Juniper Networks EX4500 10 Gigabit Ethernet Switch

Delivering exceptional performance in a virtualized data center

Highlights

- Virtualizes the data center with Virtual Chassis (VC)—delivers 128 Gb of east–west traffic that outperforms traditional stacking solutions

- Virtualizes economically—VC across an EX4500 10 GbE switch and an IBM J48E 1 GbE switch to enable price and performance optimized solutions

- Simplifies configuration, administration, and diagnostics—VC presents multiple switches to appear as one switching entity

- Simplifies upgrades, configuration, and support—a single Junos OS across all networking tiers

- IBM three-year warranty includes next business day-replacement, with telephone support, and software fixes

In today's virtualized data center, 70 percent of server network traffic travels in the east-to-west direction. This places a new design requirement on network engineers. Stacking technologies do not address the bandwidth requirements that are needed within a high performance computing (HPC) environment. To solve this problem, network designers turn to the Juniper Networks EX4500 10 Gigabit Ethernet (GbE) Switch.

The Juniper Networks EX4500 simplifies your network design in an increasingly complex virtualized data center. It is positioned for top-of-rack applications with sizable east/west Virtual Machine (VM) server traffic, and data center environments that desire an easy/nondisruptive migration path from 1 GbE to 10 GbE while maintaining the manageability of a single switch.

It is a 40-port 10 GbE SFP+ switch with server-friendly airflow options that include front-to-back and back-to-front air flow. As your network grows, it supports field-installable expansion modules (two of them) that each hold four ports of 10 GbE SFP+, increasing the switch's capacity to a maximum of 48 ports of 10 GbE. Operating at wire speed, the EX4500 switches deliver 714 Mpps throughput and a data rate of 960 Gbps (full duplex) for both Layer 2 and Layer 3 protocols. The EX4500 is also environmentally conscious, drawing less than 8 W per port under maximum load.

Its most significant feature is the standard 128 Gb Virtual Chassis (VC) Module. It is purpose-built to simplify the design of networking your virtualized servers. The 128 Gb VC module delivers exceptional performance for east-west direct-attached IBM servers, eliminating the need for an aggregation network tier. This capacity greatly exceeds the capacity of most currently marketed solutions. The VC module enables simultaneous connectivity to another EX4500 and up to eight IBM J48E 1 GbE switches. This provides a price-optimized solution for 1 GbE and 10 GbE server connectivity, and an easy migration path to 10 GbE while maintaining a single-switch presence.

Virtual chassis technology

The EX4500 supports Juniper Networks' unique Virtual Chassis technology. This enables multiple interconnected switches to operate as a single, logical entity with a single IP address. When deployed in a Virtual Chassis configuration, the EX4500 switches are connected over a 128 Gbps backplane using Virtual Chassis interconnect cables. This enables all of the SFP+ ports to be used for server connectivity. Optionally, EX4500 switches can also be interconnected over great distances by using link aggregation (LAG) for up to eight ports of SFP+ 10 GbE.

Image 1: Front view of Juniper Networks 10 GbE Switch

Image 2: Rear view of Juniper Networks 10 GbE Switch

Virtual Chassis on the EX4500 brings important simplification features to the aggregation layer. It eliminates the need for Spanning Tree, VRRP, complex routing, or VLAN configuration, thus simplifying the management of the network.

Why IBM?

IBM is your trusted source to provide the right solutions as you design your data center network. Our experience in workload optimization, virtualization and network convergence will deliver a solution that meets your unique network needs. IBM is your single point of contact for consultation, products and services. IBM offers a broad choice of networking partners that leverages industry innovation, avoids costly vendor lock-in and helps you evolve your data center using your current supplier and management tools, avoiding a forced "rip and replace."

When purchased from IBM System x®, the Juniper Networks EX4500 includes world-renowned IBM service and support. This includes a standard three-year service agreement, with next business day replacement, software fixes and telephone support.

Juniper Networks EX4500 10 GbE Switch at a glance

Form factor	2U
Dimensions (WxHxD)	(W×H×D) 17.3 in.×3.4 in.×21 in. (43.9 cm×8.6 cm×50.2 cm)
Ports	
1000BASE-X (SFP) Port Densities	40×1000BASE-X SFP ports in base unit; 48 total with optional uplink modules
10GBASE-X Port Densities	40×10 GbE in base unit; 48 total with optional uplink modules
Virtual Chassis	2 Virtual Chassis ports or 8 SFP+ LAGs; single-switch management across Virtual Chassis; up to 2 EX4500 or up to 8 J48E and 2 EX4500 per VC
Performance	
Backplane speed	128 Gbps (Virtual Chassis)
Data rate	960 Gbps
Throughput	714 Mpps
Latency	2.7 µsec
Switching and Routing Features (Highlights)	
MAC Addresses	2,4000
Jumbo Frames	9,216 bytes
IPv4 Unicast/Multicast Routes	8,000/2,000
Number of VLANs	4,096
ARP Entries	8,000
QoS Queues/Port	8
Routing	Optional SW (OSPFv3, IPv6, BGP, MLDv2, ISIS, RIP, VRRP, BFD)
DCB/CEE	Supported
Miscellaneous	
Management	1×10/100/1000 Ethernet RJ-45 port, console port
Resiliency	Standard single AC power, optional dual-internal load-sharing AC power supplies; redundant variable-speed fans
Air flow	Two models: front-to-back airflow and back-to-front airflow
Rack-mount kits	2-post kit is included with each switch, upgrades include a 4-post rack-mount kit for a standard rack, and an IBM System x® iDataPlex® rack-mount kit
Power options	Autosensing; 110/220 V ac; 60/50 Hz
Operating System	Juniper Networks JUNOS software
Warranty	IBM 3-year next business day, includes software fixes and telephone support

Part number	Description
Juniper EX4500 10 GbE Switch - Base Model	
0719410	EX4500, 40-Port 1/10 G Switch, 128G VC, AC PS, front-to-back airflow
0719420	EX4500, 40-Port 1/10 G Switch, 128G VC, AC PS, back-to- front airflow
Uplink Module (Optional)	
81Y8287	EX 4500 4-Port 10 G SFP+ Uplink Module
Redundant Power Supply (Not Included in Base Unit)	
81Y8285	EX4500 1200 W AC power supply front-to-back air-flow, 1 power cord
81Y8286	EX4500 1200 W AC power supply back-to-front air-flow, 1 power cord
Juniper Advance Features Software	
88Y6887	Juniper Advance Features (Layer 3)
Spares	
81Y8300	EX4500 Uplink Module Blank—Spare
81Y8301	EX4500 PS Blank—Spare
88Y6866	EX4500, 128G Virtual Chassis Module—Spare
81Y8302	EX4500 Fan Tray FB—Spare
81Y8303	EX4500 Fan Tray BF—Spare
Virtual Chassis Cables	
88Y6890	EX4200/EX4500 128G Virtual Chassis Port cable 1M
88Y6894	EX4200/EX4500 128G Virtual Chassis Port cable 3M
88Y6898	EX4200/EX4500 128G Virtual Chassis Port cable 5M
88Y6863	EX4200/EX4500 128G VC cable 0.5M

For more information

To learn more about the Juniper Networks EX4500, visit **ibm.com**/systems/x/hardware/options or contact your IBM marketing representative or IBM Business Partner.

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