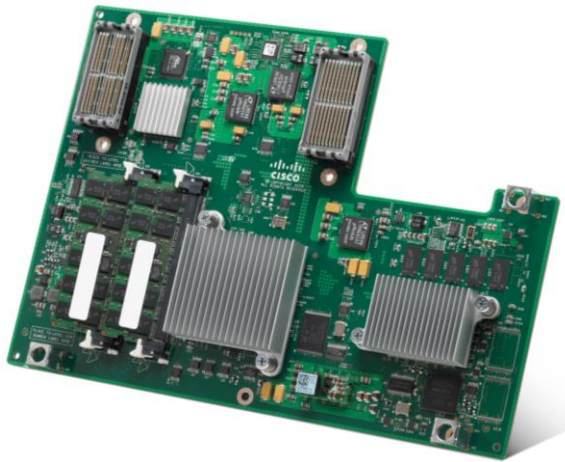# Cisco XR 12000 Service Module Daughter Card for Performance Route Processor-3

Product Overview

The Cisco[®] XR 12000 Service Module Daughter Card for Performance Route Processor-3 (PRP3-SMDC, Figure 1) is the next-generation service module that inserts into the next-generation Cisco XR 12000 Performance Route Processor-3 (PRP-3).

Figure 1.   Cisco PRP3-SMDC

Cisco PRP-3 is the premium route processor for the Cisco XR 12000 Series Routers, addressing the unique route processing requirements of carrier-grade IP and Multiprotocol Label Switching (MPLS) packet infrastructures. Cisco PRP-3 has the unique capability to insert a daughter card, and this capability is used by the Cisco PRP3-SMDC (Figure 2).

Figure 2.   Cisco XR 12000 PRP-3 with PRP3-SMDC Inserted

Cisco PRP3-SMDC adds new capabilities by supporting carrier-grade Layer 3 to Layer 4 services. Services that are not traditionaly supported on the Line Card (LC), such as Carrier Grade Network Address Translation (NAT), can now be transparently provisioned on the Cisco PRP3-SMDC. All packets entering the router (LC) that require

PRP3-SMDC processing will be diverted in hardware to the Cisco PRP3-SMDC, which will process the packet and route it back out.

At the center of the Cisco PRP3-SMDC is a 16-core Octeon processor that runs a version of Linux and is optimized for fast packet handling. While Cisco PRP3-SMDC runs Linux, all the configuration and management is handled in Cisco IOS® XR Software running on the route processor; the end-user experience does not change. The advantages of using the daughter card are that it naturally follows the route processor redundancy paradigm, and more importantly that it does not take up an additional slot that can house customer ports.

Cisco PRP3-SMDC is responsible for the following functions:

- Supporting up to 10 Gbps of service traffic per daughter card
- Running carrier-grade Layer 3 to Layer 4 services.
- Running certain types of protocol offloads that help boost Cisco XR 12000 Series scale
- Supporting all service layer configuration on Cisco IOS XR Software

Features and Benefits

Cisco XR 12000 PRP3-SMDC delivers enhanced performance and capabilities as listed in Table 1.

Table 1.   Cisco XR 12000 PRP3-SMDC Features and Benefits

Feature	Benefit
High-speed fabric connectivity	• Designed to support up to 10 Gbps traffic • Provides transparent nonblocking low-latency packet forwarding • Isolates control packets destined to Cisco PRP-3 to avoid impact
Dual modes (active-active and active-standby)	• Offers active-standby redundancy for quick failovers • Capable of supporting active-active redundancy mode to increase service handling bandwidth
Distributed forwarding plane architecture	Supports a enhanced forwarding plane to route packets after service-related processing
Control plane extensions	Capable of extending certain control plane features, such as Bidirectional Forwarding Detection (BFD), to be offloaded to Cisco PRP3-SMDC to increase the control plane scale
High application scale	Houses 4G of dedicated memory, which is used to support high application scale
Virtual output queuing and arbitration	• Offers service intelligence with prioritization of traffic (unicast and multicast) • Provides efficient congestion management mechanism and avoids problems related to head-of-line blocking
Unified management plane	All configuration and management is done on Cisco IOS XR Software running on Cisco PRP-3.

Some of the features that are planned to be supported on Cisco PRP3-SMDC include:

- Carrier Grade NAT44
- NAT64
- High availability
- IPv6 rapid deployment (6rd) border relay
- Stateless translator (XLAT)
- BFD offload

The software to run Cisco PRP3-SMDC is sold as separate license. This gives service providers the flexbility to enable and run services on the Cisco PRP3-SMDC when they need the services and not pay at the time when they order the daughter board along with the Cisco PRP-3.

Product Specifications

Tables 2 through 5 provide specifications for the Cisco PRP3-SMDC.

Table 2. Chassis Compatibility

Description	Specification
Chassis compatibility	Cisco XR 12816, XR 12810, XR 12416, XR 12410, XR 12406, XR 12404, XR 12016*, XR 12010, XR 12006, and XR 12004 Routers

Note: Cisco PRP3-SMDC is supported with these chassis operating with Cisco IOS XR Software 4.1.1 and later.

*Cisco PRP3-SMDC is not supported in the Cisco XR 12016 configured with original fabric cards GSR16/80-CSC and GSR16/80-SFC, but it is supported on this chassis with enhanced fabric cards 12016E-CSC and 12016E-SFC.

Table 3. Power Requirements

Description	Specification
PRP3-SMDC	60W
PRP-3 + PRP3-SMDC	80W + 60W = 140W

Table 4. Physical and Environmental Specifications

Description	Specification
Temperature	Operating: 32 to 104°F (0 to 40°C) Storage: –4 to 149°F (–20 to 65°C)
Humidity	Operating (noncondensing): 10–90% Storage (noncondensing): 5–95%
Dimensions (H x W x D)	7.66 x 1.10 x 10.8 in. (19.46 x 2.79 x 27.43 cm) (occupies single thin slot)
Weight	1.1 lb (500 g)

Table 5. Regulatory Approvals

Description	Specification
Safety	• UL 60950 • CSA 22.2-No. 60950 • EN60950 • IEC 60950 CB Scheme • ACA TS001 • AS/NZS 3260
EMI	• FCC Class A • ICES 003 Class A • AS/NZS 3548 Class A • CISPR 22 Class A • EN55022/EN50082-1 Class A • ETSI EN 300 386 (EN55022 Class A) • VCCI Class A
Immunity	• EN 61000-4-2, ESD Level 4 (15-kV air, 8-kV contact) • EN 61000-4-3, radiated immunity Level 3 (10V/m) • EN 61000-4-4 EFT Level 4 • EN 61000-4-5 surge • EN 61000-4-6 conducted immunity Level 3 (10V) • EN 61000-4-11 voltage dips and sags • EN 55024

Description	Specification
ETSI	EN 300 386/EN 300 386-2 Class B
Network Equipment Building Standards (NEBS)	This product is designed to meet the following requirements (qualification completed): • SR-3580 – NEBS: criteria levels (Level 3 compliant) • GR-63-Core – NEBS: physical protection • GR-1089-Core – NEBS: EMC and safety

System Requirements

Table 6 lists system requirements for the Cisco PRP3-SMDC.

Table 6. System Requirements

Specification	Requirement
Hardware	Configurable in any Cisco XR 12000 Series chassis. Supported in the older Cisco 12006, 12010, 12404, 12406, 12410, 12416, 12810, and 12816 Routers. Cisco PRP3-SMDC is not supported in chassis configured with fabric cards GSR16/80-CSC and GSR16/80-SFC.
Software	Cisco IOS XR Release 4.1.2, which runs on Cisco PRP-3. Cisco PRP3-SMDC is not supported in Cisco IOS XR Software.

Warranty Information

Find warranty information on the Product Warranties page on Cisco.com.

Ordering Information

To place an order, visit the Cisco Ordering Home Page. Refer to the part numbers in Table 7. To download software, visit the Cisco Software Center.

Table 7. Ordering Information

Product Description	Part Number
Cisco XR 12000 Performance Route Processor-3	PRP-3
Cisco XR 12000 Performance Route Processor-3 (redundant option)	PRP-3/R
Cisco XR 12000 Performance Route Processor-3 (spare)	PRP-3=
Cisco XR 12000 Service Module Daughter Card for PRP-3	PRP3-SMDC
Cisco XR 12000 Service Module Daughter Card for PRP-3 (spare)	PRP3-SMDC=
Cisco PRP-3 Service Module Daughter Card CGN Software License	XR12K-CGN-LIC
Cisco PRP-3 Service Module Daughter Card CGN Software License (spare)	XR12K-CGN-LIC=
Bundled PRP-3 and PRP3-SMDC offering	PRP3-P=

Cisco Services

Cisco has earned high customer satisfaction ratings for its wide range of support offerings for service providers. Whether the goal is speed to market, maximizing network availability, or enhancing customer satisfaction and retention, Cisco is committed to the success of service providers.

For More Information

The Cisco XR 12000 Series Routers are a portfolio of intelligent routing solutions that scale from 2.5-Gbps to n x 10-Gbps capacity per slot, supporting carrier-class IP/MPLS networks and accelerating the evolution toward IP Next-Generation Networks (NGNs). Built for investment protection, this portfolio delivers up to 1.28 terabits per second (Tbps) switching capacity with wire-speed feature performance, scalability, and graceful hardware and software upgrade paths.

For a detailed list of Cisco IOS XR Software features supported on these products, refer to the release notes of the appropriate version.

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