JUNIPER
NETWORKS

EX SERIES ETHERNET SWITCHES

Advancing the Economics of Enterprise Networking

High-Performance Business Requirements

Today's high-performance businesses demand a high-performance network infrastructure that provides fast, secure and reliable delivery of the applications that drive business processes. Switches deployed in regional offices, campuses and data centers enable these business processes by connecting users to applications, delivering everything from traditional file services to telephony, messaging, presence, video conferencing and Web services.

To fill this critical role, network infrastructure switches must:

- Be highly available to ensure uninterrupted, uncompromised delivery of business processes in the event of failures and outages

- Support unified data, voice, messaging, presence and video communications on a single IP infrastructure

- Integrate security functions traditionally implemented in appliances to defend against malicious, sophisticated attacks and optimize application response times

- Deliver operational excellence by delivering consistency and simplicity across the infrastructure to reduce total cost of ownership

Unfortunately, most contemporary switches don't meet these requirements. Designed and installed over several years, these switches—deployed in multiple layers across the network—fall short of delivering the performance, scalability and wire-speed port densities that today's converged networks demand. Multiple switch layers add considerable cost, delay and complexity to the network, which in turn drives capital and operational expenses ever higher.

Enterprises need a new approach—a strategic, innovative solution that allows them to spend less on their network infrastructure and more on revenue-generating and productivity-enhancing technologies that help them gain a competitive edge.

Juniper Networks offers such a solution—a new class of Ethernet switches for the enterprise, designed specifically to meet the demands of today's high-performance businesses. The Juniper Networks® EX Series Ethernet Switches are changing the game, delivering the next generation of switching technology for today's—and tomorrow's—networks.

With the EX Series, businesses can deploy a cost-effective family of switches that delivers the high availability (HA), unified communications, integrated security and operational excellence they need today, while providing a platform for supporting the requirements of tomorrow.

Welcome to the future of enterprise switching.
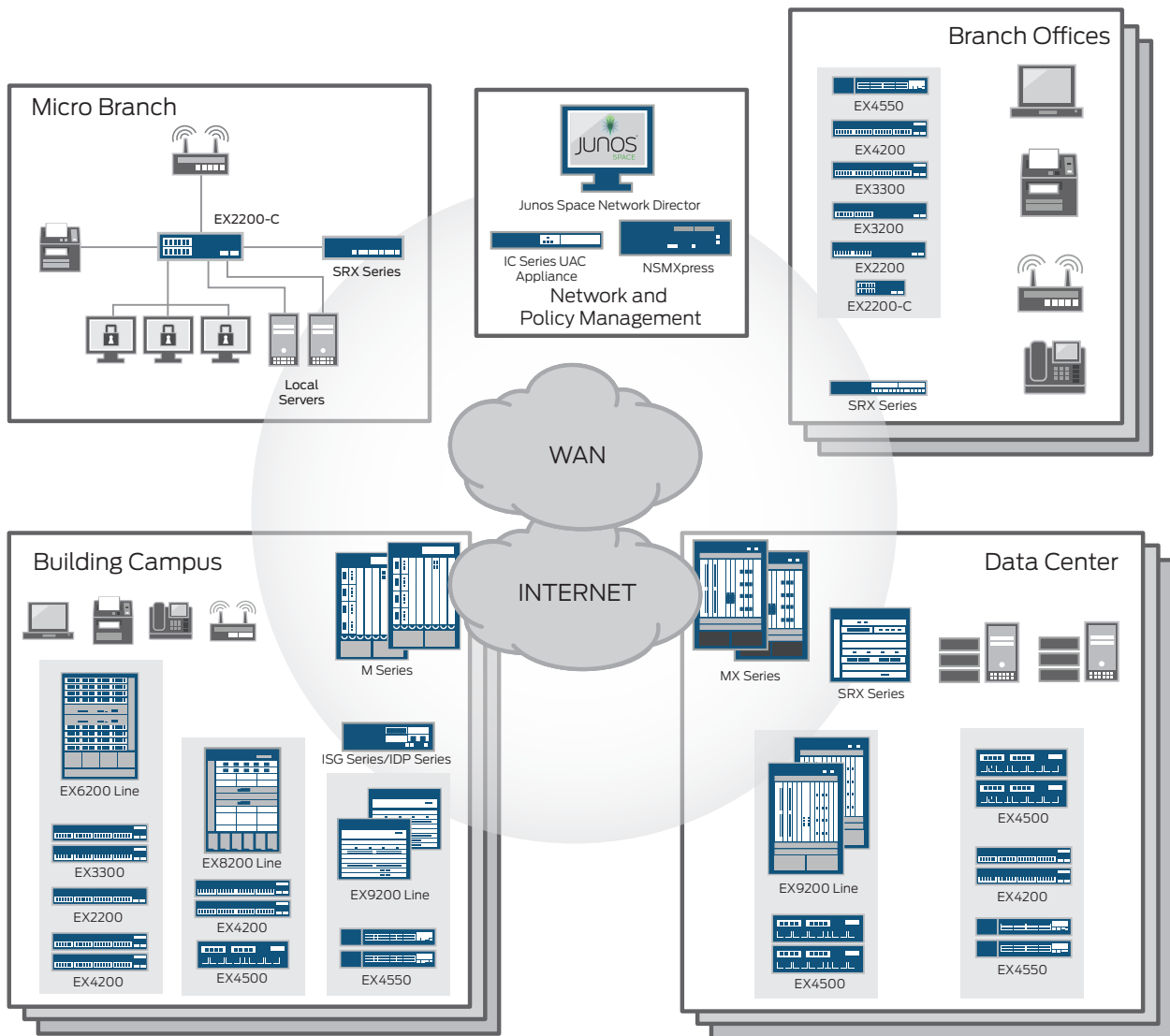
The Juniper Networks EX Series Ethernet Switches

The Juniper Networks EX2200, EX3200, EX3300, EX4200, EX4500, EX6200, EX8200 and EX9200 lines of Ethernet switches exhibit five key characteristics that, working together, deliver a true enterprise switching solution: carrier-class reliability, security risk management, network virtualization, application control, and reduced total cost of ownership (TCO).
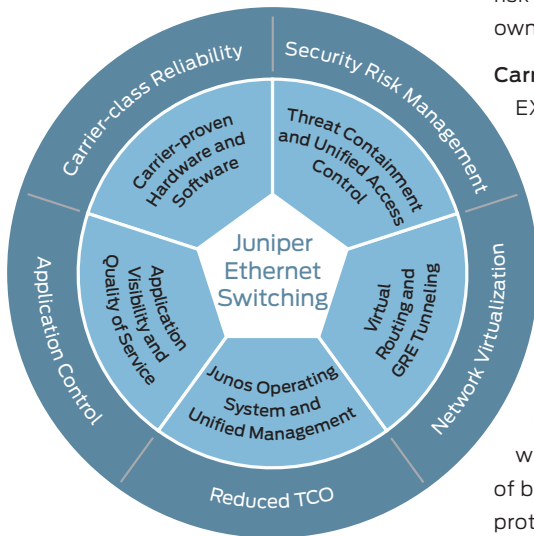
Carrier-class Reliability: Nothing succeeds like success. That's why the Juniper Networks EX Series Ethernet Switches leverage much of the same field-proven Juniper Networks technology—including high-performance application-specific integrated circuits (ASICs), system architecture and Juniper Networks Junos® operating system—that power the world's largest service provider networks. The result is a robust, time-tested and highly reliable network infrastructure solution for high-performance enterprises.

Security Risk Management: The Juniper Networks EX Series Ethernet Switches are fully compatible with the Juniper Networks Unified Access Control (UAC), delivering an extra layer of security by first authenticating users and performing virus checks, then enforcing precise, end-to-end security policies that determine who can access what network resources, as well as quality of service (QoS) policies to ensure delivery of business processes. Integrated anomaly-based threat detection provides additional protection by identifying and blocking distributed denial of service (DDoS) attacks.

Network Virtualization: The EX Series switches feature Juniper Networks Virtual Chassis technology, which enables multiple EX2200, EX2200-C, EX3300, EX4200, EX4500, EX4550 or EX8200 switches to be interconnected and operate as a single system. With Virtual Chassis technology, users get the reliability, availability and high-port densities of traditional chassis-based systems in a cost-effective, compact form factor—the best of both worlds.

Application Control: Successfully managing a network requires knowing how it's being used in order to optimize application delivery and maximize efficiency. Integrated high-performance ASICs on the chassis-based EX8200 and EX9200 line of Ethernet switches provide wire-speed forwarding for any and all packet sizes.

To ensure application traffic is properly prioritized, the EX Series Ethernet Switches support a robust eight QoS queues per port—more than enough to establish separate queues for control plane, voice, video and multiple levels of data traffic, with room to converge other networks such as building automation and security cameras.

Lower TCO: A highly scalable pay-as-you-grow architecture, network designs with lower power consumption, space and associated cooling requirements, a common operating system, and unified management tools across the Juniper portfolio all combine to help reduce operational and capital expenses for EX Series Ethernet Switch customers.

The high-performance, high-density platforms let users start small and grow incrementally, saving valuable space in crowded wiring closets and data centers while lowering recurring power and cooling costs. Leveraging a common version of the Junos operating system across the switch families ensures consistency throughout the infrastructure and accelerates the learning curve. And unified management tools consolidate system monitoring and maintenance, saving time and money.

Working together, these EX Series switch attributes advance the economics of networking by allowing businesses to spend less money and time on their network infrastructure—and more on innovative technologies that help them gain a competitive edge.

EX2200 Line of Ethernet Switches

The Juniper Networks EX2200 line of Ethernet switches deliver a compact, economical standalone solution for access layer deployments in branch and micro-branch offices, low-density campus networks, and commercial or enterprise workgroup environments outside the wiring closet.

Occupying a single rack unit, the EX2200 provides a compact solution for crowded wiring closets and access locations where space and power are at a premium. Four EX2200 switch models are available, offering 24 and 48 10/100/1000BASE-T ports with or without Power over Ethernet (PoE).

The fanless EX2200-C delivers a compact, silent and power-efficient platform for open office, classroom, hospitality and other space- and wiring-constrained environments. Two EX2200-C models offer 12 10/100/1000BASE-T ports with or without PoE.

The PoE-enabled EX2200 and EX2200-C deliver 15.4 watts of standards-based 802.3af Class 3 PoE on all ports for supporting networked devices such as telephones, video cameras, and wireless LAN (WLAN) access points in converged networks. The switches also support for the IEEE 802.3at PoE+ standard, which offers additional power for devices such as multiple radio IEEE 802.11n wireless access points that may require more than 15.4 watts.

Four fixed front panel Gigabit Ethernet (GbE) uplink ports on the EX2200 support high-speed backbone or link aggregation connections between wiring closets and upstream aggregation switches without sacrificing base ports, offering true 24+4 and 48+4 configuration options. On the EX2200-C, two SFP and two RJ-45 copper GbE uplink ports on the front provide the flexibility to connect to higher layer devices over unshielded twisted pair (UTP) or fiber optic cabling. Any two of the four ports can be used simultaneously.

Additionally, support for Layer 2 and basic Layer 3 protocols such as RIP and static routing in the base license on the EX2200 and EX2200-C delivers a level of functionality typically associated with higher cost solutions.

The EX2200 switches deliver a cost-effective, high-performance solution for branch offices and low-density campus and wiring close environments.
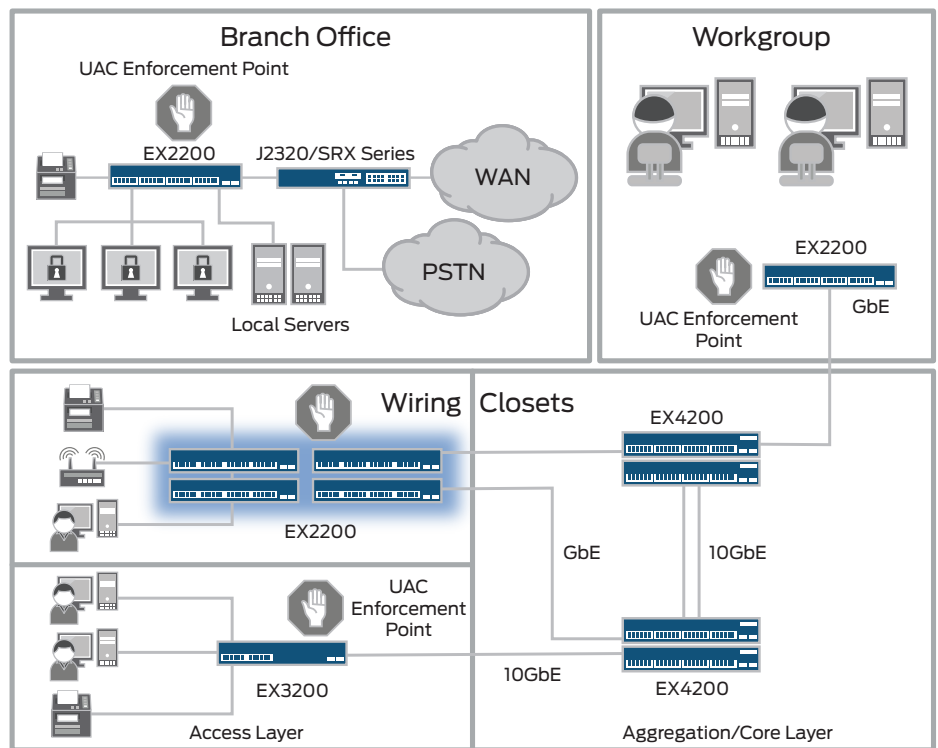
Virtual Chassis Technology

The EX2200 and EX2200-C also support Juniper's unique Virtual Chassis technology which enables up to four of the switches to be interconnected and managed as a single logical device, delivering a scalable, pay-as-you-grow solution for expanding networks.

While the switches can be interconnected over any of the front-panel uplink ports, providing tremendous configuration flexibility, the last two ports are configured by default as Virtual Chassis ports to automate deployments when using standard GbE SFP transceivers. If Virtual Chassis technology is disabled, these two ports can be used as standard uplinks for connecting to higher-level aggregation devices.

Highly Available, Friendly Solution

To avoid the complexities of the Spanning Tree Protocol without sacrificing network resiliency, the EX2200 switches employ Redundant Trunk Group (RTG) to provide the necessary port redundancy while simplifying switch configuration.

Limited Lifetime Warranty

The EX2200 and EX2200-C switches run the same Junos operating system as other Juniper Networks EX Series switches, routers and security products, ensuring a consistent implementation and operation of control plane features across all products.

And the EX2200 line, as well as the Juniper Networks EX3200 line and EX4200 line, offers a limited lifetime warranty that provides return-to-factory switch replacement for as long as the original purchaser owns the product. It's the ultimate protection for the ultimate family of Ethernet switches.

The fanless EX2200-C provides a silent solution for open-space deployments such as micro branch offices and retail store environments.
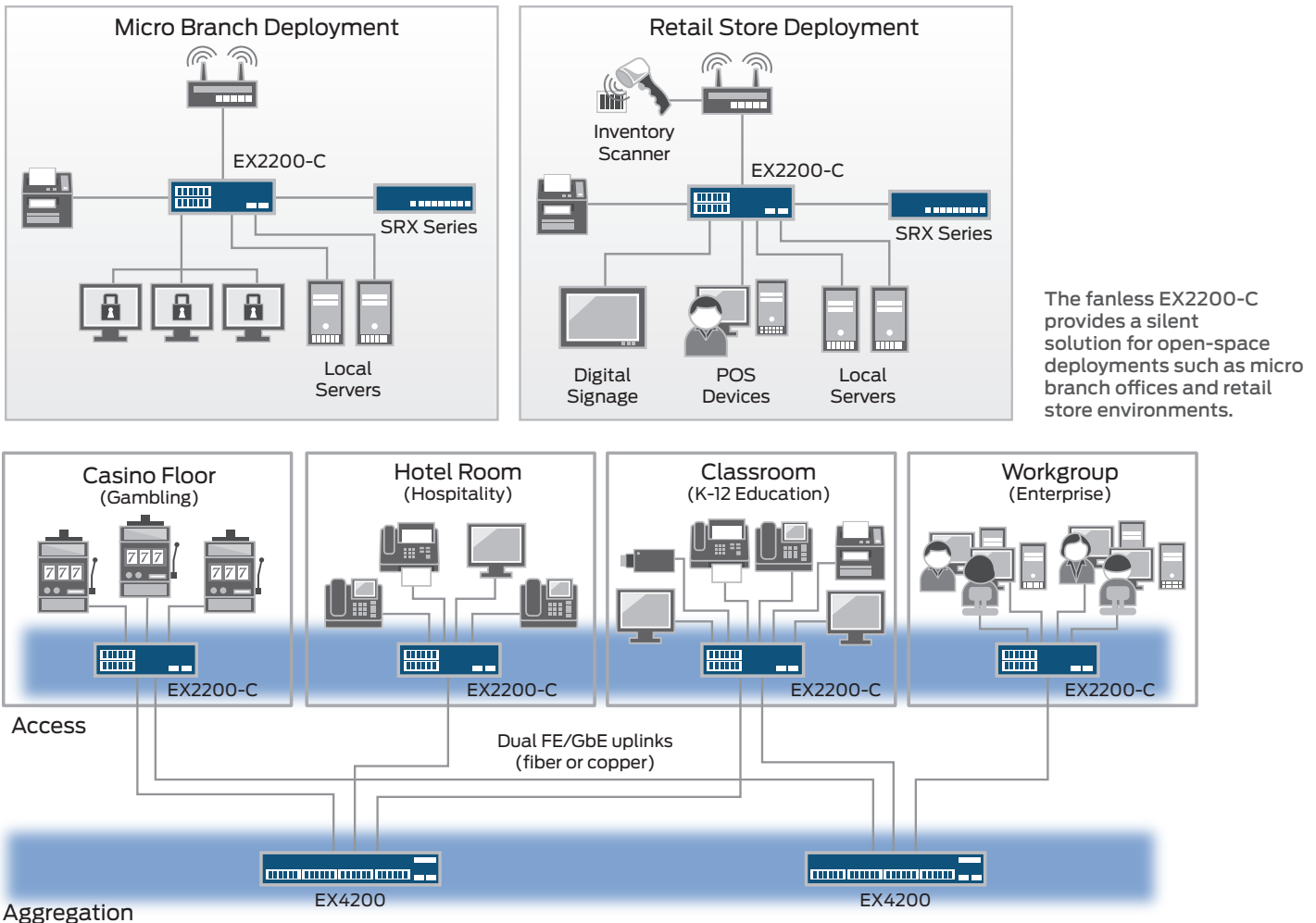
The EX2200-C Ethernet Switch is ideal for commercial access environments outside the wiring closet.

EX3200 Line of Ethernet Switches

The Juniper Networks EX3200 line of Ethernet switches offer a simple, cost-effective solution for low-density branch and regional offices. Deployed in wiring closets to provide network access for users and other IP-enabled devices, the EX3200 switches offer plug-and-play 10/100/1000BASE-T connectivity for today's converged networks.

Both 24- and 48-port fixed-configuration switches are available to provide sufficient port densities for most branch offices. Optional four-port Gigabit Ethernet (GbE) and two-port 10GbE uplink modules with pluggable optics are also available to provide high-speed connections to other EX3200 switches or upstream devices such as aggregation switches or routers. The uplink modules can be installed in the field without taking the system offline, delivering a flexible solution for remote facilities.

Converged Communications and Power over Ethernet

The EX3200 Ethernet switches were designed with today's converged communications networks in mind. Both the 24- and 48-port platforms offer full and partial PoE options to support networked telephones, closed-circuit video cameras, wireless access points and other IP-enabled devices.

Each EX3200 switch delivers a full 15.4 watts of power for every PoE-enabled port, eliminating any provisioning concerns so IT doesn't have to worry about equitable power distribution. Full (all ports) and partial (eight ports) PoE options ensure that there is a solution optimized for virtually every environment.

Simplified Maintenance

Most branch and regional offices don't have the luxury of an IT staff. The EX3200 switch makes it easy for non-technical workers to keep the network up and running.

The EX3200 switch features modular, field-replaceable fans and power supplies—the two items most likely to fail on any networking device. Spares can be stored on site and replaced in literally seconds, dramatically reducing mean-time to repair (MTTR) and lessening the impact of device failures on employee productivity. And an external redundant power-supply option makes the internal power supply hot-swappable, allowing replacements to be installed without powering down the switch.

Juniper Networks Operating System Heritage

By leveraging the same time-tested, field-proven Junos OS employed by other Juniper Networks switches, routers and security products, the EX3200 delivers a true enterprise-class switch that exceeds expectations by delivering carrier-class reliability.
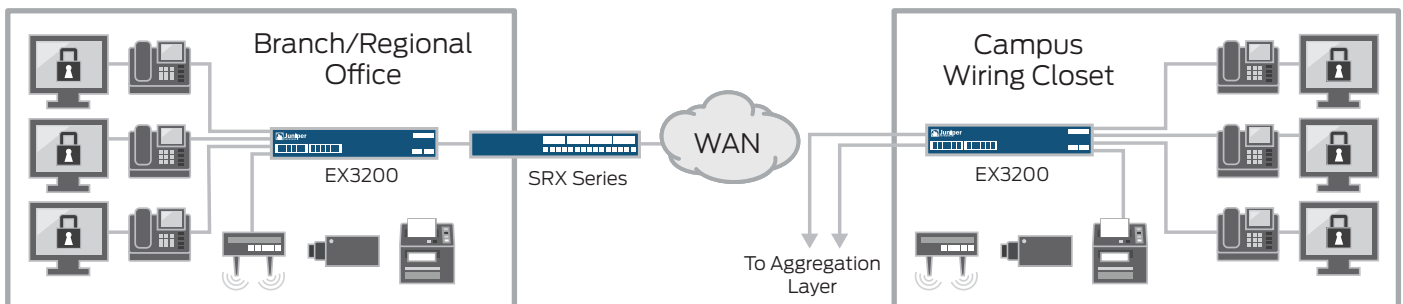
The EX3200 switches offer a simple, cost-effective solution for low-density branch and regional offices as well as campus wiring closets.

EX3300 Line of Ethernet Switches

The Juniper Networks EX3300 Ethernet Switch delivers a high-performance, flexible solution for converged data, voice, and video enterprise access environments, providing a level of flexibility and ease of management previously available only with higher end access switches.

The EX3300 line features six models offering 24 or 48 10/100/1000BASE-T ports with and without PoE+, as well as front-to-back and back-to-front cooling options and a DC power supply. Four dual-mode (GbE/10GbE) small form-factor pluggable transceiver (SFP/SFP+) front panel uplink ports provide flexible options for connecting to higher layer devices such as aggregation switches.

Optimized for GbE server access in the data center, the front-to-back and back-to-front cooling options provide the flexibility to deploy the EX3300 in both hot- and cold-aisle environments. The four SFP+ uplink ports can operate at 10 Gbps simultaneously, offering up to 40GbE of uplink connectivity to dual aggregation switches.
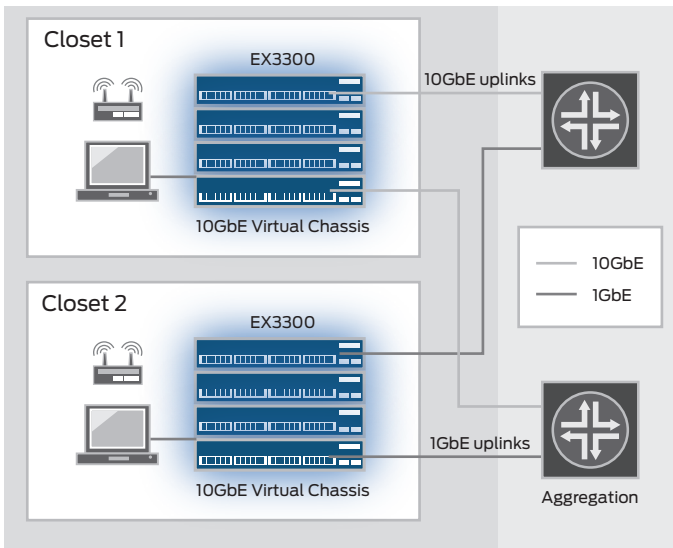
Virtual Chassis Technology

The EX3300 line also supports Juniper Networks Virtual Chassis technology, allowing up to 10 switches to be interconnected over high-speed uplink ports and managed as a single logical device, delivering a scalable, pay-as-you-grow solution for expanding network environments.

The switches are interconnected over the front panel uplink ports to create a Virtual Chassis configuration. The last two uplinks are preconfigured by default as Virtual Chassis ports, allowing the switches to be interconnected out of the box. Any of the four uplinks can be configured as Virtual Chassis ports, delivering additional deployment flexibility in environments where members of the same Virtual Chassis reside in different data centers, on different floors, or even in different buildings.

Converged LANs

When deployed in demanding converged data, voice, and video environments, the PoE-enabled EX3300 switches deliver up to 30 watts of power per port to support networked devices such as telephones, video cameras, IEEE 802.11n wireless LAN (WLAN) access points, and video phones.

EX3300 switches also work with Juniper Networks Unified Access Control, which 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 levels. Working as an enforcement point within the UAC, the EX3300 provides both standards-based 802.1X port-level access control and Layer 2-4 policy enforcement based on user identity, location, and/or device. The switches also support comprehensive Layer 2 functionality along with RIP and IPv4/IPv6 static routing.

Running Junos OS

The EX3300 runs the same modular Juniper Networks Junos operating system control plane feature implementation as other fixed configuration EX Series Ethernet Switches, as well as Juniper routers and security products, lowering the learning curve for customers running an all-Juniper infrastructure.
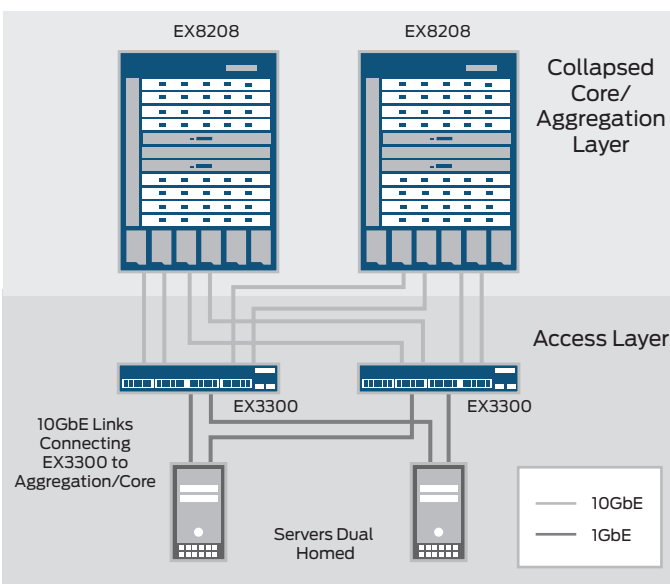
The EX3300 provides a flexible, high-performance solution for campus wiring closets as well as data center top-of-rack deployments.

EX4200 Line of Ethernet Switches

The Juniper Networks EX4200 line of Ethernet switches are truly unique, delivering the best elements of chassis-based systems in a compact and efficient form factor.

Designed for access and aggregation deployments, the EX4200 switches are a superset of the EX3200 switches, available in the same 24- and 48-port 10/100/1000BASE-T configurations with optional GbE and 10GbE uplink modules. The EX4200 offers full and partial PoE options; models are also available that support the IEEE 802.3at PoE+ standard, providing additional power for devices that require more than 15.4 watts. The EX4200 line also offers a 24-port 100BASE-FX/1000BASE-X SFP-based platform for gigabit aggregation deployments requiring the long distance links afforded by fiber.

Virtual Chassis Technology

What sets the EX4200 switches apart is Virtual Chassis technology. Using Virtual Chassis technology, up to 10 EX4200 switches can be interconnected over a 128 gigabit-per-second (Gbps) backplane, creating a single virtual switch supporting up to 480 10/100/1000BASE-T ports and up to 40 GbE or 20 10GbE uplink ports.

Interconnected EX4200 switches act as a single logical device, sharing a common operating system and configuration file, greatly simplifying system operations, maintenance and troubleshooting.

In mixed server environments, EX4200s can also be interconnected with Juniper EX4500 switches in the same Virtual Chassis configuration, creating a single logical switch that offers a variety of port, speed and density options for supporting a combination of 1GbE and 10GbE devices.

With the EX4200 switch, businesses can start with a single rack-unit device and, as requirements grow, add new units incrementally, avoiding the large up-front investments required by chassis-based solutions while keeping power and cooling costs to a minimum.
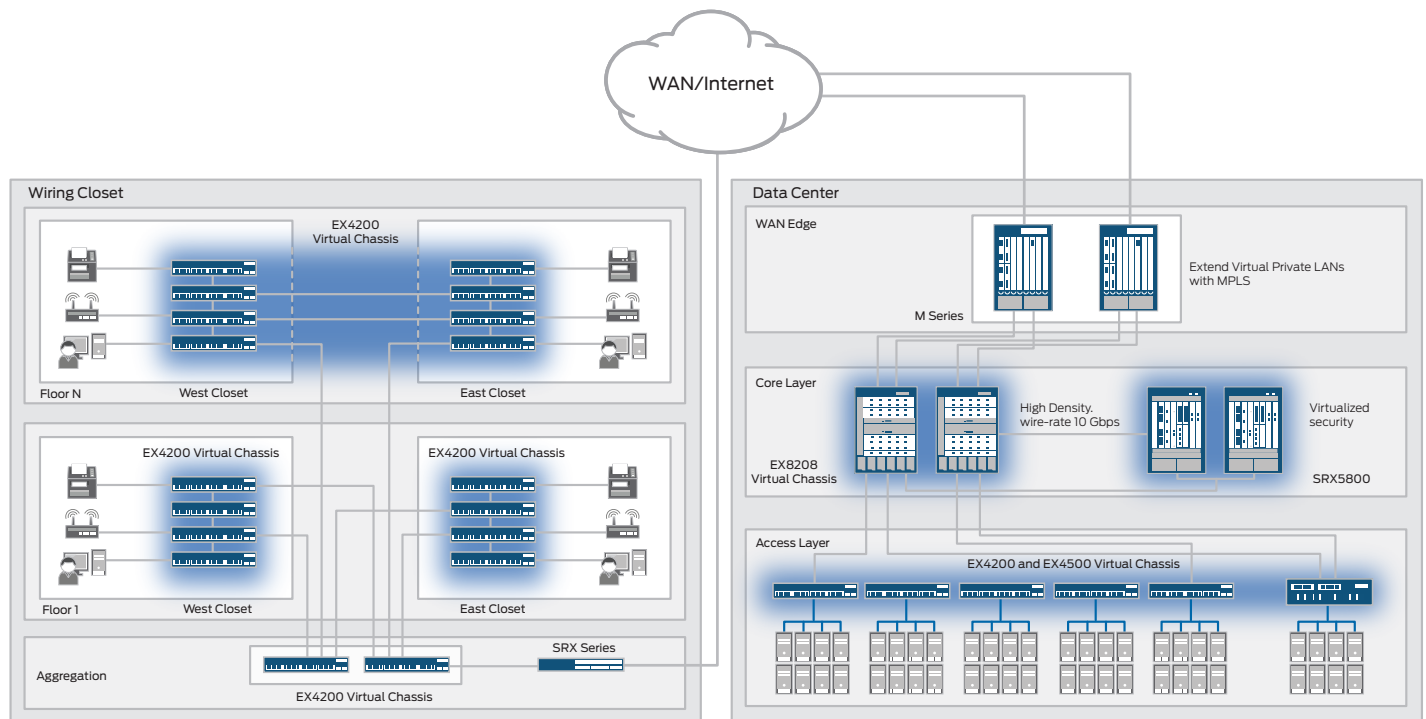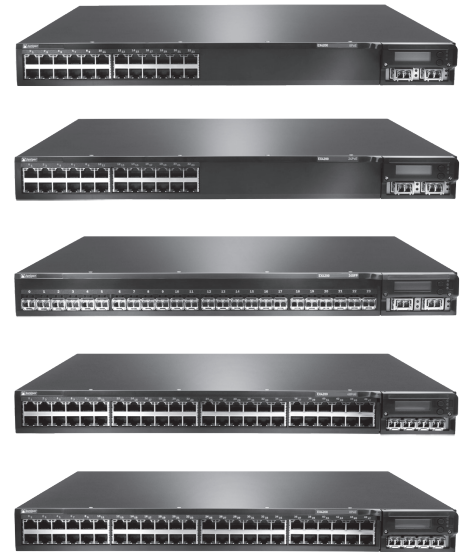
High Availability

The EX4200 switches also feature many of the same HA features as chassis-based solutions, including internal redundant hot-swappable power supplies and a field-replaceable fan tray. Power supplies and fan trays are common across the EX4200 line, so spares can be stored onsite for rapid MTTR.

In a Virtual Chassis configuration, Graceful Route Engine Switchover (GRES) ensures that network operations continue uninterrupted and no critical routing data is lost following a master Routing Engine failure. Master and backup Routing Engines are automatically assigned by the Junos OS, dictating an orderly transfer of control-plane functions.

Cost-Effective Alternative

The EX4200 switches deliver a cost-effective alternative to chassis-based systems. For typical aggregation environments requiring 48 GbE SFP fiber ports and four 10GbE uplinks, two 24-port EX4200 switches deliver the same wire-speed port densities and functionality as the most popular chassis-based solution—at one-sixth the size, one-fifth the power, and one-third the cost.
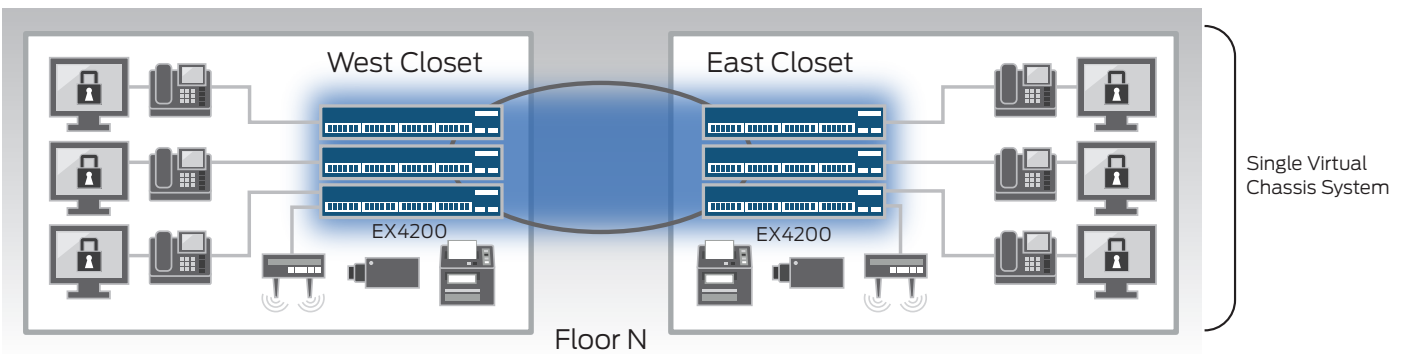
Using Virtual Chassis technology, multiple EX4200 switches can be interconnected to create a single logical device spanning multiple wiring closets, floors or even buildings.

EX4500 Line of Ethernet Switches

The Juniper Networks EX4500 line of Ethernet switches offer scalable, compact, high-performance platforms for supporting high-density 10 gigabit per second (Gbps) data center top-of-rack as well as data center, campus, and service provider aggregation deployments.

Two models are available. The EX4500 features up to 48 wire-speed dual Gigabit Ethernet (GbE) and 10GbE pluggable ports in a two rack unit platform to deliver full Layer 2 and Layer 3 connectivity to networked devices such as servers and other switches. Forty fixed ports are complemented by two optional high-speed uplink modules available for configuration flexibility, providing eight additional 10GbE ports.

The EX4550 is similar to the EX4500, supporting up to 48 wire-speed 1GbE or 10GbE fiber or copper ports in a compact one rack unit platform with 480 Gbps of Layer 2 and Layer 3 connectivity. The EX4550 base unit features 32 fixed ports, while two expansion slots—one in front and one in back—can accommodate any combination of three expansion modules: an eight-port 10GBASE-T copper card; an eight-port 10GBASE SFP/SFP+ fiber card; or a 128 Gbps Virtual Chassis module.

Optimized for the Data Center

The EX4500 and EX4550 are designed for demanding data center applications where high performance, high availability, and energy efficiency are key requirements. Delivering 10 Gbps of bandwidth and 14.88 million packets per second (Mpps) throughput on every port for any packet size, the EX4500 and EX4550 are purpose-built for top-of-rack or end-of-row deployments in today's high-performance data center.
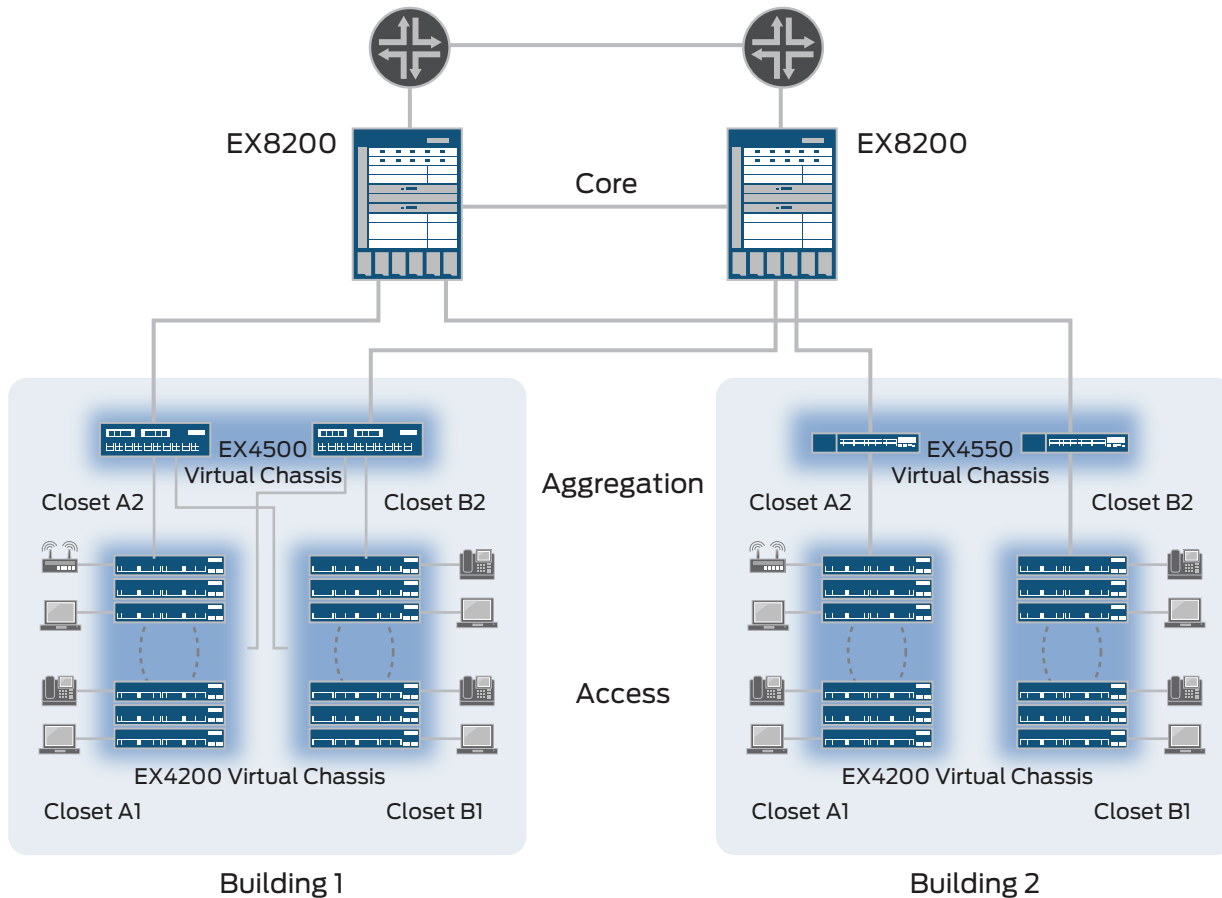
The EX4500 and EX4550 switches offer an economical, power-efficient, compact solution for campus aggregation deployments.

The EX4500 and EX4550 also offer an economical, power efficient and compact solution for aggregating 10GbE uplinks from access devices in core data center and building deployments. The switches easily meet enterprise core switch requirements by delivering wire-speed performance on every port, full device redundancy, dual speed GbE and 10GbE interfaces, support for Layer 3 dynamic routing protocols such as RIP and OSPF, and a comprehensive quality-of-service (QoS) feature set.

Virtual Chassis Technology

The EX4500 and EX4550 also support Virtual Chassis technology, dramatically reducing complexity and introducing a new level of flexibility for data center top-rack or end-row server aggregation deployments.

Redundant links are only required for each Virtual Chassis group rather than between individual switches, greatly simplifying data center configurations. It is possible to combine EX4500, EX4550 and EX4200 switches within a single Virtual Chassis configuration to support environments where both GbE and 10GbE servers are present, making the most efficient use of available resources.

Highly Available, Energy Efficient

The EX4500 and EX4550 switches offer dual internal load sharing AC power supplies and redundant variable-speed fans that adjust their speed based on existing conditions, reducing power consumption and protecting the switch from a single power supply or fan failure.

The EX4500 line also runs the same Junos operating system as other Juniper Networks EX Series Ethernet Switches, routers, and security products, contributing to a consistent user experience across the entire Juniper network infrastructure.

The EX4500 and EX4550, which support high-density 10 Gbps server top-of-rack and aggregation deployments in the data center, can also belong to the same Virtual Chassis as EX4200 switches to support mixed GbE and 10GbE server environments.
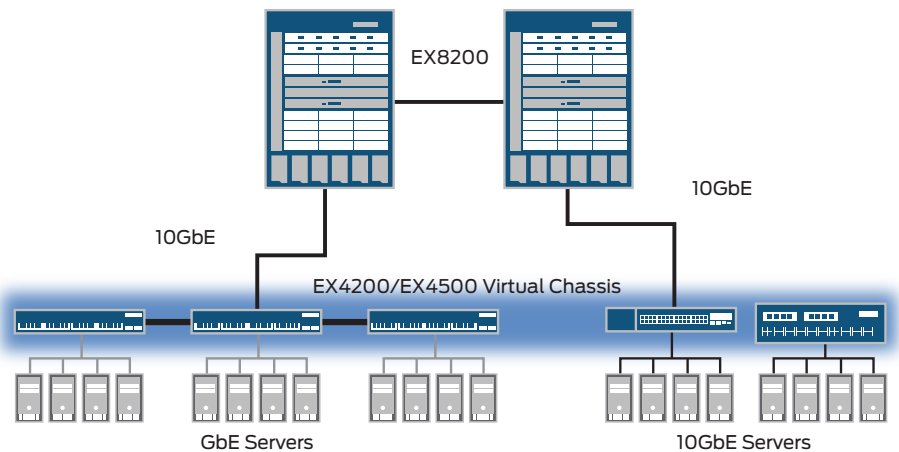
EX6200 Line of Ethernet Switches

The Juniper Networks EX6200 line of Ethernet switches delivers a scalable, resilient, and high-performance solution for enterprise campus wiring closets, as well as data center access end-of-row deployments.

Featuring a 10-slot chassis, the EX6210 Ethernet Switch supporting a variety of network configurations, the EX6200 line provides a flexible, highly available solution for businesses seeking high-performance, high density switches in a space optimized form factor.

High Density Connectivity

Eight of the EX6210 slots are reserved for EX6200 line cards. Two line cards are available, both offering 48 10/100/1000BASE-T ports with and without support for PoE and PoE+. The remaining two slots hold Switch Fabric and Routing Engine (SRE) modules, responsible for system configuration and management, running bridging and routing protocols, and managing user interfaces. The EX6210 will support optional configurations that allow an additional line card to be housed in one of the SRE slots*, enabling users to choose between higher port densities—up to 432 1GbE access ports—or redundant SREs.

Converged Environments

The EX6210 is ideal for converged network environments. The PoE-enabled EX6200 line cards provide 15.4 watts per port for powering networked devices such as telephones, video cameras, IEEE 802.11n wireless LAN (WLAN) access points, and video phones. The PoE-enabled line cards also support the PoE+ standard on all 48 ports, delivering up to 30 watts per port for devices that require more than the 15.4 watts provided by PoE.

Compact Solution

At just 14 rack units high, a single EX6210 chassis can support up to 432 PoE+ ports, delivering the industry's densest PoE+ solution in its form factor class. And at just 15.5 inches (39.4 cm) deep, the EX6210 is also compact enough for traditional wiring closets, making it ideal for campus deployments.
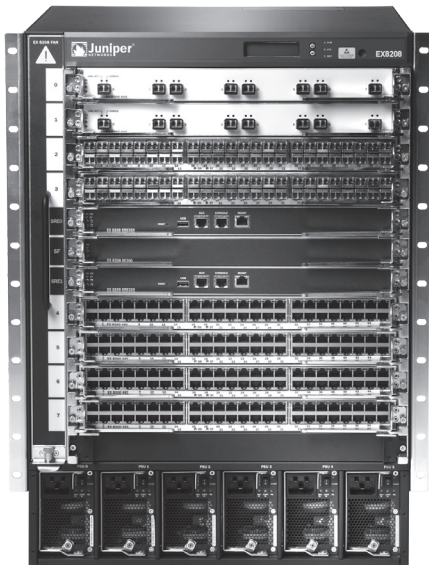
Feature-Rich Solution

The EX6200 switches run the same modular Juniper Networks Junos operating system as other Juniper switches, routers, and security devices, providing a consistent features implementation across the Juniper network infrastructure.

In addition, the EX6200 offers a rich set of Layer 2 and Layer 3 features as part of the base software, including IPv6 support*, extensive quality of service (QoS), and a number of security features—all in addition to tremendous scalability for media access control (MAC) and IP addresses.

The EX6200 is backed by Juniper's enhanced Limited Lifetime hardware warranty, which provides next business day advanced hardware replacement for as long as the original purchaser owns the product. The warranty also includes lifetime software updates, advanced shipping of replacement hardware within one business day, and 24x7 Juniper Networks Technical Assistance Center (JTAC) support.
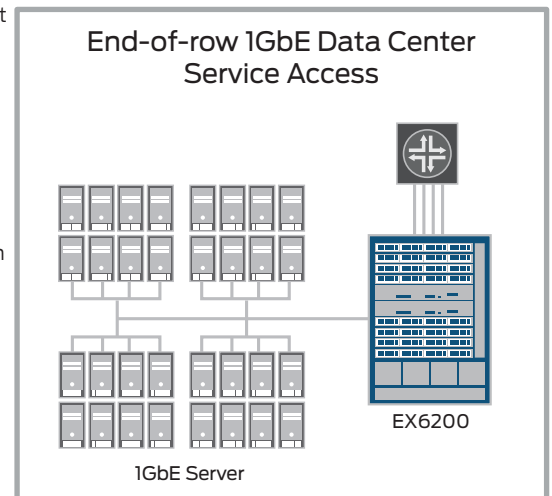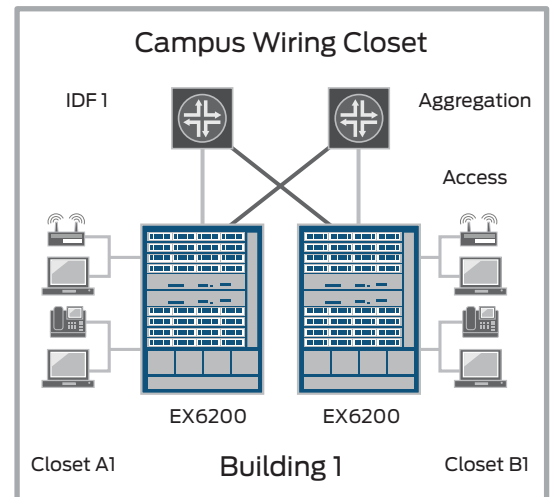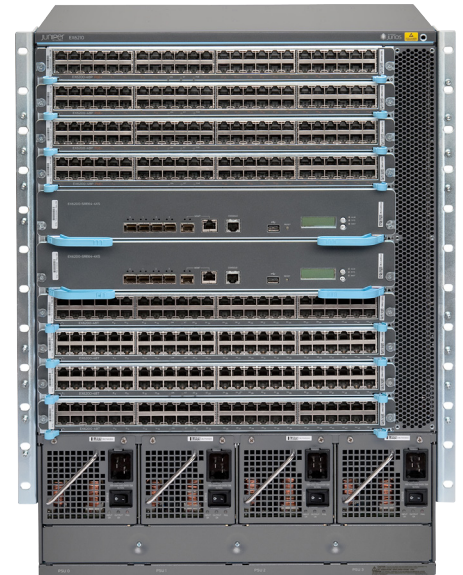
The EX6200 delivers a highly scalable solution for campus wiring closets as well as gigabit Ethernet server access end-of-row or middle-of-row data center deployments.

EX8200 Line of Ethernet Switches

The EX8200 line of modular Ethernet switches delivers a high-performance, highly available platform for today's high-density 10GbE data center, campus aggregation and core networks.

The EX8200 line of switches consists of two chassis options:

· The Juniper Networks EX8208 Ethernet Switch offers eight dedicated slots in a 14 rack-unit (RU) chassis to support line cards offering a variety of 10/100/1000BASE-T, 100BASE-FX/1000BASE-X and 10GbE interfaces. The EX8208 switch fabric delivers up to 320 Gbps per slot, enabling wire-rate forwarding performance of 960 million packets per second for packets of any size.

· The Juniper Networks EX8216 Ethernet Switch offers 16 dedicated line-card slots in a 21 RU chassis and features a switch fabric with 1.92 billion packets per second forwarding performance.

The EX8200 line of switches also offers some of the industry's highest wire-speed 10GbE port densities. Up to three EX8208 switches or two EX8216 switches can fit in a single 42-unit rack, delivering an unprecedented 256 wire-speed 10GbE ports per rack.

Like the EX2200, EX3200, EX4200 and EX4500 lines of switches, the EX8200 line leverages the Junos OS as well as other proven Juniper technology including the EX-PFE2 packet-forwarding engine ASIC and the same switching fabric employed by the Juniper Networks MX Series 3D Universal Edge Routers, bringing true carrier-class performance and reliability to the enterprise.

The EX8200 line of switches delivers high-speed, high-density platforms for aggregation and core deployments.
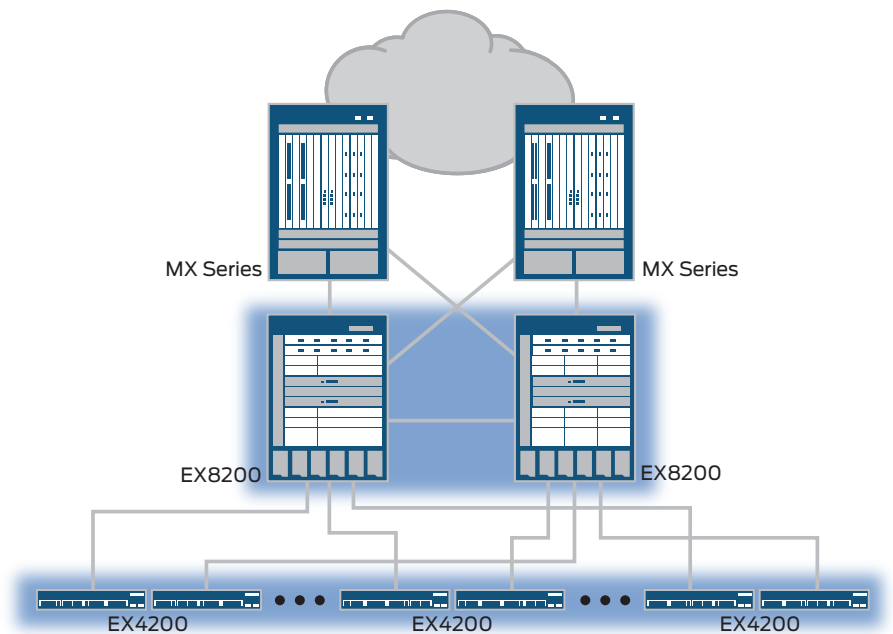
Energy Efficiency

The EX8200 line of switches deliver high-density, wire-rate platforms that consolidate network devices, interconnections, and architectural layers in both data center and campus environments.

In the data center, the EX8200 line of switches accommodate large numbers of 10GbE line-rate uplinks from access-layer devices such as the EX4200 line of switches, offering a scalable solution for supporting more servers with fewer switches, effectively reducing power consumption, heat generation, and footprint.

In campus aggregation and core environments, the line-rate 10GbE densities and carrier-class performance enable the EX8200 line of switches to support more users with less network equipment. While EX4200 switches deployed in Virtual Chassis configurations provide network access for floors or buildings with 10GbE uplinks, the high-density EX8200 line of switches can aggregate the wiring closet uplinks within a single platform, providing an effective solution for reducing energy consumption by deploying less devices.

Virtual Chassis Technology

The EX8200 line also supports Virtual Chassis technology, enabling the creation of a single, unified network fabric for interconnecting access switches, routers, and service-layer devices such as firewalls and load balancers at the aggregation or core layers.

EX8200 Virtual Chassis configurations are highly resilient, with no single point of failure. And because the EX8200 Virtual Chassis fabric eliminates bridge loops by using link aggregates (LAGs), it eliminates the need for protocols such as Spanning Tree. Working with the XRE200 External Routing Engine, EX8200-based Virtual Chassis configurations make server virtualization at scale feasible by providing simple L2 connectivity over a large pool of compute resources located anywhere in the data center.

Investment Protection

While the EX8200 line of switches are ideal for today's high-performance, high-density networks, it also provides investment protection for the future. By providing excess capacity now via the passive backplane design, the EX8200 line of switches will allow users to easily migrate to higher-speed 100 Gigabit Ethernet connections when they are ready—without requiring any upgrades to the switch fabric, Routing Engines, power supplies or cooling system.
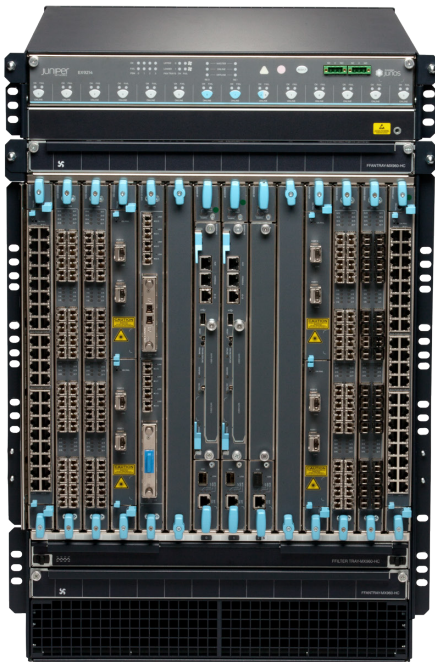
EX9200 Line of Ethernet Switches

The EX9200 programmable switch delivers a flexible and scalable platform that simplifies the deployment of cloud applications, virtualized servers and rich media collaboration tools across campus and data center environments.

Three EX9200 chassis options provide complete flexibility for supporting a variety of configurations.

- The EX9204, a four-slot, 6 U chassis that supports up to three 1GbE, 10GbE, 40GbE or 100GbE* line cards
- The EX9208, an eight-slot, 8 U chassis that supports up to six 1GbE, 10GbE, 40GbE or 100GbE* line cards
- The EX9214, a 14-slot, 16 U chassis that supports up to 12 1GbE, 10GbE, 40GbE or 100GbE* line cards

In the campus, the EX9200 enables collaboration and provides simple and secure access to mission critical applications. In the data center, the EX9200 simplifies network architectures and network operations to better align the network with today's dynamic business environments.

Programmable

As networks become more strategic, they need to become more agile as well. Agility requires programmability, and the EX9200 is the most programmable core switch for the enterprise.

Built around the Juniper One custom ASIC, the same used in Juniper's proven and field-tested routing platforms, the EX9200 is the first product in its class to be built on a programmable ASIC. As a result, users can modify the ASIC's behavior down to the Packet Forwarding Engine (PFE) to natively support networking protocols such as virtualization using MPLS over IP and overlay network protocols. Future protocol support is achieved through ASIC micro code changes delivered via Junos updates, protecting existing investments.

The EX9200 includes native programmable interfaces that support SDN automation tools such as Puppet, OpenFlow and others, and provides full support for Junos Automation and the Junos SDK as well. Automating network functions dramatically improves the time it takes to re-provision the network to support new applications, reducing it from days or weeks to just seconds, eliminating misconfigurations due to human errors.

The EX9200 also supports integration with leading orchestration applications such as VMWare and OpenStack, eliminating delays and errors caused by re-provisioning the network to support virtual machine or application mobility.

Flexible

The EX9200 is optimized for both campus and data center core and aggregation environments, making it a highly flexible solution.

By collapsing core and distribution layers in the campus, or core and aggregation layers in the data center, the EX9200 greatly simplifies the network architecture. Future-ready protocol support can be extended to include new protocols through simple software updates.

The EX9200 also features a rich feature set, including network segmentation using MPLS, where one network can offer multiple segregated services; configuration roll-back; and in-service software updates.

*Future

Scalable

The EX9200 provides the logical scale required to support any enterprise environment, including multi-tenancy and high-volume VM and VDI deployments. With a chassis capacity of 13.2 Tbps, the switch scales to support more than 1 million MAC addresses, 256,000 IPv4 and IPv6 routes, and 32,000 VLANs.

Carrier-Class Operating System & Simplified Management

The EX9200 runs the same Junos operating system as the other Juniper Networks EX Series switches, as well as the Juniper Networks routers that power the world's largest and most complex networks.

A range of system management options are also available for the EX9200. The standard Junos OS CLI provides the same granular management capabilities and scripting parameters found in all Junos OS-powered devices, while integrated Junos XML management protocol tools provide early detection and automatic resolution of potential problems related to the operating system.

Juniper Networks Junos Space software provides system-level management across all EX Series Ethernet Switches, as well as other Juniper products deployed throughout the network—all from a single console.

Five 9s of carrier-class availability and resiliency, combined with sub-50 microsecond convergence, ensures the EX9200 will protect mission-critical data, voice and video streams following link failures.
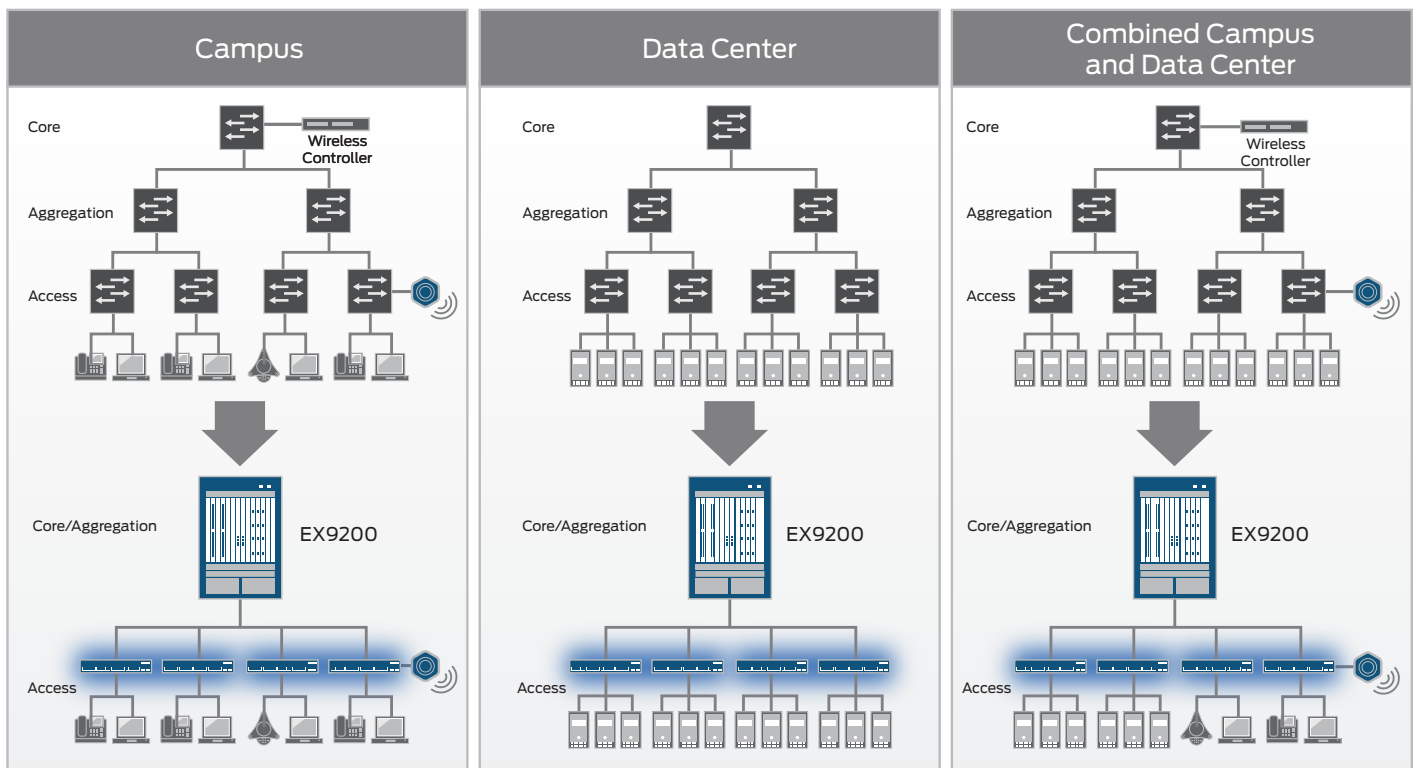
The EX9200 collapses layers in campus, data center, and combined campus and data center environments.

The Junos OS Advantage

By leveraging the same modular Junos OS as Juniper Networks router products, the EX Series switches deliver a consistent implementation of each control plane feature across the entire Juniper infrastructure. Running a common operating system across all products dramatically reduces training as well as maintenance and management overhead, which translates into lower TCO.

Junos OS makes this possible by adhering to a rigid and disciplined development process called the "three ones:" one source code, one release train and one modular architecture.

A single source code ensures that Junos OS remains a single, cohesive operating system throughout its development, regardless of the product platform on which it runs. One release train means that each new release is a superset of the previous; new Junos OS features are always implemented in the mainline, not in bug fixes to ensure stability and feature availability from one release to the next.

The Junos operating system's modular architecture ensures that it is more tightly controlled than a monolithic code base. A hardware abstraction layer allows control-plane features to be written once and implemented quickly on the underlying hardware. This modular approach also enhances fault-tolerance; since each Junos OS protocol daemon runs in its own protected memory space, if a single feature such as Spanning Tree fails, it can be gracefully restarted independently without impacting the rest of the system. A similar malfunction in a monolithic operating system would typically force a full system restart.

Management and Support Options

Junos OS utilizes a single source code, adheres to a consistent and predictable release train, and employs a single modular architecture.
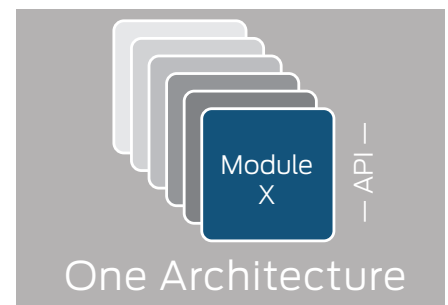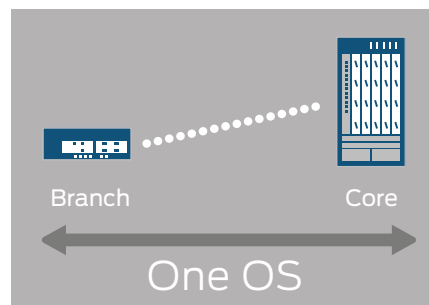
Four management options are available for the EX Series switches, two offering device-level monitoring and control and two providing enterprise-level management.

The Junos OS XML-based command-line interface (CLI) tool and J-Web user interface embedded with each EX Series switch offer device-level management. The Junos OS CLI provides the same feature implementation, automation and scripting parameters found in any Junos OS-based device, while the integrated J-Web-based management tool allows users to easily configure, monitor, troubleshoot and perform system maintenance on individual switches.

The Juniper Networks Network and Security Manager (NSM) extends support to include system-level fault, configuration and performance monitoring for EX Series switches, as well as Juniper Networks firewalls and intrusion detection products. And because they run Junos OS, the EX Series switches are also supported by third-party management systems such as HP OpenView, IBM Tivoli NetView and NetCool, and CA Unicenter, providing a complete, consolidated view of network operations.

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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