

M7i AND M10i MULTISERVICE EDGE ROUTERS

Product Overview

Juniper Networks M Series Multiservice Edge Routers uniquely combines best-in-class IP/MPLS capabilities with unmatched reliability, stability, security and service richness. These multiservice edge routing platforms allow providers and enterprises to consolidate multiple networks into a single IP/MPLS infrastructure while simultaneously generating new revenues with leading-edge services. M Series Multiservice Edge Routers use a hardware-based approach combined with the highly scalable, secure and reliable Junos OS, enabling multiple services without compromise on a single IP/MPLS platform. Providers enjoy maximized revenue and minimized operational and capital costs.

Product Description

The Juniper Networks® M7i and M10i Multiservice Edge Routers are ideal enterprise routing solutions for head offices, campuses and corporate backbones needing reliable, secure and high-performance IP WAN connectivity, Internet access and services. Unlike legacy routers with monolithic architectures and aging operating systems, the M Series M7i and M10i Multiservice Edge Routers boast a hardware-based architecture coupled with Juniper Networks Junos® operating system, Juniper's modern object-oriented operating system. This architecture ensures rich packet processing with uncompromising forwarding performance to support latency-sensitive applications such as voice, video and mission critical applications. The M7i and M10i routers are the choice for consolidating multiple services onto a single IP/MPLS network and delivering performance, reliability and security to the enterprise environment.

Deployed predominantly at the service-provider edge and in high-end, high-performance enterprise applications, the IP/MPLS M Series Multiservice Edge Routers are capable of supporting current and emerging Layer 2 and Layer 3 services. From a Layer 2 perspective, the J-FASE (Juniper Frame and ATM Service Emulation) toolkit, combined with M Series routing performance, enables accurate emulation of Asynchronous Transfer Mode (ATM) and Frame Relay services over MPLS. The same multiservice edge routing platform supports rich Ethernet services, enabling providers to capture revenue from this emerging service. Layer 2.5 Interworking VPNs are available to smoothly transition customers from ATM/FR to Ethernet services as demand dictates. M Series routers also deliver rich Layer 3 services, including the industry's most scalable and comprehensive Layer 3 VPN portfolio, granular per logical interface quality of service (QoS), hardware-based IPv6, multicast, Network Access Translation (NAT), stateful firewall and IPsec encryption. New revenues are generated faster and more cost effectively with the scalable policy control of the Juniper Networks SDX300 Service Deployment System leveraging these rich features, making the M Series routers the one to choose for next-generation consolidated infrastructures.

Architecture and Key Components

Juniper Networks service-built M Series Multiservice Edge Routers are deployed in the world's largest networks, delivering advanced IP/MPLS edge routing services at scale and helping service providers transform their businesses. Constructed with clean separation between the control plane, forwarding plane and services plane, the M Series support multiple services without compromise on a single platform to maximize revenue and minimize operational and capital costs. Services supported include a broad array of VPNs, network-based security, real-time voice and video, bandwidth on demand, rich multicast of premium content, IPv6 services, granular accounting and much more. This IP/MPLS edge routing service portfolio continues to grow with every release of Junos OS, leveraging the tremendous flexibility and performance headroom of the service-built architecture.

Applications

The versatile M Series routers can be deployed in both the service provider environment and in high-end enterprise environments.

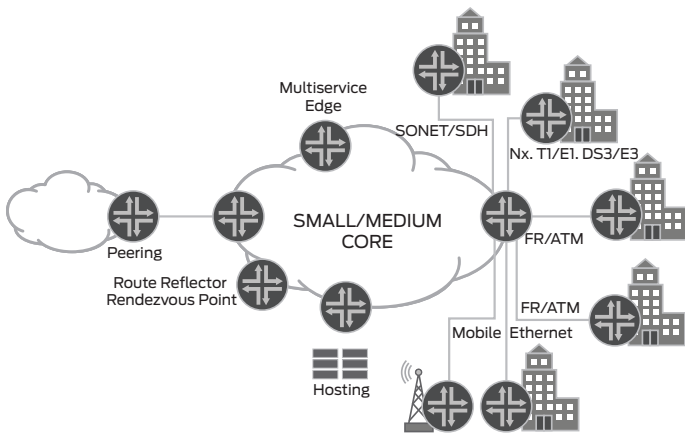


Figure 1: Service provider environment

In service provider environments, the M Series is deployed predominantly as a multiservice edge router but can also be deployed in small and medium cores, peering, route reflector, multicast, mobile and data center applications.

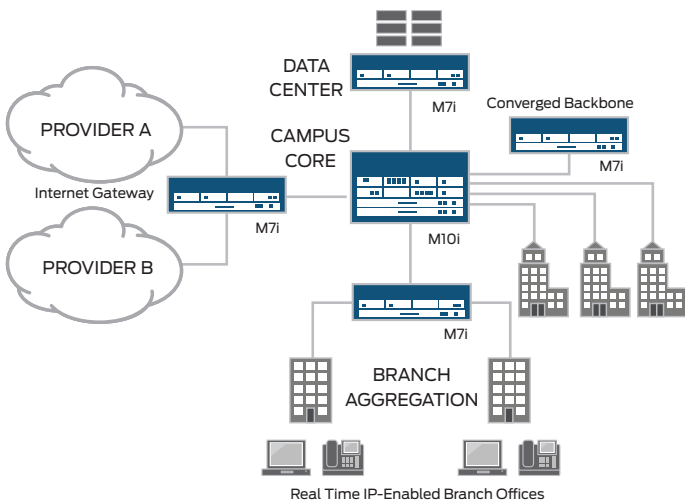


Figure 2: Enterprise

Large enterprises typically deploy M7i or M10i in a number of different locations, including Internet gateway router, WAN router, campus core router, regional backbone and data center.

Enhanced for the Edge

The versatile IP/MPLS M Series routers can be deployed at the edge of provider networks, in small and medium cores, and in peering, route reflector and data center applications. Recent M Series innovations have dramatically expanded edge capabilities by leveraging the highly programmable Internet Processor II application-specific integrated circuit (ASIC) and the IP/MPLS-rich Junos OS. M Series routers are now deployed and scaling services at the edge of some of the world's largest production networks.

Consistent Services to All Customers

The M Series spans from over 7 to 320 Gbps of throughput, including the M7i, M10i, M40e, M120 and M320 Multiservice Edge Routers. The same scalable and production-hardened Junos OS runs on all IP/MPLS M Series, making a consistent set of capabilities available at all network locations regardless of customer connection or serving area density.

Access-Agnostic with Leading Densities

With its broad interface portfolio, a single M Series router can provide a single point of edge aggregation for thousands of customers over any access type—including ATM, Frame Relay, Ethernet and time-division multiplexing (TDM)—and at any speed from DS0 up to OC-192/STM-64 and 10 Gigabit Ethernet. Leveraging dense Ethernet and highly channelized interfaces, the M Series boast leading densities.

Most Comprehensive VPN Portfolio

The M Series routers also support the industry's most comprehensive VPN portfolio with the ability to simultaneously run and scale Layer 2 virtual circuits, Layer 2 VPNs, Layer 2.5 Interworking VPNs, Layer 3 2547 VPNs, virtual private LAN service (VPLS), IPsec, generic routing encapsulation (GRE), IP over IP and other tunneling mechanisms—with no performance compromise. This broad set of VPNs meets the needs of the widest possible set of customers, maximizing the service provider's revenue while minimizing required infrastructure. For example, a provider can use Layer 3 VPNs to deliver an outsourced routing service and can also use Layer 2 VPNs to provide a point-to-point ATM service over a common IP/MPLS infrastructure.

Granular QoS and Statistics

Rich packet processing enables the M Series routers to support multiple levels of granular QoS per port, per logical circuit (DLCI, VC/VP, VLAN), and per channel (to DS0) for traffic prioritization. These comprehensive QoS functions include classification, rate limiting, shaping, weighted round-robin scheduling, strict priority queuing, weighted random early detection, random early detection and packet marking. For network convergence applications, Layer 2 class of service (CoS) can be mapped to Layer 3 CoS on a per DLCI, per VP/VC or per-VLAN basis. Simultaneously, extensive statistics can be collected and diagnostics performed at this same level of granularity to enable flexible billing, traffic planning and rapid troubleshooting.

Rich Packet Processing and Advanced Services

A broad portfolio of edge routing services can be layered on top of VPNs for additional revenue generation. A comprehensive suite of multicast capabilities, including multicast over MPLS VPNs, enables efficient distribution of premium content. Hardware-based IPv6 and a number of IPv6 migration tools, such as IPv6 over MPLS, ease access to the benefits of this next-generation IP protocol without performance compromise. NAT and stateful firewall can be configured per VPN routing and forwarding table (VRF) to enable network-based security for additional revenues. IPsec can be used to support a premium security service for end users with high security requirements. The M Series service-built edge is continuously enhanced with new packet processing capabilities to ensure maximum revenue-generation opportunities.

The latest addition in terms of advanced services capabilities is the integration of the Juniper Networks Multiservices PIC in the M7i which increases dramatically the embedded service performance of this platform.

Highly Reliable

The M Series service-built architecture has been constructed with scale and stability in mind, including the modular and fault-protected design of Junos OS and a rigorous system testing process. All M Series routers offer redundant power and cooling. The M10i, M40e, M120 and M320 routers offer fully redundant hardware, including redundant routing engines and Switching/Forwarding Engine Boards. Junos OS features enhance this redundant architecture. For example, nonstop forwarding is enabled in the event of a routing engine failure, via a hitless switchover, and in-service software upgrades are supported when a minor software upgrade is required. Other High Availability (HA) capabilities include graceful protocol routing restart, MPLS fast reroute, Virtual Router Redundancy Protocol (VRRP), SONET Automatic Protection Switching (APS), SDH Multiplex Section Protection (MSP), Bidirectional Forwarding Detection protocol (BFD) and Link Aggregation Control Protocol (LACP).

Robust Security

All M Series routers support highly scalable J-Protect filtering capabilities, unicast reverse path forwarding and high-performance rate limiting for industry-leading Denial of Service (DOS) attack protection. The J-Protect security capabilities of the M Series can be further enhanced with the Multiservices PIC, hardware that accelerates additional network-based security services such as high-speed NAT, stateful firewall with attack detection and J-Flow accounting. With the rich feature set of Junos OS combined with industry-leading ASIC technology, M Series service-built edge routing provides a new level of reliable and secure service delivery at the edge of service-provider networks.



M7i Multiservice Edge Router



M10i Multiservice Edge Router

M7i and M10i Specifications

Internet Protocols

- IPv4
- IPv6

Routing and Multicast

- OSPF
- BGP
- RIPv2
- Static routes
- IS-IS
- Multicast (IGMPv3, PIM, SDP, DVRMRP, Single Source)

IP Address Management

- Static
- DHCP relay

MPLS

- LDP
- RSVP-TE
- Traffic Engineering
- Layer 3 2547 VPN
- Layer 2 VPN
- Virtual Private LAN Service (VPLS)
- Diffserv-aware Traffic Engineering
- MPLS Detour
- MPLS Fast Reroute Link Protection
- MPLS Fast Reroute Node Protection
- MPLS Point-to-Multipoint (P2MP) Traffic Engineering

Encapsulations

- Ethernet (MAC+VLAN Tagged)
- PPP (Synch)
- PPPoA
- Frame Relay
- ATM
- HDLC
- Serial (RS-232, RS-449,X.21,V.35,EIA-530)
- 802.1q support
- MLPPP¹
- MLFR (FRF.15, FRF.16)¹
- L2TP (M7i, M10i and M120 can act as LNS)²

Traffic Management

- Policing & Shaping
- Class Based Queuing with Prioritization
- WRED
- Queuing based on VLAN/VC/VP/DLCI/Interface/Bundles

Voice Support

- FRF.1²
- LFI¹
- -cRTP²

Security

- Stateful Firewall²
- Attack detection²
- DOS & DDOS protections
- Tunnels (GRE, IP in IP)
- IPsec DES (56-bit), 3DES (168 bit) encryption³
- MD5 and SHA-1 authentication
- Packet filters

System Management

- Junos OS CLI
- Junoscope Manager
- J-Web browser interface
- Service Deployment System (SDX)
- SNMPv2 and SNMP v3
- Junoscript XML API

SLA and Measurement

- Real-Time Performance Measurement (delay/jitter)
- Alarm generation on SLA violation
- J-Flow²

Logging and Monitoring

- Syslog
- Traceroute
- MPLS Ping

High Availability

- VRRP
- IETF Graceful Restart
- Redundant forwarding and routing engines (M10i)
- Graceful Routing Engine Switchover (M10i)

Administration

- External administrator database RADIUS
- Configuration rollback
- Commit confirm for changes
- Software upgrades

¹These features require the Link Services PIC

²These features require the optional Adaptive Services Module for the M7i or the Adaptive Services II PIC or Multiservices PIC

³These features require either ASM, AS or MS PIC, or ES PIC

Specifications

	M7I	M10I
Platform		
Dimensions (W x H x D)	17.5 x 3.5 x 18 in (44.5 x 8.9 x 45.7 cm)	17.5 x 8.75 x 18 in (44.5 x 22.2 x 45.7 cm)
Fixed interfaces	2 Fast Ethernet or 1 Gigabit Ethernet	None
Number of PIC Slots	4 open slots	8 open slots
Available PICs	See www.juniper.net	See www.juniper.net
Performance		
Packet per second	16 million packets per second	16 million packets per second
Bits per second	10 Gbps	16 Gbps
WAN uplink	up to 1 Gigabit Ethernet	up to OC-48/STM-16*
Power System		
Nominal voltage AC (DC option available)	100-240 VAC, 47-63Hz	100-240 VAC, 47-63Hz
Current/power	4-2 Amps, 400 watts	8-4 Amps, 800 watts
Power supplies required	1 required, 2 for redundancy	2 required, 3 for redundancy
Environment		
Operating temp	32° to 104° F (0° to 40° C)	32° to 104° F (0° to 40° C)
Storage temp	-40° to 158° F (-40° to 70° C)	-40° to 158° F (-40° to 70° C)
Relative humidity (operating)	5% to 90% noncondensing	5% to 90% noncondensing
Agency Approvals		
Safety certifications	CAN/CSA-C22.2 No. 60950-00/UL 60950 EN 60825-1 EN 60825-2 EN 60950	
EMC	AS/NZS 3548 Class B (Australia / New Zealand) BSMI Class B (Taiwan) EN 55022 Class B Emissions (Europe) FCC Part 15 Class B (USA) VCCI Class B (Japan)	
ETSI	ETS-300386-2 Telecommunication Network Equipment Electromagnetic Compatibility Requirements	
Immunity	EN 61000-3-2 Power Line Harmonics EN-61000-3-3 EN 61000-4-2 ESD EN 61000-4-3 Radiated Immunity EN 61000-4-4 EFT EN 61000-4-5 Surge EN 61000-4-6 Low Frequency Common Immunity EN 61000-4-11 Voltage Dips and Sags	
NEBS compliant	GR-63-Core: NEBS, Physical Protection GR-1089-Core: EMC and Electrical Safety for Network Telecommunications Equipment SR-3580 NEBS Criteria Levels (Level 3 Compliance)	

*OC-48/STM-16 interfaces are only supported on non-enhanced CFEB version

Juniper Networks Services and Support

Juniper Networks is the leader in performance-enabling services and support, which are designed to accelerate, extend, and optimize your high-performance network. Our services allow you to bring revenue-generating capabilities online faster so you can realize bigger productivity gains and faster rollouts of new business models and ventures. At the same time, Juniper Networks ensures operational excellence by optimizing your network to maintain required levels of performance, reliability, and availability. For more details, please visit www.juniper.net/us/en/products-services/.

Ordering Information

STANDARD	WITH MULTISERVICES MODULE	DESCRIPTION
M7i Bundles		
Fixed Interface Card with 2-port Fast Ethernet		
M7iE-2FE-RE400-US-B	M7iE-2FE-MS-RE400-US-B	AC, US cable
M7iE-2FE-RE400-UK-B	M7iE-2FE-MS-RE400-UK-B	AC, UK cable
M7iE-2FE-RE400-IT-B	M7iE-2FE-MS-RE400-IT-B	AC, IT cable
M7iE-2FE-RE400-EU-B	M7iE-2FE-MS-RE400-EU-B	AC, EU cable
M7iE-2FE-RE400-AU-B	M7iE-2FE-MS-RE400-AU-B	AC, AU cable
M7iE-2FE-RE400-JP-B	M7iE-2FE-MS-RE400-JP-B	AC, JP cable
M7iE-DC-2FE-RE400-B	M7iE-DC-2FE-MS-RE400-B	DC
Fixed Interface Card with 1-port GbE		
M7iE-1GE-RE400-US-B	M7iE-1GE-MS-RE400-US-B	AC, US cable
M7iE-1GE-RE400-UK-B	M7iE-1GE-MS-RE400-UK-B	AC, UK cable
M7iE-1GE-RE400-IT-B	M7iE-1GE-MS-RE400-IT-B	AC, IT cable
M7iE-1GE-RE400-EU-B	M7iE-1GE-MS-RE400-EU-B	AC, EU cable
M7iE-1GE-RE400-AU-B	M7iE-1GE-MS-RE400-AU-B	AC, AU cable
M7iE-1GE-RE400-JP-B	M7iE-1GE-MS-RE400-JP-B	AC, JP cable
M7iE-DC-1GE-RE400-B	M7iE-DC-1GE-MS-RE400-B	DC
Fixed Interface Card with 1-port GbE and 1-port GbE PIC		
M7iE-2GE-RE400-US-B	M7iE-2GE-MS-RE400-US-B	AC, US cable
M7iE-2GE-RE400-UK-B	M7iE-2GE-MS-RE400-UK-B	AC, UK cable
M7iE-2GE-RE400-IT-B	M7iE-2GE-MS-RE400-IT-B	AC, IT cable
M7iE-2GE-RE400-EU-B	M7iE-2GE-MS-RE400-EU-B	AC, EU cable
M7iE-2GE-RE400-AU-B	M7iE-2GE-MS-RE400-AU-B	AC, AU cable
M7iE-2GE-RE400-JP-B	M7iE-2GE-MS-RE400-JP-B	AC, JP cable
M7iE-5GE-RE400-AU-B	M7iE-5GE-MS-RE400-AU-B	AC, AU cable
M7iE-5GE-RE400-EU-B	M7iE-5GE-MS-RE400-EU-B	AC, EU cable
M7iE-5GE-RE400-IT-B	M7iE-5GE-MS-RE400-IT-B	AC, IT cable
M7iE-5GE-RE400-JP-B	M7iE-5GE-MS-RE400-JP-B	AC, JP cable
M7iE-5GE-RE400-UK-B	M7iE-5GE-MS-RE400-UK-B	AC, UK cable
M7iE-5GE-RE400-US-B	M7iE-5GE-MS-RE400-US-B	AC, US cable
M7iE-5GE-RE850-AU-B	M7iE-5GE-MS-RE850-AU-B	AC, AU cable
M7iE-5GE-RE850-EU-B	M7iE-5GE-MS-RE850-EU-B	AC, EU cable
M7iE-5GE-RE850-IT-B	M7iE-5GE-MS-RE850-IT-B	AC, IT cable
M7iE-5GE-RE850-JP-B	M7iE-5GE-MS-RE850-JP-B	AC, JP cable
M7iE-5GE-RE850-UK-B	M7iE-5GE-MS-RE850-UK-B	AC, UK cable
M7iE-5GE-RE850-US-B	M7iE-5GE-MS-RE850-US-B	AC, US cable
M7iE-DC-5GE-RE400-B	M7iE-DC-5GE-MS-RE400-B	DC
M7iE-DC-5GE-RE850-B	M7iE-DC-5GE-MS-RE850-B	DC

One chassis, one Fixed Interface Card (FIC) with either 2 x Fast Ethernet or 1 Gigabit Ethernet, one routing engine (400 MHz) with 768 MB DRAM, one enhanced compact forwarding engine board, one power supply, one fan tray, Junos OS, documentation CD. AC bundles include country-appropriate power cable. The Multiservices Module options (includes a free NAT/firewall multi-instance license) can be ordered installed on the compact forwarding engine board by using model numbers in the right column.

RE-400	RE-850	DESCRIPTION
M10i Bundles		
M10iE-AC-RE400-US-B	M10iE-AC-RE850-US-B	AC, US cable
M10iE-AC-RE400-UK-B	M10iE-AC-RE850-UK-B	AC, UK cable
M10iE-AC-RE400-IT-B	M10iE-AC-RE850-IT-B	AC, IT cable
M10iE-AC-RE400-EU-B	M10iE-AC-RE850-EU-B	AC, EU cable
M10iE-AC-RE400-AU-B	M10iE-AC-RE850-AU-B	AC, AU cable
M10iE-AC-RE400-JP-B	M10iE-AC-RE850-JP-B	AC, JP cable
M10iE-DC-RE400-B	M10iE-DC-RE850-B	DC
M10iE-4GE-RE400-AU-B	M10iE-4GE-RE850-AU-B	AC, AU cable
M10iE-4GE-RE400-AU-R-B	M10iE-4GE-RE850-AU-R-B	AC, AU cable, fully redundant
M10iE-4GE-RE400-EU-B	M10iE-4GE-RE850-EU-B	AC, EU cable
M10iE-4GE-RE400-EU-R-B	M10iE-4GE-RE850-EU-R-B	AC, EU cable, fully redundant
M10iE-4GE-RE400-IT-B	M10iE-4GE-RE850-IT-B	AC, IT cable
M10iE-4GE-RE400-IT-R-B	M10iE-4GE-RE850-IT-R-B	AC, IT cable, fully redundant
M10iE-4GE-RE400-JP-B	M10iE-4GE-RE850-JP-B	AC, JP cable
M10iE-4GE-RE400-JP-R-B	M10iE-4GE-RE850-JP-R-B	AC, JP cable, fully redundant
M10iE-4GE-RE400-UK-B	M10iE-4GE-RE850-UK-B	AC, UK cable
M10iE-4GE-RE400-UK-R-B	M10iE-4GE-RE850-UK-R-B	AC, UK cable, fully redundant
M10iE-4GE-RE400-US-B	M10iE-4GE-RE850-US-B	AC, US cable
M10iE-4GE-RE400-US-R-B	M10iE-4GE-RE850-US-R-B	AC, US cable, fully redundant
M10iE-DC-4GE-RE400-B	M10iE-DC-4GE-RE850-B	DC
M10iE-DC-4GE-RE400-R-B	M10iE-DC-4GE-RE850-R-B	DC, fully redundant

Each bundle includes chassis, one routing engine (400 MHz or 850 MHz options), one enhanced compact forwarding engine board (two for redundant), one high-availability chassis manager board (two for redundant), one fan tray (two for redundant), two power supplies (three for AC redundancy, four for DC redundancy), Junos OS, documentation CD. AC bundles include country-appropriate power cables.

Ordering Information (continued)

MODEL	DESCRIPTION
M7i/M10i Spares	
FEB-M10i-M7i-S	M7i/M10i forwarding engine spare
FEB-M7i-SVCS-S	M7i forwarding engine spare with built-in services module
FEB-M10i-M7i-E-S	M7i enhanced forwarding engine spare
FEB-M7i-SVCS-ASM-E-S	M7i enhanced forwarding engine spare with built-in Adaptive Services module
FEB-M7i-SVCS-MS-E-S	M7i enhanced forwarding engine spare with built-in Multiservices module
RE-400-768-S	Routing Engine board spare (400 MHz Celeron, 768 MB DRAM), optional 1 GB compact flash needs to be ordered separately
RE-400-768-WW-S	Routing Engine board spare (400 MHz Celeron, 768 MB DRAM), optional 1 GB compact flash needs to be ordered separately - Junos OS worldwide
RE-850-1536-S	Routing Engine board spare (850 MHz Pentium III, 1536 MB DRAM)
RE-850-1536-WW-S	Routing Engine board spare (850 MHz Pentium III, 1536 MB DRAM) - Junos OS worldwide
CHAS-MP-M10i-S	M10i chassis spare
CHAS-MP-M7i-1GE-S	M7i chassis spare, 1 built-in GbE port
CHAS-MP-M7i-2FE-S	M7i chassis spare, 2 built-in FE ports
HCM-M10i-S	High availability chassis manager board for M10i
PWR-M10i-M7i-AC-S	M7i/M10i AC power supply spare
PWR-M10i-M7i-DC-S	M7i/M10i DC power supply spare
FANTRAY-M7i-S	M7i fan tray spare
FANTRAY-M10i-S	M10i fan tray spare
CF-UPG2-IG-S	1 GB compact flash upgrade kit for internal media usage on RE-400 or RE-850
RE-CF-IG-S	Compact flash media upgrade for RE
MEM-FEB-256-S	Optional M10i, M7i Forwarding Engine Board (FEB) memory upgrade: 256 MB DRAM module
MEM-RE-256-S	Optional RE memory upgrade: 256 MB DRAM module
Software Licenses	
JS-IPv6-L	IPv6 support on Junos OS (low end)
JS-LR	Logical router support for Junos OS

MODEL	DESCRIPTION
M7i/M10i Physical Interface Cards	
Ethernet	
PE-1GE-SFP-QPP	1-port Gigabit Ethernet IQ PIC. Requires SFP optic module.
PE-1GE-SFP	1-port Gigabit Ethernet PIC. Requires SFP optic module.
PE-4GE-TYPE1-SFP-IQ2	4-port Type1 Gigabit Ethernet IQ2 PIC. Requires SFP optic module.
PE-4GE-TYPE1-SFP-IQ2E	4-port Type 1 Gigabit Ethernet Enhanced IQ2 PIC. Requires SFP optic module.
PE-12FE-TX-MDI	12-port 10,100 TX Ethernet PIC. Includes 3-meter VHDCI to RJ21 Ethernet breakout cable. Connects to RJ21 to RJ45 patch panel and services (12) 10,100 Ethernet ports. Configured for MDI pinout.
PE-12FE-TX-MDIX	12-port 10,100 TX Ethernet PIC. Includes 3-meter VHDCI to RJ21 Ethernet breakout cable. Connects to RJ21 to RJ45 patch panel and services (12) 10,100 Ethernet ports. Configured for MDI-X pinout.
PE-4FE-TX	4-port Fast Ethernet PIC, TX interface, RJ45 connector.
ATM	
PE-1OC12-ATM2-SMIR	1-port OC-12/STM4 ATM2 IQ PIC, single mode, IR
PE-2OC3-ATM2-MM	2-port OC-3/STM1 ATM2 IQ PIC, multi mode
PE-2OC3-ATM2-SMIR	2-port OC-3/STM1 ATM2 IQ PIC, single mode, IR
PE-4DS3-ATM2	4-port DS3 ATM2 IQ PIC (ships with cable)
PE-2E3-ATM2	2-port E3 ATM2 IQ PIC (ships with cable)
POS	
PE-1OC12-SON-SFP	1-port OC12/STM4 or OC3/STM1, rate-selectable PIC. Requires OC12 or OC3 SFP.
PE-2OC3-SON-SFP	2-port OC3/STM1 PIC. Requires SFP optic module.
PE-4OC3-1OC12-SON-SFP	4-port OC3/STM1 or 1-port OC12/STM4, rate-selectable PIC. Requires SFP optic module.
Clear Channel	
PE-4DS3	4-port DS3 PIC (and cables) with PIC ejector
PE-2DS3	2-port DS3 PIC (and cables) with PIC ejector
PE-4E3-QPP	4-port E3 IQ PIC
PE-2E3	2-port E3 PIC (and cables) with PIC ejector
PE-4E1-COAX	4-port E1 PIC (75-ohm BNC connectors) (ships with cables)
PE-4E1-RJ48	4-port E1 PIC (120-ohm, RJ48 connectors)
PE-4T1-RJ48	4-port T1 PIC, (120-ohm, RJ48 connectors)
PE-2EIA530	2-port EIA-530 PIC (DB-25 connector)
Channelized	
PE-1CHSTM1-SMIR-QPP	1-port channelized STM1 to DS0 IQ PIC, SM, IR
PE-4CHDS3-QPP	4-port channelized DS3 to DS0 IQ PIC, BNC
PE-10CHE1-RJ48-QPP-N	10-port channelized E1 to DS0 IQ PIC, RJ48
PE-1CHOC3-SMIR-QPP	1-port channelized OC3 to DS0 IQ PIC, SM, IR
PE-1CHOC12SMIR-QPP	1-port channelized OC-12 to DS0 IQ PIC, SM, IR
PE-10CHT1-RJ48-QPP	10-port channelized T1 to DS0 IQ PIC

Ordering Information (continued)

MODEL	DESCRIPTION
M7i/M10i Physical Interface Cards (continued)	
Circuit Emulation	
PE-12T1E1-CE-TELCO	12-port discrete T1/E1 (Telco connector)
PE-4CHOC3-CE-SFP	4-port channelized OC3/STM1 (down to T1/E1); requires SFP optic module
Services	
PE-MS-100-1	Multiservices PIC, 1 GB DRAM
PE-AS2-FIPS	Adaptive Services PIC II - FIPS
PE-AS2-LAYER2SERVICES	Adaptive Services PIC II - Layer 2 services: supports link services (S-LSSL-4, S-LSSL-64, S-LSSL-256), CRTP (S-CRTP) and tunnel services (S-TUNNEL)
PE-LS-4	Link services PIC, 4 ML bundles, 256 LFI links, tunnel services
PE-LS-32	Link services PIC, 32 ML bundles, 256 LFI links, tunnel services
PE-TUNNEL	Tunnel services PIC with PIC ejector
Software Licenses for the Services PIC or Module	
S-NAT-FW-SINGLE	Single-instance NAT/firewall
S-NAT-FW-MULTI	Multi-instance NAT/firewall
S-ACCT	J-Flow
S-CRTP	CRTP
S-LNS	L2TP LNS
S-ES	IPsec

MODEL	DESCRIPTION
Interface Accessories	
CBL-EIA530-V35-DTE	EIA-530 to V.35 cable (DTE) for M Series
CBL-EIA530-X21-DTE	EIA-530 to X.21 cable (DTE) for M Series
CBL-RJ21-MDI-S	3-meter VHDCI to RJ21 Ethernet cable spare for PE-12FE-TX
CBL-RJ21-MDIX-S	3-meter VHDCI to RJ21 Ethernet cable spare for PE-12FE-TX
CBL-SMZ-BNC-M-S	10-ft SMZ to BNC coaxial cable spare for DS3/E3 PICs
SFP-1GE-SX	SFP 1000BASE-SX Gigabit Ethernet optic module
SFP-1GE-LX	SFP 1000BASE-LX Gigabit Ethernet optic module
SFP-1GE-T	SFP 1000BASE-T Gigabit Ethernet module (uses Cat 5 cable)
SFP-1GE-LH	SFP 1000BASE-LH Gigabit Ethernet optic module, LH
SFP-OC12-SR	SFP OC12/STM4 optic module, SR
SFP-OC12-IR	SFP OC12/STM4 optic module, IR
SFP-OC12-LR	SFP OC12/STM4 optic module, LR
SFP-OC3-SR	SFP OC3 optic module, MM, SR
SFP-OC3-IR	SFP OC3 optic module, SM, IR
SFP-OC3-LR	SFP OC3 optic module, SM, LR

For additional physical interface cards, please see www.juniper.net/us/en/products-services/routing/m-series/.

About Juniper Networks

Juniper Networks, Inc. is the leader in high-performance networking. Juniper offers a high-performance network infrastructure that creates a responsive and trusted environment for accelerating the deployment of services and applications over a single network. This fuels high-performance businesses. Additional information can be found at www.juniper.net.

Corporate and Sales Headquarters

Juniper Networks, Inc.
1194 North Mathilda Avenue
Sunnyvale, CA 94089 USA
Phone: 888.JUNIPER (888.586.4737)
or 408.745.2000
Fax: 408.745.2100
www.juniper.net

APAC Headquarters

Juniper Networks (Hong Kong)
26/F, Cityplaza One
1111 King's Road
Taikoo Shing, Hong Kong
Phone: 852.2332.3636
Fax: 852.2574.7803

EMEA Headquarters

Juniper Networks Ireland
Airside Business Park
Swords, County Dublin, Ireland
Phone: 35.31.8903.600
EMEA Sales: 00800.4586.4737
Fax: 35.31.8903.601

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

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