JUNIPER
NETWORKS

EX6200 LINE OF ETHERNET SWITCHES

Product Overview

The Juniper Networks EX6200 line of Ethernet switches is a scalable, resilient, high-performance chassis-based wiring closet solution, providing extremely high port densities in a space-optimized form factor. With a choice of data only or Power over Ethernet (PoE) and PoE+ port options, the EX6200 delivers high availability and tremendous investment protection for enterprise campus environments, as well as data center access deployments using end-of-row designs.

Product Description

Juniper Networks® EX6210 Ethernet Switch offers a total of 10 slots which allow for highly flexible configurations. Two of the slots are designed to hold Switch Fabric and Routing Engine (SRE) modules, while the remaining eight slots are dedicated I/O slots for holding any combination of EX6200 line cards. Since only one SRE module is required for switch operations, one of the SRE slots can be optionally configured as an I/O slot, enabling the switch to support a total of nine EX6200 line cards.

Each SRE module includes four 10GbE uplinks, while the line cards feature full PoE+ support to deliver complete investment protection.

Architecture and Key Components

At 14 rack units (U) high and just 15.5 inches deep, the EX6210 is compact enough to easily fit in traditional wiring closets, making it ideal for campus deployments.

The chassis is cooled front to back by a single fan tray with redundant fans (three groups of two each). The EX6210 can operate with a single fan failure, and in the unlikely event of an entire fan tray failure, the system will operate for two minutes with no cooling while the fan tray is replaced.

The EX6210 switch has four power supply slots and supports 2,500 W AC, 5,000 W AC, or 2,100 W DC power supplies (different power supplies should not be mixed in the same chassis). The EX6210 ships with a single power supply; up to three more load-sharing power supplies can be added and configured for N+1 or N+N (2+2) redundancy, providing up to 10,000 W AC (with 2,500 W AC PSUs), 20,000 W (with 5,000 W AC PSUs), or 8,400 W DC (with 2,100 W DC PSUs) to the chassis.

Switch Fabric and Routing Engine Module

The SRE module, which provides 720 Gbps (full duplex) of switching capacity to the EX6200 chassis, includes an integrated switch fabric and is responsible for system configuration and management, running bridging and routing protocols, and managing the user interface.

A front panel, chassis-level LCD panel displays Routing Engine status as well as chassis component alarm information for rapid problem identification and resolution to simplify overall operations. The LCD also provides a flexible, user-friendly interface for performing device initialization and configuration rollbacks, reporting system status and alarm notification, or restoring the switch to its default settings.

EX6200 Line Cards

Line cards are responsible for implementing packet forwarding, filtering, and queuing functions. The EX6200 line supports the following line cards:

- **EX6200-48T**: A 48-port 10/100/1000BASE-T RJ-45 line card offering 3 to 6 µs port-to-port latency for all packet sizes (except jumbo frame), eight quality-of-service (QoS) queues per port, and a 6 MB buffer for all 48 ports.

- **EX6200-48P**: Identical to the EX6200-48T, the EX6200-48P also includes support for the IEEE 802.3at PoE+ standard on all 48 ports, delivering up to 30 watts of power per port for supporting networked devices such as telephones, video cameras, multiple radio IEEE 802.11n wireless LAN (WLAN) access points, and video phones in converged network environments. The EX6200-48P also supports the 802.3af PoE standard, which delivers up to 15.4 watts of Class 3 PoE per port.

- **EX6200-48F**: Identical to the EX6200-48T, the EX6200-48F supports 100BASE-X and 1000BASE-X optics on 48 ports. The line card offers 3 to 6 µs port-to-port latency for all packet sizes (except jumbo frames), eight QoS queues per port, and a 6 MB buffer for all 48 ports.

Configuration Options and Port Densities

The EX6210 switch supports two primary configurations: high availability (HA) and high density.

- **HA configuration**: In a redundant configuration with two SRE modules and up to eight EX6200 line cards installed, the EX6210 can support a maximum of 384 wire-speed 10/100/1000BASE-T ports.

- **High-density configuration**: In a high-density configuration, one of the SRE modules is replaced with an additional line module, bringing the total number of 10/100/1000BASE-T input/output ports to a maximum of 432. Note that this configuration introduces minor oversubscription on the ports in the system.

Deployment Scenarios

The EX6210 is a highly scalable campus wiring closet solution, supporting up to 432 GbE access ports per chassis. The switch is designed for mobility and enterprise-class services with PoE+ on all ports, making it ideal for converged data, voice, and video deployment environments.

The EX6210 is also hardware-ready to support IEEE 802.1ae MACSec, providing data confidentiality, data integrity, and data origin authentication. Software support on GbE ports will be available in a future release.

LLDP-MED-based granular PoE management allows the EX6210 to negotiate PoE usage down to a fraction of a watt on powered devices, enabling more efficient PoE utilization across the switch.
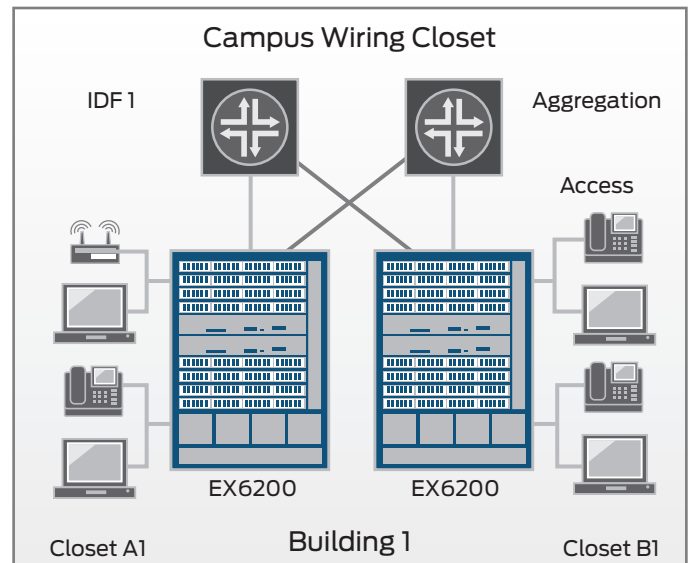

Figure 1: EX6200 campus access deployment

The EX6210 is also an ideal solution for GbE data center server access end-of-row or middle-of-row deployments. The switch's modular chassis form factor enables IT to consolidate locations for networking equipment, while the front-to-back airflow optimizes data center deployments.
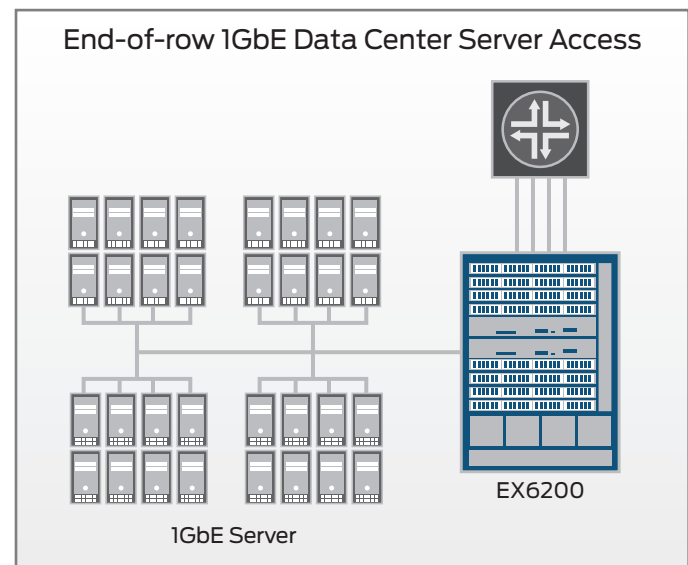

Figure 2: EX6200 data center 1GbE access deployment

Junos Operating System

The EX6200 line runs the same Juniper Networks Junos® operating system used by other Juniper Networks switches, routers, and security devices. By utilizing a common operating system across multiple product families, Juniper delivers a consistent implementation and operation of control plane features across all products.

Security

The EX6200 line of Ethernet switches fully integrates with Juniper Networks Unified Access Control as well as third-party UAC solutions. UAC consolidates all aspects of a user's identity, device, and location, enabling administrators to enforce access control and security down to the individual port or user level.

Working as an enforcement point within the UAC, the EX6200 provides both standards-based 802.1X port-level access control as well as Layer 2–4 policy enforcement based on user identity, location, and/or device. A user's identity, device type, machine posture check, and location can be used to determine whether access should be granted and for how long. If access is granted, the switch assigns the user to a specific VLAN based on authorization levels. The switch can also apply QoS policies or mirror user traffic to a central location for logging, monitoring, or threat detection by intrusion prevention systems.

The EX6200 also provides a full range of Layer 2 and Layer 3 port security features, including Dynamic Host Configuration Protocol (DHCP) snooping, dynamic ARP inspection (DAI), and media access control (MAC) limiting to defend against internal and external spoofing, man in the middle, and denial-of-service (DoS) attacks.

Management Capabilities

The following system management options are available for the EX6200 line of Ethernet switches.

- The standard Junos OS command-line interface (CLI) offers the same granular management capabilities and scripting parameters found in any router or switch powered by Junos OS.
- The integrated Junos Web management tool provides an embedded device manager that allows users to configure, monitor, troubleshoot, and perform system maintenance on individual switches via a browser-based graphical interface.
- Juniper Networks Junos Space, an open, programmable application platform for hosting a comprehensive suite of network operational application tools provides an open approach for automating the deployment and operation of a Juniper infrastructure. Explicitly designed to allow partners and customers to build and deploy smart, simple, and easy-to-use applications, Junos Space provides multiple management and infrastructure applications for managing Juniper resources and assets, including inventory management, device and interface configuration, automated software management and deployment, and event-driven fault management. These Junos Space applications offer predefined automation schemes and best practice templates to enable rapid and accurate configurations.

Junos SDK

Juniper offers a Junos Software Developer's Kit (SDK) that enables users to create, deploy and validate innovative custom applications that run on top of the Junos operating system on EX Series switches, confirming the company's commitment to software innovation through network programmability. Junos SDK simplifies the development and reuse of components for collaboration while the underlying Junos OS provides security, robustness and resiliency, creating a widespread platform for running network applications.

Network programmability itself, however, is not the goal, but the means towards greater innovation and an evolution of the network. In addition to creating SDKs, Juniper Networks is evolving its software systems to serve as platforms that will run network applications. The Junos SDK enables ease of development and reuse of components for collaboration, while the underlying Junos OS provides security, robustness, and resiliency to failure, and a widespread platform for application deployment.

Enhanced Limited Lifetime Warranty

The EX6200 includes an enhanced limited lifetime hardware warranty that provides next business day advanced hardware replacement for as long as the original purchaser owns the product. The warranty includes lifetime software updates, advanced shipping of replacement hardware within one business day, and 24x7 Juniper Networks Technical Assistance Center (JTAC) support for 90 days after the purchase date. Power supplies and fan trays are covered for a period of five years. For complete details, please visit **www.juniper.net/support/warranty**.

Features and Benefits

The EX6200 line of Ethernet switches includes the following key features and benefits:

- **High PoE+ density:** The EX6200 can support the high PoE+ densities required for modern enterprise deployments with large numbers of wireless access points, security cameras, smart devices, and telephones. The EX6210 can support up to 384 PoE+ ports with N+1 redundancy in a redundant configuration with two SRE modules and four 5,000 W AC power supplies installed. The EX6210 can also support up to 432 PoE+ ports with N+1 redundancy in nonredundant configurations with one SRE module and four 5,000 W AC power supplies installed.
- **Resiliency:** The EX6200 line is designed with robust HA features, including redundant power supplies to ensure hardware availability. Control plane and data plane separation, combined with the Junos OS high availability design, ensures maximum systems-level availability.
- **Layer 3 feature in base image:** The EX6200 includes a rich set of Layer 3 features, including OSPF support as part of the Junos OS base software image.
- **Non-Stop Bridging (NSB) and Non-Stop Routing (NSR)**: NSB and NSR on the EX6210 ensure control plane protocols, states and tables are synchronized between Master and Standby REs to prevent protocol flaps or convergence issues following a Routing Engine failover.
- **Non-Stop Software Upgrade (NSSU)**: With NSSU, multiple EX6210 line cards within a chassis can be upgraded with a single command. Mission-critical traffic can be configured as a link aggregate spread across multiple line cards, ensuring minimal disruption during the upgrade process.

Table 1: EX6210 Hardware Features

Component	Features
EX6210 chassis	• 2 SRE module slots and 8 I/O slots • Supports up to 384 10/100/1000BASE-T RJ-45 ports with 2 SRE modules installed, or 432 10/100/1000BASE-T RJ-45 ports with 1 SRE module installed • Supports both PoE and PoE+ • Front-to-back airflow

SRE module	• Support for four 10GbE small form-factor pluggable transceiver (SFP+) uplink ports
	• Line rate on all ports with two SRE modules installed
	• 3:2 oversubscription for ports in 8 I/O slots; wire speed for ports in second SRE slot with one SRE installed
	• Integrated LCD
	  - Console port
	  - SFP and copper management ports for management access
	  - LCD and LEDs for reporting system status
	  - Front panel USB port for easily uploading new software and user configuration
	  - 2 GB internal USB/flash memory

Line cards	• 48-port 10/100/1000BASE-T RJ-45 line card • 48-port 10/100/1000BASE-T PoE+ RJ-45 line card which includes support for IEEE 802.3af PoE and 802.at PoE+ standards on all ports • 48-port 100BASE-X/1000BASE-X fiber line card
Power supplies	• Support for 2,500 W AC, 5,000 W AC, or 2,100 W DC power supplies • Up to four power supplies per chassis • Load-sharing and hot-swappable • N+1 or N+N redundancy configuration options • More than 90% power efficiency
Cooling	• Front-to-back airflow • Fan tray in rear of chassis • Fan redundancy—total of 6 fans (2x3), cooling maintained if individual fan failure • Graceful system shutdown in thermal overload situations • Network Equipment Building System (NEBS) environmental standard*

EX6210

EX6200 Modular Switch Specifications

Dimensions (W x H x D)
• EX6210 chassis: 17.3 x 24.3 x 15.5 in (43.9 x 61.6 x 39.3 cm)

Weight
• 215 lb (98 kg) for fully loaded chassis (with one EX6210 chassis, one fan tray, eight I/O line cards, two SRE modules, and four power supplies)
• 159 lb (72 kg) for base system (with one EX6210 chassis, one fan tray, two I/O line cards, one SRE module, and one power supply)

EX6210 System Capacity
• Maximum backplane capacity: 4.4 Tbps
• Maximum system throughput: 690 Mpps
• Environmental Ranges
• Operating temperature: 32º to 113º F (0º to 45º C)
• Storage temperature: –40º to 158º F (–40º to 70º C)
• Operating altitude: Up to 13,000 ft (3,964 m)
• Non-operating altitude: Up to 16,000 ft (4,877 m)
• Relative humidity operating: 5% to 90% (non-condensing)
• Relative humidity non-operating: 5% to 95% (non-condensing)
• Acoustic noise with AC PSU: 52 dBA (based on operational tests taken from bystander position [front] and performed at 27º C in compliance with ISO 7779)
• Acoustic noise with DC PSU: 54 dBA (based on operational tests taken from bystander position [front] and performed at 27º C in compliance with ISO 7779)

Specifications (continued)

Hardware Specifications

- Switching Engine Model: Store and forward
- 2 GB DRAM on each SRE
- 2 GB on-board flash on each SRE
- 1.2 Ghz dual-core CPU on each SRE
- 4 10GbE uplink ports on each SRE

Layer 2 Switching

- Maximum MAC addresses per system: 32,000
- Jumbo frames: 9,216 bytes
- Number of VLANs: 4,096
- VLAN Spanning Tree (VST) instances: 253
- Port-based VLAN
- MAC-based VLAN
- GARP VLAN Registration Protocol (GVRP)
- Voice VLAN
- Physical port redundancy: Redundant trunk group (RTG)
- Compatible with Per-VLAN Spanning Tree Plus (PVST+)
- Routed VLAN Interface (RVI)
- IEEE 802.1AB: Link Layer Discovery Protocol (LLDP)
- LLDP–Media Endpoint Discovery (LLDP-MED) with VoIP integration
- LLDP-MED-based granular PoE negotiation
- IEEE 802.1D: Spanning Tree Protocol
- IEEE 802.1p: Class-of-service (CoS) prioritization
- IEEE 802.1Q: VLAN tagging
- IEEE 802.1s: Multiple Spanning Tree Protocol (MSTP)
- Number of MST instances supported: 64
- IEEE 802.1w: Rapid reconfiguration of Spanning Tree Protocol
- IEEE 802.1X: Port access control
- IEEE 802.1ak: Multiple Registration Protocol
- IEEE 802.3: 10BASE-T
- IEEE 802.3u: 100BASE-T
- IEEE 802.3ab: 1000BASE-T
- IEEE 802.3z: 1000BASE-X
- IEEE 802.3ae: 10 Gigabit Ethernet
- IEEE 802.3af: Power over Ethernet
- IEEE 802.3x: Pause frames/flow control
- IEEE 802.3ad: Link Aggregation Control Protocol (LACP)
- IEEE 802.3ah: Ethernet in the First Mile

Layer 3 Features

- Maximum number of Address Resolution Protocol (ARP) entries: 8,000
- Maximum number of IPv4 unicast routes in hardware: 10,000
- Maximum number of IPv4 multicast routes in hardware: 4,000
- Routing protocols: RIPv1/v2, OSPF, BGP, IS-IS
- Static routing
- Routing policy
- Bidirectional Forwarding Detection (BFD)
- Layer 3 redundancy: Virtual Router Redundancy Protocol (VRRP)

Layer 3 Features: IPv6

- Max number of Neighbor Discovery (ND) entries: 1,000
- Max number of IPv6 unicast routes in hardware: 1,000
- Max number of IPv6 multicast routes in hardware: 1,000
- Routing protocols: RIPng, OSPFv3, ISIS, BGP4+, PIM, MLD, MLDv2
- Static routing

Supported RFCs

- RFC 3176 sFlow*
- RFC 2925 MIB for remote ping, trace
- RFC 768 UDP
- RFC 791 IP
- RFC 783 Trivial File Transfer Protocol (TFTP)
- RFC 792 Internet Control Message Protocol (ICMP)
- RFC 793 TCP
- RFC 826 ARP
- RFC 894 IP over Ethernet
- RFC 903 RARP
- RFC 906 TFTP Bootstrap
- RFC 2068 HTTP server
- RFC 1812 Requirements for IP version 4 routers
- RFC 1519 Classless Interdomain Routing (CIDR)
- RFC 1256 IPv4 ICMP Router Discovery (IRDP)
- RFC 1058 RIP v1
- RFC 2453 RIP v2
- RFC 1112 Internet Group Management Protocol (IGMP) v1
- RFC 2236 IGMP v2
- RFC 3618 Multicast Source Discovery Protocol (MSDP)
- RFC 4915 MT-OSPF
- RFC 3376 IGMP v3
- RFC 1492 TACACS+
- RFC 2138 RADIUS authentication
- RFC 2139 RADIUS accounting
- RFC 3579 RADIUS Extensible Authentication Protocol (EAP) support for 802.1x
- RFC 5176 Dynamic authorization extensions to RADIUS
- RFC 2267 Network ingress filtering
- RFC 2030 Simple Network Time Protocol (SNTP)
- RFC 854 Telnet client and server
- RFC 951, 1542 BootP
- RFC 2131 BootP/DHCP relay agent and DHCP server
- RFC 1591 Domain Name System (DNS)
- RFC 2338 VRRP
- RFC 2328 OSPF v2 (edge mode)
- RFC 1587 OSPF not-so-stubby-area (NSSA) option
- RFC 2154 OSPF with digital signatures (password, MD-5)
- RFC 2370 OSPF opaque link-state advertisement (LSA) option
- RFC 3623 OSPF graceful restart
- RFC 2362 Physical Interface Module sparse mode (PIM-SM) (edge mode)
- RFC 3569 draft-ietf-ssm-arch-06.txt PIM source-specific multicast (PIM-SSM)
- RFC 2474 DiffServ Precedence, including 8 queues per port
- RFC 2598 DiffServ Expedited Forwarding (EF)
- RFC 2597 DiffServ Assured Forwarding (AF)
- RFC 2475 DiffServ Core and Edge Router Functions
- LLDP-MED, ANSI/TIA-1057, draft 08
- RFC 2460 Internet Protocol, Version 6 (IPv6) Specification
- RFC 2461 Neighbor Discovery for IP Version 6 (IPv6)
- RFC 2462 IPv6 Stateless Address Autoconfiguration
- RFC 2463 Internet Control Message Protocol (ICMPv6) for the Internet Protocol Version 6 (IPv6) Specification

*Roadmap

Specifications (continued)

- RFC 2464 Transmission of IPv6 Packets over Ethernet Networks
- RFC 2526 reserved IPv6 Subnet Anycast Addresses
- RFC 2283 Multiprotocol Extensions for BGP-4
- RFC 2545 Use of BGP-4 Multiprotocol Extensions for IPv6 InterDomain routing
- RFC 2740 OSPF for IPv6
- RFC 2080 RIPng for IPv6
- RFC 3484 Default Address Selection for Internet Protocol Version 6 (IPv6)
- RFC 3513 Internet Protocol Version 6 (IPv6) Addressing Architecture
- Internet draft-ietf-isis-ipv6-06.txt, routing IPv6 with IS-IS
- RFC 1122 Host requirements
- Draft IETF PIM Dense Mode (PIM-DM) draft-ietf-idmr-pimdm-05.txt, draft-ietf-pim-dm-new-v2-04.txt
- Draft-ietf-isis-wg-multi-topology-11 Multi Topology (MT) Routing in IS-IS
- Draft-ietf-bfd-base-05.txt Bidirectional Forwarding Detection

Security
- MAC limiting
- Allowed MAC addresses, configurable per port
- Dynamic ARP inspection (DAI)
- IP source guard
- Local proxy ARP
- Static ARP support
- DHCP snooping

Access Control List (ACLs) (Junos OS firewall filters)
- Port-based filter (PACL)—Ingress and egress
- VLAN-based filter (VACL)—Ingress and egress
- Router-based filter (RACL)—Ingress and egress
- Filter entries in hardware per system: 1,400
- Filter counter for denied packets
- Filter counter for permitted packets
- Ability to add/remove/change filter entries in middle of list (filter editing)
- L2-L4 filters
- 802.1X port-based
- 802.1X multiple supplicants
- 802.1X with VLAN assignment
- 802.1X with authentication bypass access (based on host MAC address)
- 802.1X with VoIP VLAN support
- 802.1X dynamic filter based on RADIUS attributes
- 802.1X supported EAP types—MD5, TLS, TTLS, PEAP
- MAC authentication (RADIUS)
- Control plane DoS protection

High Availability
- Nonstop active routing (NSR)—OSPF v2, RIP v2, BGP, ISIS, IGMP v1, v2, v3
- Nonstop bridging (NSB)—ESWD, xSTP, LACP, LLDP/LLDP-MED
- Nonstop Software Upgrade (NSSU)
- Redundant, hot-swappable power supplies
- Redundant, field-replaceable, hot-swappable fans

- Graceful Routing Engine switchover (GRES) for Layer 2 hitless forwarding and Layer 3 protocols on Routing Engine failover
- Graceful protocol restart—OSPF, BGP
- Layer 2 hitless forwarding on Routing Engine failover
- Online insertion and removal (OIR) uplink module

Link Aggregation
- 802.3ad (LACP) support
  - Number of link aggregation groups (LAGs) supported: 64
  - Maximum number of ports per LAG: 8
- LAG load-sharing algorithm, bridged or routed (unicast or multicast) traffic
  - IP: S/D IP
  - TCP/UDP: S/D IP, S/D port
  - Non-IP: S/D MAC
- Tagged ports support in LAG

QoS
- Layer 2 QoS
- Layer 3 QoS
- Ingress policing: 1 rate 2 color
- Hardware queues per port: 8
- Scheduling methods (egress): Strict priority (SP), shaped deficit weighted round-robin (SDWRR)
- 802.1p, DSCP/IP Precedence trust and marking
- Layer 2-4 classification criteria: Interface, MAC address, Ethertype, 802.1p, VLAN, IP address, DSCP/IP Precedence, TCP/UDP port numbers, etc.
- Congestion avoidance capabilities: Tail drop

Multicast
- IGMP: v1, v2, v3
- IGMP snooping
- PIM-SM, PIM-SSM, PIM-DM

Services and Manageability
- Junos OS CLI
- Out-of-band management: Serial and 10/100/1000BASE-T Ethernet
- ASCII configuration
- Rescue configuration
- Configuration rollback
- LCD management
- SNMP: v1, v2c, v3
- RMON (RFC 2819) Groups 1, 2, 3, 9
- Network Time Protocol (NTP)
- DHCP server
- DHCP relay and helper
- RADIUS
- TACACS+
- SSHv2
- Secure copy
- System logging
- Temperature sensor
- Configuration backup via FTP/secure copy

Specifications (continued)

Supported MIBs**

- RFC 1155 SMI
- RFC 1157 SNMPv1
- RFC 1905 RFC 1907 SNMPv2c, SMIv2, and Revised MIB-II
- RFC 2570-2575 SNMPv3, user-based security, encryption, and authentication
- RFC 2576 Coexistence between SNMP Version 1, Version 2, and Version 3
- RFC 1212, RFC 1213, RFC 1215 MIB-II, Ethernet-like MIB, and traps
- RFC 2578 SNMP Structure of Management Information MIB
- RFC 2579 SNMP Textual Conventions for SMIv2
- RFC 2925 Ping/traceroute MIB
- RFC 2665 Ethernet-like interface MIB
- RFC 1643 Ethernet MIB
- RFC 1493 Bridge MIB
- RFC 2096 IPv4 forwarding table MIB
- RFC 2011 SNMPv2 for IP using SMIv2
- RFC 2012 SNMPv2 for transmission control protocol using SMIv2
- RFC 2013 SNMPv2 for user datagram protocol using SMIv2
- RFC 2863 Interface MIB
- RFC 3413 SNMP application MIB
- RFC 3414 User-based security model for SNMPv3
- RFC 3415 View-based access control model for SNMP
- RFC 3621 PoE-MIB (PoE switches only)
- RFC 1724 RIPv2 MIB
- RFC 2863 Interface Group MIB
- RFC 2932 IPv4 multicast MIB
- RFC 2787 VRRP MIB
- RFC 1850 OSPFv2 MIB
- RFC 1657 BGP-4 MIB
- RFC 2819 RMON MIB
- RFC 2287 System application packages MIB
- RFC 4188 STP and extensions MIB
- RFC 4363 Definitions of managed objects for bridges with traffic classes, multicast filtering, and VLAN extensions
- RFC 2922 LLDP MIB

Troubleshooting

- Debugging: CLI via console, telnet, or SSH
- Diagnostics: Show and debug command, statistics
- Traffic mirroring (port)
- Traffic mirroring (VLAN)
- Filter-based mirroring
- Mirroring destination ports per system: 1
- LAG port monitoring
- Multiple destination ports monitored to one mirror (N:1)
- Maximum number of mirroring sessions: 1
- Mirroring to remote destination (over L2): 1 destination VLAN
- IP tools: Extended ping and trace
- Juniper Networks commit and rollback

Warranty

- Enhanced limited lifetime switch hardware warranty

**Unless explicitly specified for any particular MIB table or variables, Junos OS does not support SNMP set operations.

Safety and Compliance

Safety Certifications

- CAN/CSA-C22.2 No. 60950-1 (2007) Information
- Technology Equipment - Safety
- UL 60950-1 (2nd Ed) Information Technology Equipment - Safety
- EN 60950-1 (2006) Information Technology Equipment - Safety
- IEC 60950-1 (2005) Information Technology Equipment - Safety (all country deviations)
- EN 60825-1 (2007) Safety of Laser Products - Part 1: Equipment and Requirements

Electromagnetic Compatibility Certifications

- EN 300386 Telecom Network Equipment – EMC requirements
- FCC Part 15 Class A
- EN 55022 Class A
- VCCI Class A
- CISPR 22 Class A
- AS/NZS CISPR 22 Class A
- BSMI CNS 13438 and NCC C6357 Taiwan Radiated Emissions

Immunity

- EN 55024 Information Technology Equipment Immunity Characteristics
- EN-61000-3-2 Power Line Harmonics
- EN-61000-3-3 Power Line Voltage Fluctuations
- EN-61000-4-2 Electrostatic Discharge
- EN-61000-4-3 Radiated Immunity
- EN-61000-4-4 Electrical Fast Transients
- EN-61000-4-5 Surge
- EN-61000-4-6 Immunity to Conducted Disturbances
- EN-61000-4-11 Voltage Dips and Sags

Customer Specific Requirements

- GR-63-Core Network Equipment Building System (NEBS) Physical Protection
- GR-1089-Core EMC and Electrical Safety for Network Telecommunications Equipment
- SR-3580 NEBS Criteria Levels (Level 3)
- ETSI EN 300 019: Environmental Conditions and Environmental Tests for Telecommunications Equipment
- ETSI EN 300 019-2-1 – Storage
- ETSI EN 300 019-2-2 – Transportation
- ETSI EN 300 019-2-3 – Stationary Use at Weather-Protected Locations
- ETS 300753 – Acoustic Noise Emitted by Telecommunications Equipment

Environmental

- Reduction of Hazardous Substances (ROHS) 5/6

Telco

- Common Language Equipment Identifier (CLEI) code

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

Chassis

Model Number	Description
EX6210-S64-96P-A25	EX6210 96-port PoE+ system: 10-slot chassis with passive backplane, 1x fan tray, 1x switch routing engine with switch fabric and 4x10GbE SFP+ uplinks, 2x 48-port PoE+ line cards, 1x 2,500 W AC PSU with power cord and blanks (optics not included)
EX6210-S64-96T-A25	EX6210 96-port system: 10-slot chassis with passive backplane, 1x fan tray, 1x switch routing engine with switch fabric and 4x10GbE SFP+ uplinks, 2x 48-port RJ45 line cards, 1x 2,500 W AC PSU with power cord and blanks (optics not included)
EX6210-S64-96T-D21	EX6210 96-port system: 10-slot chassis with passive backplane, 1x fan tray, 1x switch routing engine with switch fabric and 4x10GbE SFP+ uplinks, 2x 48-port RJ45 line cards, 1x 2,100 W DC PSU with DC lugs and blanks (optics not included)
EX6210-S64-96P-A50	EX6210 96-port PoE+ system: 10-slot chassis with passive backplane, 1x fan tray, 1x switch routing engine with switch fabric and 4x10GbE SFP+ uplinks, 2x 48-port PoE+ line cards, 1x 5,000 W AC PSU with power cords and blanks (optics not included)
EX6210-CHAS	EX6210 chassis with backplane, spare
EX6210-FAN	EX6210 fan tray, spare
EX6210-FLTR	EX6210 filter, spare

Line Cards

Model Number	Description
EX6200-48P	EX6200 48-port 10/100/1000BASE-T PoE+ line card
EX6200-48T	EX6200 48-port 10/100/1000BASE-T RJ-45 line card
EX6200-48F	EX6200 48-port 100BASE-X/1000BASE-X fiber line card

Routing Engines

Model Number	Description
EX6200-SRE64-4XS	EX6200 Switch and Routing Engine including 4x 10GbE SFP+ uplinks (optics not included)

Power Supplies

Model Number	Description
EX6200-PWR-AC2500	EX6200 2,500 W AC Power Supply at 220 V (1,250 W at 110 V), power cord not included
EX6200-PWR-DC2100	EX6200 2,100 W DC Power Supply, power cord not included
EX6200-PWR-AC5000	EX6200 5,000 W AC Power Supply at 220 V (2,500 W at 110 V), power cords (2x) not included

Software

Model Number	Description
EX6200-AFL	EX6200 Advanced Feature License

Optics and Transceivers

Model Number	Description
EX-SFP-10GE-USR	SFP+ 10GbE Ultra Short Reach optics, 850 nm for 10 m on OM1, 20 m on OM2, 100 m on OM3 multimode fiber
EX-SFP-10GE-SR	SFP+ 10GBASE-SR 10GbE optics, 850 nm for up to 300 m transmission on multimode fiber-optic (MMF)
EX-SFP-10GE-LRM	SFP+ 10GbE LRM optics, 1,310 nm for 220 m transmission on MMF
EX-SFP-10GE-LR	SFP+ 10GBASE-LR 10GbE optics, 1,310 nm for 10 km transmission on single mode fiber-optic (SMF)
EX-SFP-10GE-ER	SFP+ 10GBASE-ER 10GbE optics, 1,550 nm for 40 km transmission on SMF
EX-SFP-1GE-SX*	SFP 1000BASE-SX GbE optics, 850 nm for up to 550 m transmission on MMF
EX-SFP-1GE-LX*	SFP 1000BASE-LX GbE optics, 1,310 nm for 10 km transmission on SMF
EX-SFP-1GE-LX40K*	SFP 1000BASE-LX GbE optics, 1,310 nm for 40 km transmission on SMF
EX-SFP-1GE-LH*	SFP 1000BASE-LH GbE optics, 1,550 nm for 70 km transmission on SMF
EX-SFP-1GE-T*	SFP 1000BASE-T 10/100/1000 Copper Transceiver Module for up to 100 m transmission on Cat5

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**.

*Roadmap

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

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