

Cisco 10000 Edge Services Router OC-12 Packet over SONET Interface Module

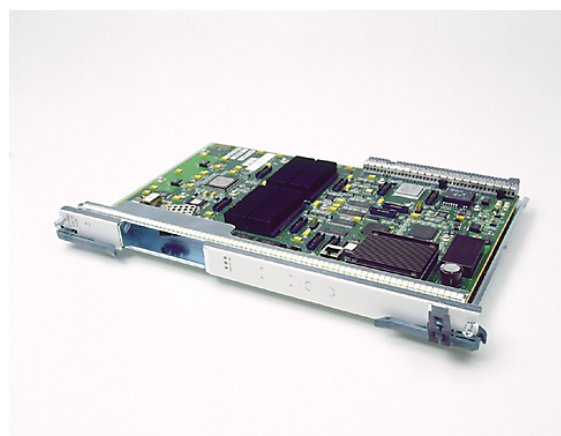
THE CISCO 10000 EDGE SERVICES ROUTER (ESR) OC-12 PACKET OVER SONET (PoS) INTERFACE MODULE IS A HIGH CAPACITY, HIGH PERFORMANCE INTERFACE THAT PROVIDES CONNECTIVITY FROM THE AGGREGATION ROUTER TO THE CORE. PoS ENABLES ISPs TO SUBSTANTIALLY INCREASE THE DATA LOAD OVER THEIR OPTICAL TRANSPORT INFRASTRUCTURE. WITH ITS OC-12 CAPACITY (622 MBPS) THIS CISCO 10000 ESR MODULE PROVIDES A POWERFUL COMBINATION OF SCALABILITY AND FLEXIBILITY. IT ALSO SUPPORTS PACKET OVER SONET HIGH AVAILABILITY TECHNOLOGY IDEALLY SUITED FOR INTERNET AND/OR IP NETWORKS.

Product Description

The OC-12 PoS module for the Cisco 10000 ESR platform is a high-capacity, high-performance interface that provides Internet service providers (ISPs) with significant performance improvements in their existing fiber networks. This increased interface capacity, combined with wire-speed IP differentiated services supported by the Cisco 10000 ESR platform, enable ISPs to provide new levels of cost-effective IP services to their expanding customer base by more efficiently utilizing existing resources.

The Cisco 10000 ESR OC-12 PoS module supports OC-12/STM-4 bandwidth of 622 Mbps of PoS traffic. The module may be placed in any interface slot in the Cisco 10000 ESR platform (up to a maximum of eight modules per chassis) and all modules are hot-swappable. The OC-12 PoS module is a standard implementation of packet over SONET, supports advanced features such as automatic protection switching (APS), alarm processing, and performance monitoring, and is fully compatible with standards-based PoS implementations on platforms such as the Cisco 7200, Cisco 7500, and Cisco 12000 series Gigabit Switch Router (GSR).

Figure 1 Cisco 10000 ESR OC-12 Packet over SONET Interface Module



Key Benefits

Efficient, High-Performance Bandwidth Utilization

The Cisco 10000 ESR OC-12 PoS card provides the unique advantages of efficient bandwidth utilization combined with very high performance. OC-12 performance of 622 Mbps provides the increased bandwidth required by many ISPs to handle the most demanding user requirements such as faster access to Web pages and data-intensive applications such as real-time video and large file transfers. But the OC-12 PoS module provides more than just a "fat pipe." Compared to multiservice IP traffic now running over ATM networks, the PoS implementation also offers a 25 to 30 percent gain in efficiency by eliminating overhead such as ATM cell header, IP over Asynchronous Transfer Mode (ATM) encapsulation, and segmentation and reassembly (SAR) required in the ATM implementation.

Fault-Tolerant Backbone Connectivity

The Cisco 10000 ESR OC-12 PoS module implements Synchronous Optical Network (SONET) automatic protection switching (APS), a valuable tool to support network resiliency, fault tolerance, and increased overall network availability. APS provides a very fast Layer 1 mechanism to support 1:1 redundant transmission circuits between SONET devices. APS allows rapid switchover from one fiber connection to another in the event of a fiber cut, module failure, signal failure, or signal degradation. The result is increased network resiliency, minimal loss of data, and reduction in time-consuming reroutes of data.

Optimized for IP-Based Differentiated Services

The Cisco PoS solution is optimized to support Internet-based multiservice networks based on IP. The Cisco PoS implementation places the IP layer directly above the SONET layer and eliminates the overhead needed to run IP over ATM over SONET for multiservice applications. The Cisco 10000 ESR's performance capacity enables service providers to provide customers guaranteed and differentiated services through IP-based quality-of-service (QoS) products for their multiservice applications. With the three precedence bits in the IP header, it is possible to provide differentiated classes of service (CoSs) by utilizing random early detection (RED) and weighted RED (WRED) to support multiservice applications, including data, voice, and video applications.

Compatibility and Interoperability Reduces Costs

PoS protects the customer's investment by providing a new high-performance backbone connection that optimizes existing fiber in the network while remaining compatible with the existing equipment in the network. The Cisco 10000 ESR OC-12 PoS module provides up to 300 percent more bandwidth over single-mode, intermediate-reach fiber than an OC-3 interface, and yet the Cisco 10000 ESR module is fully compatible with existing OC-12 PoS implementations in the network, such as those found in the Cisco GSR platform. By enabling customers to more efficiently use existing fiber and re-use currently installed platforms, the Cisco 10000 ESR PoS implementation saves the customer money and improves the overall efficiency of the network.

Key Features

Chassis

- Single-port OC-12/STM-4 SONET interface with SC connector
- Interface supports single-mode, intermediate-reach fiber (maximum distance 15 km)
- Unit power budget, 28W
- NEBS Level 3 compliant

SONET Layer

- Standards-compliant SONET interface
 - GR253 compliant
 - ITU G.707 and G.957 compliant
- Alarm processing
- Loss of signal (LoS), loss of frame (LoF), line alarm indicator signal (LAIS), path alarm indicator signal (PAIS), loss of pointer (LoP), line remote defect indicator (LRDI), path remote defect indicator (PRDI), signal failure (SF), signal degrade (SD), line remote error indicator (line FEBE), path remote error indicator (path FEBE)
- Performance monitoring
- Error counts for B1, B2, B3
- Threshold crossing alerts (TCA) for B1, B2, B3 with settable threshold
- Synchronization
- Local (internal) or loop timed (recovered from network)
- +/- 20 ppm clock accuracy
- Protection switching
- Support for SONET APS protocols
- Local (diagnostic) and line (network) loopback
- Payload mapping
- IETF RFC 1619 Point-to-Point Protocol (PPP) over SONET
- ATM 1 + X43 self-synchronous scrambler

Specifications

Physical

- Occupies a single slot
- SC duplex connector
- Interface: single mode, intermediate reach
- Hot swappable, no slot dependency
- Weight: 4.75 lb (2.16 kg)
- Dimensions: 16.0 x 1.12 x 9.97 in.
(40.64 x 2.83 x 25.32 cm) (H x W x D)

Environmental

- Storage temperature: -38 to 150 F (-40 to 70 C)
- Operating temperature, nominal: 41 to 104 F (5 to 40 C)
- Operating temperature, short term: 23 to 131 F (-5 to 55 C)
- Storage relative humidity: 5% to 95% relative humidity (RH)
- Operating humidity, nominal: 5% to 85% RH
- Operating humidity, short term: 5% to 90% RH
- Operating altitude: -60 m to 4000 m

Regulatory Compliance

Safety

- UL 1950, Third Edition (Safety of Information Technology Equipment, Including Electrical Business Equipment), with No D3 Deviations
- CSA 22.2 No. 950-95 Third Edition (Safety of Information Equipment Technology, Including Electrical Business Equipment)
- EN 60950 (Safety of Information Equipment Technology, Including Electrical Business Equipment) incorporating Amendments 1, 2, 3 and 4, with all National Deviations
- IEC 950 incorporating Amendments 1, 2, 3 and 4, with all National Deviations
- ACA TS001 1997 Test Report and Statement of Compliance AS/NZS3260 incorporating Amendments 1, 2, 3 and 4

Electromagnetic Emissions Certification

- FCC Part 15 Class B
- EN55022: 1998 Class B
- CISPR 22:1997 Class B
- CFR 47 Part 15 Class A
- ICES -003, Issue 2, Class B, April 1995
- VCCI V-3/97.04 Class II
- AS/NZS 3548:1992, Class B
- CNS-13438 Class B - BSMI (BCIQ) in Taiwan

Immunity

- EN61000-4-2 ESD immunity
- EN61000-4-3 Radiated RF field immunity
- EN61000-4-4 Immunity to electrical fast transients
- EN61000-4-5 Surge immunity
- EN61000-4-6 RF conducted immunity
- EN61000-4-6 RF conducted immunity
- EN61000-4-11 Dips and sags (AC input)
- EN61000-3-2 Power line harmonics (AC input)

Network Equipment Building Systems

- Network Equipment Building Systems (NEBS): criteria levels (Level 3 compliant)
- NEBS: physical protection
- NEBS: EMC and safety
- GR-1089-Core
- GR-63-Core
- SR-3580

European Telecommunication Standards Institute

- ETS 300 386-1—Levels for equipment with a “high priority of service” that is installed in “locations other than Telecommunication centers”
- ETS 300 386-2:1997—Levels for equipment with a “high priority of service” that is installed in “locations other than Telecommunication centers”
- ETSI 300 132-2: December 1994—Power supply interfaces at the input to telecommunications equipment Sections 4.8, 4.9

LEDs

- Carrier status (green, 1 per card)
- Packet received (green, 1 per card)
- Packet transmitted (green, 1 per card)
- Fail (yellow, 1 per card)

Encapsulation

- IETF RFC 1661, PPP
- IETF RFC 1662, PPP in High-Level Data Link Control (HDLC)-like Framing
- IETF RFC 1490, Frame Relay encapsulation

Network Management

- Simple Network Management Protocol (SNMP)
- MIB-II
- PoS MIB

Power Budget

- Component: OC-12 PoS interface module
- Unit power: 28W

Optical Power Budget

- Power budget: 12db
- Transmit power: -15 to -8dBm
- Receive power: -28 to -8 dBm
- Typical maximum distance: 9.3 miles (15km)

Ordering Information

Part Number	Description
ESR-10C-12/P-SMI	1-port OC-12/STS-12c/STM-4 PoS, Single Mode, Intermediate Reach



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