

Overview

HPE Altoline 6960 Switch Series



Models

HPE Altoline 6960 32QSFP28 x86 ONIE AC Front-to-Back Switch

JL279A

HPE Altoline 6960 32QSFP28 x86 ONIE AC Back-to-Front Switch

JL280A

Key features

- High 100GbE port density and low latency for demanding applications
- ONIE boot loader for choice of network OS and easy installation
- Open-networking and disaggregated solution for customer choice
- VXLAN for efficient network virtualization overlay solutions
- x86 CPU, 100GbE and redundant fans and power supplies for data center deployments

Product overview

The HPE Altoline 6960 Switch Series are top-of-rack (TOR) or spine switches for high-performance data centers. In a compact 1RU form factor, the switch provides line-rate L2 and L3 switching across up to 32 x QSFP28 ports, supporting 25GbE server connections as a ToR switch, or 100GbE spine interconnects as a spine switch.

The 32 fixed QSFP28 ports support up to 32 x 100GbE connections.

The HPE Altoline 6960 Switch Series are bare-metal switches loaded with the Open Network Install Environment (ONIE), which supports the installation of compatible independent switch OS offerings.

Features and benefits

Data center optimized

- **Flexible high port density**
the HPE Altoline 6960 Switch Series enables scaling of the server edge with 100GbE spine and ToR deployments to new heights with high-density 32-port solutions delivered in a 1RU design. Up to 32 100GbE QSFP28 ports can also be configured as four 25GbE ports by using a 100GbE-to-25GbE splitter cable providing up to 128 25GbE ports.
- **High-performance switching**

Overview

cut-through and nonblocking architecture delivers low latency (600 - 720 nanosecond for 100GbE) for very demanding enterprise applications; the switch delivers high-performance switching capacity and wire-speed packet forwarding

- **Hot/cold aisle support**
Models available with front-to-back (port-to-power) or back-to-front (power-to-port) airflow
- **Redundant fans and power supplies**
1+1 internal redundant and hot-pluggable power supplies and N+1 redundant fan trays enhance reliability and availability
- **VXLAN hardware support**
supports VXLAN VTEP overlay technologies

Manageability

- **Out-of-band interface**
isolates management traffic from user data plane traffic for complete isolation and total reachability, no matter what happens in the data plane
- **ONIE bootloader**
switch is loaded with Open Network Install Environment (ONIE) software installer
- **Intel x86 CPU**
provides high performance support of widely available, industry standard software and utilities

Layer 2 switching

- **VLAN support**
provides support for 4,096 VLAN IDs

Additional information

- **Low power consumption**
typical operation uses just 267W of AC power

Warranty and support

- **1-year Warranty**
see <http://www.hpe.com/networking/warrantysummary> for warranty and support information included with your product purchase.
- **Software releases**
to find software for your product, refer to <http://www.hpe.com/networking/support> ; for details on the software releases available with your product purchase, refer to <http://www.hpe.com/networking/warrantysummary>

Configuration

Build To Order:

BTO is a standalone unit with no integration. BTO products ship standalone are not part of a CTO or Rack-Shippable solution.

Router Chassis

HPE Altoline 6960 32QSFP28 x86 ONIE AC Front-to-Back Switch	JL279A
<ul style="list-style-type: none"> • 32 QSFP+ 40GbE ports (min=0 \ max=32 QSFP+ Transceivers) Each Switch: • 2 Power Supplies Standard (min=2 \ max=2) • 6 Front to Back Fan Trays Standard (min=5 6\ max=5 6) • 1U - Height 	See Configuration NOTE: 1, 2, 5
PDU Cable NA/MEX/TW/JP	JL279A#B2B
<ul style="list-style-type: none"> • C13 PDU Jumper Cord (NA/MEX/TW/JP) 	
PDU Cable NA/MEX/TW/JP	JL279A#B2C
<ul style="list-style-type: none"> • C13 PDU Jumper Cord (ROW) 	
High Volt Switch/Router to Wall Power Cord	JL279A#B2E
<ul style="list-style-type: none"> • NEMA L6-20P Cord (NA/MEX/JP/TW) 	
HPE Altoline 6960 32QSFP28 x86 ONIE AC Back-to-Front Switch	JL280A
<ul style="list-style-type: none"> • 32 QSFP+ 40GbE ports (min=0 \ max=32 QSFP+ Transceivers) Each Switch: • 2 Power Supplies Standard (min=2 \ max=2) • 5 6 Front to Back Fan Trays Standard (min=5 6\ max=5 6) • 1U - Height 	See Configuration NOTE: 1, 2, 5
PDU Cable NA/MEX/TW/JP	JL280A#B2B
<ul style="list-style-type: none"> • C13 PDU Jumper Cord (NA/MEX/TW/JP) 	
PDU Cable NA/MEX/TW/JP	JL280A#B2C
<ul style="list-style-type: none"> • C13 PDU Jumper Cord (ROW) 	
High Volt Switch/Router to Wall Power Cord	JL280A#B2E
<ul style="list-style-type: none"> • NEMA L6-20P Cord (NA/MEX/JP/TW) 	

Configuration Rules:

Note 1 Localization (Wall Power Cord) required on orders without #B2B, #B2C (PDU Power Cord) or #B2E. (See Localization Menu)

Note 2 The following Transceivers install into this Switch

HPE X140 40G QSFP+ LC LR4 SM 10km 1310nm Transceiver	JG661A
HPE X140 40G QSFP+ MPO SR4 Transceiver	JG325B
HPE X140 40G QSFP+ MPO MM 850nm CSR4 300m Transceiver	JG709A

Configuration

HPE X140 40G QSFP+ LC BiDi 100m MM Transceiver	JL251A
HPE FlexNetwork X240 40G QSFP+ QSFP+ 1m Direct Attach Copper Cable	JG326A
HPE FlexNetwork X240 40G QSFP+ QSFP+ 3m Direct Attach Copper Cable	JG327A
HPE FlexNetwork X240 40G QSFP+ QSFP+ 5m Direct Attach Copper Cable	JG328A
HPE FlexNetwork X240 40G QSFP+ to 4x10G SFP+ 1m Direct Attach Copper Splitter Cable	JG329A
HPE FlexNetwork X240 40G QSFP+ to 4x10G SFP+ 3m Direct Attach Copper Splitter Cable	JG330A
HPE FlexNetwork X240 40G QSFP+ to 4x10G SFP+ 5m Direct Attach Copper Splitter Cable	JG331A

Note 5 The following DAC Splitter Cables install into this Switch:

HPE FlexNetwork X240 40G QSFP+ to 4x10G SFP+ 1m Direct Attach Copper Splitter Cable	JG329A
HPE FlexNetwork X240 40G QSFP+ to 4x10G SFP+ 3m Direct Attach Copper Splitter Cable	JG330A
HPE FlexNetwork X240 40G QSFP+ to 4x10G SFP+ 5m Direct Attach Copper Splitter Cable	JG331A

Rack Level Integration CTO Models

CTO Switch Chassis

HPE Altoline 6960 32QSFP28 x86 ONIE AC Front-to-Back Switch	JL279A
<ul style="list-style-type: none"> 32 QSFP+ 40GbE ports (min=0 \ max=32 QSFP+ Transceivers) Each Switch: 2 Power Supplies Standard (min=2 \ max=2) 6 Front to Back Fan Trays Standard (min=5 6 \ max=5 6) 1U - Height 	See Configuration NOTE: 1, 2, 5
PDU Cable NA/MEX/TW/JP	JL279A#B2B
<ul style="list-style-type: none"> C13 PDU Jumper Cord (NA/MEX/TW/JP) 	
PDU Cable NA/MEX/TW/JP	JL279A#B2C
<ul style="list-style-type: none"> C13 PDU Jumper Cord (ROW) 	
High Volt Switch/Router to Wall Power Cord	JL279A#B2E
<ul style="list-style-type: none"> NEMA L6-20P Cord (NA/MEX/JP/TW) 	
HPE Altoline 6960 32QSFP28 x86 ONIE AC Back-to-Front Switch	JL280A
<ul style="list-style-type: none"> 32 QSFP+ 40GbE ports (min=0 \ max=32 QSFP+ Transceivers) Each Switch: 2 Power Supplies Standard (min=2 \ max=2) 5 6 Front to Back Fan Trays Standard (min=5 6 \ max=5 6) 1U - Height 	See Configuration NOTE: 1, 2, 5
PDU Cable NA/MEX/TW/JP	JL280A#B2B
<ul style="list-style-type: none"> C13 PDU Jumper Cord (NA/MEX/TW/JP) 	
PDU Cable NA/MEX/TW/JP	JL280A#B2C
<ul style="list-style-type: none"> C13 PDU Jumper Cord (ROW) 	
High Volt Switch/Router to Wall Power Cord	JL280A#B2E
<ul style="list-style-type: none"> NEMA L6-20P Cord (NA/MEX/JP/TW) 	

Configuration

Configuration Rules:

Note 1 Localization (Wall Power Cord) required on orders without #B2B, #B2C (PDU Power Cord) or #B2E. (See Localization Menu)

Note 2 The following Transceivers install into this Switch

HPE X140 40G QSFP+ LC LR4 SM 10km 1310nm Transceiver	JG661A
HPE X140 40G QSFP+ MPO SR4 Transceiver	JG325B
HPE X140 40G QSFP+ MPO MM 850nm CSR4 300m Transceiver	JG709A
HPE X140 40G QSFP+ LC BiDi 100m MM Transceiver	JL251A
HPE FlexNetwork X240 40G QSFP+ QSFP+ 1m Direct Attach Copper Cable	JG326A
HPE FlexNetwork X240 40G QSFP+ QSFP+ 3m Direct Attach Copper Cable	JG327A
HPE FlexNetwork X240 40G QSFP+ QSFP+ 5m Direct Attach Copper Cable	JG328A
HPE FlexNetwork X240 40G QSFP+ to 4x10G SFP+ 1m Direct Attach Copper Splitter Cable	JG329A
HPE FlexNetwork X240 40G QSFP+ to 4x10G SFP+ 3m Direct Attach Copper Splitter Cable	JG330A
HPE FlexNetwork X240 40G QSFP+ to 4x10G SFP+ 5m Direct Attach Copper Splitter Cable	JG331A

Note 5 The following DAC Splitter Cables install into this Switch:

HPE FlexNetwork X240 40G QSFP+ to 4x10G SFP+ 1m Direct Attach Copper Splitter Cable	JG329A
HPE FlexNetwork X240 40G QSFP+ to 4x10G SFP+ 3m Direct Attach Copper Splitter Cable	JG330A
HPE FlexNetwork X240 40G QSFP+ to 4x10G SFP+ 5m Direct Attach Copper Splitter Cable	JG331A

Transceivers

SFP Transceivers

HPE X120 1G SFP RJ45 T Transceiver	JD089B
HPE X120 1G SFP LC SX Transceiver	JD118B
HPE X120 1G SFP LC LX Transceiver	JD119B
HPE X120 1G SFP LC LH40 1550nm Transceiver	JD062A

SFP+ Transceivers

HPE X130 10G SFP+ LC SR Transceiver	JD092B
HPE X130 10G SFP+ LC LR Transceiver	JD094B
HPE X130 10G SFP+ LC SR Data Center Transceiver	JL437A
HPE X130 10G SFP+ LC LR Data Center Transceiver	JL439A
HPE X130 10G SFP+ LC LH 80km Transceiver	JG915A
HPE FlexNetwork X240 10G SFP+ to SFP+ 0.65m Direct Attach Copper Cable	JD095C
HPE FlexNetwork X240 10G SFP+ to SFP+ 1.2m Direct Attach Copper Cable	JD096C
HPE FlexNetwork X240 10G SFP+ to SFP+ 3m Direct Attach Copper Cable	JD097C
HPE FlexNetwork X240 10G SFP+ to SFP+ 5m Direct Attach Copper Cable	JG081C
HPE FlexNetwork X240 10G SFP+ SFP+ 7m Direct Attach Copper Cable	JC784C

QSFP+ Transceivers

HPE X140 40G QSFP+ LC BiDi 100m MM Transceiver	JL251A
HPE X140 40G QSFP+ LC LR4 SM 10km 1310nm Transceiver	JG661A
HPE X140 40G QSFP+ MPO SR4 Transceiver	JG325B

Configuration

HPE X140 40G QSFP+ MPO MM 850nm CSR4 300m Transceiver	JG709A
HPE FlexNetwork X240 40G QSFP+ QSFP+ 1m Direct Attach Copper Cable	JG326A
HPE FlexNetwork X240 40G QSFP+ QSFP+ 3m Direct Attach Copper Cable	JG327A
HPE FlexNetwork X240 40G QSFP+ QSFP+ 5m Direct Attach Copper Cable	JG328A
HPE FlexNetwork X240 40G QSFP+ to 4x10G SFP+ 1m Direct Attach Copper Splitter Cable	JG329A
HPE FlexNetwork X240 40G QSFP+ to 4x10G SFP+ 3m Direct Attach Copper Splitter Cable	JG330A
HPE FlexNetwork X240 40G QSFP+ to 4x10G SFP+ 5m Direct Attach Copper Splitter Cable	JG331A

Switch Enclosure Options

Rack Mount Kit

System (std 0 // max 1) User Selection (min 0 // max 1)

HPE Altoline Gen2 Rackmount Kit	JL198A See Configuration NOTE: 1, 3
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Configuration Rules:


Note 1 This rack mount kit is only supported on the following switches:

HPE Altoline 6940 32QSFP+ x86 ONIE AC Front-to-Back Switch	JL165A
HPE Altoline 6940 32QSFP+ x86 ONIE AC Back-to-Front Switch	JL166A
HPE Altoline 6920 48XG 6QSFP+ x86 ONIE AC Front-to-Back Switch	JL167A
HPE Altoline 6920 48XG 6QSFP+ x86 ONIE AC Back-to-Front Switch	JL168A
HPE Altoline 6960 32QSFP28 x86 ONIE AC Front-to-Back Switch	JL279A
HPE Altoline 6960 32QSFP28 x86 ONIE AC Back-to-Front Switch	JL280A

Note 3 If a switch is ordered and factory racked, then this rackmount must be #OD1

Technical Specifications

HPE Altoline 6960 32QSFP28 x86 ONIE AC Front-to-Back Switch (JL279A)

I/O ports and slots	32 QSFP28 100GbE ports	
Additional ports and slots	1 RJ-45 serial console port 1 RJ-45 out-of-band management port 1 USB 2.0	
Power supplies	2 power supply slots 1 minimum power supply required includes: 2 x PSUs 	
Fan tray	5 fan tray slots Switch comes with five (5) fan trays (port to power airflow)	
Physical characteristics	Dimensions	17.26(w) x 20.28(d) x 1.73(h) in (43.84 x 51.50 x 4.4 cm)
	Weight	18.52 lb (8.4 kg)
Memory and processor	Intel Rangely C2538 4-core @ 2.4 GHz, 8 GB DDR3 SDRAM; storage: mSATA: 32G; Packet buffer size: 12 MB, 8 GB NAND flash	
Performance	Routing/Switching capacity	3.2 Tbps
	MAC address table size	8000 entries
Environment	Operating temperature	32°F to 113°F (0°C to 45°C)
	Operating relative humidity	5% to 95%, noncondensing
	Nonoperating/Storage temperature	-40°F to 158°F (-40°C to 70°C)
	Altitude	up to 10,000 ft (3 km)
Electrical characteristics	Acoustic	Power: 62 dB
	Frequency	50/60 Hz
	Voltage	90 - 264 VAC, rated
	Maximum power rating	315 W
	Idle power	267 W
	Notes	Idle power is the actual power consumption of the device with no ports connected. Maximum power rating and maximum heat dissipation are the worst-case theoretical maximum numbers provided for planning the infrastructure with fully loaded PoE (if equipped), 100% traffic, all ports plugged in, and all modules populated. PSU Efficiency: Up to 93% for AC PSUs
Safety	cUL Certified; EN 60950; EN 55022 Class A; VCCI Class A; ROHS Compliance; FCC Class A: Regulations for Radio Frequency Devices for Electromagnetic Compliance; UL	
Emissions	FCC part 15 Class A; EN 55022 Class A; VCCI	
Immunity	ESD	32°F to 113°F (0°C to 45°C)
	EFT/Burst	IEC 68-2-14
Management	Command-line interface; Out-of-band management; SNMP manager; Telnet; FTP	
Services	Refer to the Hewlett Packard Enterprise website at http://www.hpe.com/networking/services for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local Hewlett Packard Enterprise sales office.	

Technical Specifications

HPE Altoline 6960 32QSFP28 x86 ONIE AC Back-to-Front Switch (JL280A)

I/O ports and slots	32 QSFP28 100GbE ports	
Additional ports and slots	1 RJ-45 serial console port 1 RJ-45 out-of-band management port 1 USB 2.0	
Power supplies	2 power supply slots 1 minimum power supply required includes: 2 x PSUs ○	
Fan tray	5 fan tray slots Switch comes with five (5) fan trays (power to port airflow)	
Physical characteristics	Dimensions	17.26(w) x 20.28(d) x 1.73(h) in (43.84 x 51.50 x 4.4 cm)
	Weight	18.52 lb (8.4 kg)
Memory and processor	Intel Rangelly C2538 4-core @ 2.4 GHz, 8 GB DDR3 SDRAM; storage: mSATA: 32GB; Packet buffer size: 12 MB, 8 GB NAND flash	
Performance	Routing/Switching capacity	3.2 Tbps
	MAC address table size	8000 entries
Environment	Operating temperature	32°F to 104°F (0°C to 40°C)
	Operating relative humidity	5% to 95%, noncondensing
	Nonoperating/Storage temperature	-40°F to 158°F (-40°C to 70°C)
	Altitude	up to 10,000 ft (3 km)
Electrical characteristics	Acoustic	Power: 62 dB
	Frequency	50/60 Hz
	Voltage	90 - 264 VAC, rated
	Maximum power rating	315 W
	Idle power	267 W
	Notes	Idle power is the actual power consumption of the device with no ports connected. Maximum power rating and maximum heat dissipation are the worst-case theoretical maximum numbers provided for planning the infrastructure with fully loaded PoE (if equipped), 100% traffic, all ports plugged in, and all modules populated. PSU Efficiency: Up to 93% for AC PSUs
Safety	cUL Certified; EN 60950; EN 55022 Class A; VCCI Class A; ROHS Compliance; FCC Class A: Regulations for Radio Frequency Devices for Electromagnetic Compliance; UL	
Emissions	FCC part 15 Class A; EN 55022 Class A; VCCI	
Immunity	ESD	EN 60950
	EFT/Burst	IEC 68-2-14
Management	Command-line interface; Out-of-band management; SNMP manager; Telnet; FTP	
Services	Refer to the Hewlett Packard Enterprise website at http://www.hpe.com/networking/services for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local Hewlett Packard Enterprise sales office.	

Summary of Changes

Date	Version History	Action	Description of Change:
18-Apr-2017	From Version 6 to 7	Added	Transceivers added on the Configuration section: JL437A, JL439A
01-Aug-2016	From Version 5 to 6	Changed	Several updates on Configuration section including the addition of the #AC3 Option
17-June-2016	From Version 4 to 5	Changed	Edits made on Configuration and Technical Specifications, Product image added.
06-May-2016	From Version 3 to 4	Changes	Minor edits on Technical Specifications
15-Apr-2016	From Version 2 to 3	Changed	SKU descriptions updated (Accessories), Configuration section updated.
08-Apr-2016	From Version 1 to 2	Changed	Voltage on Technical Specifications



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