## Overview

## HPE Altoline 6940 Switch Series

## Models

| | |
|---|---|
| HPE Altoline 6940 32QSFP+ x86 ONIE AC Front-to-Back Switch | JL165A |
| HPE Altoline 6940 32QSFP+ x86 ONIE AC Back-to-Front Switch | JL166A |

## Key features

- High 40GbE 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, 40GbE and redundant fans and power supplies for data center deployments.

## Product overview

The HPE Altoline 6940 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 QSFP ports, supporting 10GbE or 40GbE server connections as a ToR switch, or 10GbE or 40GbE spine interconnects as a spine switch.

The 32 fixed QSFP ports support up to 32 x 40GbE connections or 96 x 10GbE with 8 x 40GbE uplink connections.

The HPE Altoline 6940 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 6940 Switch Series enables scaling of the server edge with 40GbE spine and ToR deployments to new heights with high-density 32-port solutions delivered in a 1RU design. Up to 24 40GbE QSFP+ ports can also be configured as four 10GbE ports by using a 40GbE-to-10GbE splitter cable providing up to 96 10GbE ports with eight 40GbE uplinks.
- **High-performance switching**
  cut-through and nonblocking architecture delivers low latency (600 - 720 nanosecond for 40GbE) 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**

## Overview

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.

HPE Altoline 6940 32QSFP+ x86 ONIE AC Front-to-Back Switch — JL165A
See Configuration
**NOTE:** 1, 2, 5

- 32 QSFP+ 40GbE ports (min=0 \ max=32 QSFP+ Transceivers) Each Switch:
- 2 Power Supplies Standard (min=2 \ max=2)
- 5 Front to Back Fan Trays Standard (min=5 \ max=5)
- 1U - Height

PDU Cable NA/MEX/TW/JP — JL165A#B2B

- C13 PDU Jumper Cord (NA/MEX/TW/JP)

PDU Cable ROW — JL165A#B2C

- C13 PDU Jumper Cord (ROW)

High Volt Switch/Router to Wall Power Cord — JL165A#B2E

- NEMA L6-20P Cord (NA/MEX/JP/TW)

No Power Cord — JL165A#AC3

- No Localized Power Cord Selected

HPE Altoline 6940 32QSFP+ x86 ONIE AC Back-to-Front Switch — JL166A
See Configuration
**NOTE:** 1, 2, 5

- 32 QSFP+ 40GbE ports (min=0 \ max=32 QSFP+ Transceivers) Each Switch:
- 2 Power Supplies Standard (min=2 \ max=2)
- 5 Back to Front Fan Trays Standard (min=5 \ max=5)
- 1U - Height

PDU Cable NA/MEX/TW/JP — JL166A#B2B

- C13 PDU Jumper Cord (NA/MEX/TW/JP)

PDU Cable NA/MEX/TW/JP — JL166A#B2C

- C13 PDU Jumper Cord (ROW)

High Volt Switch/Router to Wall Power Cord — JL166A#B2E

- NEMA L6-20P Cord (NA/MEX/JP/TW)

No Power Cord — JL166A#AC3

- No Localized Power Cord Selected

Configuration Rules:

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

## Configuration

| | | |
|---|---|---|
| Note 2 | The following QSFP+ 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 |

## Rack Level Integration CTO Models

### CTO Switch Chassis

HPE Altoline 6940 32QSFP+ x86 ONIE AC Front-to-Back Switch — JL165A
See Configuration
**NOTE:** 1, 2, 5

- 32 QSFP+ 40GbE ports (min=0 \ max=32 QSFP+ Transceivers) Each Switch:
- 2 Power Supplies Standard (min=2 \ max=2)
- 5 Front to Back Fan Trays Standard (min=5 \ max=5)
- 1U - Height

PDU Cable NA/MEX/TW/JP — JL165A#B2B

- C13 PDU Jumper Cord (NA/MEX/TW/JP)

PDU Cable ROW — JL165A#B2C

- C13 PDU Jumper Cord (ROW)

High Volt Switch/Router to Wall Power Cord — JL165A#B2E

- NEMA L6-20P Cord (NA/MEX/JP/TW)

HPE Altoline 6940 32QSFP+ x86 ONIE AC Back-to-Front Switch — JL166A
See Configuration
**NOTE:** 1, 2, 5

- 32 QSFP+ 40GbE ports (min=0 \ max=32 QSFP+ Transceivers) Each Switch:
- 2 Power Supplies Standard (min=2 \ max=2)
- 5 Back to Front Fan Trays Standard (min=5 \ max=5)
- 1U - Height

PDU Cable NA/MEX/TW/JP — JL166A#B2B

- C13 PDU Jumper Cord (NA/MEX/TW/JP)

PDU Cable NA/MEX/TW/JP — JL166A#B2C

## Configuration

- C13 PDU Jumper Cord (ROW)

High Volt Switch/Router to Wall Power Cord JL166A#B2E

- 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 QSFP+ 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 |

## Configuration

### 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 |
| 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<br>See Configuration<br>**NOTE:** 1, 3 |

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 #0D1

## Technical Specifications

**HPE Altoline 6940 32QSFP+ x86 ONIE AC Front-to-Back Switch** (JL165A)

| | | |
|---|---|---|
| **I/O ports and slots** | 32 QSFP+ 40GbE ports | |
| **Additional ports and slots** | 1 RJ-45 serial console port<br>1 RJ-45 out-of-band management port<br>1 USB 2.0 | |
| **Power supplies** | 2 power supply slots<br>1 minimum power supply required<br>includes: 2 x PSUs | |
| **Fan tray** | 5 fan tray slots<br>Switch comes with five (5) fan trays (port to power airflow) | |
| **Physical characteristics** | **Dimensions** | 17.32(w) x 18.5(d) x 1.72(h) in (44.00 x 47.0 x 4.4 cm) |
| | **Weight** | 18.52 lb (8.4 kg) |
| **Memory and processor** | Intel Atom C2538 quad-core x86 processor @ 2.4 GHz, 8 GB DDR3 SDRAM; Packet buffer size: 12 MB, 16 GB SD Card | |
| **Performance** | **40 Gbps Latency** | > .6 µs |
| | **Throughput** | up to 1440 Mpps |
| | **Routing/Switching capacity** | 2560 Gbps |
| | **Routing table size** | 64000 entries (IPv4), 20000 entries (IPv6) |
| | **MAC address table size** | 320000 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) |
| **Electrical characteristics** | **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.<br>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.<br>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** or 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 6940 32QSFP+ x86 ONIE AC Back-to-Front Switch** (JL166A)

| | | |
|---|---|---|
| **I/O ports and slots** | 32 QSFP+ 40GbE ports | |
| **Additional ports and slots** | 1 RJ-45 serial console port<br>1 RJ-45 out-of-band management port<br>1 USB 2.0 | |
| **Power supplies** | 2 power supply slots<br>1 minimum power supply required<br>includes: 2 x PSUs | |
| **Fan tray** | 5 fan tray slots<br>Switch comes with five (5) fan trays (power to port airflow) | |
| **Physical characteristics** | **Dimensions** | 17.32(w) x 18.5(d) x 1.72(h) in (44.00 x 47.0 x 4.4 cm) |
| | **Weight** | 18.52 lb (8.4 kg) |
| **Memory and processor** | Intel Atom C2538 quad-core x86 processor @ 2.4 GHz, 8 GB DDR3 SDRAM; Packet buffer size: 12 MB, 16 GB SD Card | |
| **Performance** | **40 Gbps Latency** | > .6 µs |
| | **Throughput** | up to 1440 Mpps |
| | **Routing/Switching capacity** | 2560 Gbps |
| | **Routing table size** | 64000 entries (IPv4), 20000 entries (IPv6) |
| | **MAC address table size** | 320000 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) |
| **Electrical characteristics** | **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.<br>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.<br>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** or 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. | |

# Accessories

## HPE Altoline 6940 Switch Series accesories

### Transceivers

| | |
|---|---|
| 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 |
| 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 |

## Summary of Changes

| Date | Version History | Action | Description of Change: |
|---|---|---|---|
| 18-Apr-2017 | From Version 7 to 8 | Added | Transceivers added on the Configuration section: JL437A, JL439A |
| 23-Sep-2016 | From Version 6 to 7 | Changed | Warranty and support updated. |
| 01-Aug-2016 | From Version 5 to 6 | Changed | Several updates on Configuration section including the addition of the #AC3 Option |
| 15-Apr-2016 | From Version 4 to 5 | Changed | SKU descriptions updated (Accessories), Configuration section updated. |
| 01-Apr-2016 | From Version 3 to 4 | Changed | Minor changes on Technical Specifications |
| 18-Mar-2016 | From Version 2 to 3 | Changed | Product Number Descriptions updated<br><br>Configuration section added |
| 16-Feb-2016 | From Version 1 to 2 | Changed | QuickSpecs name changed from HP Altoline 6712 Switch Series to HPE Altoline 6940 Switch Series |



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