



Overview of the Cisco XR 12000 Series Router SIPs

This chapter provides an overview of the release history, and feature and Management Information Base (MIB) support for the SPA interface processors (SIPs) supported on the Cisco XR 12000 Series Routers.

This chapter includes the following sections:

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Release History

[Table 2-1](#) describes the release history for the SIP hardware.

Table 2-1 Release History for SIP Hardware

Release	Modification
Cisco IOS-XR Release 3.2	Support for the following SIP hardware was introduced on the Cisco XR 12000 Series Routers: <ul style="list-style-type: none">• Cisco 12000 SIP-600

Cisco 12000 SIP-600 Features

The Cisco 12000 SIP-600 provides a common 10 Gbps forwarding and queuing engine responsible for packet classification, forwarding, queuing, and accounting without compromising performance. The Cisco 12000 SIP-600 has two forwarding engines, one for ingress and one for egress. This allows the user to implement different features and QoS policies for the ingress and egress interfaces. The multicast replication is done by the egress forwarding engine, hence a very scalable multicast with built-in QoS.

The Modular Physical Layer Interface Module (PLIM) front end hosts up to 2 SPAs. Each SPA has a dedicated 10 Gbps interface to the SPA controller. The SPA controller uses a fair bandwidth allocation algorithm to share available and excess bandwidth between the 2 SPAs. The oversubscribed SPA does not cause any packet-drop on the nonoversubscribed SPA, and any unused bandwidth from one SPA is used by the other SPA.

The Cisco 12000 SIP-600 supports any combination of the following pluggable SPAs and Layer 2 encapsulations:

- Concatenated OC-192 and OC-48
- Gigabit Ethernet and 10 Gigabit Ethernet Interfaces
- Point to Point Protocol (PPP)
- High Level Data Link Control (HDLC)
- Frame Relay
- Dynamic Packet Transport (DPT)
- Resilient Packet Ring (RPR)
- 802.17
- VLANs

The SPA controller adapts the user traffic flowing between the SPA interfaces for the Layer 3 forwarding engine. The SPA controller has two levels of priority queuing with Deficit Round Robin (DRR) and Strict Priority Servicing. Strict Priority Servicing protects higher-priority packets by dropping lower priority packets first, in an oversubscribed configuration (persistent incoming traffic rate of 20 Gbps.)

The Cisco 12000 SIP-600 provides the following key features:

- Dynamic allocation of 4096 input-shaped queues to any interface, subinterface, Frame Relay connection, VLAN.
- Ingress Queuing:
 - 2048 unicast Modified DRR (MDRR) queues
 - 16 high priority queues
 - 8 multicast queues
 - 2 fabric priority queues
- Egress Queuing:
 - 8192 Modified DRR (MDRR) queues dynamically shared across 4096 interfaces;
 - Hierarchical shaping (interface, queue)
- High number of IPv4, IPv6, Multiprotocol Label Switching (MPLS), and MPLS VKPN unicast and multicast routes: Up to 1M IPv4/MPLS routes and up to 512,000 IPv6 prefixes.
- Per-VLAN/source-destination MAC address filtering, trunking, accounting, QoS, match VLAN QoS, Hot Standby Router Protocol (HSRP)/Virtual Router Redundancy Protocol (VRRP) hierarchical rate limiting and policing, dynamic queuing, and traffic shaping.
- Input and output full NetFlow Version 8 in hardware.
- Input and output Sampled NetFlow, Versions 5, 8, and 9 in hardware.
- Building Integrated Timing Supply (BITS)
- Online Insertion Removal (OIR) of SPAs; OIR of one SPA does not effect the traffic on other SPA interfaces.
- Multi-router Automatic Protection Switching (MR-APS)
- Layer 2 VPNs over MPLS (Any transport over MPLS (AToM)) and Over IP Layer 2 Tunneling Protocol Version 3 (L2TPv3)

Supported MIBs

The following MIBs are supported in Cisco IOS-XR Release 3.2 for the Cisco 12000 SIP-600 on a Cisco XR 12000 Series Router:

- IPv6 MIB
- ICMPv6 MIB
- IPv6 TCP MIB
- IPv6 UDP MIB
- SNMP v1, v2c, v3 (RFC 1157, 1901-07)
- MIB II, including interface extensions (RFC 1213, 2011-13, 2233)
- Cisco GSR Manager
- CiscoView
- ifIndex persistence
- 64-bit counters
- APS Extensions MIB
- ATM CON MIB
- ATM Forum Address MIB
- ATM Forum MIB
- ATM MIB
- BGP-4 MIB
- CAR MIB
- Cisco AAL5 MIB
- Cisco APS MIB
- Cisco ATM Extensions MIB
- Cisco BGP Policy Accounting MIB
- Cisco Bulk File MIB
- Cisco CAR MIB
- Cisco CDP MIB
- Cisco Class-Based QoS MIB (aka MQC MIB)
- Cisco Config Copy MIB
- Cisco Config Man MIB
- Cisco Enhanced MemPool MIB
- Cisco EnvMon MIB
- Cisco Flash MIB
- Cisco Frame Relay MIB
- Cisco FRU MIB
- Cisco FTP Client MIB
- Cisco HSRP Extensions MIB

- Cisco HSRP MIB
- Cisco IETF ATM2 PVCTRAP MIB
- Cisco Image MIB
- Cisco IP Statistics MIB
- Cisco IP Mroute MIB
- Cisco MDRR MIB
- Cisco Memory Pool MIN
- Cisco Optical Monitoring MIB
- Cisco PIM MIB
- Cisco Ping MIB
- Cisco Process MIB
- Cisco Queue MIB
- Cisco RTT Monitor MIB (SAA)
- Cisco SRP MIB
- Cisco Syslog MIB
- Cisco TCP MIB
- Cisco VLAN IFTABLE Relationship MIB
- Cisco WRED MIB
- DPT MIB
- DS1/E1 MIB
- DS3/E3 MIB
- Entity MIB
- Entity II MIB
- Ethernet MIB
- Ethernet RMON MIB
- Ether-like MIB
- Event MIB
- Expression MIB
- Fabric MIB
- Frame Relay MIB (IETF)
- Frame Relay DTE MIB
- HSRP MIB
- IF MIB
- IF MIB for VLANs
- IGMP MIB
- Interfaces MIB
- Int-Serv MIB
- Int-Serv Guaranteed MIB

- IP Mroute MIB
- MPLS MIB
- MPLS LDP MIB
- MPLS LSR MIB
- MPLS-TE MIB
- MPLS-TE Topo MIB
- MPLS-VPN MIB
- MPLS-DE-TE MIB
- MQC MIB
- MSDP MIB
- Old Cisco Chassis MIB
- Old Cisco CPU MIB
- Old Cisco Interfaces MIB
- Old Cisco IP MIB
- Old Cisco Memory MIB
- Old Cisco System MIB
- Old Cisco TCP MIB
- Old Cisco TS MIB
- OSPFv2 MIB
- PIM MIB
- PSA Microcode MIB
- RFC1213 MIB
- RFC1253 MIB
- RFC1315 MIB
- RFC1406 MIB
- RFC1407 MIB
- RFC1398 MIB
- RFC1595 MIB
- RMON MIB
- RS232C MIB
- RSVP MIB
- SNMP Framework MIB
- SNMP Target MIB
- SNMP USM MIB
- SNMP VACM MIB
- SNMPv2 MIB
- SNMP v3 MIB
- SONET/SDH MIB

- SONET Traps
- Syslog Trap Alert on DLCI loss
- TCP MIB
- UDP MIB
- WRED MIB

To locate and download MIBs for selected platforms, Cisco IOS-XR releases, and feature sets, use Cisco MIB Locator found at the following URL:

<http://www.cisco.com/go/mibs>

If Cisco MIB Locator does not support the MIB information that you need, you can also obtain a list of supported MIBs and download MIBs from the Cisco MIBs page at the following URL:

<http://www.cisco.com/public/sw-center/netmgmt/cmtk/mibs.shtml>

To access Cisco MIB Locator, you must have an account on Cisco.com. If you have forgotten or lost your account information, send a blank e-mail to cco-locksmith@cisco.com. An automatic check will verify that your e-mail address is registered with Cisco.com. If the check is successful, account details with a new random password will be e-mailed to you. Qualified users can establish an account on Cisco.com by following the directions found at this URL:

<http://www.cisco.com/register>

Displaying the SPA Hardware Type

To verify the SPA hardware type that is installed in your Cisco XR 12000 Series Router, you can use the **show inventory** command.

[Table 2-2](#) shows the hardware description that appears in the **show** command output for each type of SPA that is supported on the Cisco XR 12000 Series Router.

Table 2-2 SPA Hardware Descriptions in show Commands

SPA	Description in show inventory Command
1-Port 10-Gigabit Ethernet SPA	SPA-1XTENGE-XFP
5-Port Gigabit Ethernet SPA	SPA-5XTENGE-XFP
10-Port Gigabit Ethernet SPA	SPA-10XGE-XFP
1-Port OC-192c/STM-64 POS/RPR XFP SPA	SPA-OC192POS

Example of the show inventory Command

The following example shows output from the **show inventory** command on a Cisco XR 12000 Series Router with a Cisco 12000 SIP-600 installed in slot 3:

```
RP/0/0/CPU0:x-21# show inventory
NAME: "0/0/CPU0", DESCR: "Cisco 12000 Series Performance Route Processor 2"
PID: PRP-2           , VID: N/A, SN: SAD0826025M

NAME: "0/3/CPU0", DESCR: "Cisco 12000 Series SPA Interface Processor-600 "
PID: 12000-SIP-600  , VID: N/A, SN: SAD073303F8

NAME: "0/3/0", DESCR: "1-Port OC192/STM64 POS/RPR XFP Optics"
PID: SPA-OC192POS-XFP , VID: V01, SN: PRTA1204185

NAME: "0/3/1", DESCR: "1-port 10GbE Shared Port Adapter XFP based"
PID: SPA-1XTENGE-XFP , VID: V01, SN: PRTA2104133
```

