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List View

- General Information**
- Contact
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- Discount
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- Clarification Request

Procurement Folder: 1083808

Procurement Type: Central Purchase Order

Vendor ID:

Legal Name: SUN MANAGEMENT INC

Alias/DBA:

Total Bid: \$94,555.00

Response Date:

Response Time:

Responded By User ID:

First Name:

Last Name:

Email:

Phone:

SO Doc Code: CRFQ

SO Dept: 0932

SO Doc ID: DRS2300000008

Published Date: 9/13/22

Close Date: 9/15/22

Close Time: 13:30

Status: Closed

Solicitation Description:

Total of Header Attachments: 2

Total of All Attachments: 2



Department of Administration
 Purchasing Division
 2019 Washington Street East
 Post Office Box 50130
 Charleston, WV 25305-0130

**State of West Virginia
 Solicitation Response**

Proc Folder: 1083808		
Solicitation Description: Addendum No. 2 Network Switches and Related Equipment		
Proc Type: Central Purchase Order		
Solicitation Closes	Solicitation Response	Version
2022-09-15 13:30	SR 0932 ESR09122200000001291	1

VENDOR
000000180526 SUN MANAGEMENT INC

Solicitation Number: CRFQ 0932 DRS2300000008

Total Bid: 94555

Response Date: 2022-09-12

Response Time: 14:46:42

Comments:

FOR INFORMATION CONTACT THE BUYER

Toby L Welch
 (304) 558-8802
 toby.l.welch@wv.gov

Vendor Signature X	FEIN#	DATE
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All offers subject to all terms and conditions contained in this solicitation

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
1	48 PORT POE SWITCH, EXTREME NETWORKS, OR EQUAL	12.00000	EA	2935.000000	35220.00

Comm Code	Manufacturer	Specification	Model #
43221700			

Commodity Line Comments: Juniper # EX4100-48P

Extended Description:

MODEL 5320-48P-8XE
X440-G2 X440-G248p-10GE

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
2	24 PORT POE SWITCH, EXTREME NETWORKS, OR EQUAL	15.00000	EA	1840.000000	27600.00

Comm Code	Manufacturer	Specification	Model #
43221700			

Commodity Line Comments: Juniper # EX4100-24P

Extended Description:

MODEL 5320-24P-8XE
X440-G2 X440-G224p-10GE

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
3	1000BSX MINI-GBIC TRANCEIVER , EXTREME NETWORKS,OR EQUAL	30.00000	EA	56.000000	1680.00

Comm Code	Manufacturer	Specification	Model #
43221700			

Commodity Line Comments: Juniper # SFP-1G-SX-C

Extended Description:

MODEL 10051H
1Gps - 10051H

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
4	STANDARD POWER CORD, EXTREME NETWORKS,OR EQUAL	27.00000	EA	0.000000	0.00

Comm Code	Manufacturer	Specification	Model #
43221700			

Commodity Line Comments: included.

Extended Description:

5320 SERIES SWITCHES
13A-5601313-U1

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
5	ISR 4331, CISCO,OR EQUAL	1.00000	EA	1085.000000	1085.00

Comm Code	Manufacturer	Specification	Model #
43221700			

Commodity Line Comments: SRX340-SYS-JB

Extended Description:

3GE,2NIM, 1SM,4G FLASH, 4G DRAM,IPB ISR4331/K9
MIN 0.5, or equal

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
6	ROUTER ISR 4331, CISCO OR EQUAL	1.00000	EA	0.000000	0.00

Comm Code	Manufacturer	Specification	Model #
43221700			

Commodity Line Comments: Juniper # S-SD-1-C-1

Extended Description:

3GE2NIM1SM4G FLASH 4G D CON-SSSNT-ISR4331K

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
7	ISR4331, SOLNSUPP 8X5XNBD or EQUAL	1.00000	EA	230.000000	230.00

Comm Code	Manufacturer	Specification	Model #
43221700			

Commodity Line Comments: Juniper # SVC-ND-SRX340JB

Extended Description:

13A-5601313-U1

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
8	ISR4321, 2GE,2NIM.4G FLASH 4G DRAM, IPB CISCO OR EQUAL	10.00000	EA	1095.000000	10950.00

Comm Code	Manufacturer	Specification	Model #
43221700			

Commodity Line Comments: Juniper # SRX340-SYS-JB

Extended Description:

250084-00 0.5M

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
9	SOLNSUPP 8X5XNBD, CISCO,OR EQUAL	10.00000	EA	228.000000	2280.00

Comm Code	Manufacturer	Specification	Model #
43221700			

Commodity Line Comments: Juniper # SVC-ND-SRX340JB

Extended Description:

ISR4321 2GE2NIM4G FLASH4G D CON-SSSNT-ISR4321K

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
10	ISR 1101 4 PORTS ETHERNET WAN ROUTER - OR EQUAL	10.00000	EA	1095.000000	10950.00

Comm Code	Manufacturer	Specification	Model #
43221700			

Commodity Line Comments: Juniper # SRX340-SYS-JB

Extended Description:

ISR 1101 4 PORTS ETHERNET WAN ROUTER - OR EQUAL

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
11	SOLNSUPP 8X5XNBD ISR 1101 4 PORTS ETHERNET WAN ROUTER, OR E	10.00000	EA	228.000000	2280.00

Comm Code	Manufacturer	Specification	Model #
43221700			

Commodity Line Comments: Juniper # SVC-ND-SRX340JB

Extended Description:

CON-SSSNT-CISR1K4P

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
12	IP BASE LICENSE FOR CISCO ISR 1100 4P SERIES-SL-110-4P-IPB,	10.00000	EA	228.000000	2280.00

Comm Code	Manufacturer	Specification	Model #
81112218			

Commodity Line Comments: Juniper # SVC-ND-SRX340JB

Extended Description:

OR EQUAL

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
13	1109 M2M POWER SUPPLY ITEMP, OR EQUAL	10.00000	EA	0.000000	0.00

Comm Code	Manufacturer	Specification	Model #
43221700			

Commodity Line Comments: Included in above

Extended Description:

1109 M2M POWER SUPPLY ITEMP, OR EQUAL

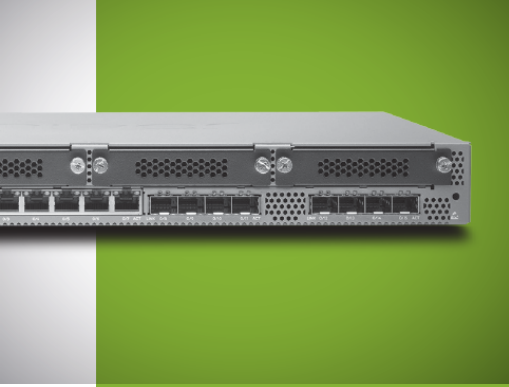
Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
14	SECURITY LICENSE FOR CISCO, OR EQUAL, ISR 1100 4P SERIES	10.00000	EA	0.000000	0.00

Comm Code	Manufacturer	Specification	Model #
81111801			

Commodity Line Comments: included in above

Extended Description:

SL-110-4PC-SEC



SRX300 LINE OF SERVICES GATEWAYS FOR THE BRANCH DATASHEET

Product Overview

The SRX300 line of services gateways combines security, SD-WAN, routing, switching, and WAN interfaces with next-generation firewall and advanced threat mitigation capabilities for cost-effective, secure connectivity across distributed enterprise locations. By consolidating fast, highly available switching, routing, security, and next-generation firewall capabilities in a single device, enterprises can remove network complexity, protect and prioritize their resources, and improve user and application experience while lowering total cost of ownership (TCO).

Product Description

Juniper Networks® SRX300 line of services gateways delivers a next-generation secure SD-WAN and security solution that supports the changing needs of cloud-enabled enterprise networks. Whether rolling out new services and applications across locations, connecting to the cloud, or trying to achieve operational efficiency, the SRX300 line helps organizations realize their business objectives while providing scalable, easy to manage, secure connectivity and advanced threat mitigation capabilities. Next-generation firewall and unified threat management (UTM) capabilities also make it easier to detect and proactively mitigate threats to improve the user and application experience.

The SRX300 line consists of five models:

- **SRX300:** Securing small branch or retail offices, the SRX300 Services Gateway consolidates security, routing, switching, and WAN connectivity in a small desktop device. The SRX300 supports up to 1.9 Gbps firewall and 336 Mbps IPsec VPN in a single, cost-effective networking and security platform.
- **SRX320:** Securely connecting small distributed enterprise branch offices, the SRX320 Services Gateway consolidates security, routing, switching, and WAN connectivity in a small desktop device. The SRX320 supports up to 1.9 Gbps firewall and 336 Mbps IPsec VPN in a single, consolidated, cost-effective networking and security platform.
- **SRX340:** Securely connecting midsize distributed enterprise branch offices, the SRX340 Services Gateway consolidates security, routing, switching, and WAN connectivity in a 1 U form factor. The SRX340 supports up to 4.7 Gbps firewall and 733 Mbps IPsec VPN in a single, cost-effective networking and security platform.
- **SRX345:** Best suited for midsize to large distributed enterprise branch offices, the SRX345 Services Gateway consolidates security, routing, switching, and WAN connectivity in a 1 U form factor. The SRX345 supports up to 5 Gbps firewall and 977 Mbps IPsec VPN in a single, consolidated, cost-effective networking and security platform.
- **SRX380:** A high-performance and secure SD-WAN gateway, the SRX380 offers superior and reliable WAN connectivity while consolidating security, routing, and switching for distributed enterprise offices. The SRX380 features greater port density than other SRX300 models, with 16x1GbE PoE+ and 4x10GbE ports, and includes redundant dual power supplies, all in a 1 U form factor. The SRX380 supports up to 20Gbps firewall and 4.4 Gbps IPsec VPN in a single, consolidated, cost-effective networking and security platform.

SRX300 Highlights

The SRX300 line of services gateways consists of secure SD-WAN routers that bring high performance and proven deployment capabilities to enterprises that need to build a worldwide network of thousands of remote sites. WAN or Internet connectivity and Wi-Fi module options include:

- Ethernet, T1/E1, ADSL2/2+, and VDSL
- 3G/4G LTE wireless
- 802.11ac Wave 2 Wi-Fi

Mist AI

WAN Assurance

Mist WAN Assurance is a cloud service that brings AI-powered automation and service levels to Juniper SRX Series Services Gateways, complementing the Juniper Secure SD-WAN solution. Mist WAN Assurance transforms IT operations from reactive troubleshooting to proactive remediation, turning insights into actions and delivering operational simplicity with seamless integration into existing deployments.

- SRX Series firewalls, deployed as secure SD-WAN edge devices, deliver the rich Junos streaming telemetry that provides the insights needed for WAN health metrics and anomaly detection. This data is leveraged within the Mist Cloud and AI engine, driving simpler operations, reducing mean time to repair (MTTR) and providing greater visibility into end-user experiences.
- Insights derived from SRX Series SD-WAN gateway telemetry data allows WAN Assurance to compute unique “User Minutes” that indicate whether users are having a good experience.
- The Marvis assistant for WAN allows you to ask direct questions like “Why is my Zoom call bad?” and provides complete insights, correlation, and actions.
- Marvis Actions identifies and summarizes issues such as application latency conditions, congested WAN circuits, or negotiation mismatches.

Simplifying Branch Deployments (Secure Connectivity/SD-WAN)

The SRX300 line delivers fully automated SD-WAN to both enterprises and service providers.

- A Zero-Touch Provisioning (ZTP) feature simplifies branch network connectivity for initial deployment and ongoing management.
- SRX300 firewalls offer best-in-class secure connectivity.
- The SRX300 firewalls efficiently utilize multiple links and load balance traffic across the enterprise WAN, blending traditional MPLS with other connectivity options such as broadband internet, leased lines, 4G/LTE, and more.
- Policy- and application-based forwarding capabilities enforce business rules created by the enterprise to steer application traffic towards a preferred path.

Comprehensive Security Suite

The SRX300 line offers a comprehensive suite of application security services, threat defenses, and intelligence services. The services consist of intrusion prevention system (IPS), application security user role-based firewall controls and cloud-based antivirus, anti-spam, and enhanced Web filtering, protecting networks from the latest content-borne threats. Integrated threat intelligence via Juniper Networks SecIntel offers adaptive threat protection against Command and Control (C&C)-related botnets and policy enforcement based on GeolIP. Customers can also leverage their own custom and third-party feeds for protection from advanced malware and other threats. Integrating the Juniper Networks Advanced Threat Protection solution, the SRX300 line detects and enforces automated protection against known malware and zero-day threats with a very high degree of accuracy.

Industry-Certified Junos Operating System

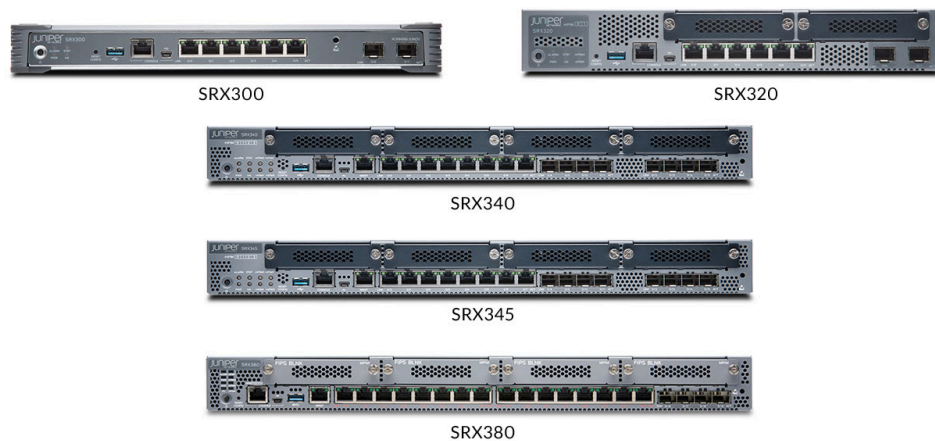
SRX300 Services Gateways run the Junos operating system, a proven, carrier-hardened OS that powers the top 100 service provider networks in the world.

The rigorously tested, carrier-class, rich routing features such as IPv4/IPv6, OSPF, BGP, and multicast have been proven over 15 years of worldwide deployments.

The SRX300 line also enables agile SecOps through automation capabilities that support Zero Touch Deployment, Python scripts for orchestration, and event scripting for operational management.

Features and Benefits

Business Requirement	Feature/Solution	SRX300 Advantages
High performance	Up to 20 Gbps of routing and firewall performance	<ul style="list-style-type: none"> Best suited for small, medium and large branch office deployments Addresses future needs for scale and feature capacity
Business continuity	Stateful high availability (HA), IP monitoring	<ul style="list-style-type: none"> Uses stateful HA to synchronize configuration and firewall sessions Supports multiple WAN interface with dial-on-demand backup Route/link failover based on real-time link performance
SD-WAN	Better end-user application and cloud experience and lower operational costs	<ul style="list-style-type: none"> ZTP simplifies remote device provisioning Advanced Policy-Based Routing (APBR) orchestrates business intent policies across the enterprise WAN Application quality of experience (AppQoE) measures application SLAs and improves end-user experience Controls and prioritizes traffic based on application and user role
End-user experience	WAN assurance	<ul style="list-style-type: none"> Complements the Juniper Secure SD-WAN solution with AI-powered automation and service levels Provides visibility and insights into users, applications, WAN links, control and data plane, and CPU for proactive remediation
Highly secure	IPsec VPN, Remote Access/SSL VPN, Media Access Control Security (MACsec)	<ul style="list-style-type: none"> Creates secure, reliable, and fast overlay link over public internet Employs anti-counterfeit features to protect from unauthorized hardware spares Includes high-performance CPU with built-in hardware to assist IPsec acceleration Provides TPM-based protection of device secrets such as passwords and certificates Offers secure and flexible remote access SSL VPN with Juniper Secure Connect
Threat protection	IPS, antivirus, anti-spam, enhanced web filtering, Juniper Advanced Threat Prevention Cloud, Encrypted Traffic Insights, and Threat Intelligence Feeds	<ul style="list-style-type: none"> Provides real-time updates to IPS signatures and protects against exploits Protects from zero-day attacks Implements industry-leading antivirus and URL filtering Integrates open threat intelligence platform with third-party feeds Restores visibility that was lost due to encryption without the heavy burden of full TLS/SSL decryption
Application visibility	On-box GUI, Security Director	<ul style="list-style-type: none"> Detects 4,275 Layer 3-7 applications, including Web 2.0 Inspects and detects applications inside the SSL encrypted traffic
Easy to manage and scale	On-box GUI, Security Director	<ul style="list-style-type: none"> Includes centralized management for auto-provisioning, firewall policy management, Network Address Translation (NAT), and IPsec VPN deployments, or simple, easy-to-use on-box GUI for local management
Minimize TCO	Junos OS	<ul style="list-style-type: none"> Integrates routing, switching, and security in a single device Reduces operation expense with Junos automation capabilities



SRX300 Specifications

Software Specifications

Routing Protocols

- IPv4, IPv6, ISO, Connectionless Network Service (CLNS)
- Static routes
- RIP v1/v2
- OSPF/OSPF v3
- BGP with Route Reflector
- IS-IS
- Multicast: Internet Group Management Protocol (IGMP) v1/v2, Protocol Independent Multicast (PIM) sparse mode (SM)/dense mode (DM)/source-specific multicast (SSM), Session Description Protocol (SDP), Distance Vector Multicast Routing Protocol (DVMRP), Multicast Source Discovery Protocol (MSDP), Reverse Path Forwarding (RPF)
- Encapsulation: VLAN, Point-to-Point Protocol (PPP), Frame Relay, High-Level Data Link Control (HDLC), serial, Multilink Point-to-Point Protocol (MLPPP), Multilink Frame Relay (MLFR), and Point-to-Point Protocol over Ethernet (PPPoE)
- Virtual routers
- Policy-based routing, source-based routing
- Equal-cost multipath (ECMP)

QoS Features

- Support for 802.1p, DiffServ code point (DSCP), EXP
- Classification based on VLAN, data-link connection identifier (DLCI), interface, bundles, or multifield filters
- Marking, policing, and shaping
- Classification and scheduling
- Weighted random early detection (WRED)
- Guaranteed and maximum bandwidth
- Ingress traffic policing
- Virtual channels
- Hierarchical shaping and policing

Switching Features

- ASIC-based Layer 2 Forwarding
- MAC address learning
- VLAN addressing and integrated routing and bridging (IRB) support
- Link aggregation and LACP
- LLDP and LLDP-MED
- STP, RSTP, MSTP
- MVRP
- 802.1X authentication

Firewall Services

- Stateful and stateless firewall
- Zone-based firewall
- Screens and distributed denial of service (DDoS) protection
- Protection from protocol and traffic anomaly
- Integration with Pulse Unified Access Control (UAC)
- Integration with Aruba Clear Pass Policy Manager
- User role-based firewall
- SSL Inspection (Forward-proxy)

Network Address Translation (NAT)

- Source NAT with Port Address Translation (PAT)
- Bidirectional 1:1 static NAT
- Destination NAT with PAT
- Persistent NAT
- IPv6 address translation

VPN Features

- Tunnels: Site-to-Site, Hub and Spoke, Dynamic Endpoint, AutoVPN, ADVPN, Group VPN (IPv4/ IPv6/ Dual Stack)
- Juniper Secure Connect: Remote access / SSL VPN
- Configuration payload: Yes
- IKE Encryption algorithms: Prime, DES-CBC, 3DES-CBC, AEC-CBC, AES-GCM, SuiteB
- IKE authentication algorithms: MD5, SHA-1, SHA-128, SHA-256, SHA-384
- Authentication: Pre-shared key and public key infrastructure (PKI) (X.509)
- IPsec (Internet Protocol Security): Authentication Header (AH) / Encapsulating Security Payload (ESP) protocol
- IPsec Authentication Algorithms: hmac-md5, hmac-sha-196, hmac-sha-256
- IPsec Encryption Algorithms: Prime, DES-CBC, 3DES-CBC, AEC-CBC, AES-GCM, SuiteB
- Perfect forward secrecy, anti-reply
- Internet Key Exchange: IKEv1, IKEv2
- Monitoring: Standard-based dead peer detection (DPD) support, VPN monitoring
- VPNs GRE, IP-in-IP, and MPLS

Network Services

- Dynamic Host Configuration Protocol (DHCP) client/server/relay
- Domain Name System (DNS) proxy, dynamic DNS (DDNS)
- Juniper real-time performance monitoring (RPM) and IP-monitoring
- Juniper flow monitoring (J-Flow)¹
- Bidirectional Forwarding Detection (BFD)
- Two-Way Active Measurement Protocol (TWAMP)
- IEEE 802.3ah Link Fault Management (LFM)
- IEEE 802.1ag Connectivity Fault Management (CFM)

High Availability Features

- Virtual Router Redundancy Protocol (VRRP)
- Stateful high availability
- Dual box clustering
- Active/passive
- Active/active
- Configuration synchronization
- Firewall session synchronization
- Device/link detection
- In-Band Cluster Upgrade (ICU)
- Dial on-demand backup interfaces
- IP monitoring with route and interface failover

Management, Automation, Logging, and Reporting

- SSH, Telnet, SNMP
- Smart image download
- Juniper CLI and Web UI
- Mist AI
 - Simplified management
 - WAN Assurance
- Junos Space and Security Director
- Python
- Junos OS event, commit, and OP script
- Application and bandwidth usage reporting
- Auto installation
- Debug and troubleshooting tools
- Zero-Touch Provisioning with Contrail Service Orchestration

Advanced Routing Services

- Packet mode
- MPLS (RSVP, LDP)
- Circuit cross-connect (CCC), translational cross-connect (TCC)
- L2/L3 MPLS VPN, pseudowires
- Virtual private LAN service (VPLS), next-generation multicast VPN (NG-MVPN)
- MPLS traffic engineering and MPLS fast reroute

Application Security Services¹

- Application visibility and control
- Application-based firewall
- Application QoS
- Application-based advanced policy-based routing
- Application quality of experience (AppQoE)

Enhanced SD-WAN Services

- Application-based advanced policy-based routing (APBR)
- Application-based link monitoring and switchover with Application quality of experience (AppQoE)

Threat Defense and Intelligence Services¹

- Intrusion prevention
- Antivirus
- Antispam
- Category/reputation-based URL filtering
- Protection from botnets (command and control)
- Adaptive enforcement based on GeoIP
- Juniper Advanced Threat Prevention to detect and block zero-day attacks
- Adaptive Threat Profiling
- Encrypted Traffic Insights
- SecIntel to provide threat intelligence

¹Offered as advanced security services subscription licenses.

Hardware Specifications

Specification	SRX300	SRX320	SRX340	SRX345	SRX380
Connectivity					
Total onboard ports	8x1GbE	8x1GbE	16x1GbE	16x1GbE	20 (16x1GbE, 4x10GbE)
Onboard RJ-45 ports	6x1GbE	6x1GbE	8x1GbE	8x1GbE	16x1GbE
Onboard small form-factor pluggable (SFP) transceiver ports	2x1GbE	2x1GbE	8x1GbE	8x1GbE	4x10GbE SFP+
MACsec-capable ports	2x1GbE	2x1GbE	16x1GbE	16x1GbE	16x1GbE 4x10GbE
Out-of-band (OOB) management ports	0	0	1x1GbE	1x1GbE	1x1GbE
Mini PIM (WAN) slots	0	2	4	4	4
Console (RJ-45 + miniUSB)	1	1	1	1	1
USB 3.0 ports (type A)	1	1	1	1	1
PoE+ ports	N/A	6 ²	0	0	16
Memory and Storage					
System memory (RAM)	4 GB	4 GB	4 GB	4 GB	4GB
Storage	8 GB	8 GB	8 GB	8 GB	100GB SSD
SSD slots	0	0	1	1	1
Dimensions and Power					
Form factor	Desktop	Desktop	1 U	1 U	1U
Size (WxHxD)	12.63 x 1.37 x 7.52 in. (32.08 x 3.47 x 19.10 cm)	11.81 x 1.73 x 7.52 in. (29.99 x 4.39 x 19.10 cm)	17.36 x 1.72 x 14.57 in. (44.09 x 4.36 x 37.01 cm)	17.36 x 1.72 x 14.57 in. (44.09 x 4.36 x 37.01 cm) / 17.36 x 1.72 x 18.7 in. (44.09 x 4.36 x 47.5 cm) ³	17.36 x 1.72 x 18.7 in. (44.09 x 4.37 x 47.5 cm) / 17.36 x 1.72 x 20.47 in. (44.09 x 4.37 x 52 cm)
Weight (device and PSU)	4.38 lb (1.98 kg)	3.28 lb (1.51 kg) ⁴ / 3.4 lb (1.55 kg) ⁵	10.80 lb (4.90 kg)	10.80 lb (4.90 kg) / 11.02 lb (5 kg) ⁵	15 lb (6.8 kg) with 1xPSU / 16.76 lb (7.6 kg) with 2xPSU
Redundant PSU	No	No	No	Yes	Yes
Power supply	AC (external)	AC (external)	AC (internal)	AC (internal) / DC (internal) ⁶	1+1 hot-swappable AC PSU
Rated DC voltage range	N/A	N/A	N/A	-48 to -60 VDC (with -15% and +20% tolerance)	NA
Rated DC operating voltage range	N/A	N/A	N/A	-40.8 VDC to -72 VDC ⁶	N/A
Maximum PoE power	N/A	180 W ⁵	N/A	N/A	480W
Average power consumption	24.9 W	46 W ⁴ /221 W ⁵	122 W	122 W	150 W (without PoE) 510 W (with PoE)
Average heat dissipation	85 BTU/h	157 BTU/h ⁴ /755 BTU/h ⁵	420 BTU/h	420 BTU/h	511.5 BTU/hr (without PoE)
Maximum current consumption	0.346 A	0.634 A ⁴ /2.755 A ⁵	1.496 A	1.496 A / 6A @ -48 VDC ⁶	1.79A/7.32A
Acoustic noise level	0dB (fanless)	37 dBA ⁴ /40 dBA ⁵	45.5 dBA	45.5 dBA	< 50dBA @ room temperature 27C
Airflow/cooling	Fanless	Front to back	Front to back	Front to back	Front to back
Environmental, Compliance, and Safety Certification					
Operational temperature	-4° to 140° F (-20° to 60° C) ⁷	32° to 104° F (0° to 40° C)	32° to 104° F (0° to 40° C)	32° to 104° F (0° to 40° C) -22° to 131° F (-30° to 55° C) for SRX345-DC	32° to 104° F (0° to 40° C) with MPIMs 32° to 122° F (0° to 50° C) without MPIMs
Nonoperational temperature	-4° to 158° F (-20° to 70° C)	-4° to 158° F (-20° to 70° C)	-4° to 158° F (-20° to 70° C)	-4° to 158° F (-20° to 70° C) -22° to 158° F (-30° to 70° C) for SRX345-DC	-4° to 158° F (-20° to 70° C)
Operating humidity	10% to 90% noncondensing	10% to 90% noncondensing	10% to 90% noncondensing	10% to 90% noncondensing	10% to 90% noncondensing
Nonoperating humidity	5% to 95% noncondensing	5% to 95% noncondensing	5% to 95% noncondensing	5% to 95% noncondensing	5% to 95% noncondensing
Mean time between failures (MTBF)	44.5 years	32.5 years ⁴ / 26 years ⁵	27 years	27.4 years	28.1 years
FCC classification	Class A	Class A	Class A	Class A	Class A
RoHS compliance	RoHS 2	RoHS 2	RoHS 2	RoHS 2	RoHS 2

Specification	SRX300	SRX320	SRX340	SRX345	SRX380
FIPS 140-2	Level 2 (Junos 15.1X49-D60)	Level 1 (Junos 15.1X49-D60)	Level 2 (Junos 15.1X49-D60)	Level 2 (Junos 15.1X49-D60)	N/A
Common Criteria certification	NDPP, VPNEP, FWEP, IPSEP (based on Junos 15.1X49-D60)	NDPP, VPNEP, FWEP, IPSEP (based on Junos 15.1X49-D60)	NDPP, VPNEP, FWEP, IPSEP (based on Junos 15.1X49-D60)	NDPP, VPNEP, FWEP, IPSEP (based on Junos 15.1X49-D60)	N/A

*SRX320 with PoE+ ports available as a separate SKU: SRX320-POE.

*SRX345 with dual AC PSU model.

*SRX320 non PoE model.

*SRX320-POE with 6 ports PoE+ model.

*SRX345 with DC power supply (operating temperature as per GR-63 Issue 4 2012 test criteria).

*As per GR63 Issue 4 (2012) test criteria.

Performance and Scale

Parameter	SRX300	SRX320	SRX340	SRX345	SRX380
Routing with packet mode (64 B packet size) in Kpps ⁸	300	300	550	750	1700
Routing with packet mode (IMIX packet size) in Mbps ⁸	800	800	1,600	2,300	5000
Routing with packet mode (1,518 B packet size) in Mbps ⁸	1,500	1,500	3,000	5,500	10,000
Stateful firewall (64 B packet size) in Kpps ⁸	200	200	350	550	1700
Stateful firewall (IMIX packet size) in Mbps ⁸	600	600	1,100	1,500	6,500
Stateful firewall (1,518 B packet size) in Mbps ⁸	1,900	1,900	4,700	5,000	20,000
IPsec VPN (IMIX packet size) in Mbps ⁸	116	116	239	325	1400
IPsec VPN (1,400 B packet size) in Mbps ⁸	336	336	733	977	4,400
Application visibility and control in Mbps ⁷	500	500	1,000	1,700	6,000
Recommended IPS in Mbps ⁷	200	200	400	600	2,000
Next-generation firewall in Mbps ¹¹	226	226	420	430	2,500
Secure Web Access firewall in Mbps ¹²	171	171	280	295	1,800
Route table size (RIB/FIB) (IPv4 or IPv6)	256,000/256,000	256,000/256,000	1 million/600,000 ¹⁰	1 million/600,000 ¹⁰	1 million/600,000 ¹⁰
Maximum concurrent sessions (IPv4 or IPv6)	64,000	64,000	256,000	375,000	380,000
Maximum security policies	1,000	1,000	2,000	4,000	4,000
Connections per second	5,000	5,000	10,000	15,000	50,000
NAT rules	1,000	1,000	2,000	2,000	3,000
MAC table size	15,000	15,000	15,000	15,000	16,000
IPsec VPN tunnels	256	256	1,024	2,048	2,048
Number of remote access/SSL VPN (concurrent) users	25	50	150	250	500
GRE tunnels	256	256	512	1,024	2,048
Maximum number of security zones	16	16	64	64	128
Maximum number of virtual routers	32	32	64	128	128
Maximum number of VLANs	1,000	1,000	2,000	3,000	3,000
AppID sessions	16,000	16,000	64,000	64,000	64,000
IPS sessions	16,000	16,000	64,000	64,000	64,000
URLF sessions	16,000	16,000	64,000	64,000	64,000

⁸Throughput numbers based on UDP packets and RFC2544 test methodology.

⁷Throughput numbers based on HTTP traffic with 44 KB transaction size.

¹⁰Route scaling numbers are with enhanced route-scale features turned on.

¹¹Next-Generation firewall performance is measured with Firewall, Application Security and IPS enabled using 64KB transactions

¹²Secure Web Access firewall performance is measured with Firewall, Application Security, IPS, SecIntel, and URL Filtering enabled using 64KB transactions

WAN and Wi-Fi Interface Support Matrix

WAN and Wi-Fi Interface	SRX300	SRX320	SRX340	SRX345	SRX380
1 port T1/E1 MPIM (SRX-MP-1T1E1-R)	No	Yes	Yes	Yes	Yes
1 port VDSL2 Annex A/M MPIM (SRX-MP-1VDSL2-R)	No	Yes	Yes	Yes	Yes
4G / LTE MPIM (SRX-MP-LTE-AA and SRX-MP-LTE-AE)	No	Yes	Yes	Yes	Yes
802.11ac Wave 2 Wi-Fi MPIM	No	Yes	Yes	Yes	Yes

WAN and Wi-Fi Interface Module Performance Data

Interface Module	Description	Performance
4G/LTE	Dual SIM 4G/LTE-A CAT 6	Up to 300 Mbps download and 50 Mbps upload
Wi-Fi MPIM	Dual band 802.11 a/b/g/n/ac Wave 2 (2x2 MIMO)	Up to 866 Mbps at 5GHz / 300 Mbps at 2.4GHz

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

To order Juniper Networks SRX Series Services Gateways, and to access software licensing information, please visit the How to Buy page at <https://www.juniper.net/us/en/how-to-buy/form.html>

	SRXnnn-SYS-JB
Hardware	Included
Management (CLI, JWEB, SNMP, Telnet, SSH)	Included
Ethernet switching (L2 Forwarding, IRB, LACP etc)	Included
L2 Transparent, Secure Wire	Included
Routing (RIP, OSPF, BGP, Virtual router)	Included
Multicast (IGMP, PIM, SSDP, DMVRP)	Included
Packet Mode	Included
Overlay (GRE, IP-IP)	Included
Network Services (J-Flow, DHCP, QOS, BFD)	Included
Stateful Firewall, Screens, ALGs	Included
NAT (static, SNAT, DNAT)	Included
IPSec VPN (Site-to-Site VPN, Auto VPN, Group VPN)	Included
Firewall policy enforcement (UAC, Aruba CPPM)	Included
Remote Access/SSL VPN (concurrent users) ¹¹	Optional
Chassis Cluster, VRRP, ISSU/ICU	Included
Automation (Junos scripting, auto-installation)	Included
MPLS, LDP, RSVP, L3 VPN, pseudo-wires, VPLS	Included

¹¹ Based on concurrent users; two free licenses included

Base System Model Numbers

Product Number	Description
SRX300-SYS-JB	SRX300 Services Gateway includes hardware (8GbE, 4G RAM, 8G Flash, power adapter and cable) and Junos Software Base (firewall, NAT, IPSec, routing, MPLS and switching). RMK not included.
SRX320-SYS-JB	SRX320 Services Gateway includes hardware (8GbE, 2x MPIM slots, 4G RAM, 8G Flash, power adapter and cable) and Junos Software Base (firewall, NAT, IPSec, routing, MPLS and switching). RMK not included.
SRX320-SYS-JB-P	SRX320 Services Gateway includes hardware (8GbE, 6-port POE+, 2x MPIM slots, 4G RAM, 8G Flash, power adapter and cable) and Junos Software Base (firewall, NAT, IPSec, routing, MPLS and switching). RMK not included.
SRX340-SYS-JB	SRX340 Services Gateway includes hardware (16GbE, 4x MPIM slots, 4G RAM, 8G Flash, power supply, cable and RMK) and Junos Software Base (firewall, NAT, IPSec, routing, MPLS and switching)
SRX345-SYS-JB	SRX345 Services Gateway includes hardware (16GbE, 4x MPIM slots, 4G RAM, 8G Flash, power supply, cable and RMK) and Junos Software Base (firewall, NAT, IPSec, routing, MPLS and switching)
SRX345-SYS-JB-2AC	SRX345 Services Gateway includes hardware (16GbE, 4x MPIM slots, 4G RAM, 8G Flash, dual AC power supply, cable and RMK) and Junos Software Base (firewall, NAT, IPSec, routing, MPLS and switching)
SRX345-SYS-JB-DC	SRX345 Services Gateway includes hardware (16GbE, 4x MPIM slots, 4G RAM, 8G Flash, single DC power supply, cable and RMK) and Junos Software Base (firewall, NAT, IPSec, routing, MPLS and switching)
SRX380-P-SYS-JB-AC	SRX380 Services Gateway includes hardware (16GbE PoE+, 4x10GbE, 4x MPIM slots, 4GB RAM, 100GB SSD, single AC power supply, cable and RMK) and Junos Software Base (firewall, NAT, IPSec, routing, MPLS and switching)

Software Licenses

Product Number	Description
S-SRXnnn-A1-1	SRXnnn Advanced 1 - JSE/SD-WAN, includes SD-WAN features App+ (AppID, AppFW, AppQoS, AppRoute, AppQoE, AppTrack) and IPS; 1-year subscription (example: S-SRX380-A1-1)
S-SRXnnn-A1-3	SRXnnn Advanced 1 - JSE/SD-WAN, includes SD-WAN features App+ (AppID, AppFW, AppQoS, AppRoute, AppQoE, AppTrack) and IPS; 3-year subscription (example: S-SRX380-A1-3)
S-SRXnnn-A1-5	SRXnnn Advanced 1 - JSE/SD-WAN, includes SD-WAN features App+ (AppID, AppFW, AppQoS, AppRoute, AppQoE, AppTrack) and IPS; 5-year subscription (example: S-SRX380-A1-5)
S-SRXnnn-P1-1	SRXnnn Premium 1, includes App+ (AppID, AppFW, AppQoS, AppRoute, AppQoE, AppTrack), IPS and Juniper ATP; 1-year subscription (example: S-SRX380-P1-1)
S-SRXnnn-P1-3	SRXnnn Premium 1, includes App+ (AppID, AppFW, AppQoS, AppRoute, AppQoE, AppTrack), IPS and Juniper ATP; 3-year subscription (example: S-SRX380-P1-3)
S-SRXnnn-P1-5	SRXnnn Premium 1, includes App+ (AppID, AppFW, AppQoS, AppRoute, AppQoE, AppTrack), IPS and Juniper ATP; 5-year subscription (example: S-SRX380-P1-5)
S-SRXnnn-A2-1	SRXnnn Advanced 2, includes App+ (AppID, AppFW, AppQoS, AppRoute, AppQoE, AppTrack), IPS and Content Security (UTM, Cloud AV, URLF and AS); 1-year subscription (example: S-SRX380-A2-1)
S-SRXnnn-A2-3	SRXnnn Advanced 2, includes App+ (AppID, AppFW, AppQoS, AppRoute, AppQoE, AppTrack), IPS and Content Security (UTM, Cloud AV, URLF and AS); 3-year subscription (example: S-SRX380-A2-3)
S-SRXnnn-A2-5	SRXnnn Advanced 2, includes App+ (AppID, AppFW, AppQoS, AppRoute, AppQoE, AppTrack), IPS and Content Security (UTM, Cloud AV, URLF and AS); 5-year subscription (example: S-SRX380-A2-5)
S-SRXnnn-P2-1 ¹²	SRXnnn Premium 2, includes App+ (AppID, AppFW, AppQoS, AppRoute, AppQoE, AppTrack), IPS, Content Security (UTM, Cloud AV, URLF and AS) and Juniper Sky ATP; 1-year subscription (example: S-SRX380-P2-1)
S-SRXnnn-P2-3 ¹²	SRXnnn Premium 2, includes App+ (AppID, AppFW, AppQoS, AppRoute, AppQoE, AppTrack), IPS, Content Security (UTM, Cloud AV, URLF and AS) and Juniper Sky ATP; 3-year subscription (example: S-SRX380-P2-3)
S-SRXnnn-P2-5 ¹²	SRXnnn Premium 2, includes App+ (AppID, AppFW, AppQoS, AppRoute, AppQoE, AppTrack), IPS, Content Security (UTM, Cloud AV, URLF and AS) and Juniper Sky ATP; 5-year subscription (example: S-SRX380-P2-5)

¹²The S-SRXnnn-P2-1/3/5 year SKUs are only available for the SRX340, SRX345, and SRX380 models.

Remote Access/Juniper Secure Connect VPN Licenses

Product Number	Description
S-RA3-SRX300-S-1	SW, Remote Access VPN - Juniper, 25 Concurrent Users, Standard, with SW support, 1 Year
S-RA3-SRX320-S-1	SW, Remote Access VPN - Juniper, 50 Concurrent Users, Standard, with SW support, 1 Year
S-RA3-SRX340-S-1	SW, Remote Access VPN - Juniper, 150 Concurrent Users, Standard, with SW support, 1 Year
S-RA3-SRX345-S-1	SW, Remote Access VPN - Juniper, 250 Concurrent Users, Standard, with SW support, 1 Year
S-RA3-SRX380-S-1	SW, Remote Access VPN - Juniper, 500 Concurrent Users, Standard, with SW support, 1 Year
S-RA3-5CCU-S-1	SW, Remote Access VPN - Juniper, 5 Concurrent Users, Standard, with SW support, 1 Year
S-RA3-25CCU-S-1	SW, Remote Access VPN - Juniper, 25 Concurrent Users, Standard, with SW support, 1 Year
S-RA3-50CCU-S-1	SW, Remote Access VPN - Juniper, 50 Concurrent Users, Standard, with SW support, 1 Year
S-RA3-100CCU-S-1	SW, Remote Access VPN - Juniper, 100 Concurrent Users, Standard, with SW support, 1 Year
S-RA3-250CCU-S-1	SW, Remote Access VPN - Juniper, 250 Concurrent Users, Standard, with SW support, 1 Year

Product Number	Description
S-RA3-500CCU-S-1	SW, Remote Access VPN - Juniper, 500 Concurrent Users, Standard, with SW support, 1 Year
S-RA3-SRX300-S-3	SW, Remote Access VPN - Juniper, 25 Concurrent Users, Standard, with SW support, 3 Year
S-RA3-SRX320-S-3	SW, Remote Access VPN - Juniper, 50 Concurrent Users, Standard, with SW support, 3 Year
S-RA3-SRX340-S-3	SW, Remote Access VPN - Juniper, 150 Concurrent Users, Standard, with SW support, 3 Year
S-RA3-SRX345-S-3	SW, Remote Access VPN - Juniper, 250 Concurrent Users, Standard, with SW support, 3 Year
S-RA3-SRX380-S-3	SW, Remote Access VPN - Juniper, 500 Concurrent Users, Standard, with SW support, 3 Year
S-RA3-5CCU-S-3	SW, Remote Access VPN - Juniper, 5 Concurrent Users, Standard, with SW support, 3 Year
S-RA3-25CCU-S-3	SW, Remote Access VPN - Juniper, 25 Concurrent Users, Standard, with SW support, 3 Year
S-RA3-50CCU-S-3	SW, Remote Access VPN - Juniper, 50 Concurrent Users, Standard, with SW support, 3 Year
S-RA3-100CCU-S-3	SW, Remote Access VPN - Juniper, 100 Concurrent Users, Standard, with SW support, 3 Year
S-RA3-250CCU-S-3	SW, Remote Access VPN - Juniper, 250 Concurrent Users, Standard, with SW support, 3 Year
S-RA3-500CCU-S-3	SW, Remote Access VPN - Juniper, 500 Concurrent Users, Standard, with SW support, 3 Year

Interface Modules

Product Number	Description
SRX-MP-1T1E1-R	1 port T1E1, MPIM form factor supported on SRX320, SRX340, SRX345, SRX380, and SRX550M. ROHS compliant
SRX-MP-1VDSL2-R	1 port VDSL2 (backward compatible with ADSL / ADSL2+), MPIM form factor supported on SRX320, SRX340, SRX345, SRX380, and SRX550M. ROHS compliant
SRX-MP-LTE-AA	4G / LTE MPIM support 1, 3, 5, 7-8, 18-19, 21, 28, 38-41 LTE bands (for Asia and Australia). Supported on SRX320, SRX340, SRX345, SRX380, and SRX550M
SRX-MP-LTE-AE	4G / LTE MPIM support 1-5, 7-8, 12-13, 30, 25-26, 29-30, 41 LTE bands (for Americas and EMEA). Supported on SRX320, SRX340, SRX345, SRX380, and SRX550M
SRX-MP-WLAN-US	Wireless access point (Wi-Fi) MPIM for SRX320, SRX34x, SRX380, and SRX550M. Supported for U.S. regulatory bands only.
SRX-MP-WLAN-WW	Wireless access point (Wi-Fi) MPIM for SRX320, SRX34x, SRX380, and SRX550M. Supported for worldwide regulatory bands (excluding U.S. and Israel).
SRX-MP-WLAN-IL	Wireless access point (Wi-Fi) MPIM for SRX320, SRX34x, SRX380, and SRX550M. Supported for Israel regulatory bands only.
SRX-MP-ANT-EXT	Antenna extension cable for WLAN MPIM on SRX Series platforms

Accessories

Product Number	Description
SRX300-RMK0	SRX300 rack mount kit with adaptor tray
SRX300-RMK1	SRX300 rack mount kit without adaptor tray
SRX300-WALL-KITO	SRX300 wall mount kit with brackets
SRX320-P-RMK0	SRX320-POE rack mount kit with adaptor tray
SRX320-P-RMK1	SRX300-POE rack mount kit without adaptor tray
SRX320-RMK0	SRX320 rack mount kit with adaptor tray
SRX320-RMK1	SRX320 rack mount kit without adaptor tray
SRX320-WALL-KITO	SRX320 wall mount kit with brackets
SRX34X-RMK	SRX340 and SRX345 rack mount kit
EX-4PST-RMK	SRX380 rack mount kit
JSU-SSD-MLC-100	Juniper Storage Unit, SSD, MLC, 100GB
JPSU-600-AC-AFO	SRX380 600W AC PSU, front-to-back

About Juniper Networks

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

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EX4100 LINE OF ETHERNET SWITCHES DATASHEET

Product Overview

The EX4100 line of Ethernet access switches offers secure, cloud-ready access for enterprise campus, branch, and data center networks in the AI era and optimized for the cloud. These 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 EX4100 line is purpose-built for, and managed by, the cloud. The switches leverage Mist AI to simplify operations and provide better visibility into the experience of connected devices, delivering a refreshing, experience-first approach to access layer switching.

Product Description

The Juniper Networks® EX4100 line of Ethernet Switches offers a secure, cloud-ready portfolio of access switches ideal for enterprise branch, campus, and data center networks. The EX4100 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 EX4100 line of Switches 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 EX4100 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
- Standards-based microsegmentation using group-based policies (GBPs)
- Switch-to-switch encryption using Media Access Control Security (MACsec) AES256
- IEEE 802.3bt Power over Ethernet Plus (PoE++)
- Flow-based telemetry to monitor traffic flows for anomaly detection, ability to measure packet delays and report drop reasons
- Precision Timing Protocol–Transparent Clock
- 10-member Virtual Chassis support

Offering a full suite of Layer 2 and Layer 3 capabilities, the EX4100 enables multiple deployments, including campus, branch, and data center top-of-rack deployments. As scale requirements increase, Juniper’s Virtual Chassis technology allows up to 10 EX4100 switches to be seamlessly interconnected and managed as a single device, delivering a scalable, pay-as-you-grow solution for expanding network environments.

The EX4100 family of Ethernet switches consists of the following models:

- The EX4100-48MP, which offers 16 x 100 MB/1GbE/2.5GbE and 32 x 10 MB/100 MB/1GbE Power over Ethernet (PoE++) access ports, delivering up to 90 W per PoE port with an overall total 1620 W of PoE power budget (using two power supplies)
- The EX4100-24MP, which offers 8 x 100 MB/1GbE/2.5GbE/5GbE/10GbE and 16 x 10 MB/100 MB/1GbE PoE++ access ports, delivering up to 90 W per port with an overall total 1620 W of PoE power budget (using two power supplies)
- The EX4100-24T, which offers 24 x 1GbE non-PoE access ports
- The EX4100-24P, which offers 24 x 1GbE PoE+ access ports, delivering up to 30 W per port with an overall total 1440 W of PoE power budget (using two power supplies)
- The EX4100-48T, which offers 48 x 1GbE non PoE-access ports
- The EX4100-48P, which offers 48 x 1GbE PoE+ access ports, delivering up to 30 W per port with an overall total 1440 W of PoE power budget (using two power supplies)

Each EX4100 model offers 4 x 1/10GbE small form-factor pluggable plus transceiver (SFP+) fixed uplink ports. The EX4100 switches include 4 x 10GbE/25GbE SFP28 ports to support Virtual Chassis connections, which can be reconfigured for use as Ethernet ports for uplink connectivity. EX4100 switches also include high availability (HA) features such as redundant, hot-swappable power supplies and field-replaceable fans to ensure maximum uptime. In addition, -24 port and -48 port Multi-Gigabit Ethernet EX4100 switch models offer standards-based 802.3af/at/bt (PoE/PoE+/PoE++) for delivering up to 90 watts on any access port. The EX4100 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.

Architecture and Key Components

Cloud Management with Juniper Mist Wired Assurance Driven by Mist AI

EX4100 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 EX4100 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.

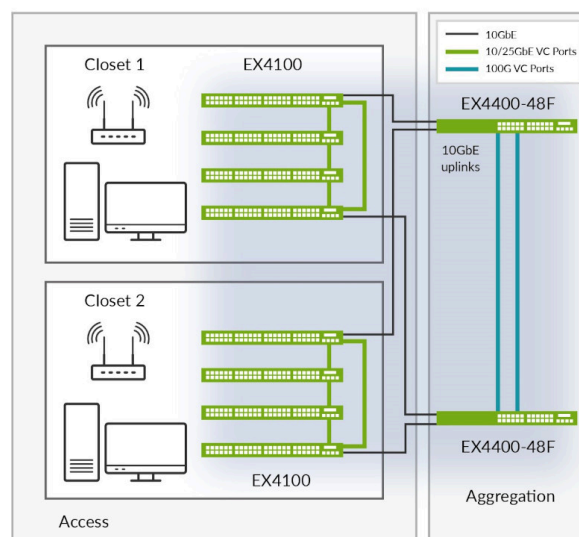


Figure 1: EX4100 Virtual Chassis configuration interconnected via dedicated front-panel 25GbE ports

EVPN-VXLAN Technology

Most traditional campus networks have 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 EX4100 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. EVPN-VXLAN also offers a scalable way to build and interconnect multiple campus sites, delivering:

- Greater consistency and scalability across all network layers
- Multivendor deployment support
- Reduced flooding and learning
- Location-agnostic connectivity
- Consistent network segmentation
- Simplified management

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 EX4100 switches can be interconnected as a Virtual Chassis using 4 x 25GbE SFP28 dedicated front-panel ports. Although configured as Virtual Chassis ports by default, the 4 x 25GbE SFP28 uplinks can also be configured as uplink ports. The EX4100 switches can form a Virtual Chassis with any other models within the EX4100 product line.

Microsegmentation Using Group-Based Policy

GBP leverages underlying VXLAN technology to provide location-agnostic endpoint access control. This allows network administrators to implement consistent security policies across the enterprise network domains. The EX4100 supports a standards-based GBP solution, allowing different levels of access control for endpoints and applications even within the same VLAN. Customers can simplify their network configuration by using GBP, avoiding the need to configure large numbers of firewall filters on all their switches. GBP can block lateral threats by ensuring consistent application of security group policies throughout the network, regardless of the location of endpoints and/or users.

Flow-Based Telemetry

Flow-based telemetry enables flow-level analytics, allowing network administrators to monitor thousands of traffic flows on the EX4100 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 to quickly identify the attack. Network administrators can also automate specific workflows, such as further examining the traffic or quarantining a port, to triage the issue. In addition to DOS attacks, Flow-Based Telemetry on EX4100 switches can measure packet delays at ingress, chip, and egress points, as well as report drop reasons.

Features and Benefits

Simplified Operations with Juniper Mist Wired Assurance

The EX4100 is fully cloud onboarded, provisioned, and managed by Juniper Mist Wired Assurance. The EX4100 is designed from the ground up to deliver the rich telemetry that enables [AI for IT Operations \(AI Ops\)](#) 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 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.

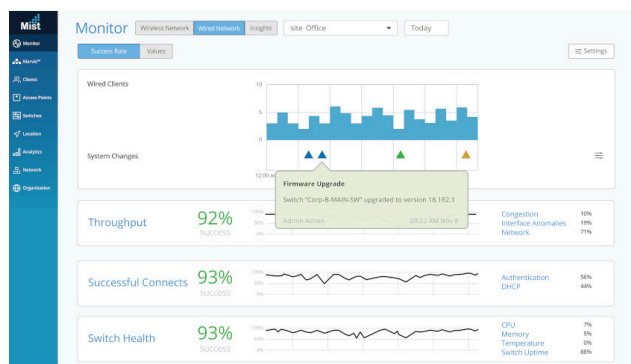


Figure 2: Juniper Mist Wired Assurance service-level expectations screen

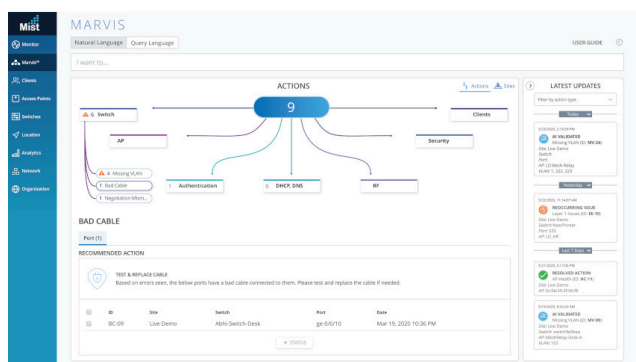


Figure 3: Marvis Actions for wired switches

The complimentary addition of Marvis 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 [Juniper Networks EX Series Switches](#) or recommended actions for external systems.

For more information, see [Juniper Mist Wired Assurance](#).

Campus Fabric Deployments

EVPN-VXLAN for Campus Core, Distribution, and Access

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: The 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.

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 (on collapsed core or distribution): A collapsed core architecture combines the core and distribution layers into a single layer, turning the traditional three-tier hierarchical 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. Due to the availability of VXLAN at access, it provides us with the opportunity to bring policy enforcement to the access layer (closest to the source) using Group Based Policy (GBP). Standards-based GBP tags bring the unique option to segment traffic both at a micro and macro level. 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.

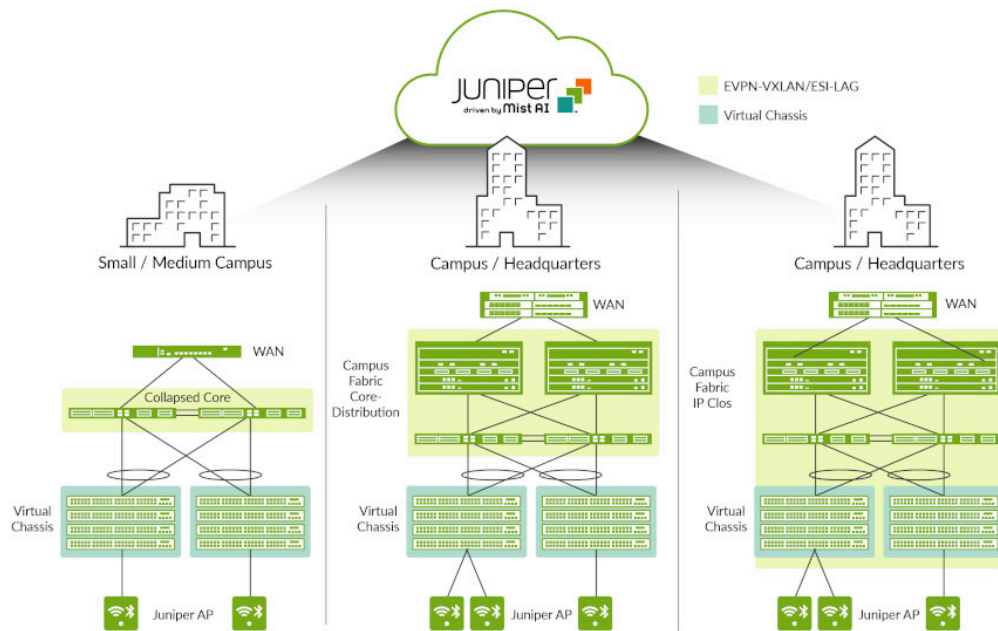


Figure 4: Campus fabrics showing Virtual Chassis and EVPN-VXLAN-based architectures

All three topologies are standards-based and interoperable with third-party vendors.

The EX4100 switches can be deployed in campus and branch access layer networks in the EVPN-VXLAN architectures shown in Figure 4.

Managing AI-Driven Campus Fabric with the Juniper Mist Cloud

Juniper Mist Wired Assurance brings cloud management and Mist AI to the 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. 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

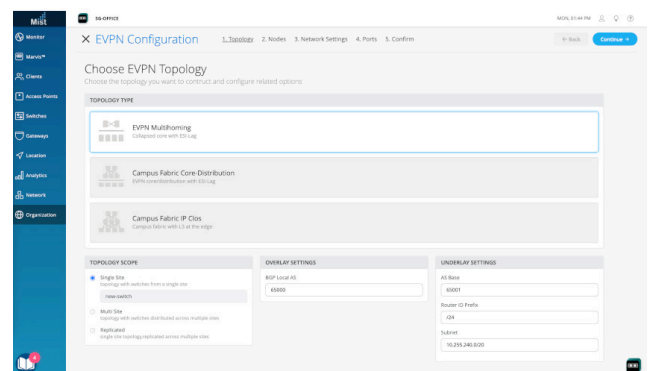


Figure 5: EVPN multihoming configuration via the Juniper Mist cloud

Chassis-Class Availability

The EX4100 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 EX4100 switch is capable of functioning as a Routing Engine (RE). When two or more EX4100 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 primary (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 primary RE fail. Primary, 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 EX4100 implements the same slot/module/port numbering scheme as other Juniper 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, greatly simplifying overall system maintenance and management.

Individually, the EX4100 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 EX4100 with true carrier-class reliability.

- **Redundant power supplies:** The EX4100 line of switches supports redundant, load-sharing, hot-swappable, and field-replaceable power supplies to maintain uninterrupted operations. Thanks to its compact footprint, the EX4100 requires significantly less power than chassis-based switches delivering equivalent port densities.
- **Hot-swappable fans:** The EX4100 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 EX4100 ensure that control plane protocols, states, and tables are synchronized between primary and standby REs to prevent protocol flaps or convergence issues following an RE failover.
- **Redundant trunk group (RTG):** To avoid the complexities of STP without sacrificing network resiliency, the EX4100 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 a Flex license, enabling highly resilient networks.

MACsec AES256

The EX4100 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 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.

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

The EX4100 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 1620W and supporting up to 90W per port based on the IEEE 802.3bt PoE standard.

EX4100 switches support perpetual PoE, which provides uninterrupted power to connected PoE powered devices (PDs) even when the EX4100 switch is rebooting.

The EX4100 switches also support a fast PoE capability that delivers PoE power to connected endpoints during a switch power-up, 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 EX4100 supports Junos telemetry interface (JTI), a modern telemetry streaming feature designed for switch health and performance monitoring. Sensor data can be streamed to a management system at configurable periodic intervals, 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 EX4100 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 to prevent 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 Advanced and Flex 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 EX4100 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 Flex Premium subscription licenses include Juniper Mist Wired Assurance. Flex Advanced and Flex 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 EX4100 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/pdf/warranty/990240.pdf>.

Product Options

Available EX4100 models are listed in Table 1.

Table 1. EX4100 Line of Ethernet Switches

Model/Product SKU	Access Port Configuration	PoE/PoE +Ports	PoE+ +Ports	PoE Budget 1 PSU/2 PSU	10GbE Ports	25GbE Ports	Power Supply Rating	Cooling
EX4100-24T	24-port 10/100/1000BASE-T	0	0	N/A	4	4	150 W AC	AFO (front-to-back airflow)
EX4100-48T	48-port 10/100/1000BASE-T	0	0	N/A	4	4	150 W AC	AFO (front-to-back airflow)
EX4100-48T-AFI	48-port 10/100/1000BASE-T	0	0	N/A	4	4	150 W AC	AFI (back-to-front airflow)
EX4100-24T-DC	24-port 10/100/1000BASE-T	0	0	N/A	4	4	150 W DC	AFO (front-to-back airflow)
EX4100-48T-DC	48-port 10/100/1000BASE-T	0	0	N/A	4	4	150 W DC	AFO (front-to-back airflow)
EX4100-24P	24-port 10/100/1000BASE-T	24	0	740 W/1440 W	4	4	920 W AC	AFO (front-to-back airflow)
EX4100-48P	48-port 10/100/1000BASE-T	48	0	740 W/1440 W	4	4	920 W AC	AFO (front-to-back airflow)
EX4100-24MP	8x 100 MB/1GbE/2.5GbE/5GbE/10GbE + 16x 10 MB/100 MB/1GbE	0	24	740W/1620 W	12	4	920 W AC	AFO (front-to-back airflow)
EX4100-48MP	16x 100 MB/1GbE/2.5GbE + 32x 10 MB/100 MB/1GbE	0	48	740 W/1620 W	4	4	920 W AC	AFO (front-to-back airflow)

The EX4100 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. EX4100 Spare Chassis SKUs

Spare Chassis SKU	Description	JPSU-150-AC-AFO + EX4100-FAN-AFO	JPSU-150-AC-AFI + EX4100-FAN-AFI	JPSU-150-DC-AFO + EX4100-FAN-AFO	JPSU-920-AC-AFO + EX4100-FAN-AFO
EX4100-24T-CHAS	Spare chassis, 24-port 10/100/1000BASE-T	Y	X	Y	X
EX4100-48T-CHAS	Spare chassis, 48-port 10/100/1000BASE-T	Y	Y	X	X
EX4100-24P-CHAS	Spare chassis, 24-port 10/100/1000BASE-T	X	X	X	Y
EX4100-48T-CHAS	Spare chassis, 48-port 10/100/1000BASE-T	X	X	Y	X
EX4100-24MP-CHAS	Spare chassis, 8x100 MB/1GbE/2.5GbE/5GbE/10GbE + 16x10 MB/100 MB/1GbE ports	X	X	X	Y
EX4100-48MP-CHAS	Spare chassis, 16x100 MB/1GbE/2.5GbE + 32x10 MB/100 MB/1GbE ports	X	X	X	Y

Y = supported; X = not supported

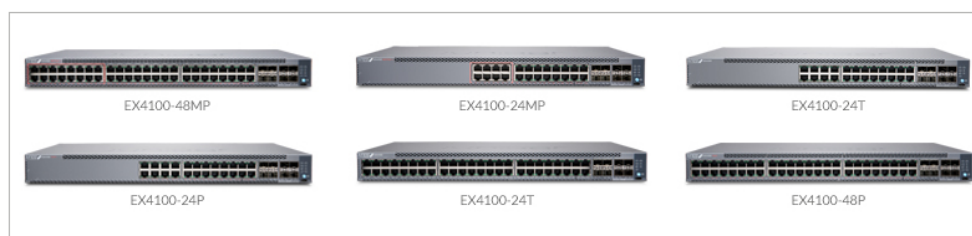


Figure 6: EX4100 line of Switches

EX4100 Line Specifications

Physical Specifications

Backplane

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

Power Options

- Power supplies: Autosensing; 100-120 V/200-240 V; 150 W, 920 W AC AFO, and 150 W AC AFI dual load sharing hot-swappable internal redundant power supplies
- Maximum current inrush: 30 amps
- DC power supply: 150 W DC AFO; 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)

- Base Unit: 17.36 x 1.72 x 13.78 in (44.1 x 4.37 x 35 cm)
- With power supply installed: 17.36 x 1.72 x 15.05 in (44.1 x 4.37 x 38.24 cm)
- Height: 1 U

System Weight

- EX4100-24T switch (with no power supply or fan module): 9.72 lb (4.41 kg)
- EX4100-24P switch (with no power supply or fan module): 10 lb (4.54 kg)
- EX4100-48T switch (with no power supply or fan module): 10 lb (4.54 kg)
- EX4100-48P switch (with no power supply or fan module): 10.27 lb (4.66 kg)
- EX4100-24MP switch (with no power supply or fan module): 10.06 lb (4.57 kg)
- EX4100-48MP switch (with no power supply or fan module): 10.41 lb (4.72 kg)
- 150 W AC power supply: 1.43 lb (0.65 kg)
- 150 W DC power supply: 1.43 lb (0.65 kg)
- 920 W AC power supply: 1.87 lb (0.85 kg)
- Fan module: 0.16 lb (0.07 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 5000 ft at 40° C (1828.8 m)
- Nonoperating altitude: Up to 16,000 ft (4877 m)
- Relative humidity operating: 5% to 90% (noncondensing)
- Relative humidity non-operating: 0% to 90% (noncondensing)

Cooling

- Field-replaceable fans: 2
- EX4100-24MP : 33.0
- EX4100-48MP : 33.0
- EX4100-24T : 31.0
- EX4100-24T-DC : 31.0
- EX4100-24P : 33.0
- EX4100-48T : 33.0
- EX4100-48T-DC : 32.0
- EX4100-48T-AFI : 31.0
- EX4100-48P : 33.0

Hardware Specifications Switching Engine Mode

- Store and forward

Memory

- DRAM: 4 GB with Error Correcting Code (ECC) on all models
- Storage: 8 GB on all models

CPU

- 1.7 GHz ARM CPU on all models

GbE Port Density per System

- EX4100-24P/24T: 32 (24 1GbE host ports + 4 10GbE/25GbE ports + 4 1GbE/10GbE ports)
- EX4100-48P/48T: 56 (48 1GbE host ports + 4 10GbE/25GbE ports + 4 1GbE/10GbE ports)
- EX4100-24MP: 32 (8 10GbE host ports + 16 1GbE host ports + 4 10GbE/25GbE ports + 4 1GbE/10GbE ports)
- EX4100-48MP: 56 (16 2.5GbE host ports + 32 1GbE host ports + 4 10GbE/25GbE ports + 4 port 1GbE/10GbE ports)

Physical Layer

- Time domain reflectometry (TDR) for detecting cable breaks and shorts: EX4100-24P/T and EX4100-48P/T
- Auto medium-dependent interface/medium-dependent interface crossover (MDI/MDIX) support: EX4100-24P/T and EX4100-48P/T

- Port speed downshift/setting maximum advertised speed on 10/100/1000BASE-T ports: EX4100-24P/T and EX4100-48P/T only
- Digital optical monitoring for optical ports

Packet Switching Capacities (Maximum with 64 Byte Packets)

- EX4100-24P/24T: 164 Gbps (unidirectional)/328 Gbps (bidirectional)
- EX4100-48P/48T: 188 Gbps (unidirectional)/376 Gbps (bidirectional)
- EX4100-24MP: 236 Gbps (unidirectional)/472 Gbps (bidirectional)
- EX4100-48MP: 212 Gbps (unidirectional)/424 Gbps (bidirectional)

Software Specifications

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

- EX4100-48P/T 279 Mpps
- EX4100-24P/T 244 Mpps
- EX4100-48MP 315 Mpps
- EX4100-24MP 351 Mpps

Security

- Media Access Control (MAC) limiting (per port and per VLAN)
- Allowed MAC addresses: 64,000
- Dynamic Address Resolution Protocol (ARP) dynamic 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: 64,000
- Jumbo frames: 9216 bytes
- Range of possible VLAN IDs: 1 to 4094
- Virtual Spanning Tree (VST) instances: 253
- 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: Class of service (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 802.3ae: 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 Spanning Tree Protocol (MSTP)
- Number of MST instances supported: 64
- Number of VLAN Spanning Tree Protocol (VSTP) instances supported: 253
- 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: 8
- LAG load-sharing algorithm bridged or routed (unicast or multicast) traffic:
 - IP: S/D IP

- TCP/UDP: S/D IP, S/D Port
- Non-IP: S/D MAC
- Tagged ports support in LAG

Layer 3 Features: IPv4

- Maximum number of ARP entries: 32,000
- Maximum number of IPv4 unicast routes in hardware: 32,650 prefixes; 32,150 host routes
- Maximum number of IPv4 multicast routes in hardware: 16,100 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

Layer 3 Features: IPv6

- Maximum number of neighbor discovery (ND) entries: 16,000
- Maximum number of IPv6 unicast routes in hardware: 16,200 prefixes; 16,050 host routes
- Maximum number of IPv6 multicast routes in hardware: 8000 multicast routes
- Routing protocols: RIPv6, OSPFv3, IPv6, IS-IS
- Static routing

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

- ACL entries (ACE) in hardware per system:
 - Port-based ACL (PACL) ingress: 4092
 - VLAN-based ACL (VACL) ingress: 4092
 - Router-based ACL (RACL) ingress: 4092
 - Port-based ACL (PACL) egress: 1022
 - VLAN-based ACL (VACL) egress: 511
 - Egress across RACL: 1022
 - 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 router advertisement (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, RIPv6, BGP, BGPv6, IS-IS, IGMP v1, v2, v3

Quality of Service

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

Multicast

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

Management and Analytics Platforms

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

Device Management and Operations

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

Supported RFCs

- RFC 768 UDP
- RFC 783 TFTP
- RFC 791 IP
- RFC 792 ICMP
- RFC 793 TCP
- RFC 826 ARP
- RFC 854 Telnet client and server

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

- RFC 3513 Internet Protocol Version 6 (IPv6) Addressing Architecture
- RFC 3569 draft-ietf-ssm-arch-06.txt PIM-SSM PIM Source Specific Multicast
- RFC 3579 RADIUS EAP support for 802.1x
- RFC 3618 Multicast Source Discovery Protocol (MSDP)
- RFC 3623 OSPF Graceful Restart
- RFC 4213 Basic Transition Mechanisms for IPv6 Hosts and Routers
- RFC 4291 IPv6 Addressing Architecture
- RFC 4443 ICMPv6 for the IPv6 Specification
- RFC 4541 IBMP and MLD snooping services
- RFC 4552 OSPFv3 Authentication
- RFC 4861 Neighbor Discovery for IPv6
- RFC 4862 IPv6 Stateless Address Autoconfiguration
- RFC 4915 MT-OSPF
- RFC 5095 Deprecation of Type 0 Routing Headers
- RFC 5176 Dynamic Authorization Extensions to RADIUS
- RFC 5798 VRRPv3 for IPv6
- Draft-ietf-bfd-base-05.txt Bidirectional Forwarding Detection
- Draft-ietf-idr-restart-10.txt Graceful Restart Mechanism
- Draft-ietf-isis-restart-02 Restart Signaling for IS-IS
- Draft-ietf-isis-wg-multi-topology-11 Multi Topology (MT) Routing in IS-IS for BGP
- Internet draft-ietf-isis-ipv6-06.txt, Routing IPv6 with IS-IS
- LLDP Media Endpoint Discovery (LLDP-MED), ANSI/TIA-1057, draft 08
- PIM-DM Draft IETF PIM Dense Mode draft-ietf-idmr-pimdm-05.txt, draft-ietf-pim-dm-new-v2-04.txt
- RFC 2570-2575 SNMPv3, user based security, encryption, and authentication
- RFC 2576 Coexistence between SNMP Version 1, Version 2, and Version 3
- RFC 2578 SNMP Structure of Management Information MIB
- RFC 2579 SNMP Textual Conventions for SMIv2
- RFC 2665 Ethernet-like interface MIB
- RFC 2787 VRRP MIB
- RFC 2819 RMON MIB
- RFC 2863 Interface Group MIB
- RFC 2863 Interface MIB
- RFC 2922 LLDP MIB
- RFC 2925 Ping/Traceroute MIB
- RFC 2932 IPv4 Multicast MIB
- RFC 3413 SNMP Application MIB
- RFC 3414 User-based Security model for SNMPv3
- RFC 3415 View-based Access Control Model for SNMP
- RFC 3621 PoE-MIB (PoE switches only)
- RFC 4188 STP and Extensions MIB
- RFC 4363 Definitions of Managed Objects for Bridges with Traffic Classes, Multicast Filtering, and VLAN extensions
- RFC 5643 OSPF v3 MIB support
- Draft – blumenthal – aes – usm - 08
- Draft – reeder - snmpv3 – usm - 3desede -00
- Draft-ietf-bfd-mib-02.txt
- Draft-ietf-idmr-igmp-mib-13
- Draft-ietf-idmr-pim-mib-09
- Draft-ietf-idr-bgp4-mibv2-02.txt – Enhanced BGP-4 MIB
- Draft-ietf-isis-wg-mib-07

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 using 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 3: EX4100 Power Supply Ratings

Product	Power Supply Rating
EX4100-24T	150 W AC AFO
EX4100-48T	150 W AC AFO
EX4100-48T-AFI	150 W AC AFI
EX4100-24T-DC	150 W DC AFO
EX4100-48T-DC	150 W DC AFO
EX4100-24P	920 W AC AFO
EX4100-48P	920 W AC AFO
EX4100-24MP	920 W AC AFO
EX4100-48MP	920 W AC AFO

Ordering Information

Product	Description
EX4100-48MP	Multigigabit 48 port, PoE++ (up to 90 W) switch with 16x100 MB/1GbE/2.5GbE + 32x10 MB/100 MB/1GbE, 4x10GbE uplinks, 4x25GbE stacking/uplink ports, MACsec AES256, redundant fans, 1x JPSU-920-AC-AFO included with Standard SW, optics sold separately, TAA-compliant.
EX4100-24MP	Multigigabit 24 port, PoE++(up to 90 W) switch with 8x100 MB/1GbE/2.5GbE + 16x10 MB/100 MB/1GbE, 4x10GbE uplinks, 4x25GbE stacking/uplink ports, MACsec AES256, redundant fans, 1x JPSU-920-AC-AFO included with Standard SW, optics sold separately, TAA-compliant.
EX4100-48P	48-port 10/100/1000BASE-T PoE+ switch, 4x10GbE uplinks, 4x25GbE stacking/uplink ports, MACsec AES256, redundant fans, 1x JPSU-920-AC-AFO included with Standard SW, optics sold separately, TAA-compliant.
EX4100-24P	24-port 10/100/1000BASE-T PoE+ switch, 4x10GbE uplinks, 4x25GbE stacking/uplink ports, MACsec AES256, redundant fans, 1x JPSU-920-AC-AFO included with Standard SW, optics sold separately, TAA-compliant.
EX4100-48T	48-port 10/100/1000BASE-T switch, 4x10GbE uplinks, 4x25GbE stacking/uplink ports, MACsec AES256, redundant fans, 1x JPSU-150-AC-AFO included with Standard SW, optics sold separately, TAA-compliant.

Product	Description
S-EX-P-C3-3-ND	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 NEXT DAY support, 3 year
S-EX-P-C3-5-ND	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 NEXT DAY support, 5 year
S-EX-A-C2-1-SD	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 SAME DAY support, 1 year
S-EX-A-C2-3-SD	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 SAME DAY support, 3 year
S-EX-A-C2-5-SD	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 SAME DAY support, 5 year
S-EX-P-C2-1-SD	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 SAME DAY support, 1 year
S-EX-P-C2-3-SD	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 SAME DAY support, 3 year
S-EX-P-C2-5-SD	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 SAME DAY support, 5 year
S-EX-A-C3-1-SD	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 SAME DAY support, 1 year
S-EX-A-C3-3-SD	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 SAME DAY support, 3 year
S-EX-A-C3-5-SD	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 SAME DAY support, 5 year
S-EX-P-C3-1-SD	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 SAME DAY support, 1 year
S-EX-P-C3-3-SD	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 SAME DAY support, 3 year
S-EX-P-C3-5-SD	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 SAME DAY support, 5 year

Power Supplies

JPSU-150-AC-AFO	EX Series 150 W AC power supply (power cord needs to be ordered separately) (front-to-back airflow)
JPSU-150-AC-AFI	EX Series 150 W AC power supply (power cord needs to be ordered separately) (back-to-front airflow)
JPSU-150-DC-AFO	EX Series 150 W DC power supply (power cord needs to be ordered separately) (front-to-back airflow)
JPSU-920-AC-AFO	EX Series 920 W DC power supply (power cord needs to be ordered separately) (front-to-back airflow)

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Product	Description
Fans	
EX4100-FAN-AFO	Spare fan with front-to-back airflow
EX4100-FAN-AFI	Spare fan with back-to-front airflow
Mounting Options	
EX-4PST-RMK	Adjustable 4-post rack-mount kit for EX4100
EX-WMK	Wall-mount kit for EX4100
EX-RMK	EX Series Rack Mount Kit
Spare Chassis	
EX4100-48MP-CHAS	Spare chassis, 16x100 MB/1GbE/2.5GbE + 32x10 MB/100 MB/1GbE ports PoE++ (optics, power supplies, and fans sold separately)
EX4100-24MP-CHAS	Spare chassis, 8x100 MB/1GbE/2.5GbE/5GbE/10GbE + 16x10 MB/100 MB/1GbE ports PoE++ (optics, power supplies, and fans sold separately)
EX4100-48P-CHAS	Spare chassis, 48-port 10/100/1000BASE-T PoE+ (optics, power supplies, and fans sold separately)
EX4100-24P-CHAS	Spare chassis, 24-port 10/100/1000BASE-T PoE+ (optics, power supplies, and fans sold separately)
EX4100-48T-CHAS	Spare chassis, 48-port 10/100/1000BASE-T (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.

