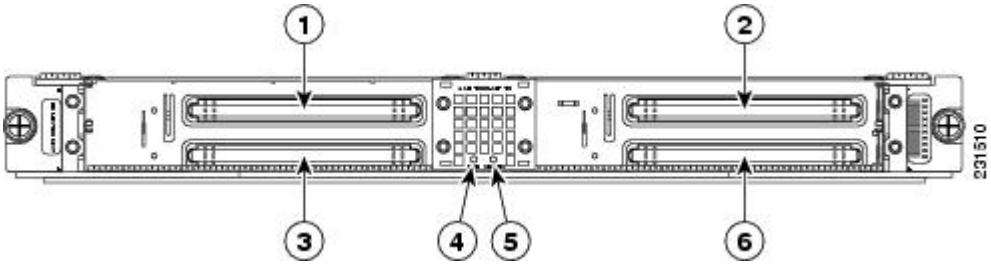
The Cisco SPAs provide the physical interfaces for router connectivity ranging from copper, channelized, POS, ATM and Ethernet. The Cisco ASR 1000 Series SIP provides the physical termination for the SPAs and accepts up to four half-height and 2 full height Cisco SPAs.

The is a list of characteristics of the Cisco ASR 1000 Series SPA Interface Processors for the Cisco ASR 1006, Cisco ASR 1004, and Cisco ASR 1013 routers:

- 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.

Note Fully populate all slots and subslots with blank filler plates or functional SPAs for maximum efficiency of the cooling system.

This section describes the Cisco ASR 1000 Series SPA Interface (SIP) components and subslot identification.Figure 4-1 shows an example of the Cisco ASR 1000 Series SPA Interface (SIP) module.

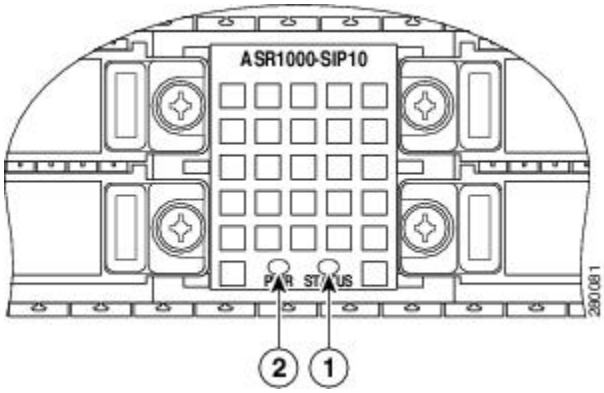


1	SPA subslot 0	4	STATUS Led
2	SPA subslot 1	5	PWR Led

3	SPA subslot 2	6	SPA subslot 3

Figure 1: Cisco ASR1000-SIP10 SPA Interface Processor, on page 3 shows the LEDs on the Cisco ASR1000-SIP10.

Figure 1: Cisco ASR1000-SIP10 SPA Interface Processor



1	STATUS LED	2	PWR LED

Table 1: Cisco ASR1000-SIP LEDs , on page 3 describes the Cisco ASR1000-SIP10 and Cisco ASR1000-SIP40 LEDs on the front panel.

Table 1: Cisco ASR1000-SIP LEDs

LED Label	LED	Color	Behavior Description
PWR	Power	Solid green	Cisco ASR 1000 Series SIP is powered on and all power supplies are within their tolerances
		Off	Cisco ASR 1000 Series SIP is powered off

LED Label	LED	Color	Behavior Description
STATUS	System status	Red	The Cisco ASR 1000 Series SPA Interface Processor has encountered an error
		Yellow	Lit when the Cisco ASR 1000 Series SIP is loading
		Solid green	The SPA drivers have started and are running and all critical processes are running (as determined by the Cisco ASR 1000 Series SPA Interface (SIP) Process Manager).

The Cisco ASR1002-SIP10 supports a built-in 4xGE SPA and three half-height SPAs (one half-height and one full-height SPA). The Cisco ASR1002-SIP10 also functions as the base board for the Cisco embedded ASR1000-RP1. The Cisco 1002 Router has one slot for FP0 with three subslots for SPAs, subslots 1 - 3.

SPA Interface Processor Slot Numbering

A shared port adapter is a modular type of port adapter that inserts into a subslot of a compatible SIP to provide network connectivity and increased interface port density. The Cisco ASR 1000 Series SPA Interface Processor (SIP) provides an aggregation function for SPAs.

Cisco ASR 1006 Router and Cisco ASR 1004 Router

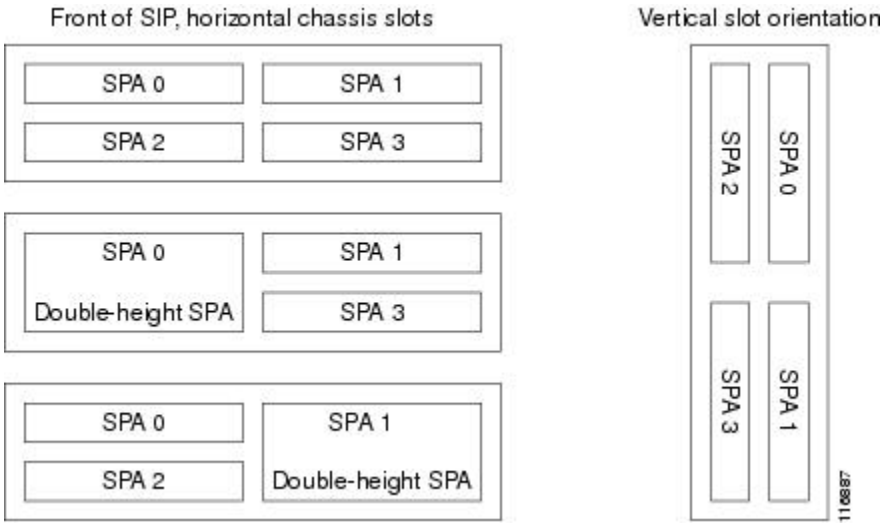
In the Cisco ASR 1006 Router and Cisco ASR 1004 Router, the SIP supports:

- Four half-height (¼ rate or full rate or combination)
- Two full-height (¼ rate or full rate or combination) SPAs with up to 32 ports per SPA
- Two half-height and 1 full-height combination that does not exceed 64 ports

The slot numbering for the SPAs in the Cisco ASR 1004 Router is the same as in the Cisco ASR 1006 Router.

Figure 4-3 shows the slot numbering for the shared port adapters on the Cisco ASR 1000 Series SPA Interface for the Cisco ASR 1006 Router and Cisco ASR 1004 Router.

Figure 2: Cisco ASR 1004 Router and Cisco ASR 1006 Router SPA Interface Subslot Numbering



Note The slot numbering for the SPAs on the Cisco ASR 1004 Router is the same as the numbering on the Cisco ASR 1006 Router.

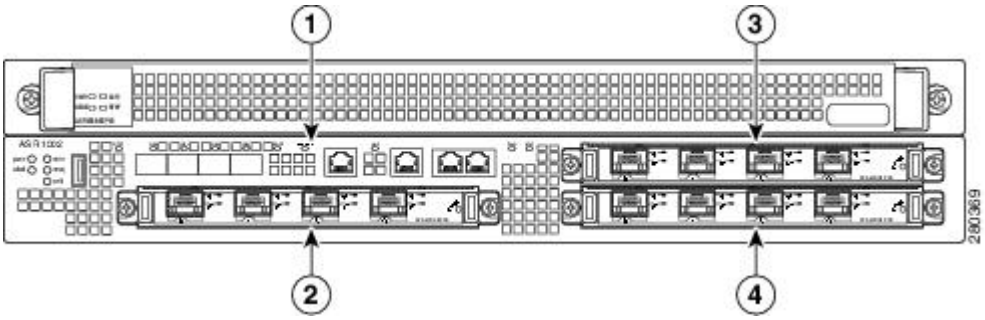
Cisco ASR 1002 Router

In the Cisco ASR 1002 Router, the Cisco ASR1002-SIP10 supports:

- Three removable half-height SPAs on Bay 1, 2, and 3
- The fourth SPA is a built-in 4xGE SPA on Bay 0 located on the Cisco ASR 1000 Series RP1

Note The shared port adapters on the Cisco ASR1002-SIP10 support online insertion and removal. However, the Cisco ASR1002-SIP10 in the Cisco ASR 1002 Router is built into the chassis and is not a field-replaceable unit and does not support online insertion and removal.Figure 3: Cisco ASR1002-SIP10 Interface Subslot Numbering, on page 6 shows the slot numbering for the shared port adapters on the Cisco ASR 1000 Series SPA Interface for the Cisco ASR 1002 Router.

Figure 3: Cisco ASR1002-SIP10 Interface Subslot Numbering



1	Cisco integrated ASR1000-RP1 subslot 0	3	SPA subslot 1
2	SPA subslot 2	4	SPA subslot 3

The Cisco integrated ASR1000-SIP10 (in the Cisco ASR 1002 Router) supports one built-in 4xGE SPA and three half height SPAs in any one of the following configurations:

- Built-in 4xGE SPA in bay 0 and three half height SPAs in bay 1, 2, 3.
- Built-in 4xGE SPA in bay 0, one half height SPA in bay 2, and one full height SPA in bay 1.

The Cisco ASR 1000 Series SPA interface processor houses SPA bay 2 and SPA bay 3. SPA bay 0 and SPA bay 1 are physically located on Cisco integrated ASR1000-RP1. A portion of the Cisco integrated ASR1000-RP1 is reserved to provide connectivity between SPA bay 1 and the Cisco integrated ASR1000-SIP10.

Note The integrated Cisco ASR1000-RP1 subslot 1 must communicate to subslot 3 of the integrated SIP when running a full height SPA in subslot 1.

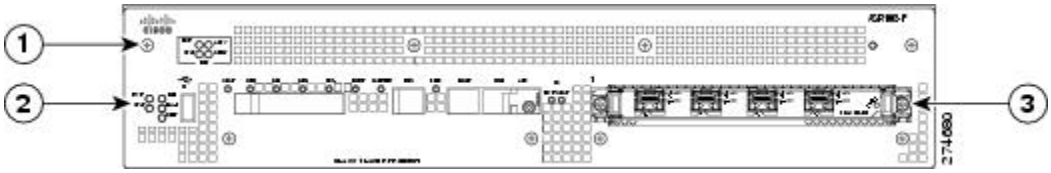
Cisco ASR 1002-F Router

In the Cisco ASR 1002-F Router, the Cisco ASR1002-SIP10-F supports:

- Three removable half-height SPAs in Bays 1, 2, and 3
- The fourth SPA is a built-in 4xGE SPA on Bay 0 located on the Cisco ASR 1000 Series RP1

Note The shared port adapter on the Cisco ASR1002-SIP10-F supports online insertion and removal. However, the Cisco ASR1002-SIP10-F in the Cisco ASR 1002-F Router is built into the chassis and is not a field-replaceable unit.

Figure 4-5 shows the slot numbering for the Cisco ASR 1002-F Router.



1	Cisco integrated ASR1002-ESP-F, slot F0	3	ASR1002-SIP-10-F, slot 0: SPAs: slot 0, subslot 0 - 4xGE-BUILT-IN slot 0, subslot 1 - SPA-2XOC3-POS
2	Cisco integrated RP, slot R0		

Cisco ASR 1013 Router

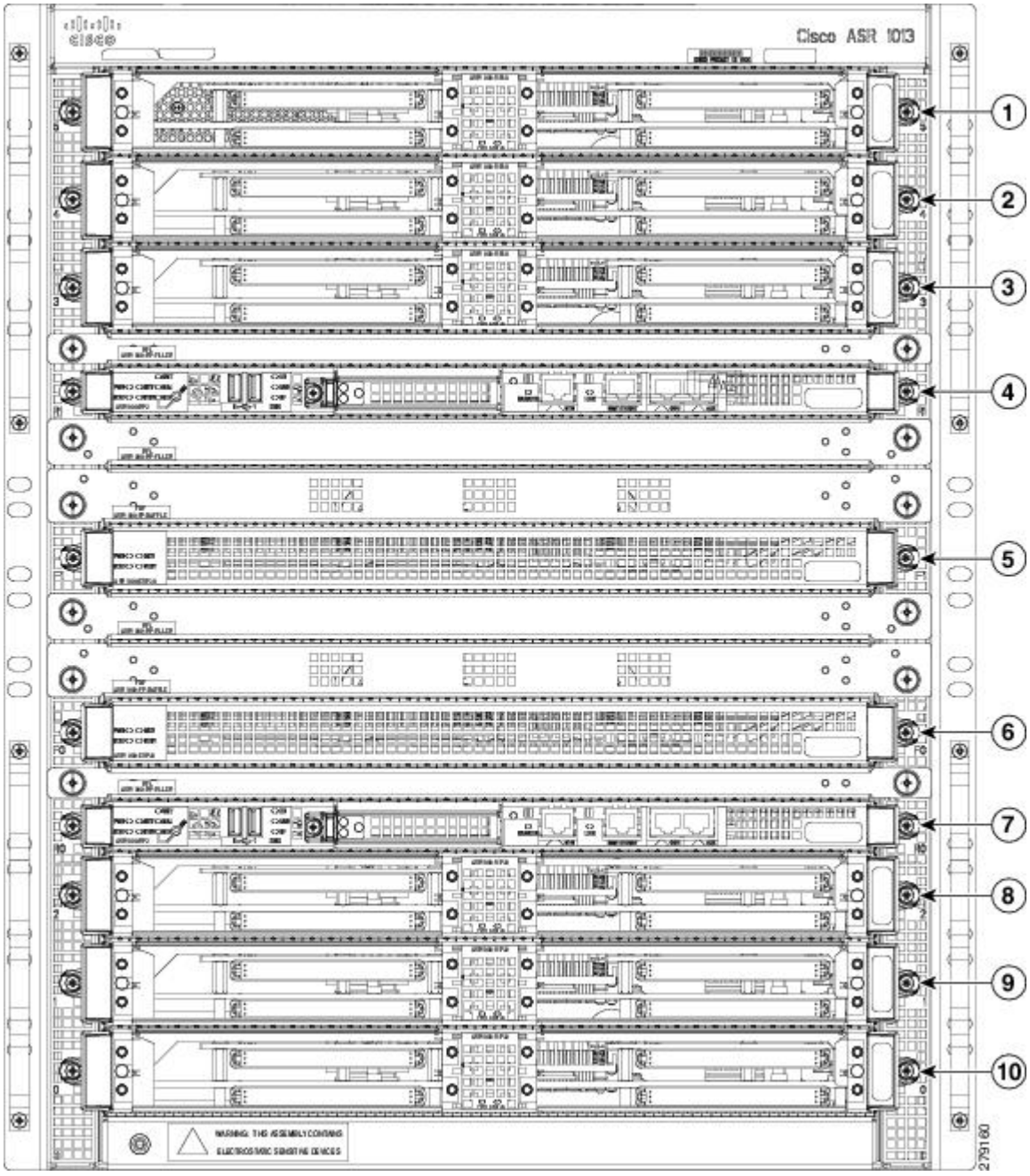
In the Cisco ASR 1013 Router, the Cisco ASR1000-SIP40 supports:

- Four half-height (¼ Rate or full rate or combination) SPAs with up to 24 ports per SPA
- Two full-height (¼ Rate or full rate or combination) SPAs with up to 48 ports per SPA
- Two half-height and 1 full-height combination that does not exceed 96 ports

The Cisco ASR 1013 Router uses the same SPA subslot numbering as the Cisco ASR 1006 and Cisco ASR 1004 routers.

Figure 4: Cisco ASR 1013 Router Slot Numbering , on page 8 shows the slot numbering for the shared port adapters on the Cisco ASR 1013 Router.

Figure 4: Cisco ASR 1013 Router Slot Numbering



1	ASR 1000 Series SIP slot 5	6	Slot F0 with ASR 1000 Series ESP-40

2	ASR 1000 Series SIP slot 4	7	Slot R0 with ASR 1000 Series RP2
3	ASR 1000 Series SIP slot 3	8	ASR 1000 Series SIP slot 2
4	Slot R1 with ASR 1000 Series RP2	9	ASR 1000 Series SIP slot 1
5	Slot F1 with ASR 1000 Series ESP-40	10	ASR 1000 Series SIP slot 0
Note: Slots 10, 9, 8, 7, and 6 reside in Zone 0 and slots 5, 4, 3, 2, and 1 reside in Zone 1.			

For detailed information about specifying SIP subslot location for a SPA and specifying slot location for a SIP, see Cisco Aggregation Services Router 1000 Series SIP and SPA Software Configuration Guide .

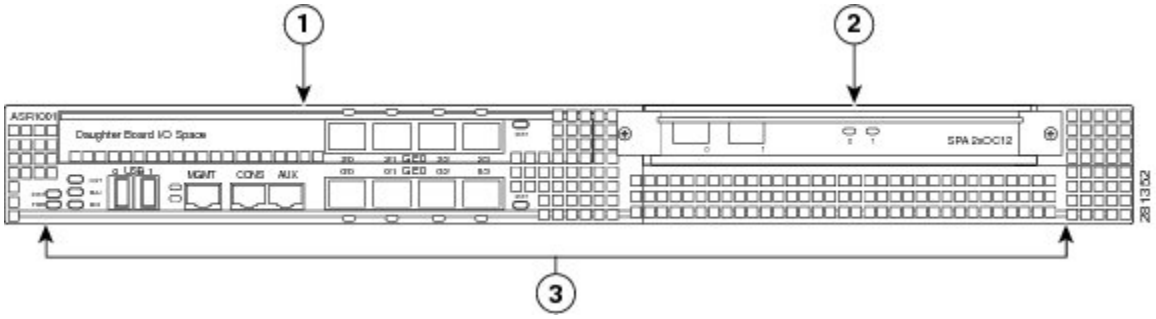
Cisco ASR 1001 Router

In the Cisco ASR 1001 Router, the Cisco ASR1000-SIP10 supports:

- One flexible integrated daughter card I/O slot
- One half-height SPA bay

Figure 5: Cisco ASR 1001 Router Slot Numbering , on page 9 shows slot numbering on the Cisco ASR 1001 Router.

Figure 5: Cisco ASR 1001 Router Slot Numbering



1	Slot 2 connected to the flexible integrated daughter card	3	Slot 0 connected to the built-in 4x1GE SPA on the mainboard

2	Slot 1 connected to the half-height SPA slot	—	—

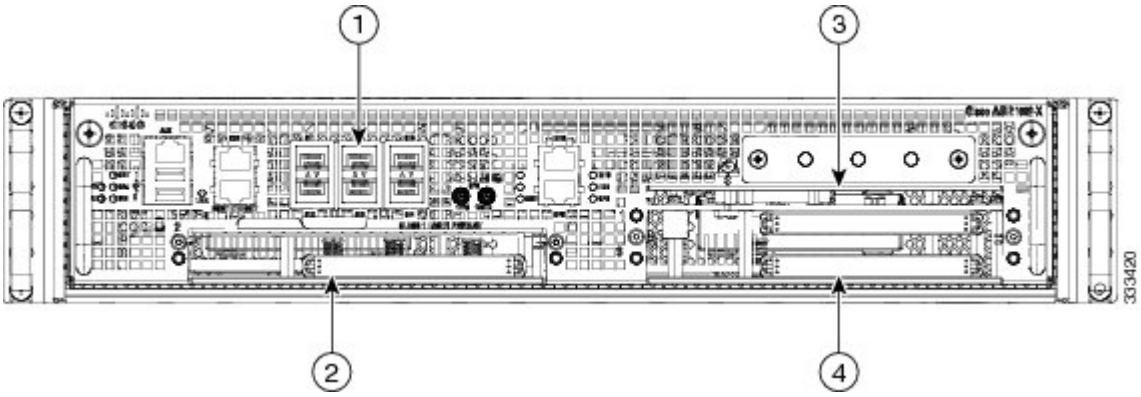
Cisco ASR 1002-X Router

In the Cisco ASR 1002-X Router, the integrated SIP supports:

- Three removable half-height SPAs in Bays 1, 2, and 3
- A built-in 6xGE SPA

Note The SPAs on the Cisco ASR1002-X support online insertion and removal. However, the SIP on the Cisco ASR 1002-X Router is built into the chassis and is not a field-replaceable unit.

Figure 4-8 shows the slot numbering for the Cisco ASR 1002-X Router.



1	6xGE Built-in SPA in Subslot 0	3	Cisco SPA subslot 1
2	Cisco SPA subslot 2	4	Cisco SPA subslot 3