ATM OC-3c/STM-1



Ascend ATM OC-3c/STM-1 IP Forwarding Media Card

The Asynchronous Transfer Mode (ATM) OC-3c/STM-1 IP Forwarding Media Card is an intelligent, self-contained IP forwarding engine that provides high-performance ATM OC-3c/STM-1 support for the GRF™. The ATM IP Forwarding Media Card leverages the GRF switch to deliver packets at full line speeds. Two full-duplex OC-3c/STM-1 SONET/SDH ports provide exceptional configuration flexibility and port density.

Integrated Layer-3 switching capabilities optimize network performance

Within the GRF distributed architecture, each intelligent IP Forwarding Media Card makes Layer-3 decisions. The ATM OC-3c/STM-1 card features two processors, a large route table and memory resources to deliver the performance and capacity for demanding networks such as the Internet. The ATM card is capable of performing hardware-assisted lookups of a full route table 100 times faster than conventional software approaches.

- Aggregate throughput of up to 130,000 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 port on the ATM OC-3C/STM-1 card and every slot on the GRF without performance degradation. In fact, the GRF scales linearly with every additional IP Forwarding Media Card. Because the ATM card is designed to utilize every square inch of the system, users have a high-density solution at the lowest price per port available.

Independent, hot-swappable architecture increases uptime

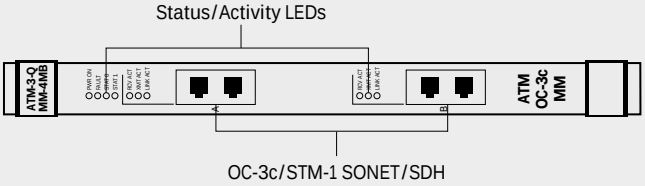
Because downtime is not an option for a network, the ATM OC-3c/STM-1 IP Forwarding Media Card has been designed so that the GRF system operates continuously.

The card is easy to install and maintain, and it automatically configures itself after initial installation.

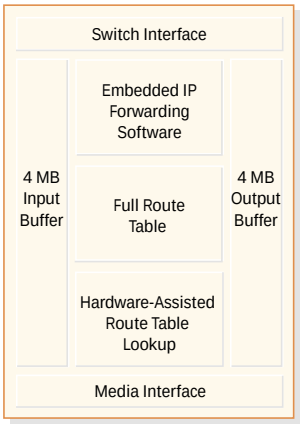
Since each card functions independently, the system continues to operate if an ATM OC-3c/STM-1 card problem occurs. Network administrators can reset the card or place it on hold until the situation has been corrected. Or they can replace the card while the system continues to operate, and the new card is configured automatically.

- Auto-configure
- Hot-swap capability
- Maintenance of each card occurs while system is on-line

ATM OC-3c/STM-1 backpanel



ATM OC-3c/STM-1 Architecture



The software on the ATM card supports:

- Full IP
- UNI 3.0, 3.1
- RFCs 1577, 1483, 1755
- IP over ATM
- Traffic shaping
- SVCs, PVCs

Features

Standard IP Routing	Performs IP datagram forwarding, header validation and processing, ICMP processing
IP over ATM	Encapsulation of IP datagrams and routing on ATM networks using AAL-5 and LLC/SNAP, as recommended in RFC 1483 and RFC 1577 VC multiplexing (null encapsulated) circuits Implements inverse ATM ARP (InATMARP)
Traffic Shaping	Supports UBR and VBR
Quality of Service (QoS)	Supports two priority classes, high and low, on a per VC basis
UNI 3.0 and 3.1 Signaling	Configurable for either UNI 3.0 or 3.1 per interface Supports SVCs between any ATM Forum-compliant devices
Virtual Circuits	512 active VCs per connector, 1024 active VCs per card
ATM Multicast	Implements IP multicast extensions in RFC 1112
ANSI Standards	Complies with ANSI T1.105-1991 and ANSI T1E1.2/93-020R1
SDH (STM-1)	Complies with Synchronous Digital Hierarchy standards
Cables	Single Mode and multimode options
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) and the GRF enterprise MIB
HIPPI over ATM (tunneling)	Extends HIPPI long-distance using public carrier services Tunneling transparent to HIPPI hosts Transfers all HIPPI protocols, IP, IPI-3, etc., per ANSI X311, Project 1026

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 1213	TCP/IP Managemenet Information Base
RFC 1483	Multiprotocol Encapsulation over ATM Adaptation Layer-5
RFC 1577	Classical IP and ARP over ATM
RFC 1626	Default IP MTU for use over ATM AAL-5
RFC 1755	ATM Signaling Support for IP over ATM

Specifications

Transfer Rate	155 Mbps
Transmission Distance	LAN; WAN distances with use of repeaters
Interfaces Per Card	2 full-duplex OC-3c/STM-1 SONET/SDH
Cable Requirements	Single-mode cables: 9/125 micron optical fiber Multimode cables: 62.5/125 micron optical fiber
Physical Connectors	Duplex 9-pin SC transceivers
Connector Requirements	Must meet JIS C 5973 standards
LASER Components	Class 1, 1,310 nm LASER diodes
Optical Input (avg.)	-32.5 dBm minimum, -14 dBm maximum (SM)
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]
DC Power Supplies	+5.0 V @ (max) 9 amps = 45 watts max
Hot-swap Capability	Yes
Operating Requirements	Temperature: 32-104˚F [0-40˚C] Relative Humidity: 10-90% (noncondensing)

SM = Single Mode
MM = Multimode

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