

Digital Transport

Prisma IP™ M-Series Metro Optical Access Platform

Description

Carrier-Class Optical Ethernet Solution for Multi-Service MANs

Scientific-Atlanta's Prisma IP™ optical networking solutions deliver a new level of reliability and performance to Metropolitan Area Network (MAN) service providers. This packet-switched platform provides full support for legacy voice and circuit TDM services, while delivering a range of new differentiated data and video services. The Prisma IP M-Series platform is targeted for Multiple Service Operators (MSO), central offices, business parks, Multi-Tenant Units (MTU), and metro co-location facilities. The Prisma IP carrier-class platform can be deployed in resilient packet ring topologies that survive network outages in less than 50 milliseconds. Prisma IP can also be deployed in point-to-point, linear, and mesh topologies. These resilient packet rings can be Stratum-timed from a master BITS or GPS clock to provide truly synchronous TDM services, end-to-end.

Prisma IP supports multi-service applications via sophisticated Quality of Service (QoS) management using enhanced DiffServ and Multiprotocol Label Switching (MPLS) functions. It supports applications such as TDM circuit emulation, Ethernet Virtual Leased Line, Voice over IP (VoIP), video, and Internet access via Ethernet, TDM, and protocol independent wavelength interfaces. Prisma IP networks incorporate all the Fault, Configuration, Accounting, Performance, and Security (FCAPS) management capabilities demanded by MSOs and carriers.

In terms of scalability, the Prisma IP M-Series offers redundant switch fabrics that scale to 20 Gbps. By using Scientific-Atlanta's Resilient Packet Transport (RPT) protocol, up to 254 Prisma IP nodes can operate in a single ring—providing more flexibility than SONET's 16 node limitation. With multi-service interfaces, flexible topologies, DWDM and full Layer 2/3 support, Prisma IP can assist in meeting the competitive environment of today's Metro Area Network.

Features

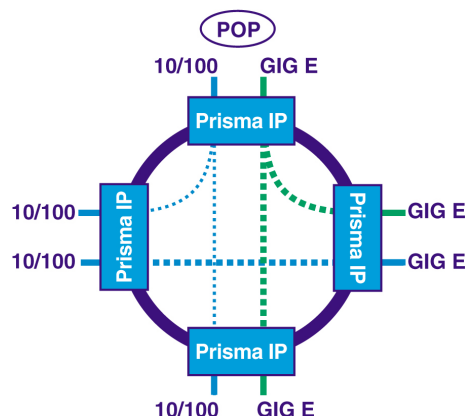
- Optimized for IP and Ethernet transport in metro access
- Toll-quality voice services including synchronized T1, E1, and DS3 TDM circuits
- Stratum-quality timing distribution (GR-246)
- Resilient Packet Rings for network survivability
- Complete 99.999% reliability
- Full support of MPLS and DiffServ for Class of Service
- In-service switch scalability to 20 Gbps
- Integrated DWDM for protocol-independent Lambda services.



Application Examples

Private Line TDM Transport

The Prisma IP M-Series provides complete support for legacy TDM interfaces such as T1 or E1 voice. Prisma IP transports T1/E1 services with complete Stratum synchronization and extremely low latency and jitter, for toll-quality voice services. This technique pioneers the transmission of synchronous services over an asynchronous, variable-length packet ring. Complete support for standard testing functions such as loop-back and BER is provided. Point-and-click provisioning and per-port management are provided for rapid service provisioning and performance monitoring.

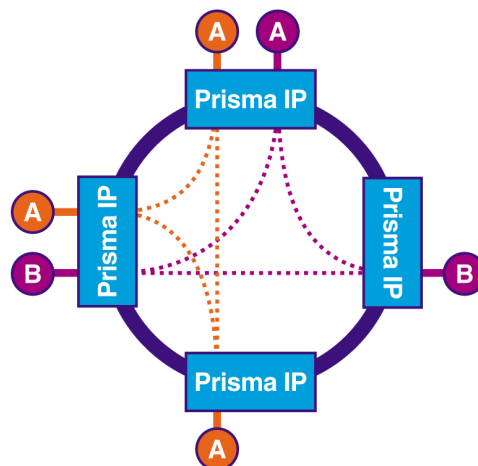


Metro Ethernet Transport

The Prisma IP M-Series is optimized for IP and Ethernet transport and provides Layer 2/3 support for switching and routing. Aggregation of multiple Ethernet services via Gigabit Ethernet and 10/100 interfaces provides carriers with efficient, high-bandwidth LAN to WAN interconnect services. Bandwidth provisioning in 64 Kbps increments is provided for all ports including 10, 100 and 1000 Mbps Ethernet. Flexible provisioning enables fractional Ethernet services that can be aggregated and delivered in wire model or routed applications. Classification of packets per DiffServ is provided for up to three different classes.

Virtual LAN Services

Another powerful application of Prisma IP is in the deployment of Virtual LAN Services. Prisma IP supports Layer 3 routing and Layer 2 switching, including MPLS interconnect to core routers. Aggregation and de-aggregation of services is accomplished via MPLS, static IP forwarding, or dynamic routing. Forwarding of packets can be based on Layer 2 addresses, MPLS labels, or Layer 3 IP addresses. For Ethernet services, aggregation and de-aggregation can be provided via Ethernet MAC address as well as the IP address or MPLS label. DiffServ is also mapped into MPLS labels for prioritization and differentiation of services. The Prisma IP M-Series can serve as both MPLS Label Edge Router (LER) or Label Switch Router (LSR).



Application Examples, cont'd.

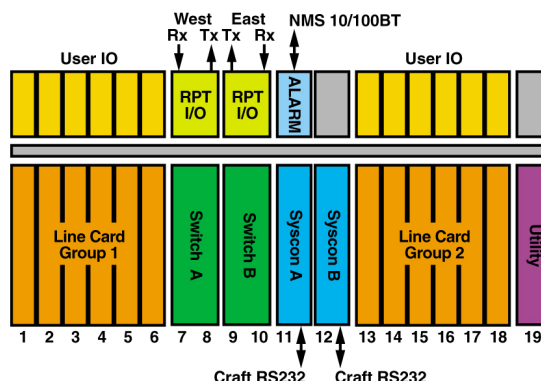
Innovative Prisma IP Architecture

M-Series Optical Access Platform Delivers Reliability and Scalability

The Prisma IP M-Series chassis is a highly reliable, complete with redundant switch fabrics and redundant system controllers. Up to 12 slots are available for user interface cards. These include 10/100baseT or FX, E1/T1 or DS3 TDM, and Gigabit Ethernet.

The Prisma IP M-Series supports scalable ring speeds from 1 to 20 Gbps using DWDM. A redundant switch fabric is also provided with scalable redundant serial links from 1 to 5 Gbps to each line card slot. The switching fabric scales to support 20 Gbps of redundant, bi-directional traffic over the passive midplane. The line side service interfaces supported on the M-Series include:

- T1/E1/DS3
- Gigabit Ethernet
- Fibre Channel
- 10/100baseT and FX
- Protocol-independent DWDM lambdas
- DV13-ASI Digital Video
- Composite IF Video



A key advantage of the M-Series architecture is its reliability, ensured by the redundant links from all user cards to both switch fabric cards and system controller cards. The initial 10 Gbps redundant switch fabric can be upgraded to 20 Gbps.

Resilient Packet Ring Leadership

Scientific-Atlanta is a leader in the emerging Resilient Packet Ring (RPR) 802.17 standards development due to its advanced development and actual field deployment of pre-standard RPR systems.

With its Resilient Packet Transport technology, Scientific-Atlanta has enhanced RPR to support innovations such as distribution of Stratum quality timing, enhanced traffic shaping, congestion management mechanisms, and DiffServ mapping into MPLS for true Quality of Service and traffic engineering. RPR can utilize the entire ring topology in both directions, rather than allocating unused protection channels for half of the ring bandwidth, as in the case of SONET and SDH. For example, a 1 Gbps ring actually offers 2 Gbps of revenue bandwidth.

Innovative DWDM Integration

The Prisma IP M-Series supports integrated DWDM optical components. The Prisma IP DWDM card implements a novel design that provides high-density and scalability on a per-wavelength basis. The DWDM functionality can be added as required.

The design of a single DWDM line card incorporates optical multiplexing and demultiplexing of wavelengths, band filters, hot swappable DWDM transceiver sleds, with all associated fiber management performed internally, multi-rate 3R regeneration, and direct connections to SONET, Gigabit Ethernet, and Fibre Channel. Each DWDM card provides long-reach optics with up to 4 wavelengths of 2.5 Gbps wavelengths. Up to six DWDM line cards can be added into Prisma IP for a total of 24 unidirectional or 12 bi-directional wavelengths. The total ring can support 32 unidirectional or 16 bi-directional wavelengths at 200 GHz spacing.

Specifications

Network Specifications	
Topology support	Ring (dual, counter-rotating) Mesh network Linear network or Dual 2.5
Ring capacity	Dual 1 Gbps and 2.5 Gbps RPT ring Up to 254 nodes per ring (RPT) Sub-50 ms restoration time for protection switching Up to 32 x 2.5 Gbps ITU compliant unidirectional C-band wavelengths at 200 GHz spacing for DWDM
Physical Dimensions	Height: 19.1 in. (48.5 cm) (11 RU) Width: 17.2 in. (43.7 cm) Depth: 19.6 in. (49.75 cm) Weight: 120 lb. (54.4 kg) Maximum
Basic Chassis	19 or 23 in. rack mountable 4 units per rack -48 V DC nominal power Dual independent power feeds 12 Line card slots 2 Switch card slots 2 System Controller card slots
Common Equipment	
Switch Fabric card	10/20 Gbps full duplex 1:1 redundant
System Controller card	Motorola 750 processor 16 to 128 Mb flash, 16 to 256 Mb SDRAM 1:1 redundant RS-232 craft interface
Utility card	Alarm cut-off; lamp test buttons
Alarm card	External alarm connections; 10/100 LAN management port
Line Cards	
8 ports 10/100 Ethernet	8 10/100 Ethernet auto sensing ports Wire speed, Layer 2/3 packet lookups Packet classification/rate limiting/policing IEEE 802.1p/Q
8 port T1/E1	8 port E1 or T1 ports TDM circuit emulation meeting GR-253 specifications for DS1 Line timing or Stratum/GPS synchronization N:1 redundancy G.703, G.823, G.706, ANSI T1.403

Specifications, cont'd,

Line Cards - Continued	
2 port Gigabit Ethernet	2 port 1000Base LX I/O card Wire speed, Layer 2/3 packet lookup engine Packet classification/rate limiting/policing/shaping IEEE 802.1p/Q
12 port DS3	TDM circuit emulation meeting GR-253 reporting specifications Line timing and Stratum/GPS GR-246 synchronization 1:1 redundancy T1.102, T1.107, T1.231, T1.404, G.703, G.704, , GR-499, GR-820
4 port DWDM Optics card	4 x 2.5 Gbps wavelengths ITU C-band at 200 GHz spacing Long reach optics Integrated multiplexer/demultiplexers and filters onboard
Protocols Supported	
Protocols	RPR/RPT 802.1p/Q OSPF MPLS
Element Management System	
Craft Interface	VT100-style text interface (CLI) via RS232c or remote Telnet Ethernet 10/100 LAN interface
Management Interfaces	SNMPv2c, Telnet, CLI, open CORBA API, Java-based GUI
Regulatory	
Emissions	FCC Class A, CE
Safety	UL, cUL, TÜV

