Cisco Route Processor Module XF

The Cisco® Route Processor Module XF (RPM-XF) is a high-performance integrated IP/Multiprotocol Label Switching (MPLS) services for the Cisco MGX® 8880 Media Gateway, Cisco MGX 8950 Multiservice Switch, and Cisco MGX 8800 Series Multiservice Switches. Its Cisco Parallel Express Forwarding (PXF) adaptive processor provides low latency through hardware-based forwarding for flexible service delivery in conjunction with Cisco IOS® Software. The Cisco RPM-XF enables the switch to provide high-performance IP/MPLS-based VPN and quality-of-service (QoS) services along with ATM and other multiservice capabilities. This enables the MGX to offer Layer 3 services as well as enable migration from Layer 2 to Layer 3 networks. The Cisco RPM-XF is used by small and large Cable, Wireline, and Wireless Service providers as well as enterprise customers.

Applications

- IP/MPLS-enabled multiservice networks for service provider and enterprise networks
- Differentiated IP Radio Access Network (IPRAN) voice and data service aggregation using MLPPP protocol
- Voice-over-IP (VoIP) services with minimal latency and without service interruption due to failure
- Support for IPv4 Multicast and Multicast VPN
- Bandwidth savings through Routing Table Protocol (RTP) header compression for IP services
- New IP Next-Generation Network converged wireline and wireless services

Product Specifications

The Cisco RPM-XF is a hot-swappable full-height card for the Cisco MGX 8830, MGX 8850, MGX 8880, and MGX 8950 switches. The Cisco RPM-XF supports three different types of backcards:

- Half-height, 2-port OC-12 POS with hot-swappable Small Form-Factor Pluggable (SFP) modules to provide single-mode interfaces
- Half-height, 2-port Gigabit Ethernet backcard, with hot-swappable SFP modules to provide a variety of Ethernet physical interfaces
- Half-height user interface backcard with EIA/TIA-232 console and auxiliary ports with 2 RJ-45 Fast Ethernet ports for management purposes

The Cisco RPM-XF along with the Cisco IOS Software offers a feature-rich routing platform that provides network intelligence for business-critical solutions. The following tables provide product highlights addressing:

- Table 1: Key features
- Table 2: Front card technical specifications
- Table 3: Backcard technical specifications
- Table 4: Ordering information

Table 1. Key features of RPM-XF/Cisco IOS Software Operating System

Services	Features
Routing	• Border Gateway Protocol Version 4 (BGPv4) • Multiprotocol BGP • Open Shortest Path First (OSPF) • Intermediate System-to-Intermediate System (IS-IS) • Routing Information Protocol Version 2 (RIPv2) • Enhanced Interior Gateway Routing Protocol (EIGRP) • IP multicast routing (Protocol Independent Multicast [PIM]) • Bidirectional Forwarding Detection (BFD for OSPF)
MPLS	Switching • Label edge router (LER) • Label switch router (LSR) • MPLS class of service (CoS) over permanent virtual circuits (PVCs) with per-VC RED and per-VC WFQ • MPLS CoS over multiple label VC (LVC) MPLS-VPN • Multiprotocol BGP extensions • VPN “route-target” extended BGP community attributes • MPLS forwarding across backbone • Multiple routing/forwarding instances on the provider edge router • Multicast VPN MPLS-QoS • Multiple Label VCs per destination model

Services	Features
QoS	• IP Differentiated Services (Diff-Serv) (type of service [ToS]) • Differentiated services code point (DSCP) • Classification/marking • Committed access rate (CAR) verify • Congestion management: ◦ First in first out (FIFO) queuing ◦ Priority queuing (PQ) ◦ Weighted fair queuing (WFQ)/class-based WFQ (CBWFQ) • Weighted random early detection (WRED) • Low-latency queuing (LLQ) • Weighted Random Early Detection (WRED)
Ethernet	• 802.1Q VLAN • Virtual Router Redundancy Protocol (VRRP) • Hot Standby Routing Protocol (HSRP) • Internet Routing and Birding (IRB)
High availability	• 1:N redundancy • Traffic Load Balancing • Support for online/offline diagnostics • Support for OAM generation when Gigabit Ethernet interfaces are down
ATM	• Real-time variable bit rate (VBR-rt) • Non-real time variable bit rate (VBR-nrt) • Unspecified bit rate (UBR) • Virtual-circuit shaping • Per-virtual circuit queues • Private Network-Network Interface (PNNI) soft permanent virtual circuit (SPVC), soft virtual circuit (SVC), soft permanent virtual path (SPVP) • Multiservice Switching Forum (MSF)-compliant architecture (Cisco Virtual Switch Architecture)
Security	• Support for SSHv2 for secure access • AAA • Control plane policing (COPP) • TACACS • RADIUS
Network management	• Simple Network Management Protocol Version 1, 2 and 3 (SNMPv1, SNMPv2, and SNMPv3) support • Cisco WAN Manager (element management, Layer 2 connection management GUI, SNMP) • Cisco IP Solution Center (MPLS VPN service management) • Cisco Information Center (CIC) • Cisco Transport Manager (CTM)
IETF standards compliance (not comprehensive)	• RFCs 3063, 3037, 3036, 3035, 3032, 3031, 2858, 2796, 2702, 2684, 2598, 2597, 2547, 2475, 2453, 2364, 2328, 2205, 1966, and 1583

Table 2. Front Card Technical Specifications

Description	Specification
Front card	Cisco MGX-RPM-XF-512
Card dimensions	15.65 x 15.83 in. (full-height) (39.75 x 40.21 cm)
Weight (front card and backcard)	6.75 lb
Mean time between failure (MTBF)	>100,000 hr
Operational temperature	0°to 50°C (32°to 122°F)
Processor	400 MHz RM7000C RISC
Processing performance	More than 2.5 million pps IP routing
Power	48 VDC, 73W

Description	Specification
MGX Platform controller	PXM45
Memory	Up to 512 MB DRAM, up to 64 MB flash memory
Backcards	• RPM-XF User Interface Backcard • 2-port OC12 POS Backcard • 2-port Gigabit Ethernet Backcard
Electrical, safety, and standards compliance	• EMI/ESD compliance • FCC Part 15 • Bellcore GR1089-CORE • IEC 801-2 • EN55022 • Safety compliance • EN 60950 • UL 60950-1 • Bellcore Network Equipment Building Standards (NEBS): Level 3 compliant
Telcordia CLEI	• GR-485-CORE – CLEI coding • GR-383-CORE – CLEI code product label • GR-209-CORE – PCN Process

Table 3. Backcard Technical Specifications

	User Interface Card	2-Port OC-12 POS Intermediate-Reach Card	2-Port Gigabit Ethernet Card
Card dimensions (H x W x D)	7 x 1 x 4.5 in. (17.78 x 2.54 x 11.43 cm)	7 x 1 x 4.5 in. (17.78 x 2.54 x 11.43 cm)	7 x 1 x 4.5 in. (17.78 x 2.54 x 11.43 cm)
Weight	0.5 lb	0.8 lb	0.75 lb
MTBF	>100,000 hr	>100,000 hr	>100,000 hr
Operational temperature	0°to 50℃ (32°to 122℉)	0°to 50℃ (32°to 122℉)	0°to 50℃ (32°to 122℉)
Power	3.3W	16.5W	14.3W
Interface specifications	• Console port: EIA/TIA-232 configuration port; synchronous interface speed based on configuration register up to 115,200 baud • Auxiliary port: EIA/TIA-232 maintenance port; asynchronous interface speed configurable up to 115,200 baud • RJ-45 Fast Ethernet ports: Maintenance port; supports two 10/100-Mbps full-duplex autosensing Ethernet ports	SFP POS OC12 Single Mode Intermediate Reach: • Optical power budget: 12 db • Transmit power: -15 to -8 dBm • Receive power: -28 to -8 dBm • Typical maximum distance: 9.3 miles (15 km) SFP POS OC12 Single Mode Long Reach: • Optical power budget: 12 db • Transmit power: -3 to 2 dBm • Receive power: -28 to -8 dBm • Typical maximum distance: 35.5 miles (40 km)	Optical power budget: 12 db 1000BASE-SX SFP (multimode fiber): • Power budget: 8.0 dB • Transmit power: -4.5 dBm maximum to -9.0 dBm minimum • Receive power: -17.0 dBm 1000BASE-LX SFP (single-mode fiber): • Power budget: 11.0 dB • Transmit power: -3.5 dBm maximum to -9 dB minimum • Receive power: -20.0 dBm 1000BASE-ZX SFP (single-mode fiber): • Power budget: 20.0 dB • Transmit power: +3.0 dBm maximum to -2.0 dBm minimum • Receive power: -22.0 to 0 dBm 1000BASE-T SFP GigE

	User Interface Card	2-Port OC-12 POS Intermediate-Reach Card	2-Port Gigabit Ethernet Card
Connector	• 2 RJ-45 Fast Ethernet connectors • EIA/TIA-232 console connector • EIA/TIA-232 auxiliary connector	Dual LC/PC connector Optional SFPs: • 622/STM4 Single Mode Intermediate Reach SONET with OC12/STM-4 HDLC Framing • 622/STM-4 Single Mode Long Reach SONET with OC12/STM-4 HDLC Framing	Dual LC optical SFP: • 1000BASE-SX SFP multimode, compliant with IEEE 802.3z specifications • 1000BASE-LX/LH SFP compliant with IEEE 802.3z specifications • 1000BASE-ZX SFP compliant with IEEE 802.3z specifications RJ45 full-duplex Gigabit Ethernet SFP: • 1000BASE-T compliant with IEEE 802.3:2000 specifications
Encapsulation		• IETF RFC 1619, Point-to-Point Protocol (PPP) over SONET • IETF RFC 1662, PPP in High-Level Data Link Control (HDLC)-like framing • IETF RFC 2615, PPP over SONET/SDH with 1 + 43 self-synchronous payload scrambling	MAC with full-duplex operation and flow control Hardware address filtering on received frames of up to 4000 address entries 802.3x flow control Ethernet encapsulation formats: • Ethernet Version 2 • 802.2 Service Advertisement Protocol (SAP) • 802.2 Subnetwork Access Protocol (SNAP) • 802.1Q VLANs
Synchronization		• Local (internal) or loop timed (recovered from network) • 20-ppm clock accuracy	
Electrical, safety, and standards compliance	• EMI/ESD compliance ◦ FCC Part 15 ◦ Bellcore GR1089-CORE ◦ IEC 801-2 ◦ EN55022 • Safety compliance ◦ EN 60950 ◦ UL 60950-1 • Bellcore NEBS: Level 3 compliant • Optical safety: IEC 60825-1 (Class 1)		
Telcordia CLEI	• GR-485-CORE – CLEI coding • GR-383-CORE – CLEI code product label • GR-209-CORE – PCN Process		

Table 4. Ordering Information

Part Number	Part Description
MGX-RPM-XF-512	Route Processor Module-XF, 512 MB
MGX-2OC12POS	Half-height, OC-12 POS backcard for Cisco MGX 8800/8900 Series RPM-XF
MGX-2GE	Half-height, 2-port Gigabit Ethernet backcard for Cisco MGX 8800/8900 Series RPM-XF
MGX-XF-UI/B	User interface card model B for Cisco MGX 8800/8900 Series RPM-XF
SMFIR-622-SFP	OC-12, SFP, intermediate-reach
SMFLR-622-SFP	OC-12, SFP, long-reach
GLC-SX-MM	1000BASE-SX, SFP multimode
GLC-LH-MM	1000BASE-LHLX, SFP single-mode

Part Number	Part Description
GLC-ZX-SM	1000BASE-ZX, SFP single-mode
SFP-GE-T	1000BASE-T SFP (NEBS 3)

For More Information

For more information about Cisco service and support programs and benefits, go to: http://www.cisco.com/.

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