SONET/SDH OC-3c/STM-1



Ascend SONET/SDH OC-3c/STM-1 IP Forwarding Media Card – Q Series

The SONET/SDH OC-3c/STM-1 Q Series IP Forwarding Media Card is an intelligent, self-contained IP forwarding engine that provides high-performance SONET/SDH support for the GRF®. The SONET/SDH card's 155 Mbps, full-duplex SONET/SDH port leverages the GRF switch to deliver packets at full line speeds.

Integrated Layer-3 switching capabilities optimize network performance

Within the GRF distributed architecture, each intelligent IP Forwarding Media Card makes Layer-3 decisions. The SONET/SDH card features two processors, a large route table and memory resources to deliver the performance and capacity for demanding networks such as the Internet. Ascend's Q series cards feature Quick Branch Routing Technology (QBRT) hardware-assisted route table lookup, which enables a full route table lookup 100 times faster than conventional software approaches.

- Aggregate throughput of up to 120,000 packets per second (pps)
- Up to 250,000 route table entries
- 8 MB buffer memory (matches speed between dissimilar media and accommodates cross-country bandwidth-delay products)

Scalable design maximizes port density and enables full system functionality

The GRF dedicates 1 Gb/s of internal bandwidth to each IP Forwarding Media Card, maximizing the use of every media card in the GRF without performance degradation. In fact, the GRF scales linearly with every additional IP Forwarding Media Card.

Point-to-Point Protocol (PPP), High-level Data Link Control (HDLC) and Frame Relay provide the most efficient use of fiber optic WAN bandwidth.

The expense, complexity and wasted bandwidth associated with ATM networks is avoided by using the low-overhead PPP, HDLC and Frame Relay framing protocols. When using Frame Relay, the GRF can operate as both a switch (NNI) and a router (UNI) on the same link.

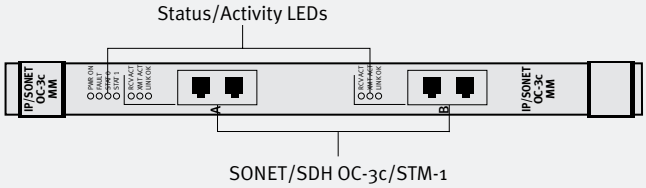
Independent, hot-swappable architecture increases uptime

To ensure maximum network uptime, the SONET/SDH card was designed so that the GRF system operates continuously. The card is easy to install and maintain, and it automatically configures itself after initial installation.

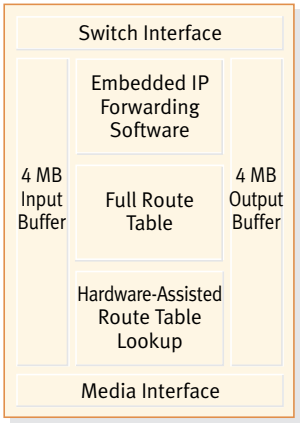
Since each card functions independently, the system continues to operate if an SONET/SDH card problem occurs. Network administrators can reset the card or place it on hold until the situation has been corrected. Or they can replace the card while the system continues to operate, and the new card is configured automatically.

- Supports APS 1+1 Architecture switching
- Auto-configure
- Hot-swap capability
- Maintenance of each card occurs while system is online

SONET Backpanel



SONET/SDH Architecture



The software on the SONET/SDH card supports:

- Full IP
- PPP
- Frame Relay UNI, NNI
- HDLC
- Inverse ARP

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Features

Standard IP Routing	Performs IP datagram forwarding, header validation and processing, ICMP processing
Support for Multiple Framing Protocols	Frame Relay, Point-to-Point Protocol (PPP), High-level Data Link Control (HDLC)
Frame Relay	Performs IP encapsulation per RFC 1490 Automatically adds PVCs via LMI (optional) Supports Annex A, Annex D, LMI-Standard and LMI-Disabled Supports Inverse ARP Provides 256 logical interfaces per card, independently configurable as point-to-point (Single PVC) or multi-access (multiple PVCs) Supports entire set of 906 unreserved PVCs per physical interface UNI and NNI signaling
Point-to-Point Protocol (PPP)	Complies with IETF RFCs 1661 and 1662 Supports Link Quality Monitoring LCP and IPCP options: ▸ Maximum receive unit ▸ Quality protocol ▸ Magic number ▸ IP address
HDLC	Full-duplex, synchronous transfer mode Cisco-compatible
SNMP Monitoring	Traffic on the card is monitored by the SNMP agent (RFC 1157), which can in turn be monitored by any SNMP manager MIBs include: MIB-II (RFC 1213), PPP MIB (RFCs 1471 and 1473) and the GRF enterprise MIB
Hot-swap capability	Yes

Internet Standards

RFC 791	Internet Protocol
RFC 792	Internet Control Message Protocol
RFC 1112	Host Extensions for IP Multicasting
RFC 1157	A Simple Network Management Protocol
RFC 1191	Path MTU Discovery
RFC 1195	Use of OSI IS-IS for Routing TCP/IP and Dual Environments
RFC 1213	TCP/IP Management Information Base
RFC 1293	Inverse Address Resolution Protocol
RFC 1332	The PPP Internet Protocol Control Protocol (IPCP)
RFC 1333	PPP LInk Quality Monitoring
RFC 1471	Managed Objects for the Link Control Protocol of the Point-to-Point Protocol
RFC 1473	Managed Objects for the IP Network Control Protocol of the Point-to-Point Protocol
RFC 1490	Multiprotocol Interconnect over Frame Relay
RFC 1619	PPP over SONET/SDH
RFC 1661	The Point-to-Point Protocol (PPP)
RFC 1662	PPP in HDLC-like Framing

Specifications

Transfer Rate	155 Mbps
Transmission Distance	LAN; WAN distances with use of repeaters
Interfaces Per Card	1 full-duplex OC-3c/STM-1 SONET/SDH Supports APS 1+1 Architecture switching
Cable Requirements	Single-mode cables: 9/125 micron optical fiber Multimode cables: 62.5/125 micron optical fiber
Physical Connectors	Duplex SC transceivers
Connector Requirements	Must meet JIS C 5973 standards
LASER Components (SM)	Class 1, 1,310 nm LASER diodes
Optical Input (avg.)	-32.5 dBm minimum, -8 dBm maximum (SM) -32.5 dBm minimum, -14 dBm maximum (MM)
Optical Output (avg.) (9/125 um)	-14 dBm minimum, -8 dBm maximum (SM) -19 dBm minimum, -14 dBm maximum (MM)
Optical Wavelength	1,261 nm minimum, 1,310 nm typical, 1,360 nm maximum (SM) 1,270 nm minimum, 1,310 nm typical, 1,380 nm maximum (MM)
Spectral Width	7.7 nm maximum (SM) 120 nm typical, 200 nm maximum (MM)
Card Dimensions	9 in x 16 in [22.9 cm x 40.6 cm]
Card Weight	~2 lbs [0.9 kg]
Operating Requirements	Temperature: 32-104˚F [0-40˚C] Relative Humidity: 10-90% (noncondensing)

SM = Single Mode
MM = Multimode

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Ascend markets the B-STDX, CBX, GRF, IP, MAX, Multiband, MultiDSL, Navis, Pipeline, SA, SecureConnect and STDX families of products. Ascend products are available in more than 40 countries worldwide.

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