Cisco Shared Port Adapters/SPA Interface Processors
Cisco 1-Port OC-12c/STM-4c POS Shared Port Adapter

The Cisco® I-Flex approach combines shared port adapters (SPAs) and SPA interface processors (SIPs), providing an extensible design that enables service prioritization for data, voice, and video services. Enterprise and service provider customers can take advantage of improved slot economics resulting from modular port adapters that are interchangeable across Cisco routing platforms. The I-Flex design maximizes connectivity options and offers superior service intelligence through programmable interface processors that deliver line-rate performance. I-Flex enhances speed-to-service revenue and provides a rich set of quality of service (QoS) features for premium service delivery while effectively reducing the overall cost of ownership. This data sheet contains the specifications for the Cisco 1-Port OC-12c/STM-4c POS Shared Port Adapter (Cisco 1-Port OC-12 POS SPA; refer to Figure 1).

Figure 1. Cisco 1-Port OC-12 POS SPA with SFP Optics



Product Overview

The Cisco 1-Port OC-12 POS SPA is available on high-end Cisco routing platforms, offering the benefits of network scalability with lower initial costs and easy upgrades. The Cisco SPA/SIP portfolio continues Cisco's focus on investment protection along with consistent feature support, broad interface availability, and the latest technology. The Cisco SPA/SIP portfolio allows different interfaces (packet over SONET/SDH [POS], ATM, Ethernet, etc.) to be deployed on the same interface processor.

The Cisco 1-Port OC-12 POS SPA provides a single Small Form-Factor Pluggable (SFP) interface. SFP modules are available in multiple optical reaches from 2 to 80 kilometers (km).

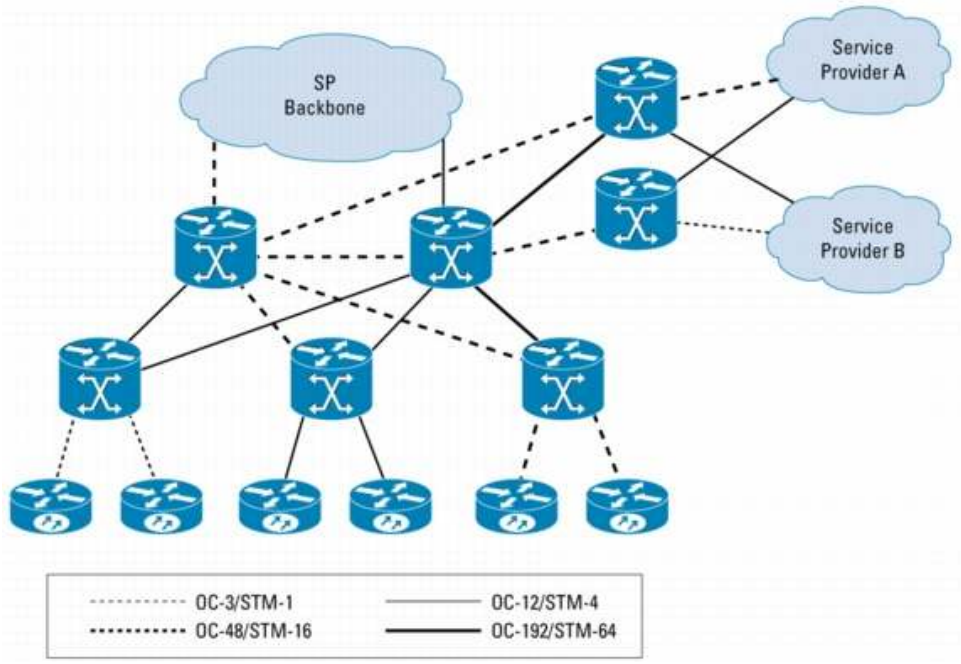
Applications

The Cisco 1-Port OC-12 POS SPA can be used in multiple applications (Figure 2), including:

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- Access and aggregation
- WAN uplinks
- Internet peering

Figure 2. POS Applications



Key Features and Benefits

The Cisco SPA/SIP portfolio offers many advantages, including:

- Highly modular, flexible, intelligent interface processors
  - Superior flexibility, providing a combination of interface types on the same interface processor for consistent services, independent of access technology.
  - Pioneering programmable interface processors that provide flexibility for the service diversity required in next-generation networks.
  - Innovative design that supports intelligent service delivery without compromising on performance.
- Increased speed to service revenue
  - The scalable, programmable Cisco architecture extended to 10 Gbps dramatically improves customer density, increasing potential revenue per platform.
  - Interface breadth (copper, channelized, POS, ATM, and Ethernet) on a modular interface processor allows service providers to roll out new services more quickly, helping ensure that all customers large and small receive consistent, secure, and guaranteed services.
  - High-density SFP interfaces are featured for high-port-count applications with reach flexibility. Future optical technology improvements can be adopted using existing SPAs.
- Dramatically improved return on your routing investment
  - Improved slot economics and increased density reduce capital expenditures (CapEx).

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- The ability to easily add new interfaces as they are needed enables a "pay-as-you-grow" business model.
- SPAs are shared across multiple platforms, and can be easily moved from one to another, providing consistent feature support, accelerated product delivery, and a significant reduction in operating expenses (OpEx) through common sparing as service needs change.

Product Specifications

Table 1 gives specifications of the Cisco 1-Port OC-12 POS SPA.

Table 1. Product Specifications

Features	Descriptions
Product Compatibility	• Cisco 7304 Router • Cisco Catalyst 6500 Series Switches • Cisco 7600 Series Routers • Cisco 12000 Series Routers • Cisco XR 12000 Series Routers • Cisco ASR 1000 Series Router
Port Density per SPA	1 port

Physical Interface	• OC-12c/STM-4c SFP optics module (refer to optical parameters in Table 2)
	• Visual status indicators (LEDs):
	  ◦ SPA status LED
	  ◦ Per-port LEDs
	• Carrier and alarm
	• Active and loopback

Protocols	• High-Level Data Link Control (HDLC), RFC 2615 • Point-to-Point Protocol (PPP), RFC 1662 • Frame Relay, RFC 2427 • IPv4/IPv6

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Features	Descriptions

Features and Functions	• Synchronization
	  ◦ Local (internal) or loop timed (recovered from network)
	  ◦ Pointer activity monitoring
	• Local (diagnostic) and line (network) loopback
	• Section data communications channel (SDCC)---Platform-dependent feature
	• Payload mapping
	  ◦ POS with 1 + X^43 self-synchronous scrambler
	• SONET/SDH compliance
	  ◦ Telcordia (Bellcore) GR-253-CORE (as applicable)
	  ◦ ANSI T1.105, T1.231
	  ◦ ITU-T G.707, G.957, G.825 (as applicable)
	• Supported SONET/SDH alarm and signal events
	  ◦ Signal failure bit error rate (SF-ber)
	  ◦ Signal degrade bit error rate (SD-ber)
	  ◦ Signal label payload construction (C2)
	  ◦ Path trace byte (J1)
	  ◦ Section
	• Loss of signal (LOS)
	• Loss of frame (LOF)
	• Error counts for B1
	• Threshold crossing alarms (TCA) for B1
	  ◦ Line
	• Line alarm indication signal (LAIS)
	• Line remote defect indication (LRDI)
	• Line remote error indication (LREI)
	• Error counts for B2
	• TCA for B2
	  ◦ Path
	• Path alarm indication signal (PAIS)
	• Path remote defect indication (PRDI)
	• Path remote error indication (PREI)
	• Error counts for B3
	• TCA for B3
	• Loss of pointer (LOP)
	• Positive stuffing event (PSE)
	• Negative stuffing event (NSE)
	• Path unequipped indication signal (PUNEQ)
	• Path payload mismatch indication signal (PPLM)

Network Management	• RFC 2558 MIB (SONET/SDH) • Simple Network Management Protocol (SNMP)
Reliability and Availability	• Online insertion and removal (OIR) • Field-replaceable SFP optical modules • 1+1 SONET Automatic Protection Switching (APS) and SDH Linear Multiplexer Section Protection (MSP) protocols • Single SPA software reset
Physical Specifications	• Weight: 0.75 lb or 0.34 kg • Height: 0.8 in. or 2.03 cm---(single height) • Width: 6.75 in. or 17.15 cm • Depth: 7.28 in. or 18.49 cm
Power	12.8 W maximum
Environmental Specifications	• Operating temperature: 41 to 104℉ or 5 to 40℃ • Storage temperature: -38 to 150℉ or -40 to 70℃ • Operating humidity: 5 to 85% relative humidity • Storage humidity: 5 to 95% relative humidity

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Features	Descriptions
Compliance and Agency Approvals	Safety • UL 60950 • CSA 22.2-No.60950 • EN60950 • IEC 60950 CB Scheme • ACA TS001 • AS/NZS 3260 • EN60825\IEC60825 laser safety (SR, IR-Class 1) (VSR-Class 1M)1 • 21CFR1040 -FDA Code of Federal Regulations (USA) laser safety (SR, IR-Class 1) (VSR-Class 1M)1 EMC • FCC Part 15 (CFR 47) • ICES 003 • EN55022 • CISPR 22 • AS/NZ 3548 • VCCI • EN55024 • EN50082-1 • EN61000-6-1 • EN61000-3-2 • EN61000-3-3 Network Equipment Building System (NEBS) This product is designed to meet the following requirements (official qualification may be in progress): • SR-3580---NEBS: Criteria levels (Level 3 compliant) • GR-63-Core---NEBS: Physical protection • GR-1089-Core---NEBS: EMC and safety ETSI • EN300 386/EN300 386-2 Class B • ETS 300 019 Storage Class 1.1 • ETS 300 019 Transportation Class 2.3 • ETS 300 019 Stationary Use Class 3.1

Table 2 gives optical specifications of the Cisco 1-Port OC-12 POS SPA.

Table 2. OC-12c/STM-4c POS Optical Specifications

SFP Optics	Maximum Distance
Multimode (MM) Short Reach (SR)	Up to 0.25 mi (500 m)
Single-Mode (SM)	Up to 1.2 mi (2 km)
SM Intermediate Reach (IR-1)	Up to 9 mi (15 km)
SM Long Reach (LR-1)	Up to 25 mi (40 km)
SM Extended Reach (LR-2)	Up to 50 mi (80 km)

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Ordering Information

To place an order, visit the Cisco Ordering Home Page or refer to Table 3.

Table 3. Ordering Information

Product Name	Part Number
Cisco 1-Port OC-12c/STM-4c POS Shared Port Adapter	SPA-1XOC12-POS
OC-12/STM-4 SFP, MM, SR	SFP-OC12-MM
OC-12/STM-4 SFP, SM, SR	SFP-OC12-SR
OC-12/STM-4 SFP, SM, IR-1	SFP-OC12-IR1
OC-12/STM-4 SFP, SM, LR-1	SFP-OC12-LR1
OC-12/STM-4 SFP, SM, LR-2	SFP-OC12-LR2

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For More Information

For more information about the Cisco SPA/SIP portfolio, visit http://www.cisco.com/go/spa or contact your local Cisco account representative.

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