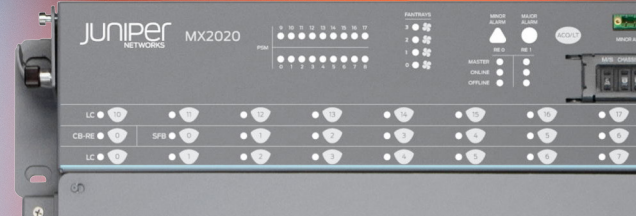


MX2020 and MX2010 3D Universal Edge Routers



Product Overview

Double-digit traffic and subscriber growth, increased adoption of cloud computing and growing amounts of online video are among the trends that are driving increased investment in high-performance networks. Now, operators are under pressure to contain spending, streamline operations, and accelerate service revenue growth and profitability.

The MX2000 line of 3D Universal Edge Routers helps service providers, cloud builders and cable operators achieve these goals by optimizing network performance and enabling service innovation at massive scale, enabling network operators to create High-IQ networks that simplify operations and create service-centric infrastructures that exceed market requirements and customer expectations.

Product Description

Today, a number of global trends are straining cloud builders and network operators to the breaking point.

At the end of 2013, analysts estimate almost 2.5 billion broadband subscribers worldwide. This represents double-digit growth from year-end 2012, and double-digit combined annual growth for subscriber rates are forecast through 2018.¹

These broadband subscribers are engaging in online video and media-rich Web experiences at an unprecedented rate. For instance:

- YouTube and Netflix traffic accounted for 50% of all Internet traffic in North America.²
- More than 6 billion hours of video are watched on YouTube every month—nearly one hour for every person on earth—while 100 hours of video are uploaded to YouTube every minute.³

Research firm IDC estimates that \$47.4 billion was spent in the cloud computing industry in 2013, and it expects the market to more than double to \$107 billion by 2017. This 23.5% compound annual growth rate places it on a trajectory to be a trillion-dollar global market.⁴

Taken together, the dramatic growth in the number of broadband subscribers and their use of bandwidth-intensive applications and services, including cloud-based services, has resulted in higher capital expenses and lower operational efficiency. Network operators are finding that their traditional network architectures are too complex, their network equipment and technologies are too inflexible, and their operational processes are too slow to efficiently and cost-effectively respond to these trends, making it difficult to create innovative services that fully monetize network investments.

The Juniper Networks® MX2000 line of 3D Universal Edge Routers is a game-changing, SDN-ready solution that offers massive investment protecting capacity, density, and scale; increased operational excellence; and service agility to help network operators transform the economics of networking. Consisting of the MX2020 3D Universal Edge Router, designed with 80 Tbps of system capacity, and the MX2010 3D Universal Edge Router, designed with 40 Tbps of system capacity, the MX2000 line offers the performance and reliability at scale that enables cable operators, service providers, content providers, and cloud operators to confidently and efficiently build the best network across residential, mobile, and cloud hosting markets.

The MX2000 line utilizes the powerful Juniper Networks Junos® operating system and the programmable Junos Trio chipset to maintain complete feature consistency with the entire Juniper Universal Edge Routing portfolio. The MX2000 line also supports all Modular Port

¹ Infonetics Research; "Total Fixed and Mobile Subscribers Pivot; Annual Worldwide and Regional Market Size and Forecast" at www.infonetics.com

² Sandvine; Global Internet Phenomena Report: 2H13 at www.sandvine.com

³ Source: YouTube, June 2014, www.youtube.com/yt/press/statistics.html

⁴ Rick Villars, IDC Vice President of data center and cloud, at the IDC Directions Conference 2014

Concentrators (MPCs), ensuring maximum investment protection and the ability to rapidly qualify and deploy the MX2020 and MX2010 in current MX Series 3D environments. Additionally, since the entire MX Series portfolio shares the same Junos OS and programmable Junos Trio chipset, feature consistency and a common operational framework are maintained, even in mixed MX Series environments, reducing the costs, risks, and complexities of network evolution.

Architecture and Key Components

The MX2020 3D Universal Edge Router offers 20 MPC slots and occupies 45 rack units (45 U) in a standard 19-inch equipment rack. The MX2010 3D Universal Edge Router offers 10 MPC slots and occupies 34 U in a standard 19-inch equipment rack.

All line cards, service cards, switch fabric cards, and routing engine cards are installed from the front of both systems, while power and cooling components are located in the back. Air intake is in the front of the system and is exhausted in the back. Cooling is provided by fully redundant fan trays.

The MX2000 line shares common switch fabrics, Routing Engines, power supplies, fan trays, line cards, and other components that are field-upgradable in a hitless manner. These routers also support all of the same MPCs and Modular Interface Cards (MICs) used by the MX240, MX480, and MX960 3D Universal Edge Routers, which simplifies sparing and protects your current MX Series investments.

Platform Components

Switch Fabric Board (SFB)

SFBs create a highly scalable and resilient “all-active” centralized switch fabric architecture that currently delivers up to 860 Gbps of full-duplex switching capacity to each line-card slot with built-in scale to 2 Tbps per slot in the future.

Control Board and Routing Engine (CB-RE)

Dual redundant CB-REs support routing protocol processing, router interface control, and control plane functions such as chassis component and system management and user access to the router. These processes run on top of a kernel that interacts with the Packet Forwarding Engine (PFE) on line cards via dedicated high-bandwidth management channels, providing clean separation of control and forwarding planes. CB-REs also run the 64-bit Junos OS.

Modular Port Concentrator (MPC)

The MPC1, MPC2, MPC3, MPC4, MPC5 and MPC6 are powered by the programmable Junos Trio chipset and deliver high Ethernet, ATM and SONET densities across the MX Series portfolio. MPCs allow highly customized “mix and match” configurations optimized for specific business and technical needs. MPCs also provide comprehensive



Layer 3 routing, MPLS, Layer 2 switching, inline services, subscriber management and advanced hierarchical quality of service (HQoS).

For more details on MPCs, please visit www.juniper.net/assets/us/en/local/pdf/datasheets/1000294-en.pdf

Multiservices MPC (MS-MPC)

MS-MPCs use the programmable Junos Trio chipset to process compute-intensive services such as Carrier Grade NAT (CGNAT), IPsec, stateful firewall, and application- and subscriber-aware routing. This allows the seamless and operationally efficient integration of these advanced service capabilities directly on the MX2020 and MX2010.

For more details on the Multiservices MPC, please visit www.juniper.net/assets/us/en/local/pdf/datasheets/1000454-en.pdf

MPC Adapter Card

In order to provide optimal air flow and maximize interface densities, the MX2020 and MX2010 MPC slots are wider than on the MX240, MX480, and MX960 routers. An adapter card houses MPC1 through MPC5 cards; these cards require no configuration and are visible in the inventory of the system from the CLI.

Power

The MX2000 line's power and thermal subsystems use advanced technology to optimize efficiency without sacrificing scale or features. The power subsystem uses a highly resilient architecture for full power supply and power cable feed redundancy. The MX2000 platforms are available with -48 V DC or AC power (in Delta or Wye 3-phase configuration), as well as 1 phase AC power.

Additionally, power-optimized components and chassis bundles that operate at up to 40C (as opposed to 55C) are available. While this is non-NEBs compliant, it is appropriate for data centers and colo facilities, which almost universally operate below 40C. Since power consumption is a function of ambient temperature, these power-optimized solutions allow customers to provision less power.

Junos OS

Junos OS is a modular operating system with a single release cycle that is supported across all Juniper Networks routers, switches, and security platforms, extending significant operational and economic benefits across the full Juniper portfolio. Junos OS streamlines network operations and improves the availability, performance, and security of all types of services supported by the MX Series 3D Universal Edge Routers, including L2/L3 VPNs, traffic segmentation, low-latency multicast, and comprehensive QoS features that accelerate the delivery of time-sensitive applications. This unified approach to OS development and deployment reduces the cost, complexity, and time to implement and maintain network infrastructure.

Additionally, Junos OS offers advanced virtualized network services such as Virtual Chassis technology, virtual customer premises equipment (virtual CPE), and Network Edge Services such as Network Address Translation (NAT) and CGNAT, IPsec, video and flow monitoring, deep packet inspection (for policy-based application and subscriber-aware networking), stateful firewall, and many others. This allows the seamless and operationally efficient integration of these advanced services directly on the MX2020 and MX2010.

For more details on Junos OS, please visit www.juniper.net/us/en/products-services/nos/junos/

For more details on Junos OS virtualized network services, please visit www.juniper.net/us/en/products-services/network-edge-services/

Features and Benefits

Industry-Leading Full-Featured Edge Routing Scale

The MX2020 is the highest capacity single chassis edge router available in the industry where full-featured edge capabilities are required (see Table 1).

Unmatched Network Availability

With N+1 fabric redundancy, control plane redundancy, N+N power feed redundancy, and even N+1 power supply module redundancy per half rack, the MX2000 line are true carrier-grade platforms that ensure nonstop network availability. Virtual Chassis technology supports chassis-level redundancy as a single element from a management perspective, while link aggregation group (LAG) technology supports stateful chassis, card and port redundancy, as well as subscriber and session persistence in the case of switchover.

On the software side, Junos OS has a modular architecture that runs each program independently in its own memory space to ensure that processes do not interfere with one another. A full set of high availability (HA) features, including graceful restart, nonstop routing, MPLS fast reroute, unified in-service software upgrade (unified ISSU), a comprehensive Operation, Administration, and Maintenance (OAM) toolkit, Junos XML management protocol commit script capabilities, and service-level resiliency with features such as virtual private LAN service (VPLS) multihoming gives operators a fully resilient system.

Advanced Network Edge Services

Junos OS-based router integrated services reduce reliance on service-specific appliances without impacting routing or forwarding performance. Services include:

- Junos Address Aware, which helps conserve the IPv4 address pool, ensure IPv4/IPv6 coexistence, and transition to IPv6
- Junos Network Secure, which provides stateful firewall services for network protection and managed security offers
- Junos VPN Site Secure, which uses standard encryption modes to secure communication between the customer premise and the network edge, and for added security over L3 VPNs
- Junos Traffic Vision, which provides the granular traffic visibility needed to improve network efficiency, increase security, and support operations and planning tasks
- Junos Video Focus, which provides standards-based video monitoring and automatic issue mitigation to ensure high-quality customer experiences
- Junos Application Aware, which identifies and classifies traffic on a per application basis for application-aware services
- Junos Subscriber Aware, which associates traffic flows with the subscriber that generated them, enabling differentiated services based on subscriber policy
- Junos Web Aware, a powerful application that tracks HTTP requests and responses, and enables tag insertion and header enrichment
- Junos L4 Load Balancer, a hybrid traffic load balancer based on advanced Junos OS capabilities that increases network efficiency

By hosting these services on the MX2000 line, you can consolidate edge elements, eliminate operating systems and element management systems, and streamline network operations, administration, and management functions—lowering their five-year total cost of ownership by 46 percent⁵.

Comprehensive Broadband Edge Capabilities

The MX2000 line offers powerful broadband network gateway (BNG) features that let operators provision broadband services for today and tomorrow with support for Point-to-Point Protocol (PPP) subscriber termination, Dynamic Host Configuration Protocol (DHCP), IPv4/IPv6 local server, and relay proxy for subscriber migration to DHCP access models. Juniper's solution also supports hierarchical queuing, granular QoS, and dynamic multilayer service activation, RADIUS and Diameter support for backend server integration to facilitate authentication, policy control, and accounting, as well as support for flexible L2/L3 wholesale models.

Table 1. MX2020 and MX2010 Ethernet Density Highlights

Feature	MX2020	MX2010
Maximum 10GbE density	960 line-rate 10GbE ports	480 line-rate 10GbE ports
Maximum 40GbE density	120 line-rate 40GbE ports	60 line-rate 40GbE ports
100GbE density	80 line-rate 100GbE ports	40 line-rate 100GbE ports

Broad Business Edge Capabilities

The MX2000 line has a comprehensive VPN toolkit to support feature-rich, standards-based, secure interworking for innovative business services. In addition to basic Layer 3 VPN, Layer 2 VPN, and VPLS support, the MX2000 line offers enhanced VPN services such as QoS prioritized VPN traffic for voice and video, VPN-aware multicast and firewall services that leverage technologies such as LDP-BGP VPLS interworking, point-to-multipoint label-switched paths (P2MP LSPs), BGP-based multicast L3VPN, L2 VPN interworking to connect dissimilar L2 access networks, MPLS plug-and-play, and IPsec/generic routing encapsulation (GRE) VPNs.

Metro Ethernet Capabilities

The MX2000 line provides outstanding support for metro and aggregation networks by offering a full suite of routing and switching features, allowing network operators to choose a deployment model that fits their business and technical needs. The MX2000 line can be deployed as IP/IP VPN edge routers, VPLS provider edge routers (VPLS-PE), MPLS label-switching routers (LSR), and as a Layer 2 Ethernet switch or Layer 3 IP router.

Universal SDN Gateway Capabilities

The MX2000 routers are ideal universal SDN gateways, interconnecting virtual and physical networks or virtual networks operating with different technologies. Key features include support for Multiprotocol BGP (MBGP), dynamic tunnels using MPLS-over-GRE or VXLAN encapsulation, virtual routing and forwarding (VRF) tables or E-VPNs, and Netconf, as well as mechanisms to send traffic between VRF and global routing tables based on configuration and policy.

Service Control Gateway Capabilities

The MX2000 line provides an excellent foundation for the service control gateway, which considers network state, application type, subscriber privilege, and operator policy to dynamically direct traffic to service chains.

Specifications and Approvals

This section lists basic specifications by platform. For further details, please refer to the hardware installation manuals at www.juniper.net/techpubs/

Table 2. MX2020 and MX2010 Physical Specifications

Specification	MX2020	MX2010
Physical dimensions (H x D x W)	78.75 x 36.2 x 17.5 in (200 x 91.95 x 44.45 cm)	59.5 x 36.2 x 17.5 in (151.1 x 91.95 x 44.45 cm)
Airflow	Front to back	Front to back
Number of fan trays	4	4
Approximate maximum weight	1,500 lbs (680.39 kg)	1,000 lbs (453.59 kg)
System mounting	Four-post rack mounting	Four-post rack mounting
Power consumption*	19.7KW	11.4KW

* Power consumption for a fully loaded chassis in typical operating condition



Warranty

For warranty information, please visit www.juniper.net/support/warranty/.

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
Premium and Base Units, Spares	
MX2020-BASE-AC	20 slot MX2020 chassis, base bundle with 1 Routing Engine, SFBs, fan trays, AC power
MX2020-BASE-DC	20 slot MX2020 chassis, base bundle with 1 Routing Engine, SFBs, fan trays, DC power
MX2010-BASE-AC	10 slot MX2010 chassis, base bundle with 1 Routing Engine, SFBs, fan trays, AC power
MX2010-BASE-DC	10 slot MX2010 chassis, base bundle with 1 Routing Engine, SFBs, fan trays, DC power
MX2020-PREMIUM-AC	20 slot MX2020 chassis, premium bundle with redundant Routing Engine, SFBs, fan trays, AC power
MX2020-PREMIUM-DC	20 slot MX2020 chassis, premium bundle with redundant Routing Engine, SFBs, fan trays, DC power
MX2020-PREMIUM2-AC	20 slot optimized power MX2020 chassis, premium bundle with redundant Routing Engine, SFBs, fan trays, AC power
MX2020-PREMIUM2-DC	20 slot optimized power MX2020 chassis, premium bundle with redundant Routing Engine, SFBs, fan trays, DC power
MX2010-PREMIUM-AC	10 slot MX2010 chassis, premium bundle with redundant Routing Engine, SFBs, fan trays, AC power
MX2010-PREMIUM-DC	10 slot MX2010 chassis, premium bundle with redundant Routing Engine, SFBs, fan trays, DC power
MX2010-PREMIUM2-AC	10 slot optimized power MX2010 chassis, premium bundle with redundant Routing Engine, SFBs, fan trays, AC power
MX2010-PREMIUM2-DC	10 slot optimized power MX2010 chassis, premium bundle with redundant Routing Engine, SFBs, fan trays, DC power
CHAS-BP-MX2020-S	20 slot MX2020 chassis with backplane installed, spare
CHAS-BP-MX2010-S	10 slot MX2010 chassis with backplane installed, spare
Routing Engines (REs)	
RE-MX2000-1800x4-S	MX2000 line Routing Engine and control board, Quad Core 1,800 GHz with 16 GB memory, spare
RE-MX2000-1800x4-BB	MX2000 line Routing Engine and control board, Quad Core 1,800 GHz with 16 GB memory, base bundle
RE-MX2000-1800x4-R	MX2000 line Routing Engine and control board, Quad Core 1,800 GHz with 16 GB memory, redundant option
RE-MX2000-1800x4-WW-S	MX2000 line Routing Engine and control board, Quad Core 1,800 GHz with 16 GB memory, worldwide version, spare
REMX2K-1800-32G-BB	MX2000 Routing Engine and control board, Quad Core 1,800 GHz with 32 GB memory, base bundle
REMX2K-1800-32G-R	MX2000 Routing Engine and control board, Quad Core 1,800 GHz with 32 GB memory, redundant option
REMX2K-1800-32G-S	MX2000 Routing Engine and control board, Quad Core 1,800 GHz with 32 GB memory, spare
REMX2K-1800-32G-WB	MX2000 Routing Engine and control board, Quad Core 1,800 GHz with 32 GB memory, worldwide version, base bundle
REMX2K-1800-32G-WR	MX2000 Routing Engine and control board, Quad Core 1,800 GHz with 32 GB memory, worldwide version, redundant
REMX2K-1800-32G-WS	MX2000 Routing Engine and control board, Quad Core 1,800 GHz with 32 GB memory, worldwide version, spare
Switch Fabric Boards (SFBs)	
MX2000-SFB-S	MX2000 line switch fabric board, spare
MX2000-SFB-BB	MX2000 line switch fabric board, base bundle
MX2000-SFB-R	MX2000 line switch fabric board, redundant option
Modular Port Concentrators (MPCs)	
MX-MPC1-3D	1xTrio chipset MPC, port queuing, price includes full scale L2/L2.5 and reduced scale L3
MX-MPC1-3D-Q	1xTrio chipset MPC, per-IFL HQoS, 128K queues (max 64K egress); full scale L2/L2.5 and reduced scale L3
MX-MPC1-3D-Q-R-B	Line-card bundle, price includes full scale L3, L2, and L2.5
MX-MPC1-3D-R-B	Line-card bundle, price includes full scale L3, L2, and L2.5
MX-MPC1E-3D	1xTrio chipset enhanced MPC, port queuing, price includes full scale L2/L2.5 and reduced scale L3
MX-MPC1E-3D-Q	1xTrio chipset enhanced MPC, per-IFL HQoS, 128K queues (max 64K egress); full scale L2/L2.5 and reduced scale L3
MX-MPC1E-3D-Q-R-B	Line-card bundle, price includes full scale L3, L2, and L2.5
MX-MPC1E-3D-R-B	Line-card bundle, price includes full scale L3, L2, and L2.5
MX-MPC2-3D	2xTrio chipset MPC, port queuing, price includes full scale L2/L2.5 and reduced scale L3
MX-MPC2-3D-EQ	2xTrio chipset MPC, per-IFL HQoS, 512K queues; full scale L2/L2.5 and reduced scale L3
MX-MPC2-3D-EQ-R-B	Line-card bundle, price includes full scale L3, L2, and L2.5
MX-MPC2-3D-Q	2xTrio chipset MPC, per-IFL HQoS, 256K queues (max 128K egress); full scale L2/L2.5 and reduced scale L3

Model Number	Description
MX-MPC2-3D-Q-R-B	Line-card bundle, price includes full scale L3, L2, and L2.5
MX-MPC2-3D-R-B	Line-card bundle, price includes full scale L3, L2, and L2.5
MX-MPC2E-3D	2xTrio chipset enhanced MPC, port queuing, price includes full scale L2/L2.5 and reduced scale L3
MX-MPC2E-3D-EQ	2xTrio chipset enhanced MPC, per-IFL HQoS, 512K queues; full scale L2/L2.5 and reduced scale L3
MX-MPC2E-3D-EQ-R-B	Line-card bundle, price includes full scale L3, L2, and L2.5
MX-MPC2E-3D-P	2xTrio chipset enhanced MPC, 1588v2, port queuing, price includes full scale L2/L2.5 and reduced scale L3
MX-MPC2E-3D-P-Q-B	Line-card bundle, 1588v2, per-IFL HQoS, 256K queues (max 128K egress), full scale L2/L2.5 and reduced scale L3
MX-MPC2E-3D-P-Q-R-B	Line-card bundle, 1588v2, per-IFL HQoS, 256K queues (max 128K egress), full scale L3, L2, and L2.5
MX-MPC2E-3D-P-R-B	Line-card bundle, price includes 1588v2, full scale L3, L2, and L2.5
MX-MPC2E-3D-Q	2xTrio chipset enhanced MPC, per-IFL HQoS, 256K queues (max 128K egress); full scale L2/L2.5 and reduced scale L3
MX-MPC2E-3D-Q-R-B	Line-card bundle, full scale L3, L2, and L2.5
MX-MPC2E-3D-R-B	Line-card bundle, full scale L3, L2, and L2.5
MX-MPC3E-3D	MPC3 with support for 100GbE, 40GbE, and 10GbE interfaces, L2.5
MX-MPC3E-3D-R-B	MPC3E with support for 100GbE, 40GbE, and 10GbE interfaces, full scale L2, L3, L3VPN
MPC-3D-16XGE-SFPP	16x10GbE line card, full scale L2/L2.5 and reduced scale L3
MPC-3D-16XGE-SFPP-R-B	16x10GbE line card bundle, full scale L3, L2, and L2.5
MPC4E-3D-2CGE-8XGE	2x100GbE and 8x10GbE ports, full scale L2/L2.5 and reduced scale L3 features
MPC4E-3D-32XGE-SFPP	32x10GbE SFP ports, full scale L2/L2.5 and reduced scale L3 features
MPC4E-3D-2CGE8XGE-IR-B	2x100GbE and 8x10GbE ports, full scale L2/L2.5, L3 features, up to 16 L3VPNs per MPC
MPC4E-3D-32XGE-IR-B	32x10GbE SFP ports, full scale L2/L2.5, L3 features, up to 16 L3VPNs per MPC
MPC4E-3D-2CGE8XGE-R-B	2x100GbE and 8x10GbE ports, full scale L2/L2.5, L3, and L3VPN features
MPC4E-3D-32XGE-R-B	32x10GbE SFP ports, full scale L2/L2.5, L3, and L3VPN features
MPC5E-100G10G	2x100GbE and 4x10GbE ports; includes full scale L2/L2.5 and reduced scale L3 features; optional license permits up to 32,000 queues with HQoS
MPC5E-100G10G-IRB	2x100GbE and 4x10GbE ports; 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-100G10G-RB	2x100GbE and 4x10GbE ports; includes full scale L2/L2.5, L3, and L3VPN features; optional license permits up to 32,000 queues with HQoS
MPC5E-40G10G	6x40GbE or 24x10GbE ports; includes full scale L2/L2.5 and reduced scale L3 features; optional license permits up to 32,000 queues with HQoS
MPC5E-40G10G-IRB	6x40GbE or 24x10GbE ports; 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	6x40GbE or 24x10GbE; includes full scale L2/L2.5, L3, and L3VPN features; optional license permits up to 32,000 queues with HQoS
MPC5EQ-100G10G	2x100GbE and 4x10GbE ports with HQoS; supports 1 million queues and 128,000 sessions; includes full scale L2/L2.5 and reduced scale L3 features
MPC5EQ-100G10G-IRB	2x100GbE and 4x10GbE ports 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 4x10GbE ports with HQoS; supports 1 million queues and 128,000 sessions; includes full scale L2/L2.5, L3, and L3VPN features
MPC5EQ-40G10G	6x40GbE or 24x10GbE ports with HQoS; supports 1 million queues and 128,000 sessions; includes full scale L2/L2.5 and reduced scale L3 features
MPC5EQ-40G10G-IRB	6x40GbE or 24x10GbE ports 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	6x40GbE or 24x10GbE 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, 48x10GbE SFP+, or 8x100GbE CXP interfaces; compatible with MX2020 and MX2010 only
MX2K-MPC6E-IRB	MPC6E line card bundle with support for 4x100GbE CFP2, 48x10GbE 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
MX2K-MPC6E-RB	MPC6E line card bundle with support for 4x100GbE CFP2, 48x10GbE 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.

Model Number	Description
Modular Interface Cards (MICs)	
MIC3-3D-10XGE-SFPP	MIC with 10x10GbE small form-factor pluggable plus transceiver (SFP+) interface, optics sold separately
MIC3-3D-1X100GE-CFP	MIC with 1x100GbE C form-factor pluggable transceiver (CFP) interface, optics sold separately
MIC3-3D-1X100GE-CXP	MIC with 1x100GbE 100-gigabit small form-factor pluggable transceiver (CXP) interface, optics sold separately
MIC3-3D-2X40GE-QSFPP	MIC with 2x40GbE quad small form-factor pluggable plus transceiver (QSFP+) interface, optics sold separately
MIC-3D-1CHOC48	1 port channelized OC48/channelized STM16 (down to DS0) MIC
MIC-3D-1OC192-XFP	1 port OC192/STM64 MIC
MIC-3D-20GE-SFP	20x10/100/1000 MIC for MX Series; requires optics sold separately
MIC-3D-2XGE-XFP	2x10GbE MIC for MX Series; requires optics sold separately
MIC-3D-40GE-TX	40x10/100/1000 RJ-45 full height MIC (fixed optics)
MIC-3D-4CHOC3-2CHOC12	4 port channelized OC3/2 port channelized OC12 (down to DS0) MIC
MIC-3D-4COC3-1COC12-CE	Multirate circuit emulation MIC, 4 port channelized OC3/STM1 (to DS0) or 1 port channelized OC12/STM4 (to DS0)
MIC-3D-4OC3OC12-1OC48	4 port non-channelized OC3-OC12/1 port non-channelized OC48 MIC
MIC-3D-4XGE-XFP	4x10GbE MIC for MX Series (supported on MX-MPC2 line cards)
MIC-3D-8CHDS3-E3-B	8 port channelized DS3 (down to DS0)/non-channelized E3 MIC, 75 ohm mini SMB
MIC-3D-8CHOC3-4CHOC12	High-density multi-rate MIC channelized, 8 port channelized OC3/4 port channelized OC12 (down to DS0) MIC
MIC-3D-8DS3-E3	8 port non-channelized DS3/non-channelized E3 MIC, 75 ohm mini SMB
MIC-3D-8OC3-2OC12-ATM	Multi-rate 8 port non-channelized ATM OC3/STM1 or 2 port non-channelized OC12/STM4 ATM MIC
MIC-3D-8OC3OC12-4OC48	Multirate 8 port non-channelized OC3-OC12/4 port non-channelized OC48 MIC
MIC6-10G	24x10GbE MIC for MPC6 only
MIC6-100G-CXP	4x100GbE CXP MIC for MPC6 only
MIC6-10G-OTN	24x10GbE SFP OTN MIC for MPC6 only
MIC6-100G-CFP2	2x100GbE 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.
Cable Management	
MX2000-CBL-TOP-S	MX2000 line front upper cable manager, spare
MX2000-CBL-BTM-S	MX2000 line front lower cable manager, spare
MX2000-CBL-MID-S	MX2000 line front middle cable manager, spare
Fan Trays	
MX2000-FANTRAY-S	MX2000 line fan tray, spare
MX2000-FANTRAY-BB	MX2000 line fan tray, base bundle
MX2000-FANTRAY-R	MX2000 line fan tray, redundant option
MX2K-FANTRAY-OP-BB	MX2000 line optimized power fan tray, base bundle
MX2K-FANTRAY-OP-S	MX2000 line optimized power fan tray, spare
Air Filters	
MX2020-FLTR-KIT-S	MX2020 filter set, containing 1 of each filter required
MX2010-FLTR-KIT-S	MX2010 filter set, containing 1 of each filter required
Craft Interface	
MX2020-CRAFT-S	Craft interface panel, MX2020 chassis, spare
MX2010-CRAFT-S	Craft interface panel, MX2010 chassis, spare
Power Distribution Modules	
MX2000-PDM-AC-WYE-S	MX2000 line 3 phase AC Wye power distribution module, spare
MX2000-PDM-AC-WYE-BB	MX2000 line 3 phase AC power distribution module, base bundle
MX2000-PDM-AC-WYE-R	MX2000 line 3 phase AC power distribution module, redundant option
MX2000-PDM-AC-DELTA-S	MX2000 line 3 phase AC Delta power distribution module, spare
MX2000-PDM-AC-DELTA-BB	MX2000 line 3 phase AC Delta power distribution module, base bundle
MX2000-PDM-AC-DELTA-R	MX2000 line 3 phase AC Delta power distribution module, redundant option
MX2000-PDM-DC-S	MX2000 line DC power 60 Amp distribution module, spare
MX2000-PDM-DC-R	MX2000 line DC power 60 Amp distribution module, spare

Model Number	Description
MX2000-PDM-AC-1PH-BB	MX2000 line 1 phase AC power distribution module, base bundle
MX2000-PDM-AC-1PH-S	MX2000 line 1 phase AC power distribution module, spare
MX2000-PDM-OP-AC-BB	MX2000 line optimized power 1 phase AC power distribution module, base bundle
MX2000-PDM-OP-AC-S	MX2000 line optimized power 1 phase AC power distribution module, spare
MX2K-PDM-OP-DC-BB	MX2000 line optimized power DC power distribution module, base bundle
MX2000-PDM-OP-DC-S	MX2000 line optimized power DC power distribution module, spare
MX2000-PDM-AC-1PH-R	MX2000 line 1 phase AC power distribution module, redundant

Power Supply Modules

MX2000-PSM-AC-S	MX2000 line AC power supply module, spare
MX2000-PSM-AC-BB	MX2000 line power supply module, base bundle
MX2000-PSM-AC-R	MX2000 line power supply module, redundant option
MX2000-PSM-DC-S	MX2000 line DC power supply module, spare
MX2000-PSM-DC-BB	MX2000 line DC power supply module, base bundle
MX2000-PSM-DC-R	MX2000 line DC power supply module, redundant option

Shipping Containers and Miscellaneous

MX2020-CHAS-PKG-S	MX2020 20 slot chassis shipping container, spare
MX2010-CHAS-PKG-S	MX2010 10 slot chassis shipping container, spare
MX2020-LC-PKG-S	MX2020 line card bulk shipping container, spare
MX2020-PSM-PKG-S	MX2020 power supply module bulk shipping container, spare

Power Cable Manager

MX2020-DC-CBL-MGR-S	MX2020 cable manager for DC power cables, spare
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Adapter Card

MX2000-LC-ADAPTER	MX2000 line card adapter, spare
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Mounting Tray

MX2000-MOUNT-TRAY-S	MX2000 line rack mount tray, spare
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Lug Kits

MX2000-DCLUG-4AWG-S	MX2000 line DC 4AWG terminal lug kit
MX2000-DCLUG-6AWG-S	MX2000 line DC 6AWG terminal lug kit

Junos OS

USA	Junos OS
Worldwide	Junos-WW

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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