



The following documentation is an electronically-submitted vendor response to an advertised solicitation from the *West Virginia Purchasing Bulletin* within the Vendor Self-Service portal at wvOASIS.gov. As part of the State of West Virginia's procurement process, and to maintain the transparency of the bid-opening process, this documentation submitted online is publicly posted by the West Virginia Purchasing Division at WVPurchasing.gov with any other vendor responses to this solicitation submitted to the Purchasing Division in hard copy format.

Header @ 4

List View

- General Information
- Contact
- Default Values
- Discount
- Document Information
- Clarification Request

Procurement Folder: 1880633
Procurement Type: Central Master Agreement
Vendor ID: 000000181088
Legal Name: ADVIZEX TECHNOLOGIES LLC
Alias/DBA:
Total Bid: \$221,168.00
Response Date: 05/18/2026
Response Time: 13:59
Responded By User ID: rbalsdon2
First Name: Ron
Last Name: Balsdon
Email: rbalsdon@advizex.com
Phone: 512-705-8045

SO Doc Code: CRFQ
SO Dept: 0803
SO Doc ID: DOT2600000089
Published Date: 5/11/26
Close Date: 5/19/26
Close Time: 13:30
Status: Closed
Solicitation Description: WVDOT NETWORKING EQUIPMENT (81260141)
Total of Header Attachments: 4
Total of All Attachments: 4



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: 1880633
Solicitation Description: WVDOT NETWORKING EQUIPMENT (81260141)
Proc Type: Central Master Agreement

Solicitation Closes	Solicitation Response	Version
2026-05-19 13:30	SR 0803 ESR05182600000007924	1

VENDOR
 000000181088
 ADVIZEX TECHNOLOGIES LLC

Solicitation Number: CRFQ 0803 DOT2600000089
Total Bid: 221168
Response Date: 2026-05-18
Response Time: 13:59:27
Comments:

FOR INFORMATION CONTACT THE BUYER
 John W Estep
 304-558-2566
 john.w.estep@wv.gov

Vendor Signature X **FEIN#** **DATE**

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	Extreme Network 5320-48p-8XEUniversal Switch or Equal.	40.00000	EA	3383.300000	135332.00

Comm Code	Manufacturer	Specification	Model #
43222609			

Commodity Line Comments: The unit price listed above is a per unit price for the equipment. The unit price for the requested license (Section 3.2) for this equipment is \$426.80.
These costs have been itemized on the attached Attachment A.

Extended Description:

Extreme Network 5320-48p-8XEUniversal Switch or Equal.

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
2	Extreme Network 5320-24p-8XEUniversal Switch or Equal.	10.00000	EA	2145.900000	21459.00

Comm Code	Manufacturer	Specification	Model #
43222609			

Commodity Line Comments: The unit price listed above is a per unit price for the equipment. The unit price for the requested license (Section 3.2) for this equipment is \$259.48.
These costs have been itemized on the attached Attachment A.

Extended Description:

Extreme Network 5320-48p-8XEUniversal Switch or Equal.

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
3	Extreme Network 5320-16p-4XEUniversal Switch or Equal.	30.00000	EA	2145.900000	64377.00

Comm Code	Manufacturer	Specification	Model #
43222609			

Commodity Line Comments: The unit price listed above is a per unit price for the equipment. The unit price for the requested license (Section 3.2) for this equipment is \$259.48.
These costs have been itemized on the attached Attachment A.

Extended Description:

Extreme Network 5320-48p-8XEUniversal Switch or Equal.



RESPONSE TO

WEST VIRGINIA
DEPARTMENT OF TRANSPORTATION
NETWORKING EQUIPMENT: EXTREME NETWORK SWITCHES
REQUEST FOR QUOTATION

VENDOR NAME: ADVIZEX TECHNOLOGIES, LLC
BUYER: JOHN ESTEP
SOLICITATION No.: CRFQ 0803 DOT2600000089
BID OPENING DATE: MAY 19, 2026
BID OPENING TIME: 1:30 PM
FAX NUMBER: 304-558-3970

SUBMITTED BY:
LORI CALDWELL
DIRECTOR, SLED
ADVIZEX TECHNOLOGIES, LLC
LCALDWELL@ADVIZEX.COM

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May 19, 2026

John Estep
Department of Administration
Purchasing Division
2019 Washington St. East
Charleston, WV 25305

RE: Networking Equipment: Extreme Network Switches Request for Quotation
Solicitation No. CRFQ 0803 DOT2600000089

Dear John:

Provided within this document is supplemental information accompanying the Advizex response to this Request for Quotation submitted via wvOASIS, as well as a response to *Section 3: General Requirements* demonstrating the equivalency of the Advizex-proposed HPE switches and licenses compared to the requested Extreme Networks equipment.

In addition to the requisite signature pages of your Request for Quotation and the responses below for Section 3, Advizex hereby acknowledges, has read and understands, and agrees to all other enumerated paragraphs of the published Request for Quotation.

We invite you to review our proposal to understand the comprehensive approach we have taken to support your needs. We believe you will be excited about our solution and our abilities to support West Virginia Department of Transportation. Please feel free to contact me directly by email at lcaldwell@advizex.com with questions to assist the West Virginia Department of Transportation with the evaluation of our response. We thank you for your consideration.

Thanks,

Lori Caldwell
Director, SLED

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3. GENERAL REQUIREMENTS:

Mandatory Contract Item Requirements: Contract Item must meet or exceed the mandatory requirements listed below.

3.1 SWITCHES

3.1.1 Contract Item #1: Extreme Networks 48 Port Network Switch (Model 5320-48P-8XE), or equal.

- 3.1.1.1 Minimum quantity per purchase: Thirteen (13)
- 3.1.1.2 Must have forty-eight (48) 10/100/1000 Base-T 802.3 at (30W) ports Full/Half-Duplex (autosensing) MACsec-capable.
- 3.1.1.3 Must have eight (8) 1Gb SFP uplink ports, with at least two (2) capable of stacking at a minimum of 10Gb. Uplink ports may be upgradable to 10Gb SFP+ via software license. MACsec-capable; the last four uplink ports must support 100Mb operation.
- 3.1.1.4 Must have one (1) Serial console port (RJ-45).
- 3.1.1.5 Must have one (1) USB A ports for management or external USB flash.
- 3.1.1.6 Must have one (1) USB Micro-B console port.
- 3.1.1.7 Form factor: 1U rack-mountable.
- 3.1.1.8 Cooling: fixed side-to-side cooling fans.
- 3.1.1.9 Power supply: fixed AC power supply.

ADVIZEX RESPONSE:

In lieu of the Extreme Networks 48 Port Network Switch (Model 5320-48P-8XE) for Contract Item #1, Advizex proposes instead the HPE Juniper Networks EX4100-48MP Switch. A description of this solution is provided below in response to Section 3.3.

3.1.2 Contract Item #2: Extreme Networks 24 Port Network Switch (Model 5320-24P-8XE), or equal.

- 3.1.2.1 Minimum quantity per purchase: Three (3)
- 3.1.2.2 Must have twenty-four (24) 10/100/1000 Base-T 802.3 at (30W) ports Full/Half-Duplex (autosensing) MACsec-capable.
- 3.1.2.3 Must have eight (8) 1Gb SFP uplink ports, with at least two (2) capable of stacking at a minimum of 10Gb. Uplink ports may be upgradable to 10Gb SFP+ via software license. MACsec-capable; the last four uplink ports must support 100Mb operation.
- 3.1.2.4 Must have one (1) Serial console port (RJ-45).
- 3.1.2.5 Must have one (1) USB A ports for management or external USB flash.
- 3.1.2.6 Must have one (1) USB Micro-B console port.
- 3.1.2.7 Form factor: 1U rack-mountable.
- 3.1.2.8 Cooling: fixed side-to-side cooling fans.
- 3.1.2.9 Power supply: fixed AC power supply.

ADVIZEX RESPONSE:

In lieu of the Extreme Networks 24 Port Network Switch (Model 5320-24P-8XE) for Contract Item #2, Advizex proposes instead the HPE Juniper Networks EX4100-24MP Switch. A description of this solution is provided below in response to Section 3.3.

3.1.3 Contract Item #3: Extreme Networks 16 Port Network Switch (Model 5320-16P-4XE), or equal.

- 3.1.3.1 Minimum quantity per purchase: Eight (8)
- 3.1.3.2 Must have sixteen (16) 10/100/1000 Base-T 802.3at (30W) ports Full/Half-Duplex (autosensing) MACsec-capable.
- 3.1.3.3 Must have four (4) 1Gb SFP uplink ports, with at least two (2) capable of stacking at a minimum of 10Gb. Uplink ports may be upgradable to 10Gb SFP+ via software license. MACsec-capable; at least the last two uplink ports must support 100Mb operation.
- 3.1.3.4 Must have one (1) Serial console port (RJ-45).
- 3.1.3.5 Must have one (1) USB A port for management or external USB flash.
- 3.1.3.6 Must have one (1) USB Micro-B console port.
- 3.1.3.7 Form factor: 1U rack-mountable.
- 3.1.3.8 Cooling: fixed side-to-side cooling fans.
- 3.1.3.9 Power supply: fixed AC power supply.

ADVIZEX RESPONSE:

In lieu of the Extreme Networks 16 Port Network Switch (Model 5320-16P-8XE) for Contract Item #2, Advizex proposes instead the HPE Juniper Networks EX4100-24MP Switch. A description of this solution is provided below in response to Section 3.3.

3.2 LICENSES

3.2.1 Contract Item #1: Extreme Networks Platform ONE Standard Networking AP Management License, Manufacturer Part Number EP1-STD-TA-S-C-EW-3YR, or equal

- 3.2.1.1 Licenses must be new and come with manufacturer warranty. Used or refurbished licenses will not be accepted.
- 3.2.1.2 Vendors must provide technical support by phone, email, or chat during regular business hours, Monday – Friday, 9:00AM EST – 5:00PM EST.
- 3.2.1.3 Licenses must allow Extreme Networks Wireless Access Points or Switches to be added to and managed by the States existing centralized management system ExtremeCloud IQ.
- 3.2.1.4 A Vendor submitting on ‘or equal’ should submit documentation with its bid showing compatibility with the State’s management system. This is preferred with bid, but must be submitted prior to award.
- 3.2.1.5 Vendor must apply licenses to the State of WV Office of Technology Extreme Account #1049238; State of West Virginia, Office of Technology; enetworking@wv.gov.

ADVIZEX RESPONSE:

In lieu of licensing for the Extreme Networks Platform One, Advizex proposes as an equivalent alternative, the HPE Juniper Networking Juniper Mist Wired Assurance subscription service. A description of this solution is provided below in response to Section 3.3.

3.3 Alternate Bids

3.3.1 Alternate bids that are equal to, meet, or exceed the specifications and requirements listed are invited. To receive full consideration, such alternate bids must be accompanied by sufficient descriptive literature and/or samples to clearly identify the offer and allow for a complete evaluation.

3.3.2 The use of brand name or equal specifications is for describing the minimum standard of quality, technical performance and installation characteristics required and are not intended to limit or restrict competition.

3.3.3 The vendor shall provide technical specifications with bid documentation.

ADVIZEX RESPONSE:

As stated above, Advizex has crafted this document as evidence of the equivalence of the HPE Juniper Networks Switch models to the specified Extreme Networks equipment.

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 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.

As shown below, Gartner, a leading global research and advisory firm, ranks HPE Juniper Networks as a clear market Leader, placing it at the absolute top spot in the 2022, 2023, 2024 and 2025 Magic Quadrant for "Enterprise Wired and Wireless LAN Infrastructure". Gartner explicitly positioned Juniper furthest in "Completeness of Vision" and highest in "Ability to Execute" among all evaluated vendors. These accolades are a result of HPE Juniper hardware leveraging the Mist AI platform as a true differentiator.

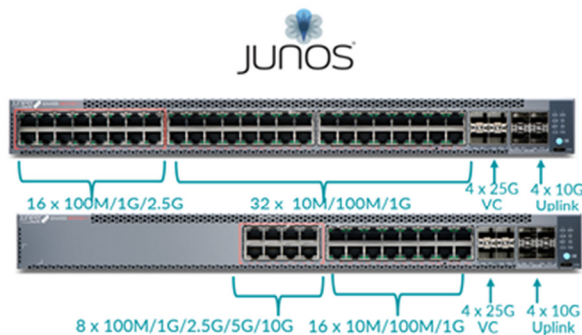
Magic Quadrant for Enterprise Wired and Wireless LAN Infrastructure



Gartner

A summary of the features of each of the proposed Switches is provided in the illustration below.

EX4100 MULTI-GIG Overview



- 100M/1G/2.5/5/10GbE-T on MGE copper ports
- 10M/100M/1G on 1 GE copper ports
- 4 x 1/10/25 GbE SFP28 fixed Virtual Chassis / Uplink ports*
- 4 x 100M/1/10 GbE SFP+ fixed Uplinks
- 802.3af/at/bt on all access ports
- MACsec AES 256

SKUs	10M/100M/1G BASE-T ports	100M/1G/2.5G BASE-T ports	100M/1G/2.5G/5G/10G BASE-T ports	1G/10GbE SFP+ module ports	10G/25G fixed VCP ports	PoE++ (90W capable) Ports	PoE Power Budget	Cooling	AC/DC	PS Rating
EX4100-48MP	32	16	N/A	4	4	48	1620 W	2x FRU, AFO	2x FRU AC	2 X 920 W
EX4100-24MP	16	N/A	8	4	4	24	1620 W	2x FRU, AFO	2x FRU AC	2 X 920 W

* 1GbE speed supported only when VC ports converted to uplink ports

Attached as an embedded document immediately below is the specifications data sheet from HPE Juniper Networks for the HPE Juniper Networks EX4100 series of Switches detailing the features of the proposed equipment.



Juniper Networks
EX4100 Line of Switch

Juniper Mist Wired Assurance is the only cloud-native and AI-Native solution for enterprise switching. It presents a different approach to network management, focusing on user and device experiences rather than network uptime. Wired Assurance delivers unparalleled user experiences for campus switching with simpler operations, shorter mean-time-to-repair, and better visibility into connected devices.

Juniper Mist AI also holds a distinct advantage over Extreme Networks Platform One due to its industry-proven data science maturity, superior root-cause analysis, and granular client-experience visibility. The Extreme Network Platform One is much newer to market (released July 2025); while Mist AI benefits from over a decade of dedicated development, establishing it as the market standard for AIOps. One specific feature that separates Mist Wired Assurance Licensing from the Extreme Platform One is the ability to leverage Agentic AI in a meaningful way. Mist AI is leading the move to a self-driving network, leveraging agentic AI to provide autonomous issue identification as well as remediation.

Attached as an embedded document immediately below is the specifications data sheet from HPE Juniper Networks for the Mist Wired Assurance detailing the features of this subscription alternative.



Juniper Mist Wired
Assurance.pdf

The HPE Juniper Networks EX4100 series of Switches, especially the Juniper EX4100-48MP is a significantly more capable, higher-tier access switch than the Extreme Networks 5320-48P-8XE series. While both function well at the enterprise edge, they target different performance brackets. The Juniper switch dominates in raw power delivery, multi-gigabit readiness, and overall switching bandwidth, making it ideal for high-density environments deploying Wi-Fi 7 access points. The Extreme 5320, by contrast, is a more standard 1GbE edge solution with basic PoE capabilities, as shown in the chart below:

Feature Comparison Overview

Juniper EX4100-48MP	Extreme Networks 5320-48P-8XE	Winner
Port Speeds (Access) 16 x 2.5GbE + 32 x 1GbE	Port Speeds (Access) 48 x 1GbE	Port Speeds (Access) Juniper
PoE Standards PoE++ (up to 90W)	PoE Standards PoE+ (up to 30W)	PoE Standards Juniper
Maximum PoE Budget 1620 W (with dual PSUs)	Maximum PoE Budget 740 W (fixed internal PSU)	Maximum PoE Budget Juniper
Uplink / Stacking Speeds 4 x 10GbE fixed + 4 x 25GbE (uplink/stack)	Uplink / Stacking Speeds 8 x 10GbE fixed (uplink/stack)	Uplink / Stacking Speeds Juniper
Switching Capacity Up to 424 Gbps	Switching Capacity 256 Gbps	Switching Capacity Juniper
Power Supplies Dual hot-swappable (load sharing)	Power Supplies Single fixed internal PSU	Power Supplies Juniper
Security Encryption MACsec AES-256 (access & uplinks)	Security Encryption MACsec (access & uplinks)	Security Encryption Tie

ABOUT ADVIZEX

At Advizex, we believe lasting relationships are built on a foundation of trust and shared values. We are a trusted ally to businesses and organizations of all sizes across various sectors. We've fostered a culture of continuous improvement, collaborating with industry leaders to deliver cutting-edge infrastructure and enterprise application solutions that exceed expectations. Our commitment to excellence is reflected in everything we do, from innovating new technologies to delivering impactful results.

Advizex is not just another technology solutions provider; we are your dedicated partner in overcoming complex business challenges. Since 1975, we've set ourselves apart by offering tailored technology consulting, implementation support, and comprehensive IT-managed services, empowering organizations of all sizes to thrive in a competitive landscape. Our expertise and results include:

- **Rapid Problem-Solving:** We quickly diagnose and address your business challenges using our expertise in Artificial Intelligence (AI), hybrid cloud, and consumption IT.
- **Cost Reduction and Agility:** Our cutting-edge technologies help businesses reduce costs, enhance agility, and improve IT environments.
- **Customized Solutions:** Through strategic partnerships, we deliver tailored solutions for retail, manufacturing, healthcare, State, Local, and Education (SLED), and more.
- **Customer Satisfaction:** With a 97% satisfaction rate, nine out of ten clients would recommend our IT services.

For the IT professional solving complex business challenges, Advizex is the solutions leader that delivers strategic transformation through our unparalleled knowledge, proven approach and deep partnerships – driving performance with innovation.



We have the highest skilled workforce designed to diagnose and address your business challenges quickly.



We have a proven and successful approach supported by a 97% client retention rate*.



Our strategic partnerships run deep, allowing us to deliver “top of the pyramid” customized solutions.

Headquartered in Independence, Ohio, with approximately 325 employees with more than 1100 individually held certifications from industry-leading partners, Advizex is your trusted partner for IT solutions, known for our extensive industry expertise, innovative strategies, and commitment to excellence. With decades of experience as a leading IT solutions company, we have the expertise to help you tackle the complexities of digital transformation. Our team works collaboratively with you to develop customized IT solutions for businesses that align with your strategic objectives. Our strong partnerships with leading technology providers ensure you receive cutting-edge solutions to drive efficiency and growth. With Advizex, you gain the

technology, support, and dedicated partnership needed to thrive in a rapidly evolving IT landscape.

ADVIZEX'S IT SOLUTIONS

Advizex offers tailored IT solutions across various industries, ensuring secure, efficient, and compliant operations. We provide reliable, scalable infrastructure to optimize production, enhance quality control, and drive innovation. Our collaborative approach ensures our solutions align with your strategic objectives and are tailored to your unique business needs. From storage and automation to network security and performance management, we go beyond traditional IT services to deliver advanced solutions that empower your organization. We provide a comprehensive suite of services designed to enhance operational efficiency and support digital transformation:

- **Adaptive Infrastructure:** We design scalable, resilient, and future-ready IT infrastructures to address businesses' changing needs.
- **Artificial Intelligence (AI):** Our AI solutions combine human expertise with machine learning to optimize operations, uncover valuable insights, and automate processes.
- **Everything as a Service (XaaS):** Our XaaS model offers flexible access to the latest technologies without the limitations of traditional IT ownership.
- **Cloud Operations:** Our cloud services enable proactive decision-making, streamline operations, and improve performance.
- **Security:** Advizex provides robust security solutions to safeguard critical data and infrastructure against emerging threats.



Artificial Intelligence

Platform Adoption Services
 Data Preparation Services
 Hybrid AI Platform
 AI/ML Ops Tools and Playbooks
 Security and Compliance Services



Everything as a Service (XaaS)

HPE GreenLake
 Dell APEX
 As-a-Service Options:
 Security Operations, Database,
 Networking, Monitoring,
 Help Desk, ServiceNow, Disaster
 Recovery,
 and Infrastructure



Adaptive Infrastructure

HCI/CI
 SDDC
 Data Protection
 Storage
 Digital Workspace
 Database



Cloud Operations

Cloud Infrastructure
 (VMC and Azure*)
 Collaboration
 (Microsoft 365/Teams)
 Identity & Access
 Management (IDM/SSO)
 Automation & Orchestration
 Multi-Cloud Management
 IT Service Management
 IT Operations Management
 Consumption IT



Network & Security

Networking
 Zero Trust
 Next-Gen Firewall
 Secure Remote Access
 Threat Detection & Response
 Business Continuity Planning
 Disaster Recovery
 Security Advisory Services
 vCISO

INNOVATIVE TECHNOLOGY BUILT ON TRUSTED PARTNERSHIPS

What sets us apart from the competition is our ability to leverage our technology partners' extensive IT expertise and innovative, industry-leading solutions across various sectors. At Advizex, our decades of experience and strategic alliances with leading technology partners enable us to deliver comprehensive, tailored IT solutions for your business. Discover how our exceptional partnerships, combined with our expertise and cutting-edge technologies, create value and drive success for our clients.

Advizex's Strategic Partners include:



Advizex holds 10 Partner Advisory Board Positions, more than 1100 Partner Certifications, and is the recipient of 24 Partner Awards. A larger sample of the 197 Advizex Technology Partners is represented below:





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

State of West Virginia
 Centralized Request for Quote
 Info Technology

Proc Folder: 1880633		Reason for Modification:	
Doc Description: WVDOT NETWORKING EQUIPMENT (81260141)		Addendum #1 issued to publish revised project specifications. (see attached)	
Proc Type: Central Master Agreement			
Date Issued	Solicitation Closes	Solicitation No	Version
2026-05-11	2026-05-19 13:30	CRFQ 0803 DOT2600000089	2

BID RECEIVING LOCATION

BID CLERK
 DEPARTMENT OF ADMINISTRATION
 PURCHASING DIVISION
 2019 WASHINGTON ST E
 CHARLESTON WV 25305
 US

VENDOR

Vendor Customer Code: 000000181088
Vendor Name : Advizex Technologies, LLC
Address :
Street : 6480 Rockside Woods Blvd. South
City : Independence
State : OH **Country :** US **Zip :** 44131
Principal Contact : Lori Caldwell
Vendor Contact Phone:304-541-3400 **Extension:**

FOR INFORMATION CONTACT THE BUYER

John W Estep
 304-558-2566
 john.w.estep@wv.gov

Signed by:

 Vendor Signature X
 827B330EC29E451...

FEIN# 37-1504931

DATE 18 May 2026

All offers subject to all terms and conditions contained in this solicitation

ADDITIONAL INFORMATION**REQUEST FOR QUOTATION:**

West Virginia Purchasing Division is soliciting bids on behalf of the Department of Transportation to establish a contract for the open-ended purchase of Networking Equipment - Switches. Per the Bid Requirements, Specifications, Terms and Conditions attached to this solicitation.

INVOICE TO		SHIP TO	
DEPT. OF TRANSPORTATION 1900 KANAWHA BLVD E, BLD. 5 RM-720		DEPT. OF TRANSPORTATION 1900 KANAWHA BLVD E, BLD. 5 RM-720	
CHARLESTON	WV	CHARLESTON	WV
US		US	

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Total Price
1	Extreme Network 5320-48p-8XEUniversal Switch or Equal.	40.00000	EA EX4100-48MP: License:	\$3,383.30 \$426.80	\$135,332.00 \$17,072.00

Comm Code	Manufacturer	Specification	Model #
43222609			

Extended Description:
Extreme Network 5320-48p-8XEUniversal Switch or Equal.

INVOICE TO		SHIP TO	
DEPT. OF TRANSPORTATION 1900 KANAWHA BLVD E, BLD. 5 RM-720		DEPT. OF TRANSPORTATION 1900 KANAWHA BLVD E, BLD. 5 RM-720	
CHARLESTON	WV	CHARLESTON	WV
US		US	

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Total Price
2	Extreme Network 5320-24p-8XEUniversal Switch or Equal.	10.00000	EA EX4100-24MP: License:	\$2145.90 \$259.48	\$21,459.00 \$2594.80

Comm Code	Manufacturer	Specification	Model #
43222609			

Extended Description:
Extreme Network 5320-48p-8XEUniversal Switch or Equal.

INVOICE TO	SHIP TO
------------	---------

DEPT. OF TRANSPORTATION 1900 KANAWHA BLVD E, BLD. 5 RM-720 CHARLESTON WV US	DEPT. OF TRANSPORTATION 1900 KANAWHA BLVD E, BLD. 5 RM-720 CHARLESTON WV US
---	---

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Total Price
3	Extreme Network 5320-16p-4XEUniversal Switch or Equal.	30.00000	EA EX4100-24MP: License:	\$2145.90 \$259.48	\$64,337.00 \$7784.40

Comm Code	Manufacturer	Specification	Model #
43222609			

Extended Description:
 Extreme Network 5320-48p-8XEUniversal Switch or Equal.

SCHEDULE OF EVENTS

<u>Line</u>	<u>Event</u>	<u>Event Date</u>
1	Tech Questions due by 10:00am	2026-05-07

REQUEST FOR QUOTATION

**WVDOT Networking Equipment Extreme Network
Switches**

- 1. CONTRACT MANAGER:** During its performance of this Contract, Vendor must designate and maintain a primary contract manager responsible for overseeing Vendor's responsibilities under this Contract. The Contract manager must be available during normal business hours to address any customer service or other issues related to this Contract. Vendor should list its Contract manager and his or her contact information below.

Contract Manager: Pam Lee

Telephone Number: (763) 464-2565

Fax Number: (216) 901-1447

Email Address: plee@advizex.com

ADDENDUM ACKNOWLEDGEMENT FORM
SOLICITATION NO.: CRFQ DOT26*89

Instructions: Please acknowledge receipt of all addenda issued with this solicitation by completing this addendum acknowledgment form. Check the box next to each addendum received and sign below. Failure to acknowledge addenda may result in bid disqualification.

Acknowledgment: I hereby acknowledge receipt of the following addenda and have made the necessary revisions to my proposal, plans and/or specification, etc.

Addendum Numbers Received:

(Check the box next to each addendum received)

- | | |
|--|--|
| <input checked="" type="checkbox"/> Addendum No. 1 | <input type="checkbox"/> Addendum No. 6 |
| <input type="checkbox"/> Addendum No. 2 | <input type="checkbox"/> Addendum No. 7 |
| <input type="checkbox"/> Addendum No. 3 | <input type="checkbox"/> Addendum No. 8 |
| <input type="checkbox"/> Addendum No. 4 | <input type="checkbox"/> Addendum No. 9 |
| <input type="checkbox"/> Addendum No. 5 | <input type="checkbox"/> Addendum No. 10 |

I understand that failure to confirm the receipt of addenda may be cause for rejection of this bid. I further understand that any verbal representation made or assumed to be made during any oral discussion held between Vendor's representatives and any state personnel is not binding. Only the information issued in writing and added to the specifications by an official addendum is binding.

Advizex Technologies, LLC

Company

Signed by:

Pam Lee

827B330EC29E451...

Authorized Signature

18 May 2026

Date

NOTE: This addendum acknowledgment should be submitted with the bid to expedite document processing.

Revised 6/8/2012

EXHIBIT A - PRICING PAGE
CRQM DOT26*57
LOCATION - BUILDING 5, ROOM A-720 CHARLESTON, WV 25305

Specifications Reference	Contract Item Number	Description	Part Number or Equal	Quantity	Unit Cost	Extended Price Total
3.1.1	#1	Extreme Networks 5320 Universal Switch - 48 Port or equal Advizex is responding with Equal: Juniper EX4100 48-PORT MULTI-GIG POE	EQUAL PART NO EX4100-48MP	40	\$3,383.30	\$135,332.00
3.1.2	#2	Extreme Networks 5320 Universal switch - 24 Port or equal: Advizex is responding with Equal: Juniper EX4100 24-PORT MULTI-GIG POE	EQUAL PART NO EX4100-24MP	10	\$2,145.90	\$21,459.00
3.1.3	#3	Extreme Networks 5320 Universal Switch - 16 Port or Equal: Advizex is responding with Equal: Juniper EX4100 24-PORT MULTI-GIG POE	EQUAL PART NO EX4100-24MP	30	\$2,145.90	\$64,377.00
3.2	#4	3YR / 1 SVC WIREDASSUR SUB EX24 INCL J-CARE CORE FOR EX23 34 43 (MIST)	SUB-EX24-1S-3Y-COR	40	\$259.48	\$10,379.20
3.2	#5	3YR / 1 SVC WIREDASSUR SUB EX48 INCL J-CARE CORE FOR EX23 34 43 (MIST)	SUB-EX48-1S-3Y-COR	40	\$426.80	\$17,072.00
						\$248,619.20

The Pricing Pages contain a list of the Contract Items and quantities to be purchased.
Unit Costs must include pricing for the specified Contract Item # and its mandatory components as detailed in Exhibit B Specifications.

****All quantities are estimated and can be more or less****

Vendor Signature

Pam Lee

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 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 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® 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 Wired Assurance and [Marvis® AI 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 802.3bz Multigigabit
- 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, HPE 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 90W per PoE port with an overall total 1620W 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 90W per port with an overall total 1620W 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 30W per port with an overall total 1440W 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 30W per port with an overall total 1440W 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 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 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 Wired Assurance data sheet](#).

In addition to Juniper Wired Assurance, Marvis AI 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.

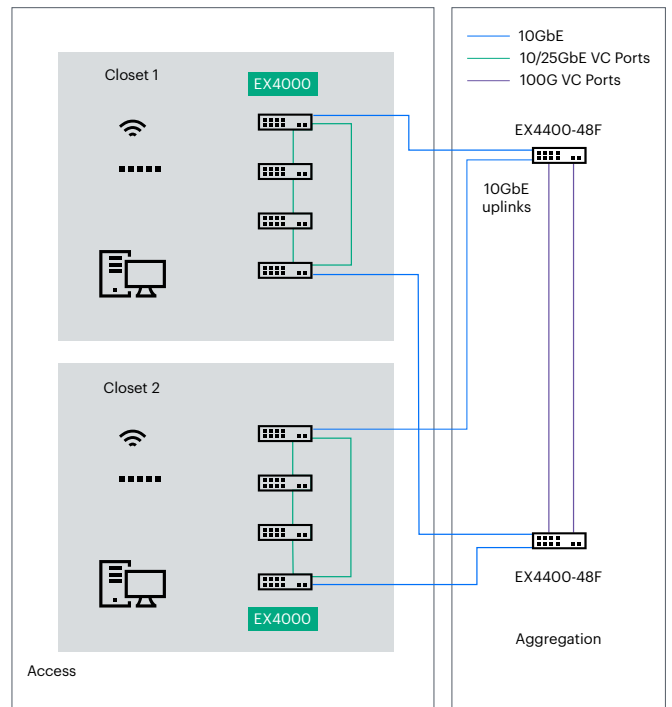


Figure 1. EX4100 Virtual Chassis configuration interconnected via dedicated front-panel 25GbE ports

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

HPE 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 Wired Assurance

The EX4100 is fully cloud onboarded, provisioned, and managed by Juniper Wired Assurance. The EX4100 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 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 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 Mist™ platform's cloud.

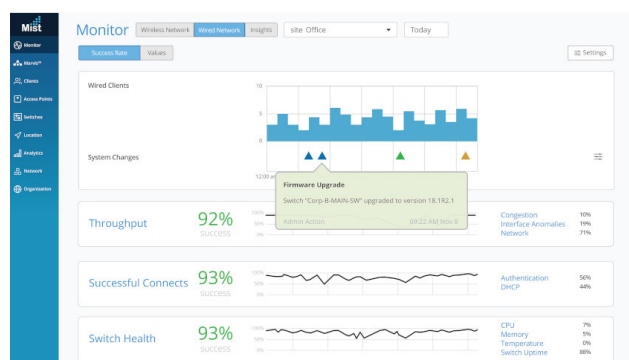


Figure 2. Juniper Wired Assurance service-level expectations screen

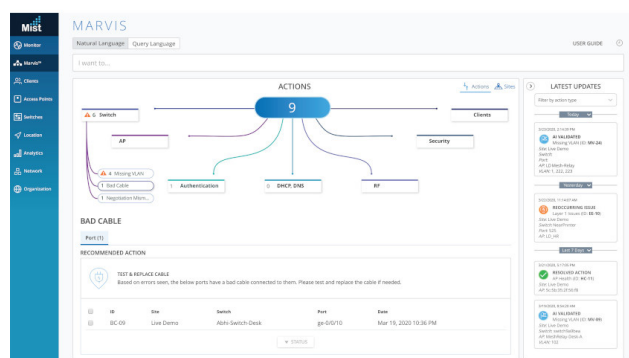


Figure 3. Marvis Actions for wired switches

The complimentary addition of Marvis AI 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 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.

HPE 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.

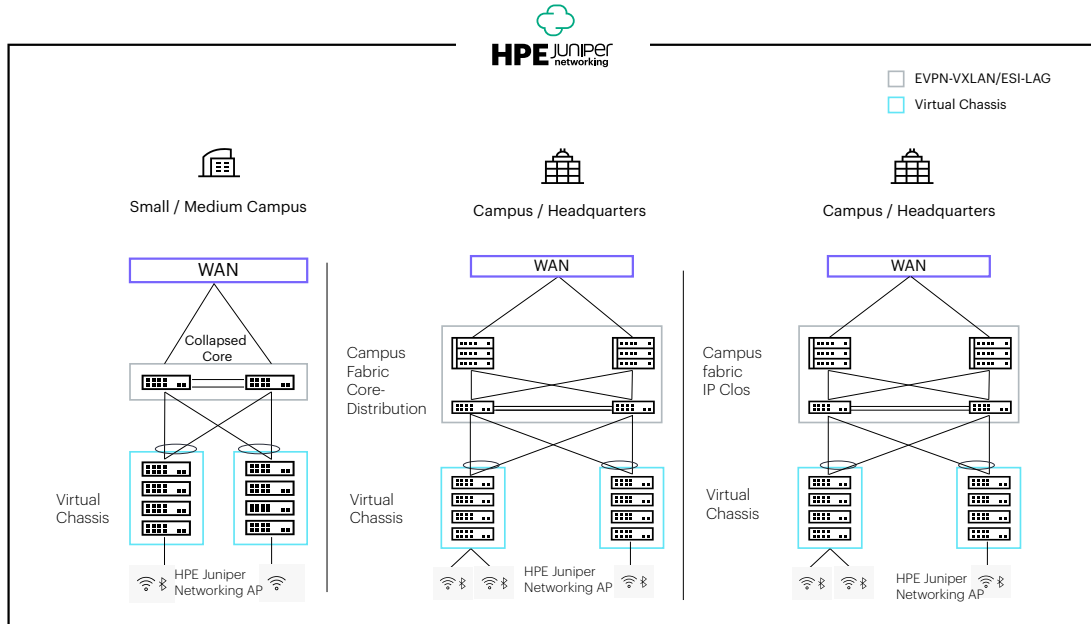


Figure 4. Campus fabrics showing Virtual Chassis and EVPN-VXLAN-based architectures

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 Mist platform's cloud

Juniper 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. Mist platform's cloud streamlines deployment and management of campus fabric architectures by allowing:

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

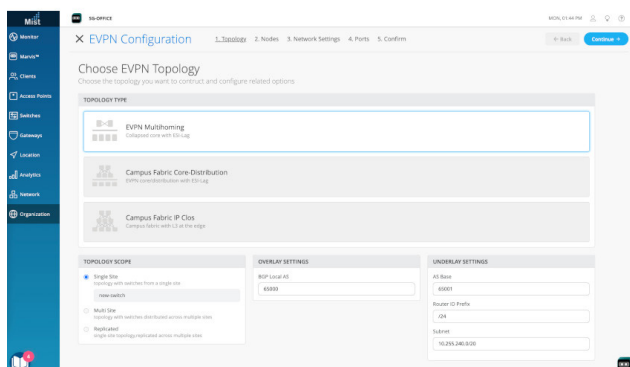


Figure 5. EVPN multihoming configuration via the Mist platform's cloud

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 HPE Juniper Networking 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](#), HPE powerful and robust network operating system that powers all HPE Juniper Networking switches, routers, and firewalls. By utilizing a common operating system, HPE 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

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 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: [juniper.net/documentation/us/en/software/license/licensing/topics/concept/flex-licenses-for-ex.html](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 support.juniper.net/support/pdf/warranty/990240.pdf.

Product options

Available EX4100 models are listed in Table 1.

Table 1. EX4100 line of 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)

Product options (continued)

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
EX4100-48P	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	740 W/ 1440 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; 100-120V/200-240V; 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 48-60V 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 [CFM] - Total maximum airflow with two power supplies and fans

- Field-replaceable fans: 2
- EX4100-24MP : 60.9
- EX4100-48MP : 61.7
- EX4100-24T : 65.6
- EX4100-24T-DC : 64.8
- EX4100-24P : 61.6
- EX4100-48T : 65.8
- EX4100-48T-DC : 66.2
- EX4100-48T-AFI : 61.8
- EX4100-48P : 64.1

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, EX4100-24MP and EX4100-48MP
- Auto medium-dependent interface/medium-dependent interface crossover (MDI/MDIX) support: EX4100-24P/T, EX4100-48P/T, EX4100-24MP and EX4100-48MP
- Port speed downshift/setting maximum advertised speed on
 - 10/100/1000BASE-T ports on EX4100-24P/T and EX4100-48P/T
 - 100/1000BASE-T/2.5GBASE-T/5GBASE-T/10GBASE-T on EX4100-24MP
 - 100/1000BASE-T/2.5GBASE-T on EX4100-48MP

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 802.3bz: 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 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: 1000

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: RIPng, 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, RIPng, 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 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 6614 RadSec
 - RFC 3618 Multicast Source Discovery Protocol (MSDP)
 - RFC 3623 OSPF Graceful Restart
 - RFC 4213 Basic Transition Mechanisms for IPv6 Hosts and Routers
 - RFC 4291 IPv6 Addressing Architecture
 - RFC 4443 ICMPv6 for the IPv6 Specification
 - RFC 4541 IBMP and MLD snooping services
 - RFC 4552 OSPFv3 Authentication
 - RFC 4861 Neighbor Discovery for IPv6
 - RFC 4862 IPv6 Stateless Address Autoconfiguration
 - RFC 4915 MT-OSPF
 - RFC 5095 Deprecation of Type 0 Routing Headers
 - RFC 5176 Dynamic Authorization Extensions to RADIUS
 - RFC 5798 VRRPv3 for IPv6
 - Draft-ietf-bfd-base-05.txt Bidirectional Forwarding Detection
 - Draft-ietf-idr-restart-10.txt Graceful Restart Mechanism
 - Draft-ietf-isis-restart-02 Restart Signaling for IS-IS
 - Draft-ietf-isis-wg-multi-topology-11 Multi Topology (MT) Routing in IS-IS for BGP
 - Internet draft-ietf-isis-ipv6-06.txt, Routing IPv6 with IS-IS
 - LLDP Media Endpoint Discovery (LLDP-MED), ANSI/ TIA-1057, draft 08
 - PIM-DM Draft IETF PIM Dense Mode draft-ietf-idmr-pimdm-05.txt, draft-ietf-pim-dm-new-v2-04.txt
- Supported MIBs**
- RFC 1155 SMI
 - RFC 1157 SNMPv1
 - RFC 1212, RFC 1213, RFC 1215 MIB-II, Ethernet-Like MIB and TRAPs
 - RFC 1493 Bridge MIB
 - RFC 1643 Ethernet MIB
 - RFC 1657 BGP-4 MIB
 - RFC 1724 RIPv2 MIB
 - RFC 1850 OSPFv2 MIB
 - RFC 1905 RFC 1907 SNMP v2c, SMIv2 and Revised MIB-II

- RFC 2011 SNMPv2 for Internet Protocol using SMIv2
- RFC 2012 SNMPv2 for transmission control protocol using SMIv2
- RFC 2013 SNMPv2 for user datagram protocol using SMIv2
- RFC 2096 IPv4 Forwarding Table MIB
- RFC 2287 System Application Packages MIB
- RFC 2570-2575 SNMPv3, user based security, encryption, and authentication
- RFC 2576 Coexistence between SNMP Version 1, Version 2, and Version 3
- RFC 2578 SNMP Structure of Management Information MIB
- RFC 2579 SNMP Textual Conventions for SMIv2
- RFC 2665 Ethernet-like interface MIB
- RFC 2787 VRRP MIB
- RFC 2819 RMON MIB
- RFC 2863 Interface Group MIB
- RFC 2863 Interface MIB
- RFC 2922 LLDP MIB
- RFC 2925 Ping/Traceroute MIB
- RFC 2932 IPv4 Multicast MIB
- RFC 3413 SNMP Application MIB
- RFC 3414 User-based Security model for SNMPv3
- RFC 3415 View-based Access Control Model for SNMP
- RFC 3621 PoE-MIB (PoE switches only)
- RFC 4188 STP and Extensions MIB
- RFC 4363 Definitions of Managed Objects for Bridges with Traffic Classes, Multicast Filtering, and VLAN extensions
- RFC 5643 OSPF v3 MIB support
- Draft - blumenthal - aes - usm - 08
- Draft - reeder - snmpv3 - usm - 3desede -00
- Draft-ietf-bfd-mib-02.txt

- Draft-ietf-idmr-igmp-mib-13
- Draft-ietf-idmr-pim-mib-09
- Draft-ietf-idr-bgp4-mibv2-02.txt - Enhanced BGP-4 MIB
- Draft-ietf-isis-wg-mib-07

Troubleshooting

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

Table 3. Acoustic in dBA

Model Number	Acoustics Noise (dBA) Typical (1 PSU)	Acoustics Noise (dBA) Maximum (2 PSU)
EX4100-24T	NA	38.0
EX4100-48T	NA	39.2
EX4100-24T-DC	NA	37.6
EX4100-48T-DC	NA	37.7
EX4100-48T-AFI	NA	38.2
EX4100-24P	39.4	50.1
EX4100-48P	38.7	48.2
EX4100-24MP	38.9	51.1
EX4100-48MP	36.8	54.3

Typical: Acoustics measurement at 50% PoE load with 1 Power Supply Unit installed.

Maximum: Acoustics measurement at 100% PoE load with 2 Power Supply Units installed.

Table 4. 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 number	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.
EX4100-48MP-TAA	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/5GbE/10GbE + 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.
EX4100-24MP-TAA	Multigigabit 24 port, PoE++(up to 90 W) switch with 8x100 MB/ 1GbE/2.5GbE/5GbE/10GbE + 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.
EX4100-48P-TAA	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.
EX4100-24P-TAA	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.
EX4100-48T-TAA	48-port 10/100/1000BASE-T switch, 4x10GbE uplinks, 4x25GbE stacking/uplink ports, MACsec AES256, redundant fans, 1x
EX4100-24T	24-port 10/100/1000BASE-T switch, 4x10GbE uplinks, 4x25GbE stacking/uplink ports, MACsec AES256, redundant fans, 1x
EX4100-24T-TAA	24-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.

Ordering information (continued)

Product number	Description
EX4100-48T-AFI	48-port 10/100/1000BASE-T switch, 4x10GbE uplinks, 4x25GbE stacking/uplink ports, MACsec AES256, redundant fans, back-to-front airflow, 1x JPSU-150-AC-AFI included with Standard SW, optics sold separately.
EX4100-48T-AFI-TAA	48-port 10/100/1000BASE-T switch, 4x10GbE uplinks, 4x25GbE stacking/uplink ports, MACsec AES256, redundant fans, back-to-front airflow, 1x JPSU-150-AC-AFI included with Standard SW, optics sold separately, TAA-compliant.
EX4100-48T-DC	48-port 10/100/1000BASE-T switch, 4x10GbE uplinks, 4x25GbE stacking/uplink ports, MACsec AES256, redundant fans, 1x JPSU-150-DC-AFO included with Standard SW, optics sold separately.
EX4100-48T-DC-TAA	48-port 10/100/1000BASE-T switch, 4x10GbE uplinks, 4x25GbE stacking/uplink ports, MACsec AES256, redundant fans, 1x JPSU-150-DC-AFO included with Standard SW, optics sold separately, TAA-compliant.
EX4100-48T-DC-T1	EX4100-48T Chassis with 2x JPSU-150-DC-AFO PSU, AFO Fans and ORv3 Tray installed
EX4100-24T-DC	24-port 10/100/1000BASE-T switch, 4x10GbE uplinks, 4x25GbE stacking/uplink ports, MACsec AES256, redundant fans, 1x JPSU-150-DC-AFO included with Standard SW, optics sold separately.
EX4100-24T-DC-TAA	24-port 10/100/1000BASE-T switch, 4x10GbE uplinks, 4x25GbE stacking/uplink ports, MACsec AES256, redundant fans, 1x JPSU-150-DC-AFO included with Standard SW, optics sold separately, TAA-compliant.
Perpetual licenses	
S-EX-A-C2-P	Software, EX Series Advanced license, Class 2 (24 ports), Perpetual license for EX4100 24-port switches
S-EX-P-C2-P	Software, EX Series Premium license, Class 2 (24 ports), Perpetual license for EX4100 24-port switches
S-EX-A-C3-P	Software, EX Series Advanced license, Class 3 (32 or 48 ports), Perpetual license for EX4100 48-port switches
S-EX-P-C3-P	Software, EX Series Premium license, Class 3 (32 or 48 ports), Perpetual license for EX4100 48-port switches
S-EX-MACSEC-C2-P	Software, EX Series MACsec license, Class 2 (24 ports), Perpetual license for EX4100 24-port switches
S-EX-MACSEC-C3-P	Software, EX Series MACsec license, Class 3 (48 ports), Perpetual license for EX4100 48-port switches
S-EX4100-FBT-P	Software, EX Series Flow Based Telemetry License. Perpetual license for all EX4100 switches.
Subscription licenses	
S-EX-A-C2-1	Software, EX Series Advanced license, Class 2 (24 ports), includes Juniper Wired Assurance and VNA 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 Wired Assurance and VNA 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 Wired Assurance and VNA subscription for EX Series 24-port switches, 5 year
S-EX-P-C2-1	Software, EX Series Premium license, Class 2 (24 ports), includes Juniper Wired Assurance and VNA 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 Wired Assurance and VNA 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 Wired Assurance and VNA subscription for EX Series 24-port switches, 5 year

Ordering information (continued)

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

Ordering information (continued)

Product number	Description
S-EX-P-C2-5-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, 5 year
S-EX-A-C3-1-ND	Software, EX Series Advanced license, Class 3 (32 or 48 ports), includes Juniper Wired Assurance and VNA subscription for EX Series 48-port switches with SVC NEXT DAY support, 1 year
S-EX-A-C3-3-ND	Software, EX Series Advanced license, Class 3 (32 or 48 ports), includes Juniper Wired Assurance and VNA subscription for EX Series 48-port switches with SVC NEXT DAY support, 3 year
S-EX-A-C3-5-ND	Software, EX Series Advanced license, Class 3 (32 or 48 ports), includes Juniper Wired Assurance and VNA subscription for EX Series 48-port switches with SVC NEXT DAY support, 5 year
S-EX-P-C3-1-ND	Software, EX Series Premium license, Class 3 (32 or 48 ports), includes Juniper Wired Assurance and VNA subscription for EX Series 48-port switches with SVC NEXT DAY support, 1 year
S-EX-P-C3-3-ND	Software, EX Series Premium license, Class 3 (32 or 48 ports), includes Juniper 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 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 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 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 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 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 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 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 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 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 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 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 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 Wired Assurance and VNA subscription for EX Series 48-port switches with SVC SAME DAY support, 5 year

Ordering information (continued)

Product number	Description
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)
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 HPE

HPE is a leader in essential enterprise technology, bringing together the power of AI, cloud, and networking to help organizations achieve more. As pioneers of possibility, our innovation and expertise advance the way people live and work. We empower our customers across industries to optimize operational performance, transform data into foresight, and maximize their impact. Unlock your boldest ambitions, with HPE. Discover more at [HPE.com](https://www.hpe.com).

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Juniper Mist wired assurance

Product overview

Juniper Mist Wired Assurance is the only cloud-native and AI-Native solution for enterprise switching. It's a different approach to network management, focusing on user and device experiences rather than network uptime. [Wired Assurance](#) delivers unparalleled user experiences for campus switching with simpler operations, shorter mean time to repair, and better visibility into connected devices.

Product description

Juniper Mist Wired Assurance is the only cloud-native and AI-Native cloud service that brings automated operations and service levels to enterprise campus switches, IoT devices, access points, servers, printers, and other equipment. It simplifies every aspect of wired switching, from Day 0 for seamless onboarding and auto-provisioning through Day 2 and beyond for operations and management. The [Juniper Mist cloud](#) streamlines provisioning, deployment, and management of switches and campus fabrics, while Mist AI simplifies operations, improves MTTR, and enables true visibility into the performance of connected devices. [Juniper EX](#) and [Juniper QFX Series Ethernet Switches](#) provide rich streaming telemetry through the [Junos operating system](#), which enables insights into what the switch is experiencing and how it is doing.

[Marvis Virtual Network Assistant \(VNA\)](#) complements Wired Assurance by using [Mist AI](#) to simplify and troubleshoot network operations with self-driving actions that automatically remediate issues. Marvis enables teams to shift from reactive troubleshooting to proactive remediation by turning insights into automated actions as part of the Self-Driving Network.

Juniper Mist cloud services are 100% programmable, using open APIs for full automation and/or integration with your IT applications.

From Client-to-Cloud, expect the Best Wired Experience

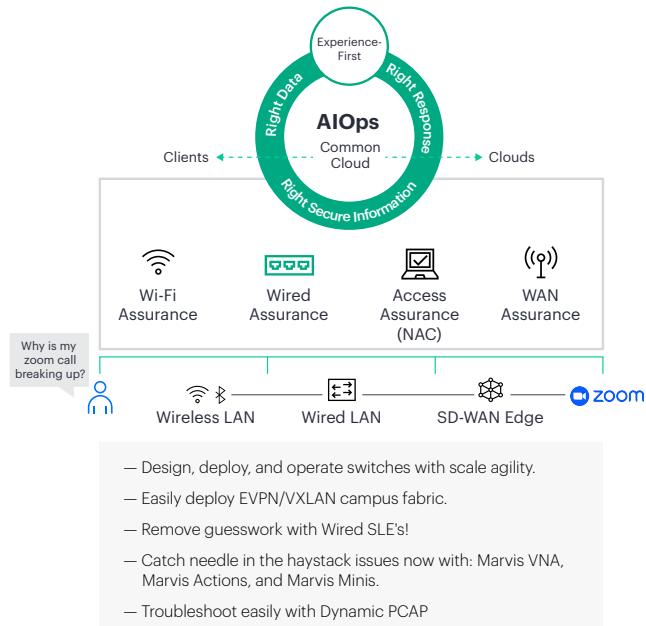


Figure 1. AI-Native Enterprise portfolio overview

Day 0/Day 1: Single-click activation and autoprovisioning of EX Switches

One-step, simplified onboarding. With true plug-and-play capabilities, the wired switches can be onboarded by the cloud with a single activation code. Network admins can get visibility into switch metrics and service levels for wired devices within a few minutes.

Existing (“brownfield”) EX deployments can take advantage of Wired Assurance as well, once adopted to the cloud.

Claim Switches and Activate Subscriptions x

Enter Switch claim codes or Activation codes

Site Assignment

Assign claimed Switches to site

Live-Demo

Name Generation

Generate names for Switches, with format:

Letters, numbers, _ - or -
Format includes arbitrary text and any/none of these options

[site] site name
[site.4] last (1-9) characters of site name
[mac] MAC address
[mac.3] last (2-3) bytes of MAC address
[ctr] incrementing counter
[ctr.3] counter with (2-6) fixed digits

Manage Configuration

Manage configuration with Mist

Root Password

Existing switch configuration will be overwritten with Mist configuration. Do not attempt to configure the switch via CLI once it is managed by Mist. Root password will be configured by the site(under site settings) to which the switch is assigned.

[View Documentation](#)

Figure 2. Claim Switches

Configurations models. Enable consistent configurations via global templates through the cloud with the flexibility to configure specific switch and site attributes. Dynamic port profiles for colorless ports add another dimension of plug-and-play, where the Juniper Mist cloud can automatically detect the type of device plugged into the switch and apply the relevant port profiles. This helps drive consistency and commonality across a number of sites while streamlining bulk deployment rollouts.

AI-Driven Campus fabric with Juniper Mist cloud. Wired Assurance brings cloud management and Mist AI to campus fabric. It sets a new standard, moving away from traditional network management toward AI-driven operations while delivering better experiences to connected devices. Build and deploy [EVPN/VXLAN-based campus fabrics](#) in minutes through the Juniper Mist cloud. Simply select devices, choose topology (EVPN multihoming, core- distribution campus fabric, and campus fabric IP Clos), and apply intent. Campus fabrics implement network microsegmentation using group-based policy that leverages the underlying VXLAN technology. Deliver improved experiences for operators, end users, and devices with rapidly reduced deployment time.

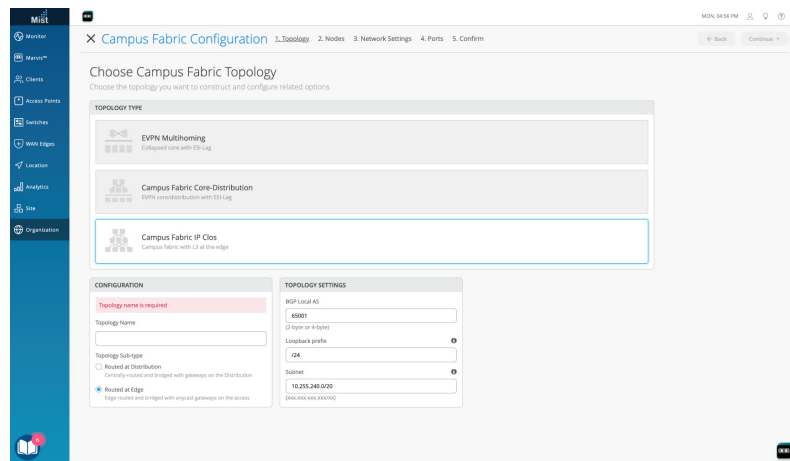


Figure 3. Campus Fabric WorkFlow

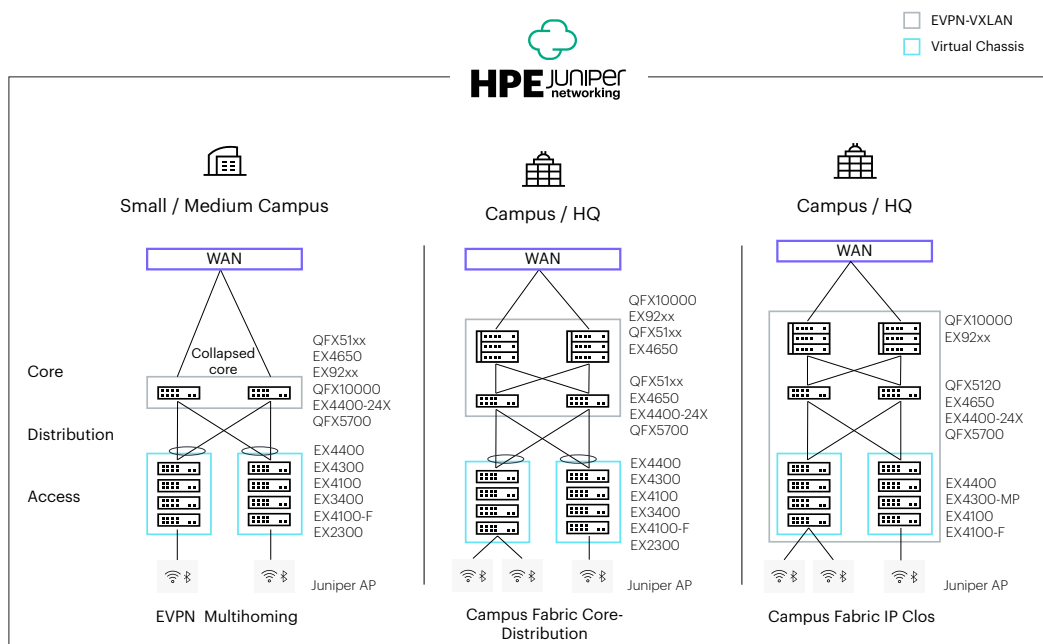


Figure 4. Campus Topologies

Device, port, and Interface profiles. Port profiles provide a convenient way to manually or automatically provision switch interfaces. For the static provisioning of color ports, users can manually assign profiles to specific port ranges and odd/even ports.

Dynamic port profiles allow users to simply plug the client device into any port. Port profiles and policies that have been configured by users can be automatically applied to wired devices (access point, corporate device, IoT device, and others) based on LLDP, RADIUS name, or manufacturer OUI attributes.

Open APIs for Third-party integrations. Proactively monitor the network with the power of 100% programmable APIs for fully automated activation, onboarding, and configuration. Juniper Mist APIs are open and seamlessly integrate with third-party systems like ServiceNow and Splunk, which support APIs for automated ticketing, troubleshooting, and more.

Day 2 and beyond: AI-Driven operations

Wired Service Level Expectations (SLEs). Get operational visibility into the wired experience with SLEs for Juniper EX and QFX Switches. Enforce throughput, successful connects, switch health, and switch bandwidth, with pre- and post-connection performance metrics. The introduction of the Switch Bandwidth SLE marks a pivotal advancement in network monitoring, offering real-time detection of congestion and headroom levels to prevent slowdowns and outages. The Throughput SLE provides comprehensive oversight of network performance, identifying storm control events, uplink congestion, and anomalies for streamlined issue resolution. Within the Successful Connect SLE, new classifications for DHCP, authentication, and refined RADIUS detection enhance troubleshooting efficiency. Meanwhile, the Switch Health SLE now includes CPU, reachability, power, memory, and temperature monitoring, alongside a new capacity classifier for optimized resource utilization. These enhancements signify a dedication to enhancing network visibility, performance, and reliability. Pre-connection shows the number and time of successful connects and authentication, while post-connection measures throughput and detects STP loops, interface errors and congestion—all in one dashboard. SLEs help to measure and manage networks for simplified troubleshooting and proactive anomaly detection.

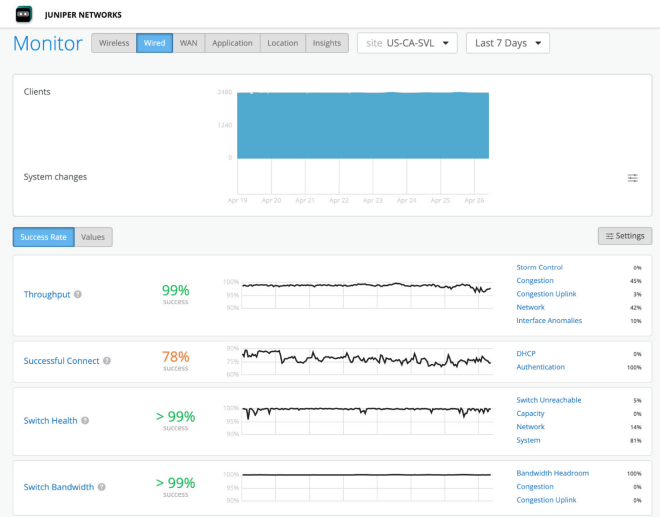


Figure 5. Juniper Mist Wired Assurance service-level expectations

AI-Native Switch Insights. Know exactly how Juniper EX and QFX Switches are performing with detailed device-level switch metrics and insights, such as CPU, memory utilization, and virtual chassis status. You can also see metrics down to the port level, including bytes transferred, traffic utilization, and power draw. You'll receive performance series data and real-time status data for connected endpoints. Wired Assurance also logs and correlates switch events, like configuration changes, firmware updates, and system alerts.

When admins hover over switch ports on the management interface, status details pop up about wired clients, access points, and connectivity, such as connected speed, PoE status, and throughput.



Figure 6. Switch level insights



Figure 10. Wired Assurance MAC limit exceeded warning

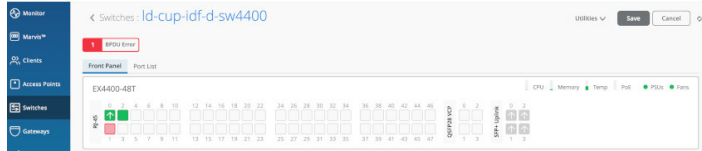


Figure 11. Wired Assurance BPDUGuard error

Marvis Virtual Network Assistant. Marvis complements Wired Assurance and takes operations toward the Self-Driving Network with simplified troubleshooting and performance analysis for help desk staff and network administrators. Simply ask a question in natural language and get actionable insights. Marvis brings proactive anomaly detection into the SLE dashboard so users know when there are deviations from established baselines. And with **Marvis Actions**, users get proactive recommendations for wired issues, such as missing VLANs, DHCP failure scopes, wired authentication failures, bad cables, port negotiation mismatches, persistently failing clients, detection of L2 loops, misconfigured ports, and traffic loops.

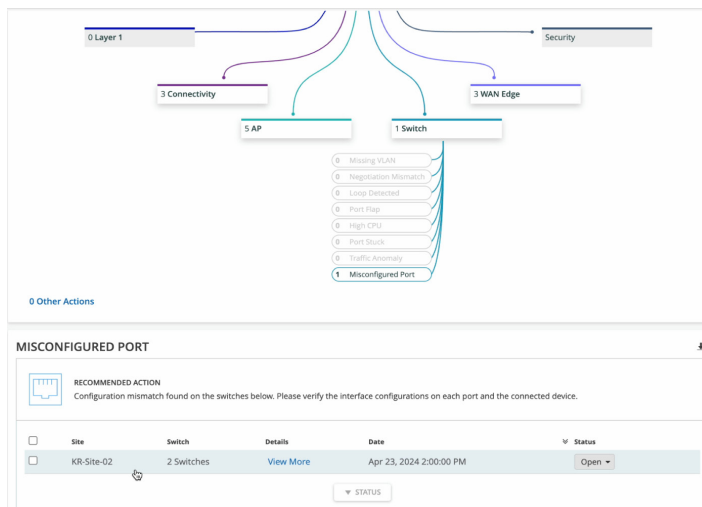


Figure 12. Marvis Actions for wired switches

Marvis Minis. [Marvis Minis](#) proactively digitally simulate user connections. By relying on network observations gained through unsupervised machine learning (ML), they can identify network issues before they impact user experiences. Minis also continuously feed data into the Mist AI engine, providing an additional source of insight to help ensure the most effective AIOps responses. For wired extends our unique AI-Native Networking Digital Experience Twins' capabilities to wired networks, enabling proactive diagnosis of authentication issues.

Network Insights. Wired Assurance includes a base analytics capability for analyzing up to 30 days of data, which simplifies the process of extracting network insights from data and analytics across your enterprise. Review your network throughput peaks to properly align your support resources. If you want to extend these capabilities to third-party network elements, consume up to one year of data, and gain the option of generating customized reports, Juniper Mist Premium Analytics is available as an additional service.

Juniper EX and QFX Switches. The EX and QFX Switches are high-performance, cloud-ready access and aggregation/core layer switches designed for enterprise branch, campus, and data center deployments. As the infrastructure foundation for the network of the next decade, the feature-rich EX and QFX Switches deliver simple and secure connectivity at scale driven by Mist AI. The following EX and QFX Switches running Junos 18.2 and beyond are supported with Wired Assurance:

- EX2300, EX2300-C, EX2300-MP
- EX3400
- EX4100, EX4100-F, EX4100-MP
- EX4300, EX4300-MP
- EX4400, EX4400-MP, EX4400-24X
- EX4600
- EX4650
- EX9200
- QFX5110
- QFX5120
- QFX5130
- QFX5700
- QFX10000

Enterprise Campus & Branch Switch Portfolio

Industry's only Cloud Native, AI Native switches.

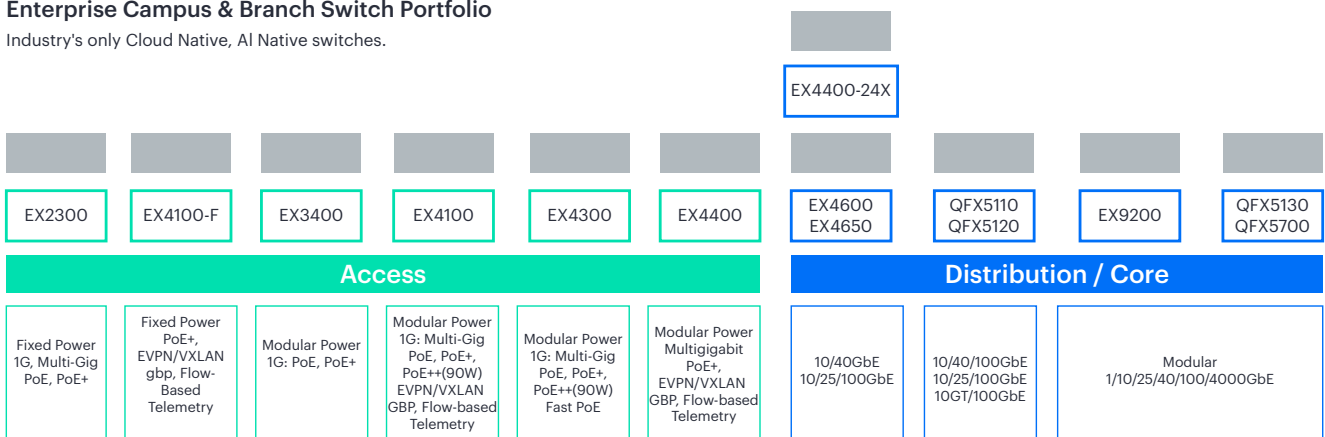


Figure 13. Enterprise Campus & Branch Switch Portfolio

About HPE

HPE is a leader in essential enterprise technology, bringing together the power of AI, cloud, and networking to help organizations achieve more. As pioneers of possibility, our innovation and expertise advance the way people live and work. We empower our customers across industries to optimize operational performance, transform data into foresight, and maximize their impact. Unlock your boldest ambitions, with HPE. Discover more at [HPE.com](https://www.hpe.com)

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