Product Overview

Service providers and enterprises are seeking to better understand network traffic patterns, increase efficiency, and offer innovative services such as network-based security and encryption services to their infrastructure.

The Multiservices Modular Port Concentrator (MS-MPC) and Multiservices Modular Interface Card (MS-MIC) for Juniper Networks MX Series 3D Universal Edge Routers virtualize network services, provide router-integrated high-performance flow processing and integrate advanced addressing and security capabilities that protect the network infrastructure as well as user data.

Product Description

Multiservices MPCs (MS-MPCs) and Multiservices MICs (MS-MICs) are next-generation, advanced service modules for Juniper Networks® MX Series 3D Universal Edge Routers. They provide the service virtualization, performance, and scalability that are critical to today’s advanced broadband edge networks. MS-MPCs are full slot modules that supply hardware acceleration for an array of packet processing-intensive services for MX2020, MX2010, MX960, MX480, and MX240 3D Universal Edge Routers. The MS-MIC is based on Juniper’s MIC card form and can be inserted in the MX5, MX10, MX40, and MX80 3D Universal Edge Routers, as well as the MPC1, MPC2, and MPC3 cards.

These cards offer flexible support for stateful firewall, Network Address Translation (NAT), IPsec, anomaly detection, flow monitoring and accounting, and tunnel services. This wide array of services enables service providers and enterprises to secure their network infrastructure; collect rich statistics for billing, capacity planning, and security purposes; and create new services, all with a single module.

The MS-MPC and MS-MIC implement all services on the router itself, eliminating discrete appliances, multiple disparate operating systems, and layers of network design and management complexity, resulting in lower operational costs and total cost of ownership as well as simplifying service design; furthermore multiple services can be hosted on a single MS-MPC, which conserves connectivity slots in the routers, reduces capital expenses, and dramatically simplifies sparing. Multiple MS-MPCs and MS-MICs can be deployed in a single MX Series 3D platform, increasing performance incrementally and cost-effectively to meet growing demand.

Architecture and Key Components

The MX Series 3D Universal Edge Router Portfolio

MX Series 3D Universal Edge Routers are Ethernet-centric services routers that are purpose-built for the most demanding carrier and enterprise applications. Providing industry-leading system capacity, density, and performance, the MX Series 3D is optimized for emerging architectures and services. The MX Series 3D leverages the Junos Trio chipset and Juniper Networks Junos® operating system to deliver the capital efficiency, service innovation and agility, and operational scale and maturity needed for cost-effective next-generation network deployments.

Junos Trio Chipset at the Heart of the Service Cards

Building on Juniper’s foundation of advanced silicon, each MS-MPC and MS-MIC leverages the Junos Trio chipset, Juniper’s next-generation silicon technology. Junos Trio is a complex of service-specific Network Instruction Set Processors that work together to deliver advanced forwarding, queuing, scheduling, and services with the capacity to scale to support future network needs. Junos Trio also enhances the MX Series with support for inline “services without compromise,” allowing customers to cost effectively add services simply via license upgrade.
Modular Software Applications

The following services can be run on the Juniper Networks MS-MPCs and MS-MICs. Each service requires a software license.

- Junos Address Aware is an addressing and tunneling software portfolio for the MX Series 3D Universal Edge Routers that helps network operators conserve and extend their IPv4 address pool, ensure IPv4/IPv6 coexistence, and pragmatically transition to IPv6 in a cost-effective and low risk manner.
- Junos Network Secure delivers stateful firewall services integrated with the MX Series to provide protection for the service provider and enterprise network, as well as a revenue-generating managed service that protects customer infrastructure.
- Junos Traffic Vision provides the capability for flow monitoring, MX Series routers with MS-MPC or MS-MICs are able to receive sampled packets from the forwarding engine and generate summarized flow records. These flow records are exported in RFC-compliant standard packet formats.
- Junos Site Secure uses a variety of standard encryption techniques to secure network communications between the customer premise and the network edge, to add security to traffic over L3 VPNs, and to enhance end-user security.

Features and Benefits

Junos Address Aware

Junos Address Aware is an addressing and tunneling software portfolio for the MX Series routers that helps network operators conserve and extend their IPv4 address pool, ensure IPv4/IPv6 coexistence, and pragmatically transition to IPv6 in a cost-effective and low risk manner.

- Offered as licensed software that protects investments in new or existing MX Series 3D Universal Edge Routers.
- MS-MPC and MS-MIC service cards provide very high address translation performance and density, enabling cost-effective service scale without impacting routing or forwarding functions.
- One software license supports many technologies, including IPv4/IPv6 dual stack, NAT44, and NAT64, among others, providing deployment flexibility and non-disruptive address scheme evolution.
- Low risk service adoption is based on mature, field-proven products and protocols deployed on a carrier-grade router via software update.
- Rich application-level gateway (ALG) support protects traffic and revenue streams by ensuring compatibility with popular applications that cannot be translated.

Junos Network Secure

Junos Network Secure provides a per-flow state table and performs packet inspection, dropping packets not complying with the protocol state. Junos Network Secure also includes attack detection, which provides anomaly-based detection and protection.

The stateful firewall capabilities of Junos Network Secure provides an extra layer of security by using state information derived from past communications and other applications to make dynamic control decisions for new communication attempts. Junos Network Secure groups relevant flows into conversations. A flow is identified by the following five properties:

- Source address
- Source port
- Destination address
- Destination port
- Protocol

Junos Traffic Vision

Flow monitoring is a vital aspect of network management. It provides the operator information about traffic in the network and aids in tasks such as billing, traffic engineering, capacity planning, and traffic analysis for peering policy decisions.

Junos Traffic Vision summary records give service providers the ability to collect data on packet flows, aggregate the data, and export the data to an external device. This enables usage-based accounting, traffic profiling, traffic engineering, attack/intrusion detection, and service-level agreement (SLA) monitoring. The flow format is industry standards based and can be exported to many third-party offline applications.

Junos Traffic Vision provides:

- Flexible deployment models and licensing options
- Flow monitoring that is transparent to the network and imposes no changes to end stations
- Flexible implementation at the individual interface, sub-interface, or virtual router level
- No impact to flow performance, no changes to networked traffic or packets

Protecting User Data via Junos VPN Site Secure and IPsec Encryption

The MS-MPC and MS-MIC implements IPsec encryption using Advanced Encryption Standard (AES), Data Encryption Standard (DES), and triple Data Encryption Standard (3DES). Enterprises can provide IPsec encryption to enhance end-user security. Providers can offer IPsec encryption of access links from the customer premise’s device to the provider edge router, charging a premium for secure access to the network. The packets can then be securely forwarded or mapped into Layer 3 VPNs for transport across the provider network. This application is particularly useful when offering a service to a customer whose access links are provisioned by a third-party provider. For the most concerned customers, providers can also offer IPsec encryption of unicast or multicast traffic over L3 VPNs for an added layer of security. IPsec may also be used to encrypt backhaul traffic by setting up encrypted tunnels across untrusted third-party wholesale networks.
Specifications and Approvals

For a complete list of supported software features, please consult the Junos OS software documentation at [www.juniper.net/techpubs/software](http://www.juniper.net/techpubs/software).

**Stateful firewall**
- Stateful packet filtering for packets in IP flow
- Assists in the detection of denial-of-service (DoS) attacks
- Firewall for inter-VPN traffic
- Tunable TCP intercept, flow, and session limits

**Network addressing**
- NAPT44, NAPT64, NAT-PT, NAPT66, 6rd, NAT44, 6to4, Twice-NAT44, 6in4, PAT-PP, 4rd, Dynamic-NAT

**Stateful firewall/NAT ALGs**
- FTP, TFTP, RTSP, PPTP, DNS, MSRPC, SUNRPC, TALK, RSH, SQL-NET, ICMP, BOOTP, DCE RPC and DCE RPC portmap, Exec, H.323, Internet Inter-ORB Protocol (IIOP), Login, NetBIOS, NetShow, RealAudio, remote procedure call (RPC) and RPC portmap, Shell, SNMP, SQLNet, Traceroute, WinFrame, and Session Initiation Protocol (SIP)

**Attack detection**
- Anomaly-based attack detection
- Active and expired flow recording
- System logging
- SYN-cookie activation

**IPsec encryption**

Encryption Algorithms (RFC 2405, RFC 2410)
- AES (128, 192, and 256 bits)
- 3DES
- DES
- Null

Authentication Hash Algorithms (RFC 2403, RFC 2404)
- Message Digest 5 (MD5)
- SHA-1, SHA-2

**Internet Key Exchange (IKE) modes**
- Main/aggressive mode supported for IKE security association (SA) setup
- Quick mode supported for IPsec SA setup
- Digital Certificates (X.509) VeriSign
- IKEv1, IKEv2

**IPsec features**
- Dynamic endpoints
- Fully qualified domain name (FQDN)
- IPv6 for IPsec (RFC 2460)

**Monitoring and flow accounting**
- cflowd v9

**Hardware Specifications**

**LEDs**
- One Tricolor Status LED
  - Green: PIC is online and operating normally
  - Amber: PIC is initializing
  - Red: PIC has an error or failure
  - Off: PIC is not enabled

One Bicolor Application LED
- Green: Service is running under acceptable load
- Amber: Service is overloaded
- Off: Flow is not enabled

**Certifications and Approvals**

**Safety**
- CAN/CSA-C22.2 No. 60950-00/UL 60950 (Third Edition)
- Safety of Information Technology Equipment
- EN 60950, Safety of Information Technology Equipment

**Certification**
- FIPS 140-2 Level 1 certification
- Stateful Firewall, ICSA certified

**Electromagnetic**
- EMC AS / NZS 3548 Class A (Australia/New Zealand)
- BSM Class A (Taiwan)
- EN 55022 Class A Emissions (Europe)
- FCC Part 15 Class A (USA)
- VCCI Class A (Japan)
- Immunity EN-61000-3-2 Power Line Harmonics
- 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

**Network Equipment Building System (NEBS)**
- Designed to meet these standards:
  - 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)

**European Telecommunications Standards Institute (ETSI)**
- ETS-300386-2 Telecommunications Network Equipment
  - Electromagnetic Compatibility Requirements

**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](http://www.juniper.net/us/en/products-services).

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1Features will be available over multiple releases, please contact your Juniper Sales Representative for specific details.
## Ordering Information

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Description</th>
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<tbody>
<tr>
<td>MS-MIC 16G</td>
<td>MS-MIC with 16 GB of memory provides 9GB of service throughput, occupies single MIC slot on MX5, MX10, MX40, and MX80 3D Universal Edge Routers, as well as on the MPC1, MPC2, and MPC3 cards for the MX2020, MX2010, MX960, MX480, and MX240 3D Universal Edge Router.</td>
</tr>
<tr>
<td>MS-MPC-128</td>
<td>MS-MPC with 128 GB of memory (32 GB per NPU), provides 60Gbps of service throughput, occupies a single slot in MX2020, MX2010, MX960, MX480, and MX240 3D Universal Edge Routers</td>
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<tr>
<td>JAA-NAT</td>
<td>Junos Address Aware CGNAT</td>
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<tr>
<td>JTV-FLOW</td>
<td>Junos Traffic Vision J-FLOW</td>
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<tr>
<td>JVPN-E</td>
<td>Junos VPN Site Secure IPSEC</td>
</tr>
<tr>
<td>JNS-FW</td>
<td>Junos Network Secure [Stateful Firewall]</td>
</tr>
<tr>
<td>JSAM</td>
<td>Juniper Secure Address Management (NAT, Jflow, IPsec, SFW)</td>
</tr>
</tbody>
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## 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](http://www.juniper.net).