

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.

EX4400 LINE OF ETHERNET SWITCHES DATASHEET

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.

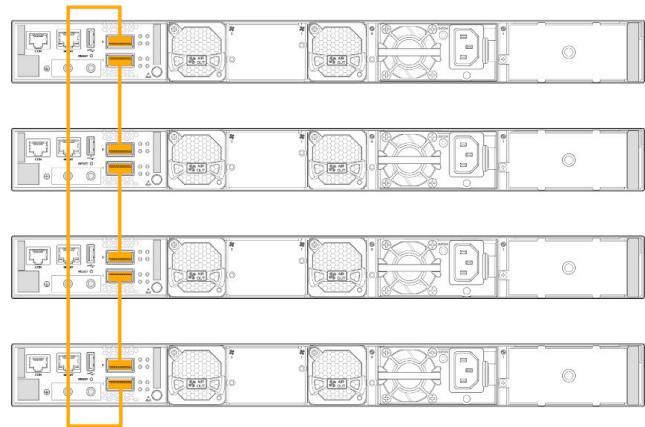


Figure 1: EX4400 Virtual Chassis configuration interconnected via dedicated rear-panel 100GbE ports

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.

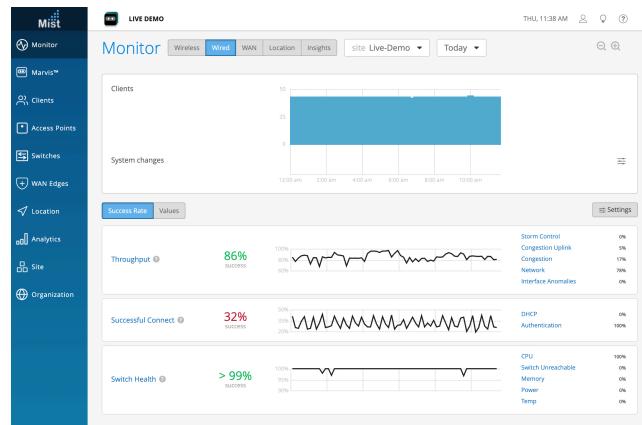


Figure 2: Juniper Mist Wired Assurance service-level expectations screen

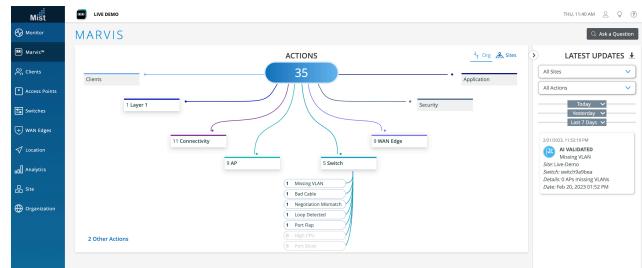


Figure 3: Marvis Actions for wired switches

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 hierachal 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.

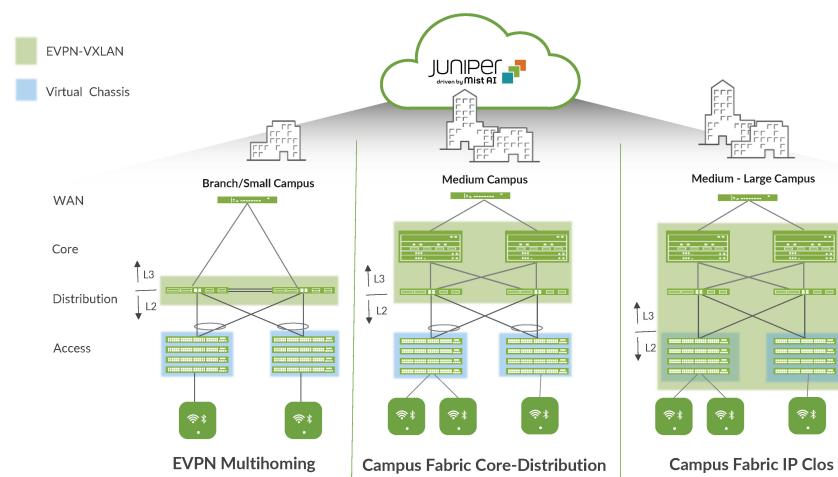


Figure 4: Campus fabrics showing Virtual Chassis and EVPN-VXLAN-based architectures

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

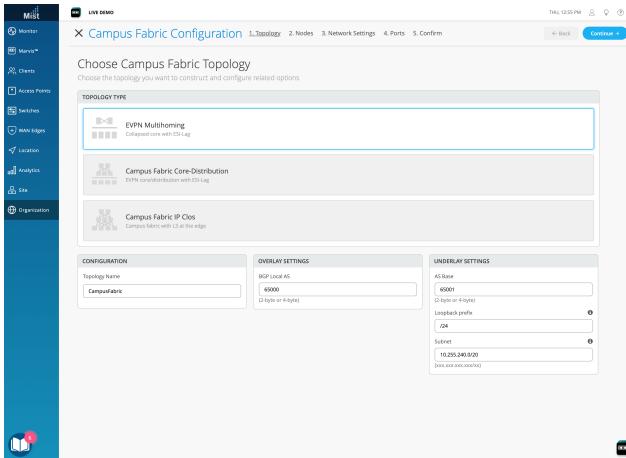


Figure 5: EVPN multihoming configuration via the Juniper Mist cloud

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)

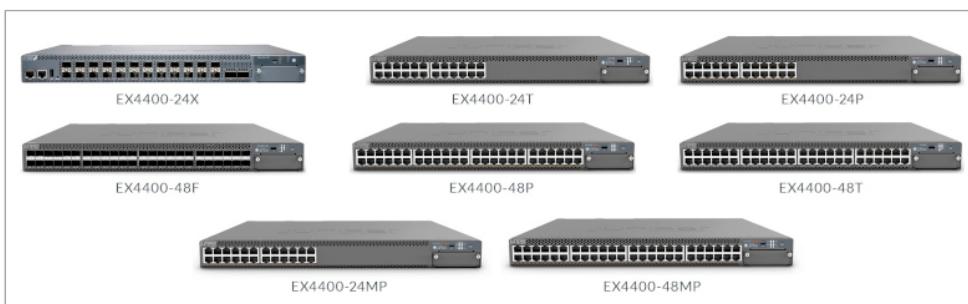
¹The POE budget numbers in the table above are supported from Junos release 22.3R1 onwards¹

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 Multigigabit 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 (PAACL) ingress: 2048
 - VLAN-based ACL (VAACL) ingress: 2048
 - Router-based ACL (RAACL) ingress: 2048
 - Egress shared across PAACL and VAACL:
 - Port-based ACL (PAACL) egress: 1024
 - Vlan based ACL (VAACL) egress: 512
 - Egress shared across PAACL and VAACL: 512
 - Egress across RAACL: 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)

- 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)

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 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

- 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
- RFC 6614 RadSec
- 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

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

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

EX4400 Line of Ethernet Switches Datasheet

Product	Description	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	EX4400-24P-S	Spare chassis, 24-port 10/100/1000BASE-T PoE++ (optics, power supplies, and fans sold separately)
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	EX4400-48T-S	Spare chassis, 48-port 10/100/1000BASE-T (optics, power supplies, and fans sold separately)
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	EX4400-24T-S	Spare chassis, 24-port 10/100/1000BASE-T (optics, power supplies, and fans sold separately)
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	EX4400-24X-S	Spare chassis, 24-port 1/10GbE SFP+ (optics, power supplies, and fans sold separately)
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	EX4400-48F-S	Spare chassis, 12-port 10000BASE-X SFP+ + 36-port 1000BASE-X SFP (optics, power supplies, and fans sold separately)
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	EX4400-24MP-S	Spare chassis, 24x100M/1/2.5/5/10GbE ports PoE++ (optics, power supplies, and fans sold separately)
Extension Modules		EX4400-48MP-S	Spare chassis, 12x100M/1/2.5/5/10GbE + 36x100M/1/2.5GbE ports PoE++ (optics, power supplies, and fans sold separately)
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)		

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.

Corporate and Sales Headquarters

Juniper Networks, Inc.

1133 Innovation Way

Sunnyvale, CA 94089 USA

Phone: 888.JUNIPER (888.586.4737)

or +1.408.745.2000

www.juniper.net

APAC and EMEA Headquarters

Juniper Networks International B.V.

Boeing Avenue 240 1119 PZ Schiphol-Rijk

Amsterdam, The Netherlands

Phone: +31.207.125.700





Product Overview

The Juniper Networks EX2300 Ethernet Switch offers an economical, entry-level, standalone solution for access-layer deployments in branch and remote offices, as well as enterprise campus networks. Both 1 Gbps and 2.5 Gbps access port options are available to provide higher-speed options, especially when connecting to 802.11ac Wave 2 access points.

For small networks, up to four EX2300 switches can be interconnected in a Virtual Chassis configuration, allowing them to be managed as a single switch.

The EX2300 is onboarded, provisioned, and managed in the Juniper Mist Cloud Architecture. Mist Wired Assurance delivers better experiences for connected devices through AI-powered automation and service levels.

EX2300 ETHERNET SWITCH DATASHEET

Product Description

The Juniper Networks® EX2300 line of Ethernet switches offers a compact, high-performance solution for supporting today's converged network access deployments.

Each EX2300 switch includes an ASIC-based Packet Forwarding Engine (PFE) with an integrated CPU to consistently deliver wire-rate forwarding, even with all control plane features enabled. Based on existing, field-proven Juniper Networks technology, the PFE brings the same level of carrier-class performance and reliability to the EX2300 switches that Juniper Networks routers bring to the world's largest service provider networks.

Select EX2300 models also support the 802.3af Class 3 Power over Ethernet (PoE) and 802.3at PoE+ standards for supporting networked devices such as telephones, video cameras, IEEE 802.11ac WLAN access points, and videophones in converged networks. The PoE-enabled EX2300 switches include a maximum system budget of 750 watts to deliver up to 30 watts to select ports.

Multiple EX2300 models are available, including versions offering multigigabit (up to 2.5 Gbps) PoE+ access ports that can accommodate higher-speed IEEE 802.11ac Wave 2 access points, enabling the switches to support more wireless users.

The EX2300 fixed-configuration Ethernet switches provide exceptional value to enterprise customers by supporting the following key technologies:

- Virtual Chassis technology enables up to four interconnected EX2300 switches to form a single logical device.
- Flexible 1GbE SFP/10GbE SFP+ uplinks provide high-speed connectivity to aggregation layer switches or other upstream devices.
- Up to 48 10/100/1000BASE-T ports are available with or without PoE/PoE+.
- Models offering 24 and 48 multigigabit ports support 1GbE/2.5GbE on 8 and 16 ports, respectively
- Energy Efficient Ethernet (EEE) support is provided on 1GbE ports.
- Complete Layer 2 and basic Layer 3 switching capabilities are available.
- Simplified onboarding and management with Juniper Mist Wired Assurance.

Additional features include:

- PoE-enabled EX2300 switches can simultaneously deliver up to 15.4 watts of standards-based 802.3af Class 3 PoE to a maximum of 48 ports or 30 watts of standards-based 802.3at PoE+ to a maximum of 24 ports, based on a total system budget of 750 watts.
- Uplink ports can be configured as Virtual Chassis interfaces and connected via standard 10GbE optics interfaces (optional Virtual Chassis license required).

- Fixed power supply and uplink ports ensure operational simplicity.
- Low power consumption, low acoustic fans, and a small 10-inch deep footprint enable flexible, environmentally friendly deployment.
- Support for L2 protocols as well as L3 protocols like RIP and static routing are included in the base license.
- Support is available for IPv6 management, including neighbor discovery, telnet, SSH, DNS, system log, and NTP.
- A single release train for Juniper Networks Junos operating system is supported to ensure a consistent control plane feature implementation.
- Modular Junos OS prevents a switch reboot if a single protocol feature fails.
- Built-in Web interface (Juniper Networks J-Web Software) is provided.
- RJ-45 serial console port is available.
- USB mini console port is included on 1GbE access switch models.
- Out-of-band Ethernet management port is provided.
- Reduction of Hazardous Waste (RoHS) is certified.

Architecture and Key Components

The EX2300 occupies a single rack unit, delivering a compact solution for crowded wiring closets and access locations where space and power are at a premium. The EX2300 switch's 10-inch/12-inch depth and low acoustics also make it ideal for open office deployments. For silent operation requirements, please see the EX2300-C, a compact, fanless version of the EX2300.

Each EX2300 switch supports four fixed front-panel 1GbE/10GbE uplink ports (six 1/10GbE uplink ports on the 48-port multigigabit model) with pluggable optics (purchased separately) for high-speed backbone or link aggregation connections between wiring closets and upstream aggregation switches. The 1GbE EX2300 access switch models also feature a front-panel mode button that offers a simple interface for bringing devices up and selecting LED modes.

A dedicated rear panel RJ-45 Ethernet port is available for out-of-band management, while a rear panel USB port can be used to easily upload the Junos OS and configuration files.

Cloud Management with Juniper Mist Wired Assurance

Juniper Mist Wired Assurance, a cloud-based service driven by Mist AI to claim, configure, manage, and troubleshoot the EX2300, delivers AI-powered automation and service levels to ensure a better experience for connected devices. Wired Assurance leverages rich Junos switch telemetry data to simplify operations, reduce mean time to repair, and improve visibility. Wired Assurance offers the following features:

- **Day 0 operations**—Onboard switches seamlessly by claiming a greenfield switch or adopting a brownfield switch with a single activation code for true plug-and-play simplicity.
- **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 1). 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 2). And perform software upgrades easily through Juniper Mist cloud.

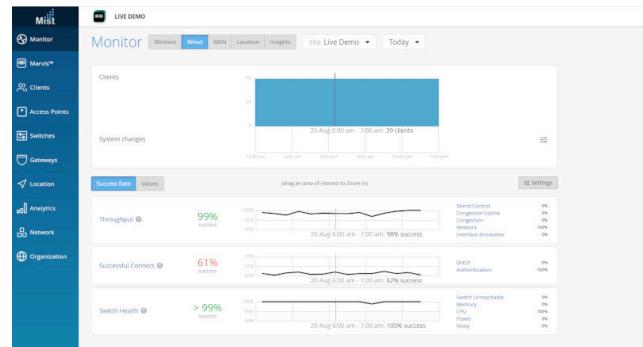


Figure 1: Juniper Mist Wired Assurance service-level expectations



Figure 2: Marvis Actions for wired switches

The addition of Marvis, a complementary 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](#).

Virtual Chassis Technology

The EX2300 supports Juniper's unique Virtual Chassis technology, enabling up to four interconnected EX2300 switches to be managed as a single logical device, delivering a scalable, pay-as-you-grow solution for expanding network environments.

While EX2300 switches can be interconnected over any of the front-panel uplink ports using standard 10GbE SFP+ transceivers (sold separately), these ports can also be configured as 1GbE/10GbE uplinks to aggregation devices by disabling the Virtual Chassis technology.

When deployed in a Virtual Chassis configuration, the EX2300 switches elect a primary and a backup switch based on a set of preconfigured policies or criteria. The primary switch automatically creates and updates the switching and optional routing tables on all other Virtual Chassis switch members. Switches can be added to or removed from the Virtual Chassis configuration without service disruption.

EX2300 Virtual Chassis configurations operate as highly resilient unified systems, providing simplified management using a single IP address, single telnet session, single command-line interface (CLI), automatic version checking, and automatic configuration. The EX2300 switches are also capable of local switching, so packets coming into a port destined for another port on the same switch do

not have to traverse the Virtual Chassis, increasing forwarding capacities.

EX2300 Virtual Chassis configurations implement the same slot/module/port numbering schema as other Juniper Networks chassis-based products, 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.

Multigigabit Switches

IEEE 802.11ac Wave 2 access points require switch ports capable of handling up to 2.5 Gbps in order to support the growing number of wireless devices and the amount of traffic they produce. To address this need, specific multigigabit EX2300 models now offer 1 Gbps and 2.5 Gbps access ports to support these increased bandwidth requirements over existing Category 5e cabling. These switches run the same Junos image and support all the same software features as other EX2300 models.

The EX2300 multigigabit switches can interoperate with other EX Series switches in Virtual Chassis deployments, protecting existing customer investments by enabling them to add multigigabit support to their existing Juniper network deployments.

The EX2300 multigigabit switches support PoE+ on all access ports, provided the power demand is within the PoE budget.

Table 1: EX2300 multigigabit switches

Model	1 Gbps Ports	1/2.5 Gbps Ports	PoE/ PoE+	Uplinks	Fans	Air Flow
EX2300- 24MP	8-23	0-7	All access ports	4 SFP+	3	Side-side
EX2300- 48MP	0-15; 32-47	16-31	All access ports	6 SFP+	4	Side-side

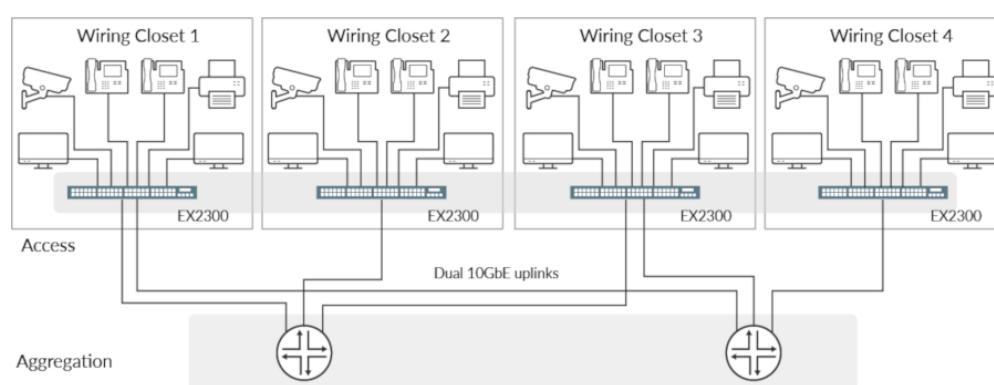


Figure 3: EX2300 switches support Virtual Chassis technology, which enables up to four interconnected switches to operate as a single, logical device.

Virtual Chassis technology simplifies network management for smaller deployments. Up to four interconnected EX2300 switches can be managed as a single device utilizing a single Junos OS image and a single configuration file, reducing the overall number of units to monitor and manage. When the Junos OS is upgraded on the primary switch in an EX2300 Virtual Chassis configuration, the software is automatically upgraded on all other member switches at the same time.

The EX2300 includes port profiles that allow network administrators to automatically configure ports with security, QoS, and other parameters based on the type of device connected to the port. Six preconfigured profiles are available, including default, desktop, desktop plus IP phone, WLAN access point, routed uplink, and Layer 2 uplink. Users can select from the existing profiles or create their own and apply them through the command-line interface (CLI), J-Web Software interface, or management system.

In addition, a feature called system snapshot makes a copy of all software files used to run the switch—including the Junos operating system, the active configuration, and the rescue configuration. These files can be used to reboot the switch at the next power-up or as a backup boot option. The Junos OS software can also be preinstalled on a flash drive and used to boot the EX2300 at any time.

Another feature, called automatic software download, enables network administrators to easily upgrade the EX2300 using the DHCP message exchange process to download and install software packages. Users simply configure the automatic software download feature on EX2300 switches acting as DHCP clients and establish a path to the server where the software package file is installed. The server then communicates the path to the software package file through DHCP server messages.

The ZTP feature allows a DHCP server to push configuration details and software images to multiple switches at boot-up time.

Campus Fabric Deployments

Juniper campus fabrics support these validated architectures with the EX2300 switch playing the role of access switch in a Virtual Chassis:

- 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 hierarchical network into a two-tier network. This eliminates the need for STP across the campus network by providing multihoming capabilities from the access to the core layer. EVPN multihoming can be deployed and managed using the Juniper Mist cloud.
- Core-Distribution:** A pair of interconnected EX Series core or distribution switches provide L2 EVPN and L3 VXLAN gateway support. The EVPN-VXLAN network between the distribution and core layers offers two modes: centrally or edge routed bridging overlay.

In all these EVPN-VXLAN deployment modes, EX2300 switches can be used in Virtual Chassis configurations.

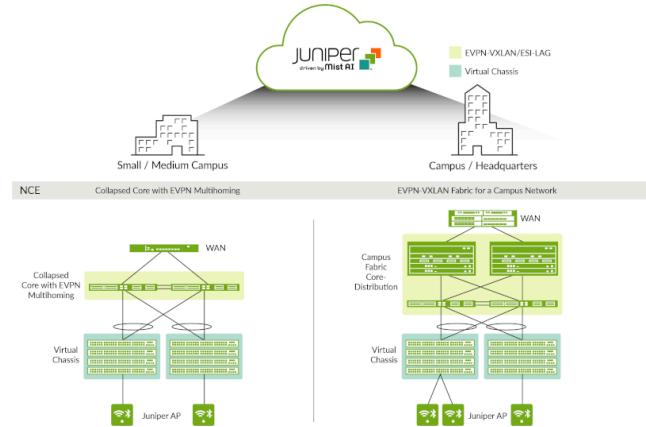


Figure 4: Campus fabrics showing Virtual Chassis and EVPN-VXLAN-based architectures

Features and Benefits

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 moving 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
- Anomaly detection
- Root cause analysis

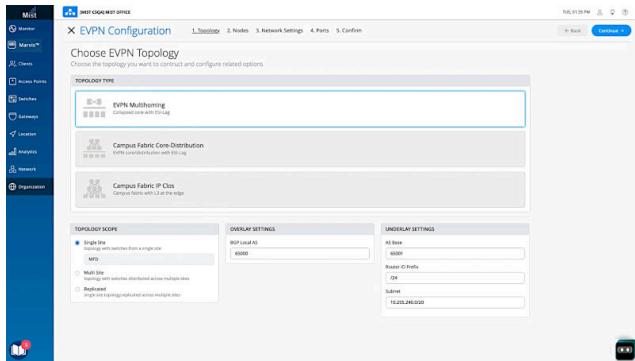


Figure 5. EVPN multihoming configuration via the Juniper Mist cloud

High Availability Features

To avoid the complexities of the Spanning Tree Protocol (STP) without sacrificing network resiliency, the EX2300 employs a redundant trunk group (RTG) to provide the necessary port redundancy and simplify switch configuration. It also supports cross-member link aggregation, which allows redundant link aggregation connections between devices in a single Virtual Chassis configuration, providing an additional level of reliability and availability.

Junos Operating System

The EX2300 switches run the same Junos OS that is used by other Juniper Networks EX Series Ethernet Switches, QFX Series Switches, Juniper Routers, Juniper SRX Firewalls, and the Juniper NFX Series Network Services Platform. By utilizing a common operating system, Juniper delivers a consistent implementation and operation of control plane features across all products. To maintain that consistency, the Junos OS adheres to a highly disciplined development process that uses a single source code, and it 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.

Converged Environments

The EX2300 provides the highest levels of flexibility and features in its class for the most demanding converged data, voice, and video environments, delivering a reliable platform for unifying enterprise communications.

By providing a full 15.4 watts of Class 3 PoE to VoIP telephones, closed-circuit security cameras, wireless access points, and other IP-enabled devices, the EX2300 delivers a future-proofed solution for converging disparate networks onto a single IP infrastructure. The EX2300 PoE switches also support 802.3at standards-based PoE+, delivering 30 watts for powering networked devices such as IEEE 802.11ac wireless access points, and videophones that might require more power than available with IEEE 802.3af.

To ease deployment, the EX2300 supports the industry-standard Link Layer Discovery Protocol (LLDP) and LLDPMedia Endpoint Discovery (LLDP-MED) protocol, enabling the switches to automatically discover Ethernet-enabled devices, determine their power requirements, and assign virtual LAN (VLAN) membership. LLDP-MED-based granular PoE management allows the EX2300 to negotiate PoE usage down to a fraction of a watt on powered devices, enabling more efficient PoE utilization across the switch.

In addition, the EX2300 supports rich quality-of-service (QoS) functionality for prioritizing data, voice, and video traffic. The switches support eight class-of-service (CoS) queues on every port, enabling them to maintain multilevel, end-to-end traffic prioritizations. The EX2300 also supports a wide range of policy options, including strict priority, low latency, weighted random early detection (WRED), and shaped-deficit weighted roundrobin (SDWRR) queuing.

Security

Working as an enforcement point in Access Policy Infrastructure, the EX2300 provides both standards-based 802.1X portlevel access control for multiple devices per port, as well as Layer 2-4 policy enforcement based on user identity, location, device, or a combination of these. A user's identity, device type, machine posture check, and location can be used to determine whether access should be granted and for how long. If access is granted, the switch provides access to the network based on authorization attributes sent by the authentication server. The switch can also apply security policies, QoS policies, or both, or it can mirror user traffic to a central location for logging, monitoring, or threat detection by intrusion prevention systems.

The EX2300 also provides a full complement of integrated port security and threat detection features, including Dynamic Host Configuration Protocol (DHCP) snooping, dynamic ARP inspection (DAI), and media access control (MAC) limiting to defend against internal and external spoofing, and man-in-the-middle and denial of service (DoS) attacks.

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 Advanced 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 EX2300 switches support both subscription and perpetual Flex licenses. Subscription licenses are offered for three- and five-year terms. In addition to Junos 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.

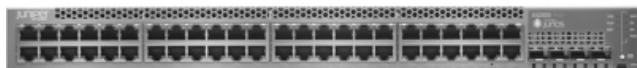
For a complete list of features supported by the Flex Standard, Advanced, and Premium tiers, or to learn more about Junos EX Series licenses, please visit <https://www.juniper.net/documentation/us/en/software/license/licensing/topics/concept/flex-licenses-for-ex.html>

Enhanced Limited Lifetime Warranty

The EX2300 includes 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/>



EX2300-24T/24P



EX2300-48T/48P



EX2300-24MP



EX2300-48MP

Physical Specifications

Power Options

Model	Max. System Power Consumption (Input Power without PoE)	Total PoE Power Budget
EX2300-24T	55 W AC	0
EX2300-24P	80 W AC	370 W
EX2300-24MP	55 W AC	380 W
EX2300-48T	70 W AC	0
EX2300-48P	100 W AC	750 W
EX2300-48MP	90 W AC	750 W

Dimensions (W x H x D)

- Width:
 - 17.4 in (44.19 cm) for desktop installations
 - 17.5 in (44.6 cm) with rack-mount brackets
- Height: 1.75 in (4.45 cm) for 1U installations
- Depth:
 - EX2300-24T: 10.2 in (25.9 cm)
 - EX2300-24P: 12.2 in (30.98 cm)
 - EX2300-24MP: 10 in (25.4 cm)
 - EX2300-48T: 10.2 in (25.9 cm)
 - EX2300-48P: 12.2 in (30.98 cm)
 - EX2300-48MP: 14.5 in (36.83 cm)

Backplane

- 80 Gbps Virtual Chassis interconnect to link up to four switches as a single logical device (EX2300-24/48T/P and EX2300-24/48 MP models)

System Weight

- EX2300-24T: 7.25 lb (3.29 kg)
- EX2300-24P: 9.89 lb (4.49 kg)
- EX2300-24MP: 8.82 lb (4 kg)
- EX2300-48T: 8.29 lb (3.76 kg)
- EX2300-48P: 11.07 lb (5.02 kg)
- EX2300-48MP: 14.33 lb (6.5 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 13,000 ft (3962 m) at 40° C according to GR-63
- Non-operating altitude: up to 15,000 ft (4572 m)
- Relative humidity operating: 10% to 85% (noncondensing)
- Relative humidity non-operating: 0% to 95% (noncondensing)

Cooling

- Airflow:
 - EX2300-24T: 25 cfm
 - EX2300-24P: 23 cfm
 - EX2300-48T: 24 cfm
 - EX2300-48P: 25 cfm

Hardware Specifications

Switching Engine Model

- Store and forward

DRAM

- 2 GB (EX2300-24/48T/P)

Flash

- 2 GB (EX2300 non-multigigabit models)
- 8 GB (EX2300-24MP, EX2300-48MP)

CPU

- 1.25GHz ARM CPU

GbE Port Density per System

- EX2300-24P/24T/24MP: 28 (24 host ports + four-port SFP/SFP+ uplinks)
- EX2300-48P/48T: 52 (48 host ports + four-port SFP/SFP+ uplinks)
- EX2300-48MP: 54 (48 host ports + six-port SFP/SFP+ uplinks)

Supported Optics

- 10/100/1000BASE-T connector type RJ-45
- GbE SFP optic/connector type: RJ-45, or LC SFP fiber supporting 1000BASE-T SFP, SX (multimode), LX (singlemode), or LH (single-mode)

Physical Layer

- Physical port redundancy: Redundant trunk group (RTG)
- Cable diagnostics for detecting cable breaks and shorts
- Auto MDI/MDIX (medium-dependent interface/mediumdependent interface crossover) support
- Port speed downshift/setting maximum advertised speed on 10/100/1000BASE-T ports
- Digital optical monitoring for optical ports

Packet-Switching Capacities (Maximum with 64-Byte Packets)

- EX2300-24P/24T: 64 Gbps (unidirectional)/128 Gbps (bidirectional)
- EX2300-24MP: 76 Gbps (unidirectional)/ 152 Gbps (bidirectional)

- EX2300-48P/48T: 88 Gbps (unidirectional)/176 Gbps (bidirectional)
- EX2300-48MP: 132 Gbps (unidirectional)/264 Gbps (bidirectional)

Software Specifications

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

- EX2300-24P/24T/24MP: 95 Mpps (wire speed)
- EX2300-48P/48T/48MP: 130 Mpps (wire speed)

Layer 2 Features

- Maximum MAC addresses in hardware: 16,000
- Jumbo frames: 9216 bytes
- Number of VLANs supported: 4093 (2044 active VLAN)
- Range of possible VLAN IDs: 1-4094
- Port-based VLAN
- MAC-based VLAN
- Voice VLAN
- Layer 2 Protocol Tunneling (L2PT)
- IEEE 802.1ak: Multiple VLAN Registration Protocol (MVRP)
- Compatible with Per-VLAN Spanning Tree Plus (PVST+)
- RVI (Routed VLAN Interface)
- IEEE 802.1AB: Link Layer Discovery Protocol (LLDP)
- LLDP-MED with VoIP integration
- IEEE 802.1ad Q-in-Q tunneling
- IEEE 802.1br: Bridge Port Extension
- IEEE 802.1D: Spanning Tree Protocol
- IEEE 802.1p: CoS Prioritization
- IEEE 802.1Q: VLAN Tagging
- IEEE 802.1Q-in-Q: VLAN Stacking
- IEEE 802.1s: Multiple Spanning Tree Protocol (MSTP)
- Number of MST instances supported: 64
- Number of VTP instances supported: 253
- IEEE 802.1w: Rapid Spanning Tree Protocol (RSTP)
- IEEE 802.1X: Port Access Control
- IEEE 802.3: 10BASE-T
- IEEE 802.3u: 100BASE-T
- IEEE 802.3ab: 1000BASE-T
- IEEE 802.3z: 1000BASE-X
- IEEE 802.3af: PoE
- IEEE 802.3at: PoE+
- IEEE 802.3ad: Link Aggregation Control Protocol (LACP)
- IEEE 802.3x: Pause Frames/Flow Control
- IEEE 802.3az: Energy Efficient Ethernet

Layer 3 Features: IPv4

- Maximum number of ARP entries: 1,500
- Maximum number of IPv4 unicast routes in hardware: 512 prefixes; 4,096 host routes
- Maximum number of IPv4 multicast routes in hardware: 2,048 groups; 2,048 multicast routes
- Routing Protocols: RIP v1/v2, OSPF v1/v2
- Static routing
- Routing policy
- Bidirectional Forwarding Detection (BFD) with slow timers (> 3 sec)
- IP directed broadcast

Layer 3 Features: IPv6

- Maximum number of Neighbor Discovery (ND) entries: 1,500
- Maximum number of IPv6 unicast routes in hardware: 512 prefixes; 2,048 host routes
- Maximum number of IPv6 multicast routes in hardware: 1,024 groups; 1,024 multicast routes
- Neighbor discovery, system logging, Telnet, SSH, SNMP, Network Time Protocol (NTP), Domain Name System (DNS)
- Static routing
- Routing protocols: RIPng, OSPF v3, Multicast Listener Discovery, Multicast Listener Discovery v2

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

- Port-based ACL (PAACL)—256 ingress; 256 egress
- VLAN-based ACL (VACL)— 256 ingress; 256 egress
- Router-based ACL (RAACL)—256 ingress; 512 egress
- ACL entries (ACE) in hardware per system: 2,000
- 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

- MAC limiting
- Allowed MAC addresses—configurable per port
- Sticky MAC (persistent MAC address learning)
- Dynamic ARP inspection (DAI)
- Proxy ARP
- Static ARP support
- DHCP snooping
- 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 EAP types: Message Digest 5 (MD5), Transport Layer Security (TLS), Tunneled Transport Layer Security (TTLS), Protected Extensible Authentication Protocol (PEAP)
- IPv6 RA Guard
- IPv6 Neighbor Discovery Inspection
- Captive Portal
- Static MAC authentication
- MAC-RADIUS
- Control plane DoS protection
- Fallback authentication
- Trusted Network Connect (TNC) certified

High Availability

- Link aggregation
- 802.3ad (LACP) support:
 - Number of LAGs supported: 128
 - Maximum number of ports per LAG: 8
- Tagged ports support in LAG
- Uplink Failure Detection

Quality of Service (QoS)

- Layer 2 QoS
- Layer 3 QoS
- Ingress policing: one-rate two-color; two-rate three-color markers
- Hardware queues per port: 8
- Scheduling methods (egress): Strict Priority (SP), shapeddeficit weighted round-robin (SDWRR)
- 802.1p, 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
- Congestion avoidance capabilities: Tail drop and WRED

Multicast

- IGMP snooping entries: 2,000
- IGMP: v1, v2, v3
- IGMP snooping
- PIM-SM, PIM-SSM, PIM-DM
- MLD snooping

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
- Junos Web interface (J-Web)
- Out-of-band management: Serial, 10/100BASE-T Ethernet
- ASCII configuration
- Rescue configuration
- Configuration rollback
- Image rollback
- Simple Network Management Protocol (SNMP): v1, v2c, v3
- Remote monitoring (RMON) (RFC 2819) Groups 1, 2, 3, 9
- Network Time Protocol (NTP)
- DHCP server
- DHCP client and DHCP proxy
- DHCP relay and helper
- RADIUS authentication
- TACACS+ authentication
- SSHv2
- Secure copy
- HTTP/HTTPs
- DNS resolver
- System log logging
- Temperature sensor
- Configuration backup via FTP/secure copy
- Interface range

Supported RFCs

- RFC 768 UDP
- RFC 783 Trivial File Transfer Protocol (TFTP)
- RFC 791 IP
- RFC 792 Internet Control Message Protocol (ICMP)
- RFC 793 TCP
- RFC 826 ARP
- RFC 854 Telnet client and server
- RFC 894 IP over Ethernet
- RFC 903 Reverse ARP (RARP)
- RFC 906 Bootstrap Loading using TFTP
- RFC 951, 1542 BootP
- RFC 1027 Proxy ARP
- RFC 1058 RIP v1
- RFC 1122 Requirements for Internet Hosts
- RFC 1256 IPv4 ICMP Router Discovery (IRDP)
- RFC 1492 TACACS+
- RFC 1519 Classless Interdomain Routing (CIDR)
- RFC 1591 Domain Name System (DNS)
- RFC 1812 Requirements for IP Version 4 routers
- RFC 2030 Simple Network Time Protocol (SNTP)
- RFC 2068 HTTP/1.1
- RFC 2131 BOOTP/DHCP relay agent and DHCP server

- RFC 2138 RADIUS Authentication
- RFC 2139 RADIUS Accounting
- RFC 2267 Network Ingress Filtering
- RFC 2453 RIP v2
- RFC 2474 DiffServ Precedence, including 8 queues/port
- RFC 2597 DiffServ Assured Forwarding (AF)
- RFC 2598 DiffServ Expedited Forwarding (EF)
- RFC 2710 Multicast Listener Discovery Version (MLD) for IPv6
- RFC 2925 Definitions of Managed Objects for Remote Ping, Traceroute, and Lookup Operations
- RFC 3176 sFlow
- RFC 3579 RADIUS Extensible Authentication Protocol (EAP) support for 802.1X
- RFC 5176 Dynamic Authorization Extensions to RADIUS
- LLDP Media Endpoint Discovery (LLDP-MED), ANSI/TIA1057, draft 08

Supported MIBs

- RFC 1155 Structure of Management Information (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 1724 RIPv2 MIB
- RFC 1905 RFC 1907 SNMP v2c, SMIv2 and Revised MIB-II
- RFC 1981 Path MTU Discovery for IPv6
- RFC 2011 SNMPv2 Management Information Base for the IP using SMIv2
- RFC 2012 SNMPv2 Management Information Base for the Transmission Control Protocol using SMIv2
- RFC 2013 SNMPv2 Management Information Base for the User Datagram Protocol using SMIv2
- RFC 2096 IPv4 Forwarding Table MIB
- RFC 2287 System Application Packages MIB
- RFC 2460 IPv6 Specification
- RFC 2464 Transmission of IPv6 Packets over Ethernet Networks
- RFC 2570-2575 SNMPv3, User-based Security, Encryption, and Authentication
- RFC 2576 Coexistence between Version 1, Version 2, and Version 3 of the Internet-standard Network Management Framework
- RFC 2578 SNMP Structure of Management Information MIB
- RFC 2579 SNMP Textual Conventions for SMIv2
- RFC 2665 Definitions of Managed Objects for the Ethernet-like Interface Types
- RFC 2819 RMON MIB

- RFC 2863 The Interfaces Group MIB
- RFC 2922 LLDP MIB
- RFC 2925 Definitions of Managed Objects for Remote Ping, Traceroute, and Lookup Operations
- RFC 3413 SNMP Application MIB
- RFC 3414 User-based Security Model for SNMPv3
- RFC 3415 View-based Access Control Model (VACM) for SNMP
- RFC 3484 Default Address Selection for IPv6
- RFC 3621 PoE-MIB (PoE switches only)
- RFC 3810 Multicast Listener Discovery Version 2 (MLDv2) for IPv6
- RFC 4188 STP and Extensions MIB
- RFC 4213 Basic Transition Mechanisms for IPv6 Hosts and Routers
- RFC 4291 IPv6 Addressing Architecture
- RFC 4363 Definitions of Managed Objects for Bridges with Traffic Classes, Multicast Filtering, and VLAN Extensions
- RFC 4443 ICMPv6 for the IPv6 Specification
- RFC 4861 Neighbor Discovery for IPv6
- RFC 4862 IPv6 Stateless Address Autoconfiguration
- Draft – blumenthal – aes – usm - 08
- Draft – reeder - snmpv3 – usm - 3desede -00

Troubleshooting

- Debugging: CLI via console, telnet, or SSH
- Diagnostics: Show and debug command statistics
- Traffic mirroring (port)
- Traffic mirroring (VLAN)
- 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
- Encapsulated Remote Switched Port Analyzer (ERSPAN)
- IP tools: Extended ping and trace
- Juniper Networks commit and rollback

Safety Certifications

- UL-UL60950-1 (Second Edition)
- C-UL to CAN/CSA 22.2 No.60950-1 (Second Edition)
- TUV/GS to EN 60950-1 (Second Edition)
- CB-IEC60950-1 (Second Edition with all country deviations)
- EN 60825-1 (Second Edition)

Electromagnetic Compatibility Certifications

- FCC 47CFR Part 15 Class A
- EN 55022 Class A
- ICES-003 Class A
- VCCI Class A
- AS/NZS CISPR 22 Class A
- CISPR 22 Class A
- EN 55024
- EN 300386
- CE

Telecom Quality Management

- TL9000

Environmental

- Reduction of Hazardous Substances (ROHS) 6

Telco

- CLEI code

Noise Specifications

Noise measurements based on operational tests taken from bystander position (front) and performed at 25° C in compliance with ISO 7779. The PoE load was 370 W (24 ports powered at 15.4W each) on the EX2300-24P and 740 W (48 ports powered at 15.4W each) on the EX2300-48P.

Model	Acoustic Noise in DB
EX2300-24T	34.2
EX2300-24P	40.6
EX2300-48T	34.6
EX2300-48P	51.4
EX2300-24MP	45.7
EX2300-48MP	45.8

Warranty

- Enhanced limited lifetime switch hardware warranty

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>.

Ordering Information

Product Number	Description
Switches	
EX2300-24T	EX2300 24-port 10/100/1000BASE-T, 4 x 1/10GbE SFP/SFP+ (optics sold separately)
EX2300-24T-VC	EX2300 24-port non-PoE+ w/ Virtual Chassis License
EX2300-24P	EX2300 24-port 10/100/1000BASE-T PoE+, 4 x 1/10GbE SFP/SFP+ (optics sold separately)
EX2300-24P-VC	EX2300 24-port PoE+ w/ Virtual Chassis License
EX2300-24MP	EX2300 16-port 10/100/1000BASE-T PoE+, 8-port 10/100/1000/2500BASE-T PoE+, 4 x 1/10GbE SFP/ SFP+ (optics sold separately)
EX2300-24T-DC	EX2300 24-port 10/100/1000BASE-T with internal DC PSU, 4 x 1/10GbE SFP/SFP+ (optics sold separately)
EX2300-24T-TAA	EX2300 TAA 24-port 10/100/1000BASE-T, 4 x 1/10GbE SFP/SFP+ (optics sold separately)
EX2300-24P-TAA	EX2300 TAA 24-port 10/100/1000BASE-T PoE+, 4 x 1/10GbE SFP/SFP+ (optics sold separately)
EX2300-48T	EX2300 48-port 10/100/1000BASE-T, 4 x 1/10GbE SFP/SFP+ (optics sold separately)
EX2300-48T-VC	EX2300 48-port non-PoE+ w/ Virtual Chassis License
EX2300-48P	EX2300 48-port 10/100/1000BASE-T PoE+, 4 x 1/10GbE SFP/SFP+ (optics sold separately)
EX2300-48P-VC	EX2300 48-port PoE+ w/ Virtual Chassis License
EX2300-48MP	EX2300 32-port 10/100/1000BASE-T PoE+, 16-port 10/100/1000/2500BASE-T PoE+, 6 x 1/10GbE SFP/ SFP+ (optics sold separately)
EX2300-48T-TAA	EX2300 TAA 48-port 10/100/1000BASE-T, 4 x 1/10GbE SFP/SFP+ (optics sold separately)
EX2300-48P-TAA	EX2300 TAA 48-port 10/100/1000BASE-T PoE+, 4 x 1/10GbE SFP/SFP+ (optics sold separately)
Accessories	
EX-RMK	Rack-mount kit for EX2300
EX-4PST-RMK	Adjustable 4-post rack-mount kit for EX2300
EX-WMK	Wall-mount kit for EX2300
Subscription Licenses	
S-EX-A-C2-3	Software, EX Series Advanced license, Class 2 (24 ports), includes 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 Wired Assurance subscription for EX Series 24-port switches, 5 year
S-EX-A-C3-3	Software, EX Series Advanced license, Class 3 (32 or 48 ports), includes Wired Assurance subscription for EX Series 48-port switches, 3 year
S-EX-A-C3-5	Software, EX Series Advanced license, Class 3 (32 or 48 ports), includes Wired Assurance subscription for EX Series 48-port switches, 5 year
S-EX-A-C2-3-COR	Software, EX Series Advanced license, Class 2 (24 ports), includes Wired Assurance subscription for EX Series 24-port switches with SVC CORE support, 3 year
S-EX-A-C2-5-COR	Software, EX Series Advanced license, Class 2 (24 ports), includes Wired Assurance subscription for EX Series 24-port switches with SVC CORE support, 5 year
S-EX-A-C3-3-COR	Software, EX Series Advanced license, Class 3 (32 or 48 ports), includes Wired Assurance subscription for EX Series 48-port switches with SVC CORE support, 3 year
S-EX-A-C3-5-COR	Software, EX Series Advanced license, Class 3 (32 or 48 ports), includes Wired Assurance subscription for EX Series 48-port switches with SVC CORE support, 5 year

Product Number	Description
Perpetual Licenses	
EX2300-VC	EX2300 Virtual Chassis License for EX2300 24- 48-port switches
S-EX-A-C2-P	Software, EX Series Advanced license, Class 2 Perpetual license for 24 port switches
S-EX-A-C3-P	Software, EX Series Advanced license, Class 3 Perpetual License for 48-port switches
EX-24-EFL	Enhanced Feature License for EX2300 24-port switches
EX-48-EFL	Enhanced Feature License for EX2300 48-port switches
Pluggable Optics	
EX-SFP-1GE-T	SFP 10/100/1000BASE-T copper; RJ-45 connector; 100m reach on UTP
EX-SFP-1GE-SX	SFP 1000BASE-SX; LC connector; 850 nm; 550m reach on multimode fiber
EX-SFP-1GE-SX-ET	SFP 1000BASE-SX; LC connector; 850 nm; 550m reach on multimode fiber, extended temperature
EX-SFP-1GE-LX	SFP 1000BASE-LX; LC connector; 1310 nm; 10 km reach on single-mode fiber
EX-SFP-1GE-LH	SFP 1000BASE-LH; LC connector; 1550 nm; 70 km reach on single-mode fiber
EX-SFP-1GE-LX40K	SFP 1000BASE-LX; LC connector; 1310 nm; 40 km reach on single-mode fiber
EX-SFP-GE10KT13R14	SFP 1000BASE-BX; TX 1310 nm/RX 1490 nm for 10 km transmission on single-strand, single-mode fiber
EX-SFP-GE10KT13R15	SFP 1000BASE-BX; TX 1310 nm/RX 1550 nm for 10 km transmission on single-strand, single-mode fiber
EX-SFP-GE10KT14R13	SFP 1000BASE-BX; TX 1490 nm/RX 1310 nm for 10 km transmission on single-strand, single-mode fiber
EX-SFP-GE10KT15R13	SFP 1000BASE-BX; TX 1550 nm/RX 1310 nm for 10 km transmission on single-strand, single-mode fiber
EX-SFP-GE40KT13R15	SFP 1000BASE-BX; TX 1310 nm/RX 1550 nm for 40 km transmission on single-strand, single-mode fiber
EX-SFPGE80KCW1470	SFP Gigabit Ethernet CWDM, LC connector; 1470 nm, 80 km reach on single-mode fiber
EX-SFPGE80KCW1490	SFP Gigabit Ethernet CWDM, LC connector; 1490 nm, 80 km reach on single-mode fiber
EX-SFPGE80KCW1510	SFP Gigabit Ethernet CWDM, LC connector; 1510 nm, 80 km reach on single-mode fiber
EX-SFPGE80KCW1530	SFP Gigabit Ethernet CWDM, LC connector; 1530 nm, 80 km reach on single-mode fiber
EX-SFPGE80KCW1550	SFP Gigabit Ethernet CWDM, LC connector; 1550 nm, 80 km reach on single-mode fiber
EX-SFPGE80KCW1570	SFP Gigabit Ethernet CWDM, LC connector; 1570 nm, 80 km reach on single-mode fiber

Product Number	Description
EX-SFPGE80KCW1590	SFP Gigabit Ethernet CWDM, LC connector; 1590 nm, 80 km reach on single-mode fiber
EX-SFPGE80KCW1610	SFP Gigabit Ethernet CWDM, LC connector; 1610 nm, 80 km reach on single-mode fiber
EX-SFP-10GE-USR	SFP+ 10 Gigabit Ethernet Ultra Short Reach Optics, 850 nm for 10m on OM1, 20m on OM2, 100m on OM3 multimode fiber
EX-SFP-10GE-SR	SFP+ 10GBASE-SR; LC connector; 850 nm; 300m reach on 50 microns multimode fiber; 33m on 62.5 microns multimode fiber
EX-SFP-10GE-LR	SFP+ 10GBASE-LR; LC connector; 1310 nm; 10 km reach on single-mode fiber
EX-SFP-10GE-ER	SFP+ 10GBASE-ER 10 Gigabit Ethernet Optics, 1550 nm for 40 km transmission on single-mode fiber
EX-SFP-10GE-ZR	SFP+ 10GBASE-ZR; LC connector; 1550nm; 80 km reach on single-mode fiber
EX-SFP-10GE-DAC1M	SFP+ 10 Gigabit Ethernet Direct Attach Copper (twinax copper cable) – 1-meter length
EX-SFP-10GE-DAC3M	SFP+ 10 Gigabit Ethernet Direct Attach Copper (twinax copper cable) – 3-meter length
EX-SFP-10GE-DAC5M	SFP+ 10 Gigabit Ethernet Direct Attach Copper (twinax copper cable) – 5-meter length

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.

Corporate and Sales Headquarters

Juniper Networks, Inc.

1133 Innovation Way

Sunnyvale, CA 94089 USA

Phone: 888.JUNIPER (888.586.4737)

or +1.408.745.2000

www.juniper.net

APAC and EMEA Headquarters

Juniper Networks International B.V.

Boeing Avenue 240 1119 PZ Schiphol-Rijk

Amsterdam, The Netherlands

Phone: +31.207.125.700



Driven by
Experience®



Product Overview

The wall plate [AP12 access point](#) driven by [Mist AI](#) automates network operations and boosts Wi-Fi performance. It's optimized for environments that require easy, flexible deployment, and the simultaneous support of multiple devices. It supports an aggregate data rate up to 1.8 Gbps concurrently on both 2.4 GHz and 5 GHz radios. Managed by Juniper Mist Cloud Architecture, the AP12 access point delivers unprecedented user experiences at a lower cost for branch office, remote worker, school dormitory, and hotel room environments.

AP12 ACCESS POINT DATASHEET

Product Description

The Juniper® AP12 is a wall plate [Wi-Fi 6 access point optimized](#) for environments that require easy, flexible deployment, and the simultaneous support of multiple devices. It supports an aggregate data rate up to [1.8 Gbps concurrently on both 2.4 GHz and 5 GHz](#) radios and provides a cost-effective investment choice for branch offices, remote workers, school dormitory, and hotel room environments.

While wired and wireless networks are business critical, without the right architecture they can be harder to operate given the sheer number of mobile and IoT devices—not to mention the extensive variety of hardware, operating systems, and applications currently in use. Traditional architectures—highly manual and network-centric—lack the scale, flexibility, and end-to-end visibility required to support modern mobility requirements and the IT departments that manage them.

Juniper AI-Driven Network

Juniper Mist™ brings true innovation to wireless networking with the world's first AI-driven wireless LAN (WLAN). The Juniper AI-Driven Enterprise makes Wi-Fi predictable, reliable, and measurable, offering unprecedented visibility into the user experience through the use of unique Service-Level Expectation (SLE) metrics. Proactive AI-driven automation and a self-healing network replace time-consuming manual tasks, lowering Wi-Fi operational costs and saving substantial time and money.

The Juniper Mist Cloud Architecture

Juniper's Mist AI leverages a cloud-native microservices architecture that delivers unparalleled agility, scale, and resiliency to your network. [An AI engine lowers OpEx and delivers insights by using data science to analyze](#) large amounts of rich metadata collected by the [Juniper Access Points](#).

Juniper Access Point Family

The Juniper enterprise-grade access point family consists of:

- [AP45 Series](#), [AP34](#), and [AP24](#), which support [Wi-Fi 6E](#), 802.11ax (Wi-Fi 6), and Bluetooth LE
- [AP43 Series](#), [AP33](#), [AP32](#), [AP12](#), and [AP63 Series](#), which support 802.11ax (Wi-Fi 6) and Bluetooth LE

The real-time microservices in Juniper Mist cloud manage all these access points.

Table 1 compares the supported major functions of the Juniper Wi-Fi 6E and Wi-Fi 6 access points to help in selecting the most appropriate model(s).

Table 1: Juniper AP Comparison Chart

	AP45	AP34	AP24	AP43	AP33	AP12	AP63
Deployment	Indoor	Indoor	Indoor	Indoor	Indoor	Indoor Wall Plate/ Desk Mount	Outdoor
Wi-Fi Standard	Wi-Fi 6E 802.11ax (Wi-Fi 6) 4x4:4 SS	Wi-Fi 6E 802.11ax (Wi-Fi 6) 2x2:2 SS	Wi-Fi 6E 802.11ax (Wi-Fi 6) 2x2:2 SS 2.4/6 + 5 GHz	802.11ax (Wi-Fi 6) 4x4:4 SS	802.11ax (Wi-Fi 6) 5 GHz; 4x4:4 SS 2.4 GHz; 2x2:2 SS	802.11ax (Wi-Fi 6) 2x2:2 SS	802.11ax (Wi-Fi 6) 4x4:4 SS
Wi-Fi Radios	Dedicated fourth radio for scanning	Dedicated fourth radio for scanning	Dedicated third radio for scanning	Dedicated third radio for scanning	Dedicated third radio for scanning	Dedicated third radio for scanning	Dedicated third radio for scanning
Antenna Options	Internal/External	Internal	Internal	Internal/External	Internal	Internal	Internal/External
Virtual BLE	✓	—	—	✓	✓	—	✓
USB	✓	✓	✓	✓	✓	—	—
IoT Sensors	Temperature, Accelerometer	Temperature, Accelerometer	Temperature, Accelerometer	Humidity, Pressure, Temperature	Temperature, Accelerometer	—	Humidity, Pressure, Temperature
Warranty	Limited Lifetime	Limited Lifetime	Limited Lifetime	Limited Lifetime	Limited Lifetime	Limited Lifetime	One Year
Frequencies Supported	2.4 GHz, 5 GHz, 6 GHz	2.4 GHz, 5 GHz, 6 GHz	2.4 GHz, 5 GHz, 6 GHz	2.4 GHz, 5 GHz	2.4 GHz, 5 GHz	2.4 GHz, 5 GHz	2.4 GHz, 5 GHz

Services Available for the Juniper AP12

Wi-Fi Cloud Services

Marvis™ Virtual Network Assistant

For IT Helpdesk Teams

- AI-Powered Virtual Network Assistant
- Natural Language Processing Conversational Interface
- Anomaly Detection
- Client SLE Visibility and Enforcement
- Data Science-Driven Root Cause Analysis

- Orchestrated Networking and Application Performance Queries
- Simplified Network Transparency

For Business Teams

- Baseline analytics features come included with Wi-Fi Assurance and Asset Visibility subscriptions
- Customer Segmentation and Reporting Based on Visitor Telemetry
- Customized¹ Dwell and Third-Party Reporting for Traffic and Trend Analysis
- Correlate Customer-Guest Traffic and Trend Analysis

Bluetooth Cloud Services

Juniper Mist Asset Visibility

For Process and Resource Improvement Teams

- Identify Assets by Name and View Location
- Zonal/Room Accuracy for Third-Party Tags
- Historical Analytics for Asset Tags
- Telemetry for Asset Tags (such as temperature and motion data)
- APIs for Viewing Assets and Analytics

Access Point Features

High-Performance Wi-Fi

The AP12 access point is a tri-radio 2x2:2 SS 802.11ax access point with maximum data rates of 1,200 Mbps in the 5 GHz band and 575 Mbps in the 2.4 GHz band. The integrated third radio functions as a network, location, and security sensor, a synthetic test client radio, as well as a spectrum monitor.

By adding 802.11ax Orthogonal Frequency Division Multiple Access (OFDMA), Multi-User Multiple Input Multiple Output (MU-MIMO), and BSS Coloring technologies, performance is boosted to unprecedented levels to support new bandwidth-hungry applications and soaring device densities.

Analytics Cloud Services

Juniper Mist Premium Analytics

For Network Teams

- Baseline Analytics Features Come Included with Wi-Fi Assurance and Asset Visibility Subscriptions
- End-to-end Network Visibility

AI for AX

With the new features that 802.11ax (Wi-Fi 6) introduces to boost performance and efficiency, configuring and operating an access point has grown far more complex. Juniper automates and optimizes these features with AI for AX capabilities, which optimize BSS coloring, improve data transmission scheduling within OFDMA and MU-MIMO, and assign clients to the best radio to boost the overall performance of the network.

Greater Spectral Efficiency

OFDMA improves spectral efficiency so that an increasing density of devices can be supported on the network. Density has become an issue with the rapid growth of IoT devices, which often utilize smaller data packets than mobile devices and hence increase the burden and contention on the network. Additionally, BSS Coloring improves the coexistence of overlapping BSSs and allows spatial reuse within a given channel by reducing packet collisions.

Automatic RF Optimization

With the increasing complexity that the addition of 6 GHz spectrum to the 2.4 GHz and 5 GHz spectrum brings, reliable RF optimization is even more critical than in the past. Radio resource management (RRM) automates dynamic channel and power assignment, taking Wi-Fi and external sources of interference into account with its dedicated sensor radio. The AI engine continuously monitors the SLE coverage and capacity metrics to learn and optimize the RF environment. A learning algorithm uses hysteresis on a 24-hour window to conduct sitewide rebalancing for optimal channel and power assignment.

Proactive Insight and Action

A dedicated dual-band third radio collects data for Juniper's patent-pending Proactive Analytics and Correlation Engine (PACE), which leverages machine learning to analyze user experience, correlate problems, and automatically detect root causes. These metrics are used to monitor SLEs and provide proactive recommendations to ensure problems don't occur (or are fixed as quickly as possible when they do). This radio also is able to function as a synthetic test client to proactively detect and mitigate network anomalies.

¹Juniper Mist Premium Analytics service subscription is needed

Dynamic Packet Capture

The Juniper Mist platform automatically captures packets and streams them to the cloud when major issues are detected. This

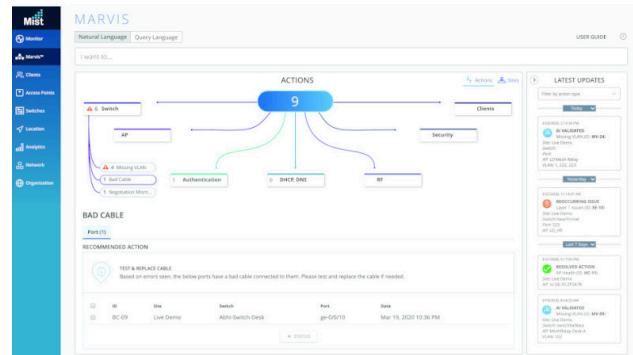
saves IT time and effort and eliminates the need for truck rolls with sniffers to reproduce and capture data for troubleshooting.

Client Events		47 Total	31 Good	7 Neutral	9 Bad				
						AP	Reason	Join	Server IP Address
Association	Scanner 2	12:29:36.867 AM, Jun 8							10.1.1.1
Fast BSS Assoc Failure	Scanner 2	12:29:48.458 AM, Jun 8							5d5d25:10:10:d
IP Assigned	Scanner 2	12:29:47.331 AM, Jun 8							SSID
DNS OK	Scanner 2	12:29:49.033 AM, Jun 8							Network 1
Default Gateway ARP Success	Scanner 2	12:29:49.837 AM, Jun 8							Subnet
DHCP Stuck - Bind Failure	Scanner 2	12:29:49.947 AM, Jun 8							Transaction ID
Authorization	Scanner 2	12:29:49.207 AM, Jun 8							9223498d
DNS OK	Scanner 2	12:29:49.158 AM, Jun 8							
Fast Roaming 802.11R	Scanner 2	12:29:39.098 AM, Jun 8							
Reassociation	Scanner 2	12:29:39.298 AM, Jun 8							

[Download Packet Capture](#)

Marvis Virtual Network Assistant

Marvis is a natural language processing (NLP)-based assistant with a conversational interface that help the understanding of user intent and goals, simplifies troubleshooting, and collects network insights. It uses AI and data science to proactively identify issues, determine the root causes and scope of impact, and gain insights into your network and user experiences. It eliminates the need to manually hunt through endless dashboards and CLI commands.



Effortless, Cloud-Based Setup and Updates

The AP12 access point automatically connects to the Juniper Mist cloud, downloads its configuration, and joins the appropriate network. Firmware updates are retrieved and installed automatically, ensuring that the network is always up to date with new features, bug fixes, and security updates.

Premium Analytics

Juniper Mist Wireless Assurance, User Engagement, and Asset Visibility services include a base analytics capability for analyzing up to 30 days of data, which enables you to simplify the process of extracting network insights across your enterprise. If you require dynamic insights like motion paths¹ and other third-party¹ data and would like the option of customized reports, the Juniper Mist Premium Analytics service is available as an additional subscription.

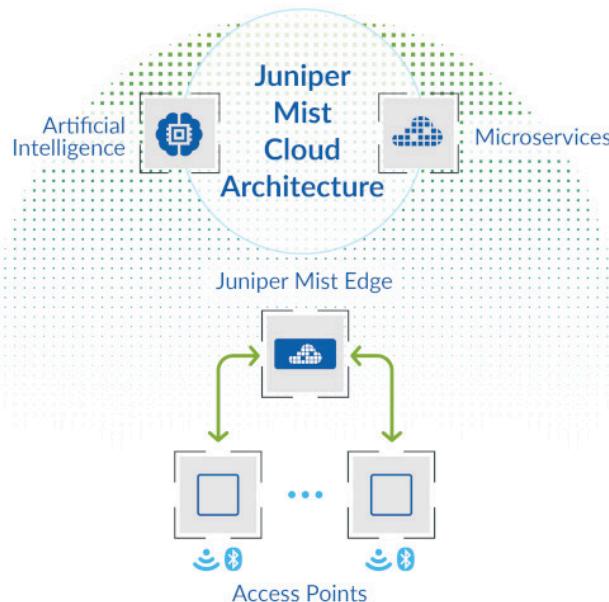


Improves Battery Efficiency for IoT Devices

The AP incorporates the 802.11ax target wake time (TWT) capability and Bluetooth 5.0, which together extend IoT devices' battery life as new IoT devices join the network.

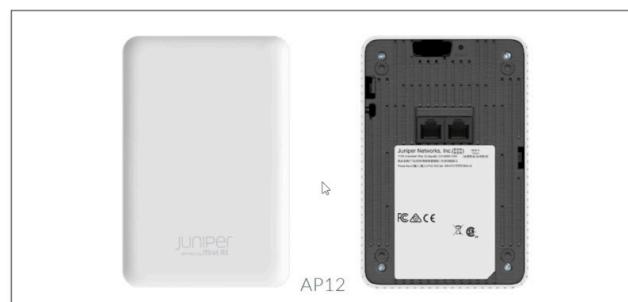
Dynamic Debugging

Constantly monitor services running on the AP12 model and send alerts whenever a service behaves abnormally. Dynamic debugging relieves IT of having to worry about an AP going offline or any services running on it becoming unavailable.



Juniper Mist Edge

Juniper APs offer a flexible data plane. Juniper Mist Edge is an on-premises appliance that runs a tunnel termination service. Traffic can be broken out locally or tunneled to Juniper Mist Edge. Juniper Mist Edge use cases include seamless mobility in large campus environments, tunneling of guest traffic to a DMZ, IoT segmentation, and teleworker services.



Specifications

Wi-Fi Standard	802.11ax (Wi-Fi 6), including support for OFDMA, 1024-QAM, MU-MIMO, Target Wake Time (TWT), and Spatial Frequency Reuse (BSS Coloring). Backwards compatibility with 802.11a/b/g/n/ac
Combined Highest Supported Data Rates	1.8 Gbps
2.4 GHz	2x2:2 802.11b/g/n up to 400 Mbps data rate; 2x2 : 2 802.11ax up to 575 Mbps data rate
5 GHz	2x2:2 802.11ax up to 1,200 Mbps data rate
MIMO Operation	Two spatial stream Single User (SU) MIMO for up to 1,200 Mbps wireless data rate to individual 2x2 HE80 Two spatial stream Multi User (MU) MIMO for up to 1,200 Mbps wireless data rate to up to four MUMIMO-capable client devices simultaneously
Dedicated Third Radio	2.4 GHz and 5 GHz dual-band WIDS/WIPS, spectrum analysis, synthetic client and location analytics radio
Internal Antennas	2.4 GHz omnidirectional antennas with 3 dBi peak gain 5 GHz omnidirectional antennas with 6 dBi peak gain
Bluetooth 5.0	Omnidirectional Bluetooth antenna Supports superbeacon mode with iBeacon and Eddystone
Beam Forming	Transmit Beamforming and Maximal Ratio Combining
Power Options	802.3af/at PoE
Dimensions	150 x 100 x 40 mm (5.9 x 3.9 x 1 in)
Weight	0.6 kg (1.3 lbs) excluding mount and accessories
Operating Temperature	Internal antenna: 0° to 40° C
Operating Humidity	10% to 90% maximum relative humidity, noncondensing
Operating Altitude	3,048 m (10,000 ft)
Mean Time Between Failures (MTBF)	Indoor MTBF in hours is 804,0432
Trusted Platform Module (TPM)	Includes a TPM for infrastructure security

^aBased on Telcordia SR-332 issue 3, Method I, Case 3 and measured at temperature of 25°C (77°F) for indoor access points, and 65°C (149°F) for outdoor access points.

Ordering Information

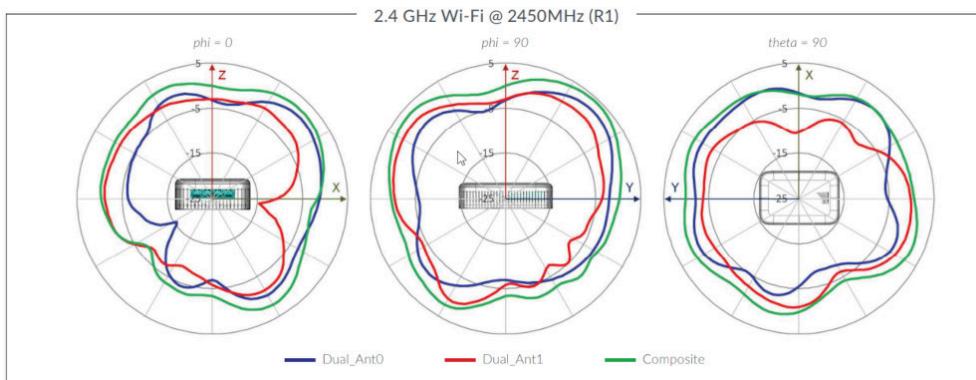
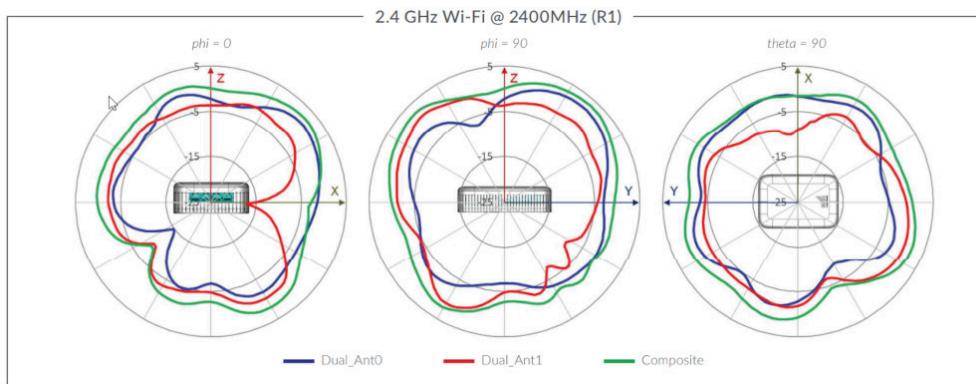
United States only	AP12-US (Internal Antenna) AP12E-US (External Antenna)
Outside of United States	AP12-WW (Internal Antenna) AP12E-WW (External Antenna)

* Juniper products are manufactured in accordance with electrical and environmental regulations specific to certain regions and countries. Customers are responsible for ensuring that any regional or country-specific SKUs are only used in the specified authorized area. Failure to do so may void the warranty of the Juniper products.

I/O and Indicators

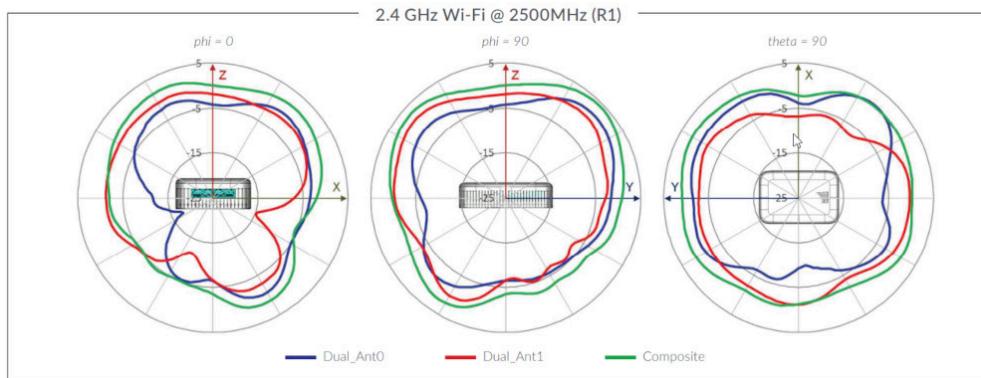
Eth0	10/100/1000Base-T, RJ45; PoE PD
Eth1	10/100/1000Base-T; RJ45 PoE Out class 2 (requires .3at power)
Eth2-3	10/100/1000BaseT, RJ45

AP12 2.4 GHz Wi-Fi Antenna Plots

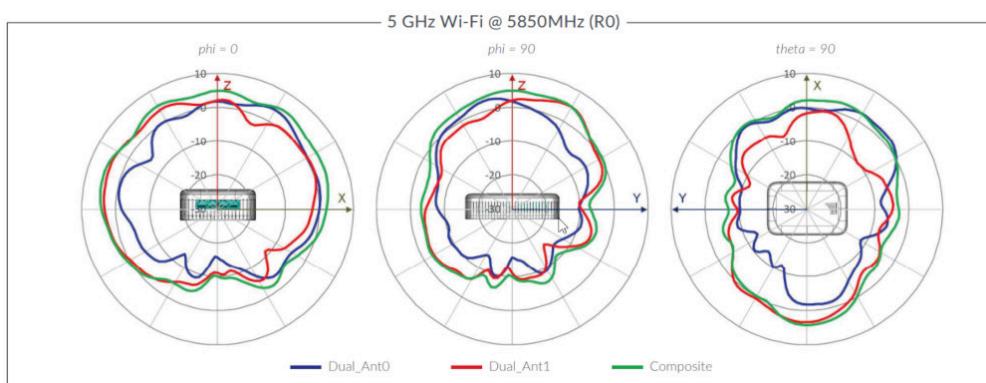
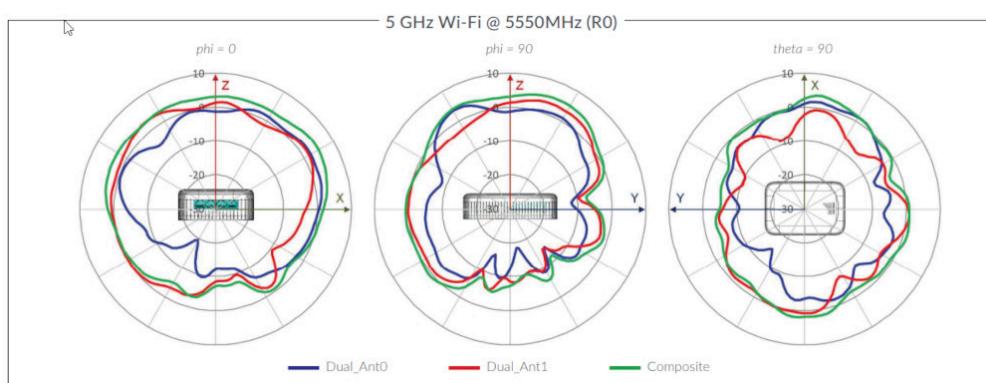
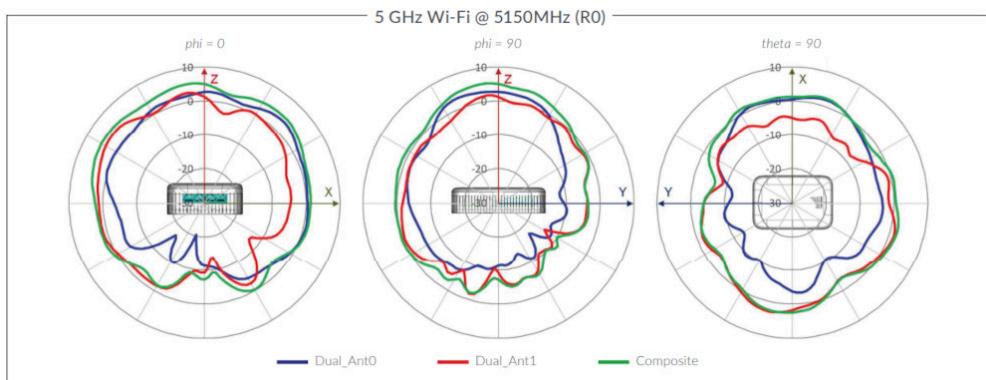


Mounting Brackets

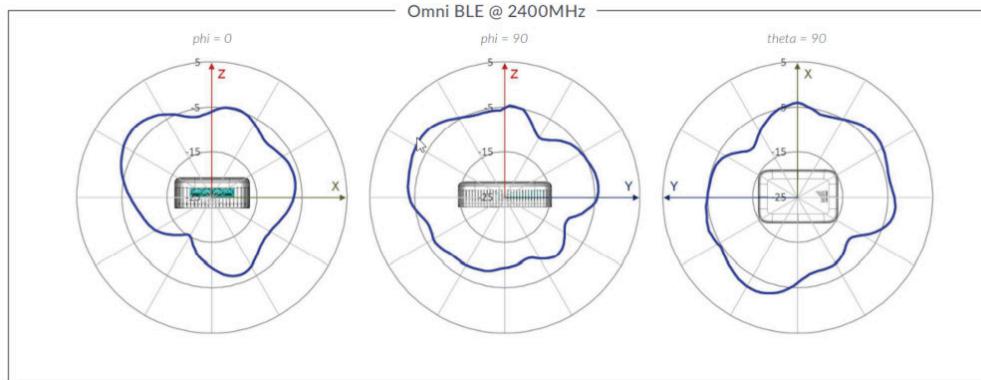
APBR-WP1	Wall plate bracket for AP12
APBR-DS1	Desktop Stand for small form factor AP
APWP-KIT	Wallplate DeskStand (APBR-DS1) with wall pluggable 802.3af POE injector



AP12 5 GHz Wi-Fi Antenna Plots



AP12 2.4 GHz Omni BLE Antenna Plots



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.

Corporate and Sales Headquarters

Juniper Networks, Inc.

1133 Innovation Way

Sunnyvale, CA 94089 USA

Phone: 888.JUNIPER (888.586.4737)

or +1.408.745.2000

www.juniper.net

APAC and EMEA Headquarters

Juniper Networks International B.V.

Boeing Avenue 240 1119 PZ Schiphol-Rijk

Amsterdam, The Netherlands

Phone: +31.207.125.700



[Solicitar información](#)

Características principales

- Memoria RAM: 32 GB
- Tipo de memoria interna: DDR5-SDRAM
- Sistema Operativo Instalado: Windows 11 Pro
- Tarjeta de Video: NVIDIA RTX A2000
- Procesador: Intel Core i9

Más Información

Fabricante: Lenovo

Especificaciones técnicas

Procesador	
Modelo del procesador	i9-13900
Circuito integrado de tarjeta madre	Intel W680
Número de procesadores instalados	1
Fabricante de procesador	Intel
Procesador	Intel Core i9
Número de núcleos de procesador	24
Número de filamentos de procesador	32
Frecuencia Turbo (max)	5.6 GHz
Caché del procesador	36 MB
Tipo de cache en procesador	Smart Cache
Núcleos eficientes	16
Núcleos de rendimiento	8
Potencia base del procesador	65 W
Maximum turbo power	219 W
Frecuencia base del núcleo eficiente	1.5 GHz
Frecuencia base del núcleo de rendimiento	2 GHz
Turbo frecuencia máxima del núcleo de eficiencia	4.2 GHz
Turbo frecuencia máxima del núcleo de rendimiento	5.2 GHz
Memoria	
Tipo de memoria interna	DDR5-SDRAM
Ranuras de memoria	4x SO-DIMM
Memoria interna máxima	128 GB
Velocidad de memoria del reloj	4800 MHz
No ECC	
Memoria RAM	32 GB
Soporte de canales de memoria	Doble canal
Disposición de la memoria	1 x 32 GB
Gráficos discretos memoria del adaptado	12 GB
Impulsión óptica	
Tipo de unidad óptica	
Audio	
Audio chip	Realtek ALC897-Q

Puertos e Interfaces

Cantidad de DisplayPorts	3
Combo de salida de auriculares / micrófono del puerto	
Versión de DisplayPort	1.2

Peso y dimensiones

Peso	3.6 kg
Altura	202 mm
Ancho	87 mm
Profundidad	223 mm
Volumen	3.9 L

Control de energía

Fuente de alimentación	230 W
Fuente de alimentación, voltaje de entrada	100 - 240 V

Condiciones ambientales

Altitud de funcionamiento	0 - 3048 m
Intervalo de humedad relativa para funcionamiento	20 - 80%
Intervalo de temperatura de almacenaje	-40 - 60 °C
Intervalo de temperatura operativa	10 - 35 °C
Intervalo de humedad relativa durante almacenaje	10 - 90%
Altitud no operativa	0 - 12192 m

Red

Wi-Fi estándares	Wi-Fi 6E (802.11ax)
Versión de Bluetooth	5.1

Wi-Fi

Bluetooth

WLAN controller manufacturer	Intel
------------------------------	-------

Medios de almacenaje

Unidad de Almacenamiento	SSD
Tarjeta de lectura integrada	
Número de unidades SSD instalados	1
Capacidad Total SSD	1000 GB

Altavoces

Número de parlantes	1
---------------------	---

Panel trasero Puertos de I/O (Input/Output)

USB 3.1 (3.1 Gen 2) Type-A ports quantity	5
---	---

Seguridad

Protección con contraseña	BIOS, Encendido, Supervisor
Tipo de ranura de bloqueo del cable	Kensington
Protección mediante contraseña	

Sistema operativo/software

Sistema Operativo Instalado	Windows 11 Pro
Arquitectura del sistema operativo	64-bit
Idioma del sistema operativo	Español

Características de LAN inalámbrico

Wi-Fi standard	Wi-Fi 6E (802.11ax)
----------------	---------------------

Ergonomía

Ranura para cable de seguridad	
--------------------------------	--

Antena

Tipo de antena	2x2
----------------	-----

BIOS

Tipos de BIOS

UEFI

Otras características

WLAN controller model

Intel Wi-Fi 6E AX211

Diseño

Certificación

EPEAT Gold Registered
ENERGY STAR 8.0
TCO Certified 9.0
RoHS compliant
MIL-STD-810H

Colocación soportada

Horizontal/Vertical

SSD form factor

M.2

Color del producto

Negro

Gráficos

Tarjeta de Video

NVIDIA RTX A2000

Modelo de gráficos en tarjeta

Intel UHD Graphics 770

Tipo de memoria de gráficos discretos

GDDR6

Adaptador gráfico en tablero

Cantidad de puertos del adaptador gráfico Mini DisplayPort

4

Discrete graphics adapter

On-board graphics adapter family

Intel® UHD Graphics

Desempeño

Módulo de plataforma confiable (TPM)

Interfaces de disco de estado sólido

PCI Express 4.0

Disco de estado sólido, capacidad

1 TB

Tipo de producto

Estación de trabajo

Compatible con NVM Express (NVMe)

Multimedia

Altavoces incorporados

Calidad de la ficha técnica: Creada/Estandarizada por Iecat**Opiniones de clientes**

Todavía no hay opiniones para este producto. Sé el primero en dejar una.

[Escribir mi opinión](#)**Los Productos que le han Interesado**Para descripciones, capacidades, especificaciones y compatibilidades completas, **verifique el sitio del fabricante basándose en el modelo elegido.**[Términos y condiciones](#)



**COMPUTADORA
GEN. 8GB**
\$230.00

Mini computador HP de RAM,y 500 GB HD

1

CATEGORÍA: Computadoras



DESCRIPCIÓN

VALORACIONES (0)

ESTADO: USADO, casi como nueva: 9/10.

INCLUYE:

- MINI PC HP i5 de 4ta GENERACIÓN CON 8GB RAM, 500 GB HD
- CON WINDOWS 10 Y PROGRAMAS COMPLEMENTARIOS
- ADAPATADOR DE CORRIENTE DEL MINI PC.
- INCLUYE ENVIO A TODO EL ECUADOR.





IPC322LB-SF28(40)-A

2MP Vandal-resistant Network IR Fixed Dome Camera

- High quality image with 2MP, 1/2.8"CMOS sensor
- **2MP (1920*1080)@30/25fps; 720P (1280*720)@30/25fps**
- Ultra 265, H.265, H.264
- Smart IR, up to 30m (98ft) IR distance
- Day/night functionality
- 2D/3D DNR (Digital Noise Reduction)
- **IP67 protection**
- IK10 vandal resistant
- Support PoE power supply
- 2-Axis



[المواصفات](#) [الملحقات](#) [تنزيل](#)

	IPC322LB-SF28-A		IPC322LB-SF40-A			
Camera						
Sensor	1/2.8", progressive scan, 2.0 megapixel, CMOS					
Lens	2.8mm@F2.0		4.0mm@F2.0			
DORI Distance	Lens (mm)	Detect (m)	Observe (m)	Recognize (m)		
	2.8	43.4	17.4	8.7		
	4.0	62.1	24.8	12.4		
Angle of View (H)	106.7°		87.5°			
Angle of View (V)	57.1°		46.3°			
Adjustment angle	Pan: 3° ~ 360°		Tilt: 0° ~ 75°			
Shutter	Auto/Manual, 1 ~ 1/100000s					
Minimum illumination	Colour: 0.01Lux (F2.0, AGC ON) 0Lux with IR					
Day/Night	IR-cut filter with auto switch (ICR)					
Digital noise reduction	2D/3D DNR					
S/N	>52dB					
IR Range	Up to 30m (98ft) IR range					
Wavelength	850nm					
IR On/Off Control	Auto/Manual					

WDR	DWDR
Video	
Video Compression	Ultra 265, H.265, H.264
H.264 code profile	Baseline profile, Main profile, High profile
Frame Rate	Main Stream: 1080P (1920*1080), Max 30fps; 720P (1280*720), Max 30fps Sub Stream: D1 (720*576), Max 30fps; 640*360, Max 30fps; 2CIF(704*288), Max 30fps; CIF(352*288), Max 30fps;
Video Bit Rate	128 Kbps~16 Mbps
OSD	Up to 4 OSDs
Privacy Mask	Up to 4 areas
ROI	Up to 8 areas
Motion Detection	Up to 4 areas
Image	
White Balance	Auto/Outdoor/Fine Tune/Sodium Lamp/Locked/Auto2
Digital noise reduction	2D/3D DNR
Smart IR	Supported
Flip	Normal/Vertical/Horizontal/180°
Dewarping	N/A
HLC	Supported
BLC	Supported
Network	
Protocols	IPv4, IGMP, ICMP, TCP, UDP, DHCP, RTP, RTSP, RTCP, DNS, DDNS, NTP, UPnP, HTTP
Compatible Integration	API
Client	EZStation EZView EZLive
Web Browser	Plug-in free live view: Chrome 57.0+, Firefox 58.0+, Edge 16+
Interface	
Network	10/100M Base-TX Ethernet
Certifications	
Certifications	CE: EN 60950-1 UL: UL60950-1 FCC: FCC Part 15
General	
Power	DC 12V±25%, PoE (IEEE 802.3af)
	Power consumption: Max 5.0W

Material	Metal + Plastic
Working Environment	-30°C ~ 60°C (22°F ~ 140°F), Humidity: ≤95% RH (non-condensing)
Storage Environment	-30°C ~ 60°C (22°F ~ 140°F), Humidity: ≤95% RH (non-condensing)
Surge Protection	4kV
Ingress Protection	IP67
Vandal Resistant	IK10
Reset Button	N/A

Want to learn more?

 Contact sales

المنتجات ذات الصلة

روابط سريعة

غرفة الأخبار

شركتنا

Subscriber

 Subscriber النشرة الإخبارية



Copyright 2011-2024 Zhejiang Uniview Technologies Co.,Ltd. All rights reserved.

شعار رسمي سياسة الخصوصية سياسة ملفات تعريف الارتباط الإشعارات القانونية لشركة Uniview