



MPC4E FOR MX SERIES

Product Overview

Juniper Networks MX Series 3D Universal Edge Routers are designed to provide network operators with a common platform for delivery of business, residential and mobile services. The MX Series 3D Universal Edge Routers offer intelligence, flexibility and efficiency with three-dimensional scale of bandwidth, subscribers and services. With support for high-density 10GbE and 100GbE interfaces, Juniper solutions help service providers meet the demands being placed on today's carrier networks. The new MPC4E-3D expands the MX Series family of Junos Trio-based line cards by delivering up to 260 Gbps of line-rate throughput. The MPC4E-3D is initially supporting two fixed interface line cards, one providing 32 ports of 10GbE (MPC4E-3D-32XGE-SFP) and a second line card offering 2 100-Gigabit Ethernet interfaces plus 8 10-Gigabit Ethernet interfaces (MPC4E-3D-2CGE-8XGE).

Product Description

Juniper Networks® MX Series 3D Universal Edge Routers are architected to deliver industry-leading system density with support for scalable services. The Juniper Networks MPC4E-3D card family is optimized for two fixed port models—32 x10GbE ports and 2x100GbE plus 8x10GbE ports. Powered by Juniper Networks Junos® Trio chipset and with a line rate of up to 260 Gbps, the MPC4E cards are compliant with the 802.3ba standard. The cards are supported on the Juniper Networks MX2020, MX2010, MX960, MX480 and MX240 3D Universal Edge Routers. The MPC4E line cards deliver economical, scalable, highly available, line-rate Ethernet and IP/MPLS edge services.

The MX Series routers are a portfolio of high-performance Ethernet routers that function as a universal edge platform capable of supporting all types of business, mobile and residential services. Including powerful switching and security features, the MX Series delivers unmatched flexibility and reliability supporting advanced services and applications. With distributed control plane and forwarding functions, the MX Series routers are designed to provide maximum scale and intelligent service delivery capabilities. MX Series 3D Universal Edge Routers are optimized for Ethernet and address a wide range of deployments, architectures, port densities and interfaces for both service provider and enterprise applications. The MPC4E delivers increased system throughput and performance with the existing SCBE switch fabrics, power supply and fans. The MPC4E is backward compatible with all existing MX Series line cards - both Dense Port Concentrators (DPCs) and Trio-based MPC cards.

Architecture and Key Components

The MPC4E line card supports an extensive feature set for Layer 2 and Layer 3 services and provides customers with a single line card that can be deployed in any combination of Layer 2 and Layer 3 applications. This helps customers streamline operations and considerably reduces the time to develop, certify and deploy new services. In addition, these line cards provide the architecture to support standards-based transport-class network timing, enabling network-synchronized services and applications such as mobile backhaul and time-division multiplexing (TDM) migration including future IEEE 1588-2008 (1588v2) synchronization services.

Dynamic Policy Engine for QoS

The Junos Trio chipset not only delivers a wide range of quality-of-service (QoS) features and functionality, it is also a policy engine that enables a variety of intelligent applications. It is dynamic in the way it supports various policies and in the fact that it can support several applications simultaneously.

The following are dynamic policy engine highlights:

- **Stateless application detection**—Junos Trio has the ability to search deeply into packets to detect applications and class of packets.
- **Intelligent, class-aware hierarchical rate limiters**—These offer the ability to both honor user-configured rate-limit policies for multiple classes of traffic at the same time, and protect conforming high-priority traffic from low-priority traffic bursts. These rate limiters can be applied to a variety of attachment points—ports, logical interfaces, arbitrary collection of interfaces and a variety of user-configured policies.
- **Dynamic bandwidth profiles**—These provide the ability to group a set of interfaces and provide an aggregate shaping bandwidth control for them.
- **Class aggregate bandwidth profiles**—These feature the ability to apply a policy to individual subscribers, as well as shape individual classes of traffic as an aggregate of all subscribers.
- **Dynamic priority protection**—This is the ability to protect bandwidth of high-priority traffic, even in the presence of bursty, low-priority traffic that has depleted a subscriber's bandwidth.

Features and Benefits

Via Juniper Networks Junos operating system, the MPC4E supports a wide range of L2 and L3 Ethernet functionality, including 802.1Q VLAN, link aggregation, circuit cross-connect (CCC), Virtual Router Redundancy Protocol (VRRP), L2 to L3 mapping and port monitoring. Additionally, the MPC4E supports filtering, sampling, load balancing, rate limiting, class of service (CoS) and other key features necessary for deployment of dependable, high-performance Ethernet services.



MPC4E Specifications

- Accepts traffic destined for generic routing encapsulation (GRE) tunnels or Distance Vector Multicast Routing Protocol (DVMRP) (IP-in-IP) tunnels
- Bidirectional Forwarding Detection (BFD) protocol
- BGP
- BGP and MPLS VPNs
- DVMRP and GRE support for access side and server side
- Firewall filters
- Flexible Ethernet encapsulation
- IEEE 802.3ad link aggregation
- IPv4
- IP multicast
- IPv6
- IPv6 multicast
- IPv6 neighbor discovery
- IS-IS
- G.781 “Synchronization layer functions”
- G.8261 “Timing and synchronization aspects in packet networks”
- G.8262 “Timing characteristics of a synchronous Ethernet equipment slave clock”
- G.8264 “Distribution of timing information through packet networks”
- Local loopback
- Media access control (MAC) learning, policing, accounting and filtering
- Maintenance data link (MDL)
- Multiple Tag Protocol Identifiers (TPIDs)
- MPLS
- OSPF
- Packet mirroring
- Quality of service (QoS) per channel: weighted round-robin (WRR), random early detection (RED) and weighted random early detection (WRED)
- Remote loopback
- RIP
- Spanning Tree Protocol (STP)
- Transparent bridging
- IEEE 802.1Q VLANs
 - VLAN stacking and rewriting
 - Channels defined by two stacked VLAN tags
 - IP service for nonstandard TPID and stacked VLAN tags
- Virtual private LAN service (VPLS)
- VPN
- VRRP

Table 1: MPC4E Maximum Interface Densities

Platform	Per Chassis	
	10GbE	100GbE
MX2020	640	40
MX2010	320	20
MX960	320	20
MX480	160	10
MX240	96	6

MPC4E Physical Specifications

Physical Dimensions (W x H x D)

- 1.25" x 15.5" x 21.25" (3.18 cm x 39.37 cm x 53.98 cm)

Approximate Weight

- 22 lbs (9.98 kg)

Worst-Case Power (actual power much lower)

- 610 watts

Optical Transceivers

The following are the transceivers that are supported for 100GbE and 10GbE interfaces.

- CFP: 100GBASE-LR4, 100GBASE-SR10
- SFP+: 10GBASE-LR, 10GBASE-SR, 10GBASE-ER, 10GBASE-ZR

Network Management

- MPC4 supports existing Junos OS MIBs supported by Trio-based MPCs as of 11.1R1.

Standards Compliance and Interoperability

Environment

- Operating Temperature: 32° to 104° F, 0° to 40° C
- Storage Temperature: -40° to 158° F, -40° to 70° C
- Relative Humidity: (Operating) 5% to 90% noncondensing

Safety

- CAN/CSA-C22.2 No. 60950-1 (2007) Information Technology Equipment - Safety
- UL 60950-1 (Second Edition) Information Technology Equipment - Safety
- EN 60950-1 (2005) Information Technology Equipment - Safety
- IEC 60950-1 (2005) Information Technology Equipment - Safety (All country deviations)
- EN 60825-1 +A1+A2 (1994) Safety of Laser Products - Part 1: Equipment Classification

Electromagnetic Compatibility

- EN 300 386 V1.4.1 (2008) Telecom Network Equipment - EMC requirements
- EN 55024 +A1+A2 (1998) Information Technology Equipment Immunity Characteristics

EMI

- FCC CFR 45, Part 15 Class A (2009) USA Radiated Emissions
- EN 55022 Class A (2006)+ A1 2007 European Radiated Emissions
- VCCI Class A (2007) Japanese Radiated Emissions
- BSMI CNS 13438 and NCC C6357 Taiwan Radiated Emissions
- AS/NZS CISPR22:2009

Customer-Specific Requirements

- GR-63-Core (2006) Network Equipment Building Systems (NEBS) Physical Protection
- GR-1089-Core Issue 5 (2009) EMC and Electrical Safety for Network Telecommunications Equipment
- SR-3580 (2007) NEBS Criteria Levels (Level 3)
- ETSI EN 300 019: Environmental conditions and environmental tests for telecommunications equipment
- ETSI EN 300 019-2-1 (2000) – Storage
- ETSI EN 300 019-2-2 (1999) – Transportation
- ETSI EN 300 019-2-3 (2003) – Stationary use at weather-protected locations
- ETSI EN 300 019-2-4 (2003) – Stationary use at non-weather-protected locations
- ETS 300753 (1997) – Acoustic noise emitted by telecommunications equipment
- 1 TR 9 (2005) Deutsche Telekom EMC Specification
- British Telecom EMC Immunity Requirements (2004)
- ITU-T K.21 (2003) Resistibility of telecommunication equipment installed in customer premises to overvoltages and overcurrents

Note: There are some exceptions to full GR/SR NEBS compliance in limited cases. Contact your Juniper Networks service representative for further detail.

Mandatory Power Supply Markings

- UL, CSA: UL/CSA 60950-1 (2007)
- TUV: EN 60950-1 2nd Edition (2005)
- CE: EN55022 Class B (2006), EN55024 + A1 + A2 (1998), EN60950-1 2nd Edition (2005)
- China CCC
- Argentina IRAM/S-mark

Juniper Networks Services and Support

Juniper Networks is the leader in performance-enabling services that are designed to accelerate, extend, and optimize your high-performance network. Our services allow you to maximize operational efficiency while reducing costs and minimizing risk, achieving a faster time to value for your network. Juniper Networks ensures operational excellence by optimizing the network to maintain required levels of performance, reliability, and availability. For more details, please visit www.juniper.net/us/en/products-services.

Ordering Information

Model Number	Description	Platform
MPC4E-3D-2CGE-8XGE	2x100GbE and 8x10GbE ports, full scale L2/L2.5 and reduced scale L3 features	MX2020, MX2010, MX960, MX480, MX240
MPC4E-3D-32XGE-SFPP	32x10GbE SFPP ports, full scale L2/L2.5 and reduced scale L3 features	MX2020, MX2010, MX960, MX480, MX240
MPC4E-3D-2CGE8XGE-IR-B	2x100GbE and 8x10GbE ports, full scale L2/L2.5, L3 features, up to 16 L3VPNs per MPC	MX2020, MX2010, MX960, MX480, MX240
MPC4E-3D-32XGE-IR-B	32x10GbE SFPP ports, full scale L2/L2.5, L3 features, up to 16 L3VPNs per MPC	MX2020, MX2010, MX960, MX480, MX240
MPC4E-3D-2CGE8XGE-R-B	2x100GbE and 8x10GbE ports, full scale L2/L2.5, L3 and L3VPN features	MX2020, MX2010, MX960, MX480, MX240
MPC4E-3D-32XGE-R-B	32x10GbE SFPP ports, full scale L2/L2.5, L3 and L3VPN features	MX2020, MX2010, MX960, MX480, MX240
CFP-100GBASE-LR4	100GbE Ethernet 4 x 25G SMF CFP module	MX2020, MX2010, MX960, MX480, MX240
CFP-GEN2-100GBASE-LR4	Second generation 100GbE 4 x 25G SMF CFP	MX2020, MX2010, MX960, MX480, MX240
CFP-100GBASE-SR10	100GbE Ethernet 10x10G MMF CFP module	MX2020, MX2010, MX960, MX480, MX240
SFPP-10GE-SR	10GbE Ethernet SR SFP plus module	MX2020, MX2010, MX960, MX480, MX240
SFPP-10GE-LR	10GbE Ethernet LR SFP plus module	MX2020, MX2010, MX960, MX480, MX240
SFPP-10GE-ER-XT	10GbE Ethernet ER-XT SFP plus module	MX2020, MX2010, MX960, MX480, MX240
SFPP-10GE-ZR	10GbE Ethernet ZR SFP Pplus module	MX2020, MX2010, MX960, MX480, MX240

About Juniper Networks

Juniper Networks is in the business of network innovation. From devices to data centers, from consumers to cloud providers, Juniper Networks delivers the software, silicon and systems that transform the experience and economics of networking. The company serves customers and partners worldwide. Additional information can be found at www.juniper.net.

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