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EX4400 LINE OF ETHERNET SWITCHES DATASHEET

Product Overview

The EX4400 line of Ethernet access switches offers secure, cloud-ready access for enterprise campus, branch, and data center networks for the AI era and optimized for the cloud. The platforms boost network performance and visibility, meeting the security demands of today as well as for networks of the next decade.
As part of the underlying infrastructure for Juniper Mist Wired Assurance, the EX4400 is purpose-built for, and managed by, the cloud. The switch leverages Mist AI to simplify operations and provide better visibility into the experience of connected devices, delivering a refreshing, user experience-first approach to access layer switching.

Product Description

The Juniper Networks® EX4400 line of Ethernet switches offers a secure, cloud-ready portfolio of access switches ideal for enterprise branch, campus, and data center networks. The EX4400 switches combine the simplicity of the cloud, the power of Mist AI™, and a robust hardware foundation with best-in-class security and performance to deliver a differentiated approach to access switching in the cloud, mobile, and IoT era. With Juniper Mist™ Wired Assurance, the EX4400 can be effortlessly onboarded, configured, and managed from the cloud. This simplifies operations, improves visibility, and ensures a much better experience for connected devices.

Key features of the EX4400 include:

- Cloud-ready, driven by Mist AI with Juniper Mist Wired Assurance and Marvis Virtual Network Assistant
- Ethernet VPN–Virtual Extensible LAN (EVPN-VXLAN) to the access layer
- End-to-end encryption using Media Access Control Security (MACsec) AES256
- IEEE 802.3bz Multigigabit
- IEEE 802.3bt Power over Ethernet (PoE++)
- Standards-based microsegmentation using group-based policies (GBP)
- Flow-based telemetry to monitor traffic flows for anomaly detection
- Precision Timing Protocol – Transparent clock
- 10-member Virtual Chassis support

Offering a full suite of Layer 2 and Layer 3 capabilities, the EX4400 enables a variety of deployments, including campus, branch, and data center top-of-rack deployments. As requirements grow, Juniper's Virtual Chassis technology allows up to 10 EX4400 switches to be seamlessly interconnected and managed as a single device, delivering a scalable, pay-as-you-grow solution for expanding network environments.

The EX4400 line consists of eight SKUs:

- The EX4400-48MP, which offers 12 x 100M/1/2.5/5/10GbE and 36 x 100M/1/2.5GbE PoE access ports, delivering up to 90 W per PoE port with an overall total 2200 W of PoE power budget (using two power supplies)
- The EX4400-24MP, which offers 24 x 100M/1/2.5/5/10GbE PoE access ports, delivering up to 90 W per port with an overall total 1776 W of PoE power budget (using two power supplies). A total PoE budget of 2160 W can be achieved with two optional 1600 W power supplies.
- The EX4400-24T, which offers 24 x 1GbE non-PoE access ports
- The EX4400-24P, which offers 24 x 1GbE PoE access ports, delivering up to 90 W per port with an overall total 1806 W of PoE power budget (using two power supplies). A total PoE budget of 2160 W can be achieved with two optional 1600 W power supplies.
- The EX4400-48T, which offers 48 x 1GbE non PoE-access ports

- The EX4400-48P, which offers 48 x 1GbE PoE access ports, delivering up to 90 W per port with an overall total 2200 W of PoE power budget (using two power supplies)
- The EX4400-24X, which offers 24 x 10GbE SFP+ fiber access/distribution ports
- The EX4400-48F, which offers 12 x 10GbE SFP+ and 36 x 1GbE SFP fiber access ports

Note: EX4400-24X can be used as an access or a distribution layer switch.

Each EX4400 model offers a choice of optional 4 x 1/10GbE SFP+, a 4 x 10/25GbE SFP28 and a 1 x 100GbE QSFP28 extension module. The EX4400 switches include two dedicated 100GbE ports to support virtual chassis connections, which can be reconfigured to be used as Ethernet ports for uplink connectivity. The 100GbE ports can also accept 40GbE optics for virtual chassis connection or uplink connectivity. EX4400 switches also include high availability (HA) features such as redundant, hot-swappable power supplies and field-replaceable fans to ensure maximum uptime. In addition, PoE-enabled EX4400 switch models offer standards-based 802.3af/at/bt (PoE/PoE+/PoE++) for delivering up to 90 watts on any access port. The EX4400 switches can be configured to deliver fast PoE capability, which enables the switches to deliver PoE power to connected PoE devices within a few seconds of power being applied to the switches. In addition, the EX4400 switches support perpetual PoE, which provides uninterrupted power to connected PoE powered devices (PDs) even when the switch is rebooting.

Architecture and Key Components

Cloud Management with Juniper Mist Wired Assurance Driven by Mist AI

EX4400 switches can be quickly and easily onboarded (Day 0), provisioned (Day 1), and managed (Day 2+) from the cloud with Juniper Mist Wired Assurance, which brings AI-powered automation and insights that optimize experiences for end-users and connected devices. The EX4400 provides rich Junos® operating system telemetry data for Mist AI, which helps achieve simpler operations, shorter mean time to repair (MTTR), and streamlined troubleshooting. For more information, read the Juniper Mist Wired Assurance datasheet.

In addition to Juniper Mist Wired Assurance, Marvis Virtual Network Assistant—a key part of The Self-Driving Network™—makes the Mist AI engine interactive. A digital extension of the IT team, Marvis offers automatic fixes or recommended actions, allowing IT teams to streamline how they troubleshoot and manage their network operations.

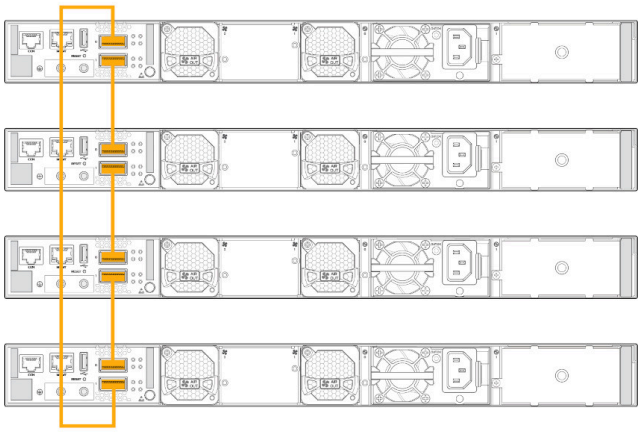


Figure 1: EX4400 Virtual Chassis configuration interconnected via dedicated rear-panel 100GbE ports

EVPN-VXLAN Technology

Most traditional campus networks have used a single-vendor, chassis-based architecture that worked well for smaller, static campuses with few endpoints. However, this approach is too rigid to support the changing needs of modern campus networks. The EX4400 supports EVPN-VXLAN, extending an end-to-end fabric from campus core to distribution to the access layer.

An EVPN-VXLAN fabric is a simple, programmable, highly scalable architecture built on open standards. This technology can be applied in both data centers and campuses for architectural consistency. A campus EVPN-VXLAN architecture uses a Layer 3 IP-based underlay network and an EVPN-VXLAN overlay network. A flexible overlay network based on a VXLAN overlay with an EVPN control plane efficiently provides Layer 2 and/or Layer 3 connectivity throughout the network.

The main advantages of EVPN-VXLAN in campus networks are:

- **Flexibility of consistent VLANs across the network**: Endpoints can be placed anywhere in the network and remain connected to the same logical L2 network, enabling a virtual topology to be decoupled from the physical topology.
- **Microsegmentation Using Group-Based Policy**: Group-based policies (GBP) with EVPN-VXLAN-based architecture lets you deploy a common set of policies and services across campuses with support for L2 and L3VPNs.
- **Scalability**: With an EVPN control plane, enterprises can scale out easily by adding more core, aggregation, and access layer devices as the business grows without having to redesign the network or perform a forklift upgrade. Using an L3 IP-based underlay coupled with an EVPN-VXLAN overlay, campus network operators can deploy much larger and more resilient networks than would otherwise be possible with traditional L2 Ethernet-based architectures.

Virtual Chassis Technology

Juniper's Virtual Chassis technology allows multiple interconnected switches to operate as a single, logical unit, enabling users to manage all platforms as one virtual device.

Up to 10 EX4400 switches can be interconnected as a Virtual Chassis using two 100GbE ports. These ports are located on the front-panel for EX4400-24X and on the rear-panel for the remaining EX4400 switches. They accept 100G as well as 40G optics and are configured as Virtual Chassis ports by default (except for EX4400-24X).

As 100GbE uplinks, these ports can also be channelized as 4 x 10GbE/25GbE Ethernet uplink ports.

The EX4400 switches support HiGig as well as HiGig over Ethernet (HGoE) protocols for forming a virtual chassis. However, the EX4400-24X supports only HGoE protocol for virtual chassis formation. A virtual chassis consisting of EX4400 switches (except EX4400-24X) may use either the HiGig protocol (default) or the HGoE protocol. A virtual chassis consisting of only EX4400-24X switches or a mix of any EX4400 and EX4400-24X switches, must use HGoE protocol to form a virtual chassis.

Flow-Based Telemetry

Flow-based telemetry enables flow-level analytics, allowing network administrators to monitor thousands of traffic flows on the EX4400 without burdening the CPU. This improves network security by monitoring, baselining, and detecting flow anomalies. For example, if predefined flow thresholds are breached due to an attack, IP Flow Information Export (IPFIX) alerts can be sent to an external server so the attack can be quickly identified. Network administrators can also automate specific workflows, such as further examining the traffic or quarantining a port, to triage the issue.

Features and Benefits

Simplified Operations with Juniper Mist Wired Assurance

The EX4400 is fully cloud onboarded, provisioned, and managed by Juniper Mist Wired Assurance. The EX4400 is designed from the ground up to deliver the rich telemetry that enables AI for IT Operations (AIOps) with simplified operations from Day 0 to Day 2 and beyond. Juniper Mist Wired Assurance provides detailed switch insights for easier troubleshooting and improved time to resolution by offering the following features:

- **Day 0 operations**—Onboard switches seamlessly by claiming a greenfield switch or all purchased switches with a single activation code for true plug-and-play simplicity. You may also onboard brownfield switches with the adopt switch process.
- **Day 1 operations**—Implement a template-based configuration model for bulk rollouts of traditional and campus fabric deployments, while retaining the flexibility and control required to apply custom site- or switch-specific attributes. Automate provisioning of ports via Dynamic Port Profiles.
- **Day 2 operations**—Leverage the AI in Juniper Mist Wired Assurance to meet service-level expectations such as throughput, successful connects, and switch health with key pre- and post-connection metrics (see Figure 2). Add the self-driving capabilities in Marvis Actions to detect loops, add missing VLANs, fix misconfigured ports, identify bad cables, isolate flapping ports, and discover persistently failing clients (see Figure 3). Perform software upgrades easily through Juniper Mist The EX4400 switches also support secure packet capture (pcap) and export to an external collector (in the cloud), to aid in monitoring and troubleshooting poor network experience.

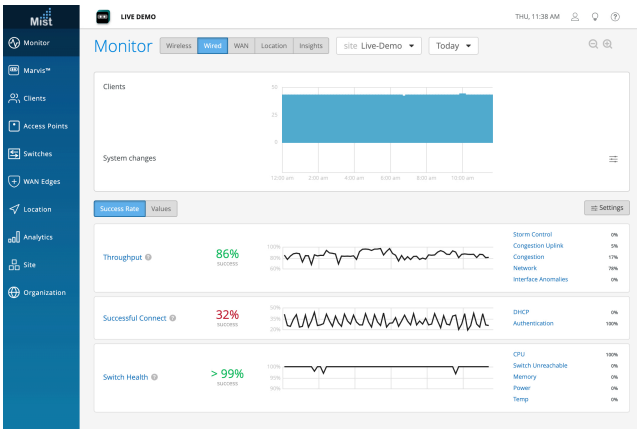


Figure 2: Juniper Mist Wired Assurance service-level expectations screen

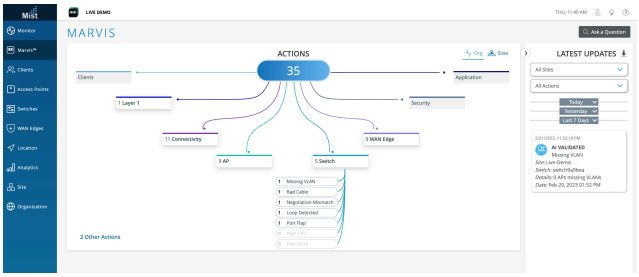


Figure 3: Marvis Actions for wired switches

The addition of Marvis, a Virtual Network Assistant driven by Mist AI, lets you start building a self-driving network that simplifies network operations and streamlines troubleshooting via automatic fixes for EX Series switches or recommended actions for external systems.

For more information see Juniper Mist Wired Assurance.

EX4400 Deployments

The EX4400 switches can be deployed in branch and campus access/distribution layer networks or as top-of-rack switches in data center environments. 10GbE/25GbE/40GbE/100GbE uplinks support technologies such as EVPN multihoming etc.

EVPN-VXLAN for Campus Core, Distribution, and Access

Juniper offers complete flexibility in choosing any of the following validated EVPN-VXLAN campus fabrics that cater to networks of different sizes, scale, and segmentation requirements:

- **EVPN multihoming (collapsed core or distribution)**: A collapsed core architecture combines the core and distribution layers into a single switch, turning the traditional three-tier hierarchal network into a two-tier network. EVPN Multihoming on a collapsed core eliminates the need for Spanning Tree Protocol (STP) across campus networks by providing link aggregation capabilities from the access layer to the core layer. This topology is best suited for small to medium distributed enterprise networks and allows for consistent VLANs across the network. This topology uses ESI (Ethernet Segment Identifier) LAG (Link Aggregation) and is a standards-based protocol.
- **Campus Fabric Core distribution**: When EVPN VXLAN is configured across core and distribution layers, it becomes a campus Fabric Core Distribution architecture, which can be configured in two modes: centrally or edge routed bridging overlay. This architecture provides an opportunity for an administrator to move towards campus-fabric IP Clos without fork-lift upgrade of all access switches in the existing network, while bringing in the advantages of moving to a campus fabric and providing an easy way to scale out the network.
- **Campus Fabric IP Clos**: When EVPN VXLAN is configured on all layers including access, it is called the campus fabric IP Clos architecture. This model is also referred to as "end-to-end," given that VXLAN tunnels are terminated at the access layer. The availability of VXLAN at access layer provides us with the opportunity to bring policy enforcement and microsegmentation to the access layer (closest to the source) using standards based Group Based Policy (GBP) to segment traffic even within a VLAN. GBP tags are assigned dynamically to clients as part of Radius transaction by Mist Cloud NAC. This topology works for small-medium and large campus architectures that need macro and micro segmentation.

In all these EVPN-VXLAN deployment modes, EX4400 switches can be used in standalone or Virtual Chassis configurations. All three topologies are standards-based and hence are inter-operable with 3rd party vendors.

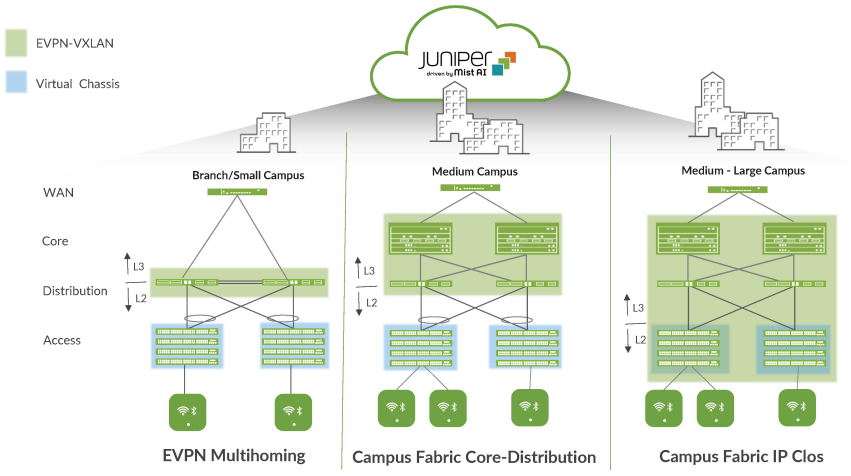


Figure 4: Campus fabrics showing Virtual Chassis and EVPN-VXLAN-based architectures

Managing AI-Driven Campus Fabric with the Juniper Mist Cloud

Juniper Mist Wired Assurance brings cloud management and Mist AI to campus fabric. It sets a new standard that moves away from traditional network management towards AI-driven operations, while delivering better experiences to connected devices. The Juniper Mist Cloud streamlines deployment and management of campus fabric architectures by allowing:

- Automated deployment and zero touch deployment (ZTD)
- Anomaly detection
- Root cause analysis

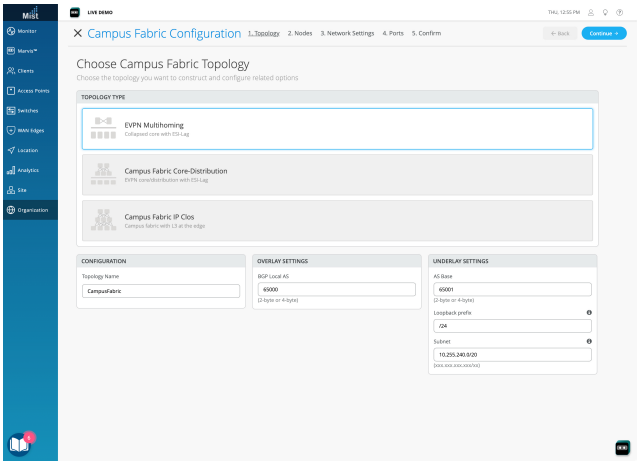


Figure 5: EVPN multihoming configuration via the Juniper Mist cloud

Chassis-Class Availability

The EX4400 switches deliver high availability through redundant power supplies and fans, graceful Routing Engine switchover (GRES), and nonstop bridging and routing when deployed in a Virtual Chassis configuration.

In a Virtual Chassis configuration, each EX4400 switch is capable of functioning as a Routing Engine (RE). When two or more EX4400 switches are interconnected, a single control plane is shared among all Virtual Chassis member switches. Junos OS automatically initiates an election process to assign a master (active) and backup (hot-standby) RE. An integrated L2 and L3 GRES feature maintains uninterrupted access to applications, services, and IP communications in the unlikely event of a primary RE failure.

When more than two switches are interconnected in a Virtual Chassis configuration, the remaining switch elements act as line cards and are available to assume the backup RE position should the designated master fail. Master, backup, and line card priority status can be assigned to dictate the order of ascension; this N+1 RE redundancy, coupled with the GRES, nonstop active routing (NSR), and nonstop bridging (NSB) capabilities of Junos OS, assures a smooth transfer of control plane functions following unexpected failures.

The EX4400 implements the same slot/module/port numbering schema as other Juniper Networks chassis-based products when numbering Virtual Chassis ports, providing true chassis-like operations. By using a consistent operating system and a single configuration file, all switches in a Virtual Chassis configuration are treated as a single device, simplifying overall system maintenance and management.

Individually, the EX4400 offers a number of HA features that are typically associated with modular chassis-based switches. When combined with the field-proven Junos OS and L2/L3 failover capabilities, these features provide the EX4400 with true carrier-class reliability.

- **Redundant power supplies**: The EX4400 line of Ethernet switches supports redundant, load-sharing, hot-swappable, and field-replaceable power supplies to maintain uninterrupted operations. Thanks to its compact footprint, the EX4400 requires significantly less power than chassis-based switches delivering equivalent port densities.
- **Hot-swappable fans**: The EX4400 includes hot-swappable fans, providing sufficient cooling (for a short duration) even if one of the fans were to fail.
- **Nonstop bridging and nonstop active routing**: NSB and NSR on the EX4400 ensure that control plane protocols, states, and tables are synchronized between primary and standby REs to prevent protocol flaps or convergence issues following a Routing Engine failover.
- **Redundant trunk group (RTG)**: To avoid the complexities of Spanning Tree Protocol (STP) without sacrificing network resiliency, the EX4400 employs redundant trunk groups to provide the necessary port redundancy and simplify switch configuration.
- **Cross-member link aggregation**: Cross-member link aggregation allows redundant link aggregation connections between devices in a single Virtual Chassis configuration, providing an additional level of reliability and availability.
- **IPv4 and IPv6 routing support**: IPv4 and IPv6 Layer 3 routing (OSPF and BGP) is available with an Enhanced license, enabling highly resilient networks.

MACsec AES256

The EX4400 switches support IEEE 802.1ae MACsec with AES-256-bit encryption to increase security of point-to-point traffic communications. MACsec provides encrypted communication at the link layer that is capable of identifying and preventing threats from denial of service (DoS) and other intrusion attacks, as well as man-in-the-middle, masquerading, passive wiretapping, and playback attacks launched from behind the firewall. When MACsec is deployed on all ports, the traffic is encrypted on the wire, but the traffic inside the switch is not. This allows the switch to apply network policies such as quality of service (QoS) or deep packet inspection (DPI) to each packet without compromising the security of packets on the wire. On the EX4400 switches, the MACsec AES-256 encryption capability is supported on all user-facing interfaces as well as the 25GbE and 100GbE extension modules. EX4400-24X supports MACsec AES256 on the native front-panel 100GbE ports as well.

PoE/PoE+/Poe++ Power, Perpetual and Fast PoE

The EX4400 delivers PoE for supporting connected devices such as phones, surveillance cameras, IoT devices, and 802.11AX/Wi-Fi 6 access points, offering a PoE power budget of up to 2200 W and supporting up to 90 W per port based on the IEEE 802.3bt PoE standard.

The EX4400 switches support perpetual PoE, which provides uninterrupted power to connected PoE powered devices (PDs) even when the switch is rebooting.

The EX4400 switches also support a fast PoE capability that delivers PoE power to connected endpoints during a switch reboot, even before the switch is fully operational. This is especially beneficial in situations where the endpoint only needs the power and is not necessarily dependent on network connectivity.

Junos Telemetry Interface

The EX4400 supports Junos telemetry interface (JTI), a modern telemetry streaming feature designed for switch health and performance monitoring. Sensor data can be streamed at configurable periodic intervals to a management system, enabling network administrators to monitor individual link and node utilization as well as troubleshoot issues such as network congestion in real time. JTI delivers the following features:

- Performance management by provisioning sensors to collect and stream data and analyze application and workload flow paths through the network
- Capacity planning and optimization by proactively detecting hotspots and monitoring latency and microbursts
- Troubleshooting and root cause analysis via high-frequency monitoring and correlation of overlay and underlay networks

Junos Operating System

The EX4400 switches run Junos OS, Juniper's powerful and robust network operating system that powers all Juniper switches, routers, and firewalls. By utilizing a common operating system, Juniper delivers a consistent implementation and operation of control plane features across all products. To maintain that consistency, Junos OS adheres to a highly disciplined development process that uses a single source code and employs a highly available modular architecture that prevents isolated failures from bringing down an entire system.

These attributes are fundamental to the core value of the software, enabling all Junos OS-powered products to be updated simultaneously with the same software release. All features are fully regression tested, making each new release a true superset of the previous version. Customers can deploy the software with complete confidence that all existing capabilities are maintained and operate in the same way.

Flex Licensing

Juniper Flex licensing offers a common, simple, and flexible licensing model for EX Series access switches, enabling customers to purchase features based on their network and business needs.

Flex licensing is offered in Standard, Advanced, and Premium tiers. Standard tier features are available with the Junos OS image that ships with EX Series switches. Additional features can be unlocked with the purchase of a Flex Advanced or Flex Premium license.

The Flex and Premium licenses for the EX Series platforms are class-based, determined by the number of access ports on the switch. Class 1 (C1) switches have 12 ports, Class 2 (C2) switches have 24 ports, and Class 3 (C3) switches have 32 or 48 ports.

The EX4400 switches support both subscription and perpetual Flex licenses. Subscription licenses are offered for three- and five-year terms. In addition to Junos OS features, the Flex Advanced and Premium subscription licenses include Juniper Mist Wired Assurance. Flex Advanced and Premium subscription licenses also allow portability across the same tier and class of switches, ensuring investment protection for the customer.

For a complete list of features supported by the Flex Standard, Advanced, and Premium tiers, or to learn about Junos OS EX Series licenses, please visit: https://www.juniper.net/documentation/us/en/software/license/licensing/topics/concept/flex-licenses-for-ex.html.

Enhanced Limited Lifetime Warranty

The EX4400 switches include an enhanced limited lifetime hardware warranty that provides return-to-factory switch replacement for as long as the original purchaser owns the product. The warranty includes lifetime software updates, advanced shipping of spares 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 https://support.juniper.net/support/pdf/warranty/enhanced-limited-lifetime-warranty-ex-series.pdf.

Product Options

Available EX4400 models are listed in Table 1.

Table 1. EX4400 Line of Ethernet Switches

Model/Product SKU	Access Port Configuration	PoE++ Ports	PoE++ Budget 1 PSU/2 PSU[1]	10GbE Ports (max. with module)	25GbE Ports (max. with module)	100GbE/ 40GbE Ports (max with module)	Power Supply Rating	Cooling
EX4400-48P	48-port 10/100/1000BASE-T	48	1310 W/ 2200 W	0(4)	0(4)	2(3)	1600 W AC	AFO (Front-to-back airflow)
EX4400-24P	24-port 10/100/1000BASE-T	24	783 W/ 1806W	0(4)	0(4)	2(3)	1050 W AC	AFO (Front-to-back airflow)
EX4400-24P	24-port 10/100/1000BASE-T	24	1320 W/ 2160 W	0(4)	0(4)	2(3)	1600 W AC (optional)	AFO (Front-to-back airflow)
EX4400-48T	48-port 10/100/1000BASE-T	0	N/A	0(4)	0(4)	2(3)	550 W AC	AFO (Front-to-back airflow)
EX4400-24T	24-port 10/100/1000BASE-T	0	N/A	0(4)	0(4)	2(3)	550 W AC	AFO (Front-to-back airflow)
EX4400-24X	24-Port 1/10GbE SFP+	0	N/A	24 (28)	0(4)	2(3)	550 W AC	AFO (Front-to-Back airflow)
EX4400-48F	12-port 1000/10000BASE-X + 36-port 100/1000BASE-X	0	N/A	12(16)	0(4)	2(3)	550 W AC	AFO (Front-to-back airflow)
EX4400-24MP	24x-port 100M/1/2.5/5/10GbE	24	753 W/ 1776 W	24(28)	0(4)	2(3)	1050 W AC	AFO (Front-to- back airflow)
EX4400-24MP	24x-port 100M/1/2.5/5/10GbE	24	1290 W/ 2160 W	24(28)	0(4)	2(3)	1600 W AC (optional)	AFO (Front-to- back airflow)
EX4400-48MP	48-port GbE (12x100M/1/2.5/5/10GbE + 36x100M/1/2.5GbE	48	1260 W/ 2200 W	12(16)	0(4)	2(3)	1600 W AC	AFO (Front-to-back airflow)
EX4400-48T-AFI	48-port 10/100/1000BASE-T	0	N/A	0(4)	0(4)	2(3)	550 W AC	AFI (Back-to-front airflow)
EX4400-24T-AFI	24-port 10/100/1000BASE-T	0	N/A	0(4)	0(4)	2(3)	550 W AC	AFI (Back-to-front airflow)
EX4400-48T-DC	48-port 10/100/1000BASE-T	0	N/A	0(4)	0(4)	2(3)	550 W DC	AFO (Front-to-back airflow)
EX4400-48T-DC-AFI	48-port 10/100/1000BASE-T	0	N/A	0(4)	0(4)	2(3)	550 W DC	AFI (Back-to-front airflow)
EX4400-24T-DC	24-port 10/100/1000BASE-T	0	N/A	0(4)	0(4)	2(3)	550 W DC	AFO (Front-to-back airflow)
EX4400-24T-DC-AFI	24-port 10/100/1000BASE-T	0	N/A	0(4)	0(4)	2(3)	550 W DC	AFI (Back-to-front airflow)
EX4400-24X-AFI	24-Port 1/10GbE SFP+	0	N/A	24 (28)	0 (4)	2(3)	550 W AC	AFI (Back-to-Front airflow)
EX4400-24X-DC	24-Port 1/10GbE SFP+	0	N/A	24 (28)	0 (4)	2(3)	550 W DC	AFO (Front-to-Back airflow)
EX4400-24X-DC-AFI	24-Port 1/10GbE SFP+	0	N/A	24 (28)	0 (4)	2(3)	550 W DC	AFI (Back-to-Front airflow)
EX4400-48F-AFI	12-port 1000/10000BASE-X + 36-port 100/1000BASE-X	0	N/A	12(16)	0(4)	2(3)	550 W AC	AFI (Back-to-front airflow)

Model/Product SKU	Access Port Configuration	PoE++ Ports	PoE++ Budget 1 PSU/2 PSU[1]	10GbE Ports (max. with module)	25GbE Ports (max. with module)	100GbE/ 40GbE Ports (max with module)	Power Supply Rating	Cooling
EX4400-48F-DC-AFI	12-port 1000/10000BASE-X + 36-port 100/1000BASE-X	0	N/A	12(16)	0(4)	2(3)	550 W DC	AFI (Back-to-front airflow)
EX4400-48F-DC	12-port 1000/10000BASE-X + 36-port 100/1000BASE-X	0	N/A	12(16)	0(4)	2(3)	550 W DC	AFO (Front-to-back airflow)

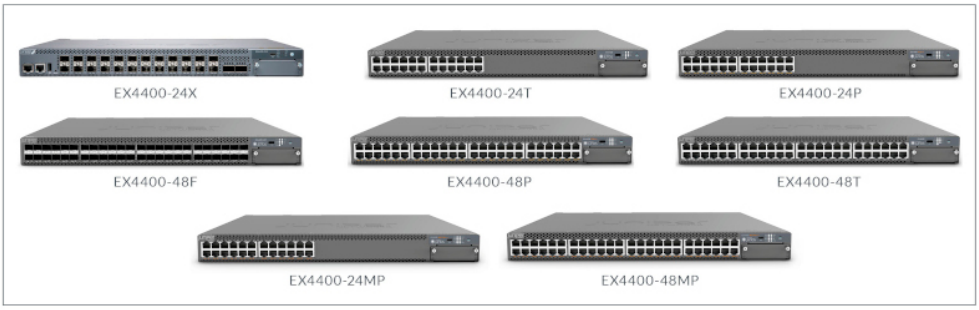
[1]The POE budget numbers in the table above are supported from Junos release 22.3R1 onwards'

The EX4400 also offers spare chassis options without power supplies or fans, providing customers with the flexibility to stock SKUs (see Table 2). See the Ordering Information section for additional details.

Table 2. EX4400 Spare Chassis SKUs

Spare Chassis SKU	Description	JPSU-550-C-AC-AFO + EX4400-FAN	JPSU-550-C-AC-AFI + EX4400-FAN-AFI	JPSU-550-C-DC-AFO + EX4400-FAN	JPSU-550-C-DC-AFI + EX4400-FAN-AFI	JPSU-1050-C-AC-AFO + EX4400-FAN	JPSU-1600-C-AC-AFO + EX4400-FAN
EX4400-48P-S	Spare chassis, 48-port 10/100/1000BASE-T	X	X	X	X	X	Y
EX4400-24P-S	Spare chassis, 24-port 10/100/1000BASE-T	X	X	X	X	Y	Y
EX4400-48T-S	Spare chassis, 48-port 10/100/1000BASE-T	Y	Y	Y	Y	X	X
EX4400-24T-S	Spare chassis, 24-port 10/100/1000BASE-T	Y	Y	Y	Y	X	X
EX4400-24X-S	Spare chassis, 24-port 1/10GbE SFP+	Y	Y	Y	Y	X	X
EX4400-48F-S	Spare chassis, 12-port 1000/10000BASE-X + 36-port 100/1000BASE-X	Y	Y	Y	Y	X	X
EX4400-24MP-S	Spare chassis, 24x100M/ 1/2.5/5/10GbE ports	X	X	X	X	Y	Y
EX4400-48MP-S	Spare chassis, 12 x 100M/1/2.5/5/10GbE + 36x100M/1/2.5GbE ports	X	X	X	X	X	Y

Y = supported; X = not supported



EX4400 Line Specifications

Physical Specifications

Backplane

- 400 Gbps Virtual Chassis interconnect to combine up to 10 units as a single logical device

Extension Module Options

- EX4400-EM-4S, 4 port SFP+
- EX4400-EM-4Y, 4 port SFP28
- EX4400-EM-1C, 1 port QSFP28

Power Options

- Power supplies: Autosensing; 100-120 V/200-240 V; 550 W, 1050 W, 1600 W AC AFO and 550 W AC AFI dual load sharing hot-swappable internal redundant power supplies
- Maximum current inrush: 30 amps
- DC power supply: 550 W DC AFO and 550 W DC AFI; input voltage range 48-60 V max; dual load-sharing hot-swappable internal redundant power supplies
- Minimum number of PSUs required for fully loaded chassis: 1 per switch

Dimensions (W x H x D)

- With power supply and fans installed: 17.39 x 1.72 x 16.93 in. (44.17 x 4.37 x 43 cm)
- Height: 1 U

System Weight

- EX4400 switch and EX4400 Mlutigigabit switch (with no power supply or fan module): 13.01 lb (5.9 kg)
- 550 W AC power supply: 1.76 lb (0.8 kg)
- 550 W DC power supply: 1.65 lb (0.75 kg)
- 1050 W AC power supply: 1.98 lb (0.9 kg)
- 1600 W AC power supply: 2.0 lb (0.91 kg)
- EX4400-EM-4S: 0.2 lb (0.09 kg)
- EX4400-EM-4Y: 0.29 lb (0.13kg)
- EX4400-EM-1C: 0.26 lb (0.11kg)
- Fan module: 0.26 lb (0.12 kg)

Environmental Ranges

- Operating temperature: 32° to 113° F (0° to 45° C)
- Storage temperature: -40° to 158° F (-40° to 70° C)
- Operating altitude: up to 6000 ft at 40° C (1828.8m)
- Nonoperating altitude: up to 16,000 ft (4,877 m)
- Relative humidity operating: 5% to 90% (noncondensing)
- Relative humidity non-operating: 0% to 90% (noncondensing)

Cooling

- Field-replaceable fans: 2
- Total maximum airflow throughput with two power supplies: 61 CFM

Hardware Specifications

Switching Engine Mode

- Store and forward

Memory

- DRAM: 4 GB with Error Correcting Code (ECC) on all models
- Storage: 20 GB on all models

CPU

- All models: 2.2 GHz Quad-Core Intel x86 CPU

Physical Layer

- Time domain reflectometry (TDR) for detecting cable breaks and shorts: EX4400-24P/T/MP and EX4400-48P/T/MP
- Auto medium-dependent interface/medium-dependent interface crossover (MDI/MDIX) support: EX4400-24P/T/MP and EX4400-48P/T/MP
- Port speed downshift/setting maximum advertised speed on 10/100/1000BASE-T ports: EX4400-24P/T and EX4400-48P/T only
- Digital optical monitoring for optical ports

Packet Switching Capacities (Maximum with 64 Byte Packets)

- EX4400-24P/24T: 324 Gbps (unidirectional)/648 Gbps (bidirectional)
- EX4400-48P/48T: 348 Gbps (unidirectional)/696 Gbps (bidirectional)
- EX4400-24X: 540 Gbps (unidirectional)/ 1080 Gbps (bidirectional)

- EX4400-48F: 456 Gbps (unidirectional)/912 Gbps (bidirectional)
- EX4400-24MP: 540 Gbps (unidirectional)/1080 Gbps (bidirectional)
- EX4400-48MP: 510 Gbps (unidirectional)/1020 Gbps (bidirectional)

Software Specifications

Layer 2/Layer 3 Throughput (Mpps) (Maximum with 64 Byte Packets)

- EX4400-48P/T 517Mpps
- EX4400-24P/T 482Mpps
- EX4400-24X 803 Mpps
- EX4400-48F 678 Mpps
- EX4400-48MP 758 Mpps
- EX4400-24MP 803 Mpps

Security

- MAC limiting (per port and per VLAN)
- Allowed MAC addresses: 112,000
- Dynamic Address Resolution Protocol (ARP) inspection (DAI)
- IP source guard
- Local proxy ARP
- Static ARP support
- Dynamic Host Configuration Protocol (DHCP) snooping
- Captive portal
- Persistent MAC address configurations
- Distributed denial of service (DDoS) protection (CPU control path flooding protection)

Layer 2 Switching

- Maximum MAC addresses per system: 112,000
- Jumbo frames: 9216 Bytes
- Number of VLANs supported: 4093
- Range of possible VLAN IDs: 1 to 4094
- Virtual Spanning Tree (VST) instances: 510
- Port-based VLAN
- Voice VLAN
- Physical port redundancy: Redundant trunk group (RTG)
- Compatible with Per-VLAN Spanning Tree Plus (PVST+)
- Routed VLAN interface (RVI)
- Uplink failure detection (UFD)
- ITU-T G.8032: Ethernet Ring Protection Switching
- IEEE 802.1AB: Link Layer Discovery Protocol (LLDP)
- LLDP-MED with VoIP integration
- Default VLAN and multiple VLAN range support
- MAC learning deactivate
- Persistent MAC learning (sticky MAC)
- MAC notification
- Private VLANs (PVLANs)
- Explicit congestion notification (ECN)
- Layer 2 protocol tunneling (L2PT)
- IEEE 802.1ak: Multiple VLAN Registration Protocol (MVRP)
- IEEE 802.1p: CoS prioritization
- IEEE 802.1Q: VLAN tagging
- 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 802.3bz: 2.5GBASE-T and 5GBASE-T
- IEEE 802.3ae: 10-Gigabit Ethernet
- IEEE 802.3by: 25-Gigabit Ethernet
- IEEE 802.3af: Power over Ethernet
- IEEE 802.3at: Power over Ethernet Plus
- IEEE 802.3bt: 90 W Power over Ethernet
- IEEE 802.3x: Pause Frames/Flow Control
- IEEE 802.3ah: Ethernet in the First Mile

Spanning Tree

- IEEE 802.1D: Spanning Tree Protocol
- IEEE 802.1s: Multiple instances of Spanning Tree Protocol (MSTP)
- Number of MST instances supported: 64
- Number of VLAN Spanning Tree Protocol (VSTP) instances supported: 510
- IEEE 802.1w: Rapid reconfiguration of Spanning Tree Protocol

Link Aggregation

- IEEE 802.3ad: Link Aggregation Control Protocol
- 802.3ad (LACP) support:
  - Number of LAGs supported: 128
  - Maximum number of ports per LAG: 16
- 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

Layer 3 Features: IPv4

- Maximum number of ARP entries: 24,000
- Maximum number of IPv4 unicast routes in hardware: 130,048 prefixes; 81,000 host routes
- Maximum number of IPv4 multicast routes in hardware: 40,000 multicast routes
- Routing protocols: RIPv1/v2, OSPF, BGP, IS-IS
- Static routing
- Routing policy
- Bidirectional Forwarding Detection (BFD)
- L3 redundancy: Virtual Router Redundancy Protocol (VRRP)
- VRF-Lite: 1000

Layer 3 Features: IPv6

- Maximum number of Neighbor Discovery (ND) entries: 12,000
- Maximum number of IPv6 unicast routes in hardware: 87,000 prefixes; 40,000 host routes
- Maximum number of IPv6 multicast routes in hardware: 20,000 multicast routes
- Routing protocols: RIPng, OSPFv3, IPv6, ISIS
- Static routing

Access Control Lists (ACLs) (Junos OS Firewall Filters)

- ACL entries (ACE) in hardware per system:
  - Port-based ACL (PACL) ingress: 2048
  - VLAN-based ACL (VACL) ingress: 2048
  - Router-based ACL (RACL) ingress: 2048
  - Egress shared across PACL and VACL:
    - Port-based ACL (PACL) egress: 1024
    - Vlan based ACL (VACL) egress: 512
  - Egress shared across PACL and VACL: 512
  - Egress across RACL: 1024
- ACL counter for denied packets
- ACL counter for permitted packets
- Ability to add/remove/change ACL entries in middle of list (ACL editing)
- L2-L4 ACL

Access Security

- 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 ACL based on RADIUS attributes
- 802.1X Supported Extensible Authentication Protocol (EAP) types: Message Digest 5 (MD5), Transport Layer Security (TLS), Tunneled TLS (TTLS), Protected Extensible Authenticated Protocol (PEAP)
- MAC authentication (RADIUS)
- Control plane DoS protection
- Radius functionality over IPv6 for authentication, authorization, and accounting (AAA)
- DHCPv6 snooping
- IPv6 neighbor discovery
- IPv6 source guard
- IPv6 RA guard
- IPv6 Neighbor Discovery Inspection
- MACsec

High Availability

- Redundant, hot-swappable power supplies
- Redundant, field-replaceable, hot-swappable fans
- GRES for Layer 2 hitless forwarding and Layer 3 protocols on RE failover
- Graceful protocol restart (OSPF, BGP)
- Layer 2 hitless forwarding on RE failover
- Nonstop bridging: LACP, xSTP
- Nonstop routing: PIM, OSPF v2 and v3, RIP v2, RIPng, BGP, BGPv6, ISIS, IGMP v1, v2, v3
- Online insertion and removal (OIR) uplink module

Quality of Service

- L2 QoS
- L3 QoS
- Ingress policing: 1 rate 2 color
- Hardware queues per port: 12 (8 unicast + 4 multicast)
- Scheduling methods (egress): Strict priority (SP), weighted deficit round-robin (WDRR)
- 802.1p, DiffServ code point (DSCP)/IP precedence trust and marking
- L2-L4 classification criteria: Interface, MAC address, Ethertype, 802.1p, VLAN, IP address, DSCP/IP precedence, TCP/UDP port numbers, and more
- Congestion avoidance capabilities: Tail drop, weighted random early detection (WRED)

Multicast

- IGMP: v1, v2, v3
- IGMP snooping
- Multicast Listener Discovery (MLD) snooping
- Protocol Independent Multicast-Sparse Mode (PIM-SM), PIM Source-Specific Mode (PIM-SSM), PIM Dense Mode (PIM-DM)

Management and Analytics Platforms

- Juniper Mist Wired Assurance for Campus
- Junos Space Network Director for Campus
- Junos Space® Management

Device Management and Operations

- Junos OS CLI
- Out-of-band management: Serial; 10/100/1000BASE-T Ethernet
- Rescue configuration
- Configuration rollback
- Image rollback
- RMON (RFC2819) groups 1, 2, 3, 9
- Remote performance monitoring
- SNMP: v1, v2c, v3
- Network Time Protocol (NTP)
- DHCP server
- DHCP client and DHCP proxy
- DHCP relay and helper
- DHCP local server support
- RADIUS
- TACACS+
- SSHv2
- Secure copy
- HTTP/HTTPs
- Domain Name System (DNS) resolver
- System logging
- Temperature sensor
- Configuration backup via FTP/secure copy

Supported RFCs

- RFC 768 UDP
- RFC 783 TFTP
- RFC 791 IP
- RFC 792 ICMP
- RFC 793 TCP
- RFC 826 ARP
- RFC 854 Telnet client and server
- RFC 894 IP over Ethernet
- RFC 903 RARP
- RFC 906 TFTP Bootstrap
- RFC 951, 1542 BootP
- RFC 1027 Proxy ARP
- RFC 1058 RIP v1
- RFC 1112 IGMP v1
- RFC 1122 Host Requirements
- RFC 1195 Use of OSI IS-IS for Routing in TCP/IP and Dual Environments (TCP/IP transport only)
- RFC 1256 IPv4 ICMP Router Discovery (IRDP)
- RFC 1492 TACACS+RFC 1519 CIDR
- RFC 1587 OSPF NSSA Option
- RFC 1591 DNS
- RFC 1812 Requirements for IP Version 4 Routers
- RFC 1981 Path MTU Discovery for IPv6
- RFC 2030 SNTP, Simple Network Time Protocol
- RFC 2068 HTTP server
- RFC 2080 RIPng for IPv6
- RFC 2131 BOOTP/DHCP relay agent and DHCP server
- RFC 2138 RADIUS Authentication
- RFC 2139 RADIUS Accounting
- RFC 2154 OSPF w/Digital Signatures (password, MD-5)
- RFC 2236 IGMP v2
- RFC 2267 Network Ingress Filtering
- RFC 2328 OSPF v2 (edge-mode)
- RFC 2338 VRRP
- RFC 2362 PIM-SM (edge-mode)
- RFC 2370 OSPF Opaque LSA Option
- RFC 2453 RIP v2
- RFC 2460 Internet Protocol, Version 6 (IPv6) Specification
- RFC 2461 Neighbor Discovery for IP Version 6 (IPv6)
- RFC 2463 Internet Control Message Protocol (ICMPv6) for the Internet Protocol Version 6 (IPv6) Specification
- RFC 2464 Transmission of IPv6 Packets over Ethernet Networks
- RFC 2474 DiffServ Precedence, including 12 queues/port
- RFC 2475 DiffServ Core and Edge Router Functions
- RFC 2526 Reserved IPv6 Subnet Anycast Addresses
- RFC 2597 DiffServ Assured Forwarding (AF)
- RFC 2598 DiffServ Expedited Forwarding (EF)
- RFC 2740 OSPF for IPv6
- RFC 2925 MIB for Remote Ping, Trace
- RFC 3176 sFlow
- RFC 3376 IGMP v3
- RFC 3484 Default Address Selection for Internet Protocol Version 6 (IPv6)

- RFC 3513 Internet Protocol Version 6 (IPv6) Addressing Architecture
- RFC 3569 draft-ietf-ssm-arch-06.txt PIM-SSM PIM Source Specific Multicast
- RFC 3579 RADIUS EAP support for 802.1x
- RFC 3618 Multicast Source Discovery Protocol (MSDP)
- RFC 3623 OSPF Graceful Restart
- RFC 4213 Basic Transition Mechanisms for IPv6 Hosts and Routers
- RFC 4291 IPv6 Addressing Architecture
- RFC 4443 ICMPv6 for the IPv6 Specification
- RFC 4541 IBMP and MLD snooping services
- RFC 4552 OSPFv3 Authentication
- RFC 4861 Neighbor Discovery for IPv6
- RFC 4862 IPv6 Stateless Address Autoconfiguration
- RFC 4915 MT-OSPF
- RFC 5095 Deprecation of Type 0 Routing Headers
- RFC 5176 Dynamic Authorization Extensions to RADIUS
- RFC 5798 VRRPv3 for IPv6
- Draft-ietf-bfd-base-05.txt Bidirectional Forwarding Detection
- Draft-ietf-idr-restart-10.txt Graceful Restart Mechanism
- Draft-ietf-isis-restart-02 Restart Signaling for IS-IS
- Draft-ietf-isis-wg-multi-topology-11 Multi Topology (MT) Routing in IS-IS for BGP
- Internet draft-ietf-isis-ipv6-06.txt, Routing IPv6 with IS-IS
- LLDP Media Endpoint Discovery (LLDP-MED), ANSI/ TIA-1057, draft 08
- PIM-DM Draft IETF PIM Dense Mode draft-ietf-idmr-pimdm-05.txt, draft-ietf-pim-dm-new-v2-04.txt

Supported MIBs

- RFC 1155 SMI
- RFC 1157 SNMPv1
- RFC 1212, RFC 1213, RFC 1215 MIB-II, Ethernet-Like MIB and TRAPs
- RFC 1493 Bridge MIB
- RFC 1643 Ethernet MIB
- RFC 1657 BGP-4 MIB
- RFC 1724 RIPv2 MIB
- RFC 1850 OSPFv2 MIB
- RFC 1905 RFC 1907 SNMP v2c, SMIv2 and Revised MIB-II
- RFC 2011 SNMPv2 for Internet Protocol using SMIv2
- RFC 2012 SNMPv2 for transmission control protocol using SMIv2
- RFC 2013 SNMPv2 for user datagram protocol suing SMIv2
- RFC 2096 IPv4 Forwarding Table MIB
- RFC 2287 System Application Packages MIB
- RFC 2570–2575 SNMPv3, user based security, encryption, and authentication
- RFC 2576 Coexistence between SNMP Version 1, Version 2, and Version 3
- RFC 2578 SNMP Structure of Management Information MIB
- RFC 2579 SNMP Textual Conventions for SMIv2
- RFC 2665 Ethernet-like interface MIB
- RFC 2787 VRRP MIB
- RFC 2819 RMON MIB
- RFC 2863 Interface Group MIB
- RFC 2863 Interface MIB
- RFC 2922 LLDP MIB
- RFC 2925 Ping/Traceroute MIB
- RFC 2932 IPv4 Multicast 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 4188 STP and Extensions MIB
- RFC 4363 Definitions of Managed Objects for Bridges with Traffic Classes, Multicast Filtering, and VLAN extensions
- RFC 5643 OSPF v3 MIB support
- Draft – blumenthal – aes – usm - 08
- Draft – reeder - snmpv3 – usm - 3desede -00
- Draft-ietf-bfd-mib-02.txt
- Draft-ietf-idmr-igmp-mib-13
- Draft-ietf-idmr-pim-mib-09
- Draft-ietf-idr-bgp4-mibv2-02.txt – Enhanced BGP-4 MIB
- Draft-ietf-isis-wg-mib-07

Troubleshooting

- Debugging: CLI via console, Telnet, or SSH
- Diagnostics: Show and debug command, statistics
- Traffic mirroring (port)
- Traffic mirroring (VLAN)
- IP tools: Extended ping and trace
- Juniper Networks commit and rollback

Traffic Monitoring

- ACL-based mirroring
- Mirroring destination ports per system: 4
  - LAG port monitoring
  - Multiple destination ports monitored to 1 mirror (N:1)
- Maximum number of mirroring sessions: 4
- Mirroring to remote destination (over L2): 1 destination VLAN

Safety and Compliance

Electromagnetic Compatibility (EMC) Requirements

- FCC 47 CFR Part 15
- ICES-003 / ICES-GEN
- EN 300 386 V1.6.1
- EN 300 386 V2.1.1
- EN 55032
- CISPR 32
- EN 55024
- CISPR 24
- EN 55035
- CISPR 35
- IEC/EN 61000 Series
- AS/NZS CISPR 32
- VCCI-CISPR 32
- BSMI CNS 13438
- KN 32 and KN 35
- KN 61000 Series
- TEC/SD/DD/EMC-221/05/OCT-16
- TCVN 7189
- TCVN 7317

Safety Requirements Chassis and Optics:

- CAN/CSA-C22.2 No. 62368-1 and 60950-1
- UL 62368-1 and 60950-1
- IEC 62368-1 and 60950-1 (All country deviations): CB Scheme report
- IEC 62368-3 for USB and PoE: CB Scheme report
- CFR, Title 21, Chapter 1, Subchapter J, Part 1040
- REDR c 1370 OR CAN/CSA-E 60825-1- Part 1
- IEC 60825-1
- IEC 60825-2

Energy Efficiency

- AT&T TEER (ATIS-06000015.03.2013)
- ECR 3.0.1
- ETSI ES 203 136 V.1.1.1
- Verizon TEEER (VZ.TPR.9205)

Environmental

- Reduction of Hazardous Substances (ROHS) 6/6

Telco

- CLEI code

Noise Specifications

- Noise measurements based on operational tests taken from bystander position (front) and performed at 23° C in compliance with ISO 7779.

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 https://www.juniper.net/us/en/products.html.

Table 4: EX4400 Power Supply Ratings and Acoustic in dBA

Product	Power Supply Rating	Acoustic Noise (1PSU)	Acoustic Noise (2PSU)
EX4400-24T/48T/48F	550W AC AFO	42.7 / 42.32 / 43.23	41.68 / 42.87 / 43.35
EX4400-24T/48T/48F	550W AC AFI	46.08 / 44.78 / 44.91	46.03 / 44.64 / 44.79
EX4400-24T/48T/48F	550W DC AFO	42.59 / 42.72 /43.71	42.54 / 42.73 / 43.69
EX4400-24T/48T/48F	550W DC AFI	46.19 / 44.6 / 44.93	46.54 / 44.72 / 44.61
EX4400-24X	550 W AC AFO	42.71	42.24
EX4400-24X	550W AC AFI	45.79	46.18
EX4400-24X	550W DC AFO	43.32	42.86
EX4400-24X	550W DC AFI	46.62	47.39
EX4400-24P	1050W AC AFO	44.45	44.23
EX4400-48P	1600W AC AFO	44.78	44.68
EX4400-48MP	1600W AC AFO	45.56	49.28
EX4400-24MP	1050W AC AFO	47.39	52.41

Ordering Information

Product	Description
EX4400-48P	48-port 10/100/1000BASE-T PoE++ power + 1600 W AC PS (provides 1310/2200W PoE++ power with single/dual PS) (DAC for Virtual Chassis ordered separately)
EX4400-48MP	12x100M/1/2.5/5/10GbE + 36x100M/1/2.5GbE ports PoE++ power + 1600 W AC PS (provides 1260/2200W PoE++ power with single/dual PS) (DAC for Virtual Chassis ordered separately)
EX4400-24P	24-port 10/100/1000BASE-T PoE++ power + 1050 W AC PS (provides 783/1806W PoE++ power with single/dual PS) (DAC for Virtual Chassis ordered separately)
EX4400-24MP	24x100M/1/2.5/5/10GbE ports PoE++ power + 1050 W AC PS (provides 753/1776W PoE++ power with single/dual PS) (DAC for Virtual Chassis ordered separately)
EX4400-48T	48-port 10/100/1000BASE-T + 550 W AC PS (DAC for Virtual Chassis ordered separately)
EX4400-24T	24-port 10/100/1000BASE-T + 550 W AC PS (DAC for Virtual Chassis ordered separately)
EX4400-24X	24-port 1/10GbE SFP+ + 550W AC PSU (front-to-back airflow) (optics ordered separately)
EX4400-48F	12-port 1000/10000BASE-X SFP+ + 36-port 100/1000BASE-X SFP + 550 W AC PS (optics sold separately)
EX4400-48T-AFI	48-port 10/100/1000BASE-T + 550 W AC PS (back-to-front airflow) (DAC for Virtual Chassis ordered separately)
EX4400-24T-AFI	24-port 10/100/1000BASE-T + 550 W AC PS (back-to-front airflow) (DAC for Virtual Chassis ordered separately)
EX4400-48T-DC	48-port 10/100/1000BASE-T + 550 W DC PS (DAC for Virtual Chassis ordered separately)
EX4400-48T-DC-AFI	48-port 10/100/1000BASE-T + 550 W DC PS (back-to-front airflow) (DAC for Virtual Chassis ordered separately)
EX4400-24T-DC	24-port 10/100/1000BASE-T + 550 W DC PS (DAC for Virtual Chassis ordered separately)
EX4400-24T-DC-AFI	24-port 10/100/1000BASE-T + 550 W DC PS (back-to-front airflow) (DAC for Virtual Chassis ordered separately)
EX4400-24X-AFI	24-port 1/10GbE SFP+ + 550W AC PSU (back-to-front airflow) (optics ordered separately)
EX4400-24X-DC	24-port 1/10GbE SFP+ + 550W DC PSU (front-to-back airflow) (optics ordered separately)
EX4400-24X-DC-AFI	24-port 1/10GbE SFP+ + 550W DC PSU (back-to-front airflow) (optics ordered separately)
EX4400-48F-AFI	12-port 1000/10000BASE-X SFP+ + 36-port 100/1000BASE-X SFP + 550 W AC PS (back-to-front airflow) (optics sold separately)
EX4400-48F-DC-AFI	12-port 1000/10000BASE-X SFP+ + 36-port 100/1000BASE-X SFP + 550 W DC PS (back-to-front airflow) (optics sold separately)
EX4400-48F-DC	12-port 1000/10000BASE-X SFP+ + 36-port 100/1000BASE-X SFP + 550 W DC PS (optics sold separately)
Perpetual Licenses	
S-EX-A-C2-P	Software, EX Series Advanced license, Class 2 (24 ports), Perpetual license for EX4400 24-port switches
S-EX-P-C2-P	Software, EX Series Premium license, Class 2 (24 ports), Perpetual license for EX4400 24-port switches
S-EX-A-C3-P	Software, EX Series Advanced license, Class 3 (32 or 48 ports), Perpetual license for EX4400 48-port switches
S-EX-P-C3-P	Software, EX Series Premium license, Class 3 (32 or 48 ports), Perpetual license for EX4400 48-port switches
S-EX-MACSEC-C2-P	Software, EX Series MACsec license, Class 2 (24 ports), Perpetual license for EX4400 24-port switches
S-EX-MACSEC-C3-P	Software, EX Series MACsec license, Class 3 (48 ports), Perpetual license for EX4400 48-port switches
S-EX-FBT-P	Software, EX Series Flow Based Telemetry license, Perpetual license for all EX4400 switches

Product	Description
Subscription Licenses	
S-EX-A-C2-1	Software, EX Series Advanced license, Class 2 (24 ports), includes Wired Assurance subscription for EX Series 24-port switches, 1 year
S-EX-A-C2-3	Software, EX Series Advanced license, Class 2 (24 ports), includes Juniper Mist Wired Assurance subscription for EX Series 24-port switches, 3 year
S-EX-A-C2-5	Software, EX Series Advanced license, Class 2 (24 ports), includes Juniper Mist Wired Assurance subscription for EX Series 24-port switches, 5 year
S-EX-P-C2-1	Software, EX Series Premium license, Class 2 (24 ports), includes Wired Assurance subscription for EX Series 24-port switches, 1 year
S-EX-P-C2-3	Software, EX Series Premium license, Class 2 (24 ports), includes Juniper Mist Wired Assurance subscription for EX Series 24-port switches, 3 year
S-EX-P-C2-5	Software, EX Series Premium license, Class 2 (24 ports), includes Juniper Mist Wired Assurance subscription for EX Series 24-port switches, 5 year
S-EX-A-C3-1	Software, EX Series Advanced license, Class 3 (48 ports), includes Wired Assurance subscription for EX Series 48-port switches, 1 year
S-EX-A-C3-3	Software, EX Series Advanced license, Class 3 (48 ports), includes Juniper Mist Wired Assurance subscription for EX Series 48-port switches, 3 year
S-EX-A-C3-5	Software, EX Series Advanced license, Class 3 (48 ports), includes Juniper Mist Wired Assurance subscription for EX Series 48-port switches, 5 year
S-EX-P-C3-1	Software, EX Series Premium license, Class 3 (48 ports), includes Wired Assurance subscription for EX Series 48-port switches, 1 year
S-EX-P-C3-3	Software, EX Series Premium license, Class 3 (48 ports), includes Juniper Mist Wired Assurance subscription for EX Series 48-port switches, 3 year
S-EX-P-C3-5	Software, EX Series Premium license, Class 3 (48 ports), includes Juniper Mist Wired Assurance subscription for EX Series 48-port switches, 5 year
S-EX-A-C2-1-COR	Software, EX Series Advanced license, Class 2 (24 ports), includes Juniper Mist Wired Assurance and VNA subscription for EX Series 24-port switches with SVC CORE support, 1 year
S-EX-A-C2-3-COR	Software, EX Series Advanced license, Class 2 (24 ports), includes Juniper Mist Wired Assurance subscription for EX Series 24-port switches, 3 year with SVC CORE support, 3 year
S-EX-A-C2-5-COR	Software, EX Series Advanced license, Class 2 (24 ports), includes Juniper Mist Wired Assurance subscription for EX Series 24-port switches with SVC CORE support, 5 year
S-EX-P-C2-3-COR	Software, EX Series Premium license, Class 2 (24 ports), includes Juniper Mist Wired Assurance subscription for EX Series 24-port switches with SVC CORE support, 3 year
S-EX-P-C2-5-COR	Software, EX Series Premium license, Class 2 (24 ports), includes Juniper Mist Wired Assurance subscription for EX Series 24-port switches with SVC CORE support, 5 year
S-EX-A-C3-1-COR	Software, EX Series Advanced license, Class 3 (32 or 48 ports), includes Juniper Mist Wired Assurance and VNA subscription for EX Series 48-port switches with SVC CORE support, 1 year
S-EX-A-C3-3-COR	Software, EX Series Advanced license, Class 3 (48 ports), includes Juniper Mist Wired Assurance subscription for EX Series 48-port switches, 3 year with SVC CORE support, 3 year
S-EX-A-C3-5-COR	Software, EX Series Advanced license, Class 3 (48 ports), includes Juniper Mist Wired Assurance subscription for EX Series 48-port switches, 3 year with SVC CORE support, 5 year
S-EX-P-C3-1-COR	Software, EX Series Premium license, Class 3 (32 or 48 ports), includes Juniper Mist Wired Assurance and VNA subscription for EX Series 48-port switches with SVC CORE support, 1 year
S-EX-P-C3-3-COR	Software, EX Series Premium license, Class 3 (48 ports), includes Juniper Mist Wired Assurance subscription for EX Series 48-port switches, 3 year with SVC CORE support, 3 year

Product	Description
S-EX-P-C3-5-COR	Software, EX Series Premium license, Class 3 (48 ports), includes Juniper Mist Wired Assurance subscription for EX Series 48-port switches, 3 year with SVC CORE support, 5 year
S-EX-A-C2-1-ND	Software, EX Series Advanced license, Class 2 (24 ports), includes Juniper Mist Wired Assurance and VNA subscription for EX Series 24-port switches with SVC NEXT DAY support, 1 year
S-EX-A-C2-3-ND	Software, EX Series Advanced license, Class 2 (24 ports), includes Juniper Mist Wired Assurance and VNA subscription for EX Series 24-port switches with SVC NEXT DAY support, 3 year
S-EX-A-C2-5-ND	Software, EX Series Advanced license, Class 2 (24 ports), includes Juniper Mist Wired Assurance and VNA subscription for EX Series 24-port switches with SVC NEXT DAY support, 5 year
S-EX-P-C2-1-ND	Software, EX Series Premium license, Class 2 (24 ports), includes Juniper Mist Wired Assurance and VNA subscription for EX Series 24-port switches with SVC NEXT DAY support, 1 year
S-EX-P-C2-3-ND	Software, EX Series Premium license, Class 2 (24 ports), includes Juniper Mist Wired Assurance and VNA subscription for EX Series 24-port switches with SVC NEXT DAY support, 3 year
Extension Modules	
EX4400-EM-4S	EX4400 4-port 1GbE/10GbE SFP+ Extension Module
EX4400-EM-4Y	EX4400 4-port 10/25GbE SFP28 Extension Module
EX4400-EM-1C	EX4400 1-port 100GbE QSFP28 Extension Module
Power Supplies	
JPSU-550-C-AC-AFO	EX4400 550 W AC power supply (power cord needs to be ordered separately) (front-to-back airflow)
JPSU-550-C-AC-AFI	EX4400 550 W AC power supply (power cord needs to be ordered separately) (back-to-front airflow)
JPSU-550-C-DC-AFO	EX4400 550 W DC power supply (power cord needs to be ordered separately) (front-to-back airflow)
JPSU-550-C-DC-AFI	EX4400 550 W DC power supply (power cord needs to be ordered separately) (back-to-front airflow)
JPSU-1050-C-AC-AFO	EX4400 1050 W AC power supply (power cord needs to be ordered separately) (front-to-back airflow)
JPSU-1600-C-AC-AFO	EX4400 1600 W AC power supply (power cord needs to be ordered separately) (front-to-back airflow)
Fans	
EX4400-FAN	Spare fan with front-to-back airflow
EX4400-FAN-AFI	Spare fan with back-to-front airflow
Mounting Options	
EX-4PST-RMK	Adjustable 4-post rack-mount kit for EX4400
EX-WMK	Wall-mount kit for EX4400
EX-RMK	Rack-mount kit for EX4400
Spare Chassis	
EX4400-48P-S	Spare chassis, 48-port 10/100/1000BASE-T PoE++ (optics, power supplies, and fans sold separately)
EX4400-24P-S	Spare chassis, 24-port 10/100/1000BASE-T PoE++ (optics, power supplies, and fans sold separately)
EX4400-48T-S	Spare chassis, 48-port 10/100/1000BASE-T (optics, power supplies, and fans sold separately)
EX4400-24T-S	Spare chassis, 24-port 10/100/1000BASE-T (optics, power supplies, and fans sold separately)
EX4400-24X-S	Spare chassis, 24-port 1/10GbE SFP+ (optics, power supplies, and fans sold separately)
EX4400-48F-S	Spare chassis, 12-port 10000BASE-X SFP+ + 36-port 1000BASE-X SFP, (optics, power supplies, and fans sold separately)
EX4400-24MP-S	Spare chassis, 24x100M/1/2.5/5/10GbE ports PoE++ (optics, power supplies, and fans sold separately)
EX4400-48MP-S	Spare chassis, 12x100M/1/2.5/5/10GbE + 36x100M/1/2.5GbE ports PoE++ (optics, power supplies, and fans sold separately)

About Juniper Networks

At Juniper Networks, we are dedicated to dramatically simplifying network operations and driving superior experiences for end users. Our solutions deliver industry-leading insight, automation, security and AI to drive real business results. We believe that powering connections will bring us closer together while empowering us all to solve the world's greatest challenges of well-being, sustainability and equality.

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