MODULAR PORT CONCENTRATORS FOR THE MX SERIES 3D UNIVERSAL EDGE ROUTERS

Product Overview

Modular Port Concentrators (MPCs) are single slot line modules for chassis-based MX Series 3D Universal Edge Routers that provide high-speed packet forwarding, sophisticated subscriber management, and advanced services in the largest and most demanding enterprise and service provider networks globally.

Utilizing the programmable Junos Trio chipset, MPCs deliver the high density, performance, and agility that customers need to cost-effectively scale, optimize, and customize the network infrastructure to meet their specific requirements both today and into the future.

Product Description

Modular Port Concentrators (MPCs) are advanced line modules for Juniper Networks® MX2020, MX2010, MX960, MX480, and MX240 3D Universal Edge Routers. Building on Juniper's foundation of advanced silicon technology, MPCs utilize the programmable Junos® Trio chipset, a complex of service-specific Network Instruction Set Processors that deliver advanced L2, L2.5, and L3 forwarding, queuing, and scheduling with many other features. Powered by the Trio chipset, MPCs support high-density 1GbE, 10GbE, 40GbE, and 100GbE interfaces, enabling you to cost effectively scale your networks to meet ever-increasing demand.

MPCs support a wide range of advanced L2 and L3 Ethernet capabilities, including 802.1Q virtual LAN (VLAN), link aggregation, circuit cross-connect (CCC), Virtual Router Redundancy Protocol (VRRP), L2 to L3 mapping, and port monitoring. Additionally, MPCs support advanced timing, filtering, sampling, load balancing, rate limiting, class of service (CoS), and other key features necessary for deployment of dependable, high-performance Ethernet services.

Junos Trio chipsets also enable services directly on the MPC, allowing the simple and agile addition of services via software license. These "inline services" include video and flow monitoring, lawful intercept, Network Address Translation (NAT), tunnel services (such as generic routing encapsulation (GRE), and IP over IP (IP-IP)), IP reassembly, Multilink Point-to-Point Protocol (MLPPP), Layer 2 Tunneling Protocol (L2TP), L2TP access concentrator (LAC), and L2TP network server (LNS). Furthermore, the Multiservices MPC (MS-MPC) provides dedicated service processing to compute intensive applications such as stateful firewall, Carrier Grade NAT (CGNAT), and deep-packet inspection (DPI), among many others.

The Junos Trio chipset has the ability to inspect traffic to identify packet class and application. With this insight, as well as comprehensive quality-of-service (QoS) support, intelligent hierarchical rate limiters can be applied to multiple different classes of traffic and applications concurrently, and they can protect conforming high priority traffic from low priority traffic bursts. Additionally, dynamic bandwidth profiles can be created to apply aggregate shaping and bandwidth control to individual subscribers, individual classes of traffic, and even groups of interfaces for precise traffic control.

MPCs provide a broad range of connectivity, performance, and feature options. The newest MPCs are the MPC5 and MPC6. The MPC5 has the built-in capacity for 128,000 subscribers and one million queues, making it ideal for residential broadband deployments. The MPC6 is designed for the MX2020 and MX2010 only; it has 500 Gbps of capacity per slot and supports two MIC slots, permitting flexible high-density 100GbE and 10GbE configurations.

Architecture and Key Components

Modular Port Concentrators (MPCs)

MPCs occupy a full slot in chassis-based MX Series Routers and provide a broad range of connectivity, performance, and feature options.

- The MPC1, MPC2 , MPC3, and MPC6 host two Modular Interface Card (MIC) slots for flexible configuration of network interfaces.
- The MPC-3D-16XGE-SFPP, MPC4, and MPC5 have fixed port configurations that are optimized for high-density, high-speed Ethernet interfaces.

Modular Interface Cards (MICs)

MICs are installed in the MIC slots on MPC1s, MPC2s, MPC3s and MPC6s, and provide physical network connectivity.

Adapter Card

The Adapter Card allows the use of MPC1s through MPC5s in MX2020 and MX2010, which have a wider slot footprint than the MX960, MX480, and MX240.

Features and Benefits

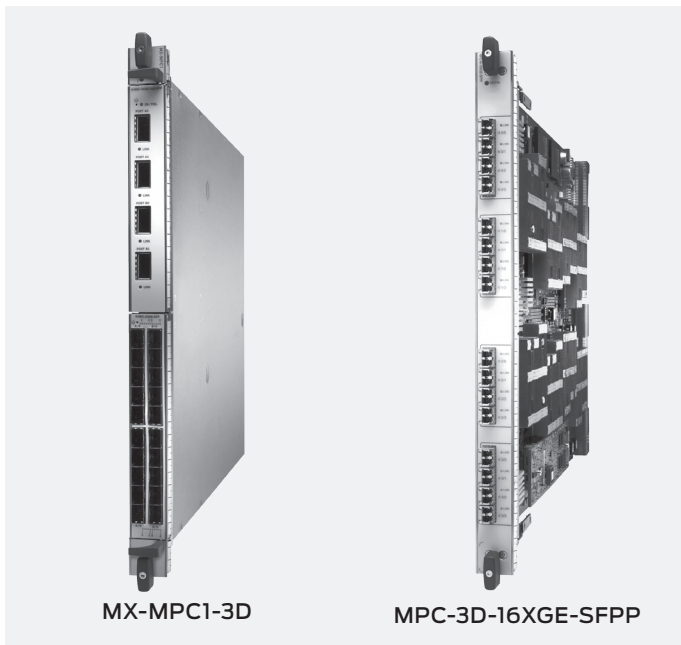| Feature	Description	Benefit
High per slot and per system density	MX2020 and MX2010 support: 48x 10GbE or 4x100 GbE per slot MX960, MX480, and MX240 support: 26x10GbE or 2x 100 GbE per slot	• Increases efficiency and cost effectiveness • Improves scale and provides future proof growth
High subscriber density	Up to 128,000 subscribers per MPC	• Increases revenue density and return on investment for broadband network operators
Comprehensive QoS and intelligent over subscription	Intelligent oversubscription is unique to MX Series MPCs. It increases network efficiency by protecting high priority traffic such as control, voice, and video traffic by dropping low priority traffic as early as possible to free up resources for high priority traffic processing. • Up to 1 million queues per MPC • Up to 8 queues per session • Per queue shaping • 5 levels of scheduler hierarchy • Strict priority queuing • Weighted round-robin (WRR) • Weighted random early detection (WRED) • Intelligent oversubscription • 16 K IFL set shapers • Shared shaping	• Increases capital efficiency and subscriber density • Protects high-value traffic • Supports quality of experience (QoE) achievement • Speeds ROI
Service agility	The Junos Trio chipset offers "inline services" such as: • Video monitoring • Flow monitoring • Lawful intercept • Network Address Translation (NAT) • GRE and IP-IP tunnel services • IP reassembly • Multilink Point-to-Point Protocol (MLPPP) • Layer 2 Tunneling Protocol (L2TP), L2TP access concentrator (LAC), and L2TP network server (LNS) The MS-MPC provides dedicated service throughput for processing intensive applications such as: • Deep packet inspection for application and subscriber identification, intelligent policy enforcement, and intelligent traffic steering • Stateful firewall to protect critical control plane functions and network resources • Carrier Grade NAT (CGNAT) for IPv6 transition	• Reduces network design complexity • Simplifies operations and reduces risk of service failure • Reduces OpEx related to maintaining multiple different OS and EMS needed for service-specific appliances • Reduces space requirements • Reduces power requirements
Cross platform consistency and portability	• Common hardware (Junos Trio chipset) and software (Junos operating system) architecture enable consistent feature set across the platform portfolio • Adapter card enables MPC1, MPC2, MPC3, MPC-3D-16XGE-SFPP, MPC4, and MPC5 reuse in the MX2020 and MX2010	• Provides investment protection • Reduces CapEx • Reduces OpEx

Specifications

Please refer to the hardware installation manuals at www.juniper.net/techpubs/hardware.

MX-MPC1-3D   MPC-3D-16XGE-SFPP

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
MX-MPC1-3D	1xTrio Chipset MPC, port queuing; includes full scale L2/L2.5 and reduced scale L3 features
MX-MPC1-3D-Q	1xTrio Chipset MPC, per-IFL HQoS, 128,000 queues (maximum 64000 egress); includes full scale L2/L2.5 and reduced scale L3 features
MX-MPC1-3D-Q-R-B	MX-MPC1-3D-Q line card bundle; includes full scale L3, L2, and L2.5 features
MX-MPC1-3D-R-B	MX-MPC1-3D line card bundle; includes full scale L3, L2, and L2.5 features
MX-MPC1E-3D	1xTrio Chipset Enhanced MPC, port queuing; includes full scale L2/L2.5 and reduced scale L3 features
MX-MPC1E-3D-Q	1xTrio Chipset Enhanced MPC, per-IFL HQoS, 128,000 queues (max 64,000 egress); includes full scale L2/L2.5 and reduced scale L3 features
MX-MPC1E-3D-Q-R-B	MX-MPC1E-3D-Q line card bundle; includes full scale L3, L2, and L2.5 features
MX-MPC1E-3D-R-B	MX-MPC1E-3D line card bundle; includes full scale L3, L2, and L2.5 features
MX-MPC2-3D	2xTrio Chipset MPC, port queuing; includes full scale L2/L2.5 and reduced scale L3 features
MX-MPC2-3D-EQ	2xTrio Chipset MPC, per-IFL HQoS, 512,000 queues; includes full scale L2/L2.5 and reduced scale L3 features
MX-MPC2-3D-EQ-R-B	MX-MPC2-3D-EQ line card bundle, includes full scale L3, L2 and L2.5 features

Model Number	Description
MX-MPC2-3D-Q	2xTrio Chipset MPC, per-IFL HQoS, 256,000 queues (max 128,000 egress); includes full scale L2/L2.5 and reduced scale L3 features
MX-MPC2-3D-Q-R-B	MX-MPC2-3D-Q line card bundle; includes full scale L3, L2, and L2.5 features
MX-MPC2-3D-R-B	MX-MPC2-3D line card bundle; includes full scale L3, L2, and L2.5 features
MX-MPC2E-3D	2xTrio Chipset Enhanced MPC, port queuing; includes full scale L2/L2.5 and reduced scale L3 features
MX-MPC2E-3D-EQ	2xTrio Chipset Enhanced MPC, per-IFL HQoS, 512,000 queues; includes full scale L2/L2.5 and reduced scale L3 features
MX-MPC2E-3D-EQ-R-B	MX-MPC2E-3D-EQ line card bundle; includes full scale L3, L2, and L2.5 features
MX-MPC2E-3D-P	2xTrio Chipset Enhanced MPC, 1588v2, port queuing; includes full scale L2/L2.5 and reduced scale L3 features
MX-MPC2E-3D-P-Q-B	MX-MPC2E-3D-P line card bundle; includes 1588v2, per-IFL HQoS, 256,000 queues (maximum 128,000 egress), full scale L2/ L2.5 and reduced scale L3 features
MX-MPC2E-3D-P-Q-R-B	MX-MPC2E-3D-P line card bundle; includes 1588v2, per-IFL HQoS, 256,000 queues (maximum 128,000 egress), full scale L3, L2, and L2.5 features
MX-MPC2E-3D-P-R-B	MX-MPC2E-3D-P line card bundle; includes 1588v2, full scale L3, L2, and L2.5 features
MX-MPC2E-3D-Q	2xTrio Chipset Enhanced MPC, per-IFL HQoS, 256,000 queues (maximum 128,000 egress); includes full scale L2/L2.5 and reduced scale L3 features
MX-MPC2E-3D-Q-R-B	MX-MPC2E-3D-Q line card bundle; includes full scale L3, L2, and L2.5 features
MX-MPC2E-3D-R-B	MX-MPC2E-3D line card bundle; includes full scale L3, L2, and L2.5 features
MX-MPC3E-3D	MPC3 with support for 100GbE, 40GbE, and 10GbE interfaces, L2.5 features, optics sold separately
MX-MPC3E-3D-R-B	MPC3E with support for 100GbE, 40GbE, and 10GbE interfaces, includes full scale L2, L3, L3VPN features, optics sold separately
MPC-3D-16XGE-SFPP	16x10GbE ports with L2.5 features, optics sold separately
MPC-3D-16XGE-SFPP-R-B	16x10GbE ports with full scale L3, L2, and L2.5 features, optics sold separately
MPC4E-3D-2CGE	2x100GbE and 8x10GbE ports, full scale L2/ L2.5 and reduced scale L3 features
MPC4E-3D-32XGE-SFPP	32x10GbE, full scale L2/L2.5 and reduced scale L3 features
MPC4E-3D-2CGE-8XGE-IRB	2x100GbE and 8x10GbE ports, full scale L2/ L2.5, L3 features, up to 16 L3VPNs per MPC
MPC4E-3D-32XGE-IRB	32x10GbE SFPP ports, full scale L2/L2.5, L3 features, up to 16 L3VPNs per MPC
MPC4E-3D-2CGE8XGE-RB	2x100GbE and 8x10GbE ports, full scale L2/ L2.5, L3 and L3VPN features
MPC4E-3D-32XGE-RB	32XGbE SFPP ports, full scale L2/L2.5, L3 and L3VPN features
MPC5E-100G10G	2-port 100GbE and 4-port 10GbE; Includes full scale L2/L2.5 and reduced scale L3 features, optional license permits up to 32,000 queues with HQoS.
MPC5E-100G10G-IRB	2-port 100GbE and 4-port 10GbE; includes full scale L2/L2.5, L3 features and up to 16 L3VPN instances, optional license permits up to 32,000 queues with HQoS.

Ordering Information (continued)

Model Number	Description
MPC5E-100G10G-RB	2-port 100GbE and 4-port 10GbE; includes full scale L2/L2.5, L3 and L3VPN features, optional license permits up to 32,000 queues with HQoS.
MPC5E-40G10G	6-port 40GbE or 24-port 10GbE; includes full scale L2/L2.5 and reduced scale L3 features, optional license permits up to 32,000 queues with HQoS.
MPC5E-40G10G-IRB	6-port 40GbE or 24-port 10GbE; includes full scale L2/L2.5, L3 features and up to 16 L3VPN instances, optional license permits up to 32,000 queues with HQoS.
MPC5E-40G10G-RB	6-port 40GbE or 24-port 10GbE; includes full scale L2/L2.5, L3 and L3VPN features, optional license permits up to 32,000 queues with HQoS.
MPC5EQ-100G10G	2-port 100GbE and 4-port 10GbE with HQoS; supports 1 million queues and 128,000 sessions; includes full scale L2/L2.5 and reduced scale L3 features.
MPC5EQ-100G10G-IRB	2-port 100GbE and 4-port 10GbE with HQoS; supports 1 million queues and 128,000 sessions; includes full scale L2/L2.5, L3 features and up to 16 L3VPN instances.
MPC5EQ-100G10G-RB	2-port 100GbE and 4-port 10GbE with HQoS; supports 1 million queues and 128,000 sessions; includes full scale L2/L2.5, L3 and L3VPN features.
MPC5EQ-40G10G	6-port 40GbE or 24-port 10GbE with HQoS; supports 1 million queues and 128,000 sessions; includes full scale L2/L2.5 and reduced scale L3 features.
MPC5EQ-40G10G-IRB	6-port 40GbE or 24-port 10GbE with HQoS; supports 1 million queues and 128,000 sessions, includes full scale L2/L2.5, L3 features and up to 16 L3VPN instances.
MPC5EQ-40G10G-RB	6-port 40GbE or 24-port 10GbE with HQoS; supports 1 million queues and 128,000 sessions, includes full scale L2/L2.5, L3 and L3VPN features.
MX2K-MPC6E	MPC6E with support for 4x100GbE CFP2, 48x10G SFP+, or 8x100GbE CXP interfaces; compatible with MX2020 and MX2010 only
MX2K-MPC6E-IRB	MPC6E line card bundle with support for 4x100GbE CFP2, 48x10G SFP+, or 8x100GbE CXP interfaces; includes full scale L2/L2.5, L3 features and up to 16 L3VPN; instances; compatible with MX2020 and MX2010 only

Model Number	Description
MX2K-MPC6E-RB	MPC6E line card bundle; with support for 4x100GbE CFP2, 48x10G SFP+, or 8x100GbE CXP interfaces; includes full scale L2/L2.5, L3 and L3VPN features; compatible with MX2020 and MX2010 only
MS-MPC-128	Multiservices MPC supports a variety of licensed applications including Stateful firewall, Carrier-Grade NAT (CGN), and deep-packet inspection (DPI); each purchased separately. MS-MPC occupies a single slot in MX2020, MX2010, MX960, MX480, and MX240.

Modular Interface Cards

Modular Interface Cards (MICs) provide the physical network interface in MPCs that host MIC slots.

MIC3-3D-10XGE-SFPP	MIC with 10x10GE SFP+ interface
MIC-3D-20GE-SFP	20 ports of 10/100/1000 Ethernet with small form-factor pluggable transceiver (SFP) interfaces
MIC-3D-20GE-SFP-E	20 ports of 10/100/1000 Ethernet with enhanced small form-factor pluggable transceiver (SFP) interfaces
MIC-3D-20GE-SFP-EH	20 ports of 10/100/1000 Ethernet with enhanced and temperature hardened small form-factor pluggable transceiver (SFP) interfaces
MIC-3D-2XGE-XFP	2 10GbE modular interface cards with XFP interfaces
MIC-3D-4XGE-XFP	4 10GbE modular interface cards with XFP interfaces
MIC-3D-40GE-TX	40 ports of 10/100/1000 Ethernet with TX interfaces
MIC3-3D-1X100GE-CFP	MIC with 1x100GbE C form-factor pluggable transceiver (CFP) interface
MIC3-3D-1X100GE-CXP	MIC with 1x100GbE CXP interface
MIC3-3D-2X40GE-QSFPP	MIC with 2x40GbE QSFP+ interfaces
MIC6-10G	24x 10GE MIC for MPC6 only
MIC6-100G-CXP	4x 100GE CXP MIC for MPC6 only
MIC6-10G-OTN	24x 10GE SFPP OTN MIC for MPC6 only
MIC6-100G-CFP2	2x 100GE CFP2 OTN MIC for MPC6 only
MS-MIC-16	Multiservices MIC supports a variety of licensed applications including Stateful firewall, Carrier-Grade NAT (CGN), and deep-packet inspection (DPI); each purchased separately.

To purchase Juniper Networks solutions, please contact your Juniper Networks representative at +1-866-298-6428 or authorized reseller.