**HPE FlexFabric 5945 Switch Series**

**Key features**

- Cut through with ultra-low latency and wirespeed
- VXLAN, VTEP, and OVSDB support for virtualized environments
- High-density 100GbE/40GbE/25GbE/10GbE spine/top-of-rack (ToR) connectivity
- IPv6 support with full L2 and L3 features
- HPE FlexFabric Network Analytics solution support for real-time microburst detection

**Product overview**

HPE FlexFabric 5945 Switch Series is a family of high-density, ultra-low-latency, and ToR switches that is part of HPE FlexFabric solution (from the HPE Cloud-First Reference Architecture).

Ideally suited for deployment at the aggregation or server access layer of large enterprise data centers, the HPE FlexFabric 5945 Switch Series is also powerful enough for deployment at the core layer of medium-sized enterprises.

With the increase in virtualized applications and server-to-server traffic, customers require spine and ToR switches that can meet their throughput requirements. With the HPE FlexFabric 5945, data centers can now support up to 100 Gb per ports, allowing high-performance server connectivity and the capabilities to handle virtual environments. This is available in the low-latency HPE FlexFabric 5945 Switch Series.

**Features and benefits**

**Quality of service (QoS)**

- **Flexible queue scheduling**
  - Including Strict Priority (SP), WRR, WFQ, SP+WRR, SP+WDRR, SP+WFQ, configurable buffer, time range, queue shaping, and CAR with 8 kbps granularity
  - Packet filtering based on packet header fields from Layer 2 through Layer 4
  - Including source MAC, destination MAC, source IP (IPv4/IPv6), destination IP (IPv4/IPv6), port number, protocol type, and VLAN
**Data center optimized**

- **Flexible high-port density**
  HPE FlexFabric 5945 Switch Series enables scaling of the server edge, with 100GbE, 40GbE, 25GbE, and 10GbE spine and leaf deployment. The HPE FlexFabric 5945 Switch Series solution includes a 48-port of 25 Gb with 8-port of 100 Gb and a 2RU 4-slot modular form factor
- **High-performance switching**
  Cut through and nonblocking architecture delivers low latency (~1 microsecond for 100GbE) for very demanding enterprise applications; the switch delivers high-performance switching capacity and wirespeed packet forwarding
- **Higher scalability**
  HPE Intelligent Resilient Fabric (IRF) technology simplifies the architecture of server access networks; up to 10 HPE FlexFabric 5945 switches can be combined to deliver unmatched scalability of virtualized access layer switches and flatter 2-tier networks using HPE IRF, which reduces cost and complexity
- **Advanced modular operating system**
  Comware v7 software’s modular design and multiple processes bring native high stability, independent process monitoring, and restart; the OS also allows individual software modules to be upgraded for higher availability and supports enhanced serviceability functions such as hitless software upgrades with HPE IRF-based in-service software upgrade (ISSU)
- **Reversible airflow**
  Enhanced for data center hot-cold aisle deployment with reversible airflow—for either front-to-back or back-to-front airflow
- **Redundant fans and power supplies**
  Internal redundant and hot-pluggable power supplies and dual fan trays enhance reliability and availability
- **Lower OPEX and greener data center**
  Provides reversible airflow and advanced chassis power management
- **Data Center Bridging (DCB) protocols**
  Provides support for IEEE 802.1Qbb Priority Flow Control (PFC), Data Center Bridging Exchange (DCBX), IEEE 802.1Qaz Enhanced Transmission Selection (ETS), Explicit Congestion Notification (ECN) for converged FCoE, iSCSI, and RoCE environments
- **Jumbo frames**
  With frame sizes of up to 9416 bytes on 100GbE ports, high-performance remote backup and disaster recovery services are enabled
- **VXLAN hardware support**
  VXLAN L2/L3 gateway support for up to 4K tunnels
- **Dynamic VXLAN configuration OVSDB support for dynamic VXLAN configuration**

**Manageability**

- The HPE FlexFabric Network Analytics solution with real-time telemetry analysis provides insight into data center network operation
  - Tracks all the accounting associated with the admission and allocation process of all the buffers and queues across the ingress and egress ports
  - Microburst congestion detection
  - Rich congestion analytics
  - Buffer congestion state and statistics
  - For more information, see the HPE FlexFabric Network Analytics, data sheet, and HPE FlexFabric Network Analytics, technical white paper
- **Full-featured console**
  Provides complete control of the switch with a familiar CLI
- **Troubleshooting**
  - Ingress and egress port monitoring
  - Enables network problem solving
  - Traceroute and ping
  - Enables testing of network connectivity
- **Multiple configuration files**
  Allows multiple configuration files to be stored to a flash image
- **sFlow® (RFC 3176)**
  Provides wirespeed traffic accounting and monitoring
- **SNMPv1, v2c, and v3**
  Facilitates centralized discovery, monitoring, and secure management of networking devices
- **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
- **Remote configuration and management**
  Delivered through a secure CLI over Telnet and SSH; role-based access control (RBAC) provides multiple levels of access; configuration rollback and multiple configurations on the flash provide ease of operation; remote visibility is provided with sFlow and SNMPv1/v2/v3, and is fully supported in HPE Intelligent Management Center (IMC)
- **ISSU and hot patching**
  Provides hitless software upgrades with IRF-based ISSU and hitless patching of the modular operating system
- **PTP and NTP support**
  Synchronizes timekeeping among distributed time servers and clients; support for Network Time Protocol (NTP)

**Resiliency and high availability**

- **IRF technology**
  Enables an HPE FlexFabric switch to deliver resilient, scalable, and secured data center networks for physical and virtualized environments; groups up to 10 HPE FlexFabric 5945 switches in an HPE IRF configuration, allowing them to be configured and managed as a single switch with a single IP address; simplifies ToR deployment and management, reducing data center deployment and operating expenses
• IEEE 802.1w Rapid Convergence Spanning Tree Protocol (STP)
  Increases network uptime through faster recovery from failed links
• IEEE 802.1s Multiple Spanning Tree
  Provides high-link availability in multiple VLAN environments by allowing Multiple Spanning Trees
• Virtual Router Redundancy Protocol (VRRP)
  Allows groups of two routers to back each other up dynamically to create highly available routed environments
• Hitless patch upgrades
  Allows patches and new service features to be installed without restarting the equipment, increasing network uptime, and facilitating maintenance
• Fast protocol convergence with standard-based failure detection—Bidirectional Forwarding Detection (BFD)
  Enables link connectivity monitoring and reduces network convergence time for RIP, OSPF, Border Gateway Protocol (BGP), Intermediate system to intermediate system (IS-IS), VRRP, MPLS, and IRF
• Device Link Detection Protocol (DLDP)
  Monitors link connectivity and shuts down ports at both ends if unidirectional traffic is detected, preventing loops in STP-based networks
• Graceful restart
  Allows routers to indicate to others their capability to maintain a routing table during a temporary shutdown and significantly reduces convergence times upon recovery; supports OSPF, BGP, and IS-IS

**L2 switching**

• Address Resolution Protocol (ARP)
  Supports static, dynamic, and reverse ARP and ARP proxy
• IEEE 802.3x Flow Control
  Provides intelligent congestion management via PAUSE frames
• Ethernet Link Aggregation
  Provides IEEE 802.3ad Link Aggregation of up to 256 groups of 32 ports; support for LACP LACP Local Forwarding First, and LACP Short-time provide a fast, resilient environment that is ideal for the data center
• Spanning Tree Protocol
  Supports STP (IEEE 802.1D), Rapid STP (RSTP, IEEE 802.1w), and Multiple STP (MSTP, IEEE 802.1s)
• VLAN support
  Provides support for 4096 VLANs based on port
• IGMP support
  Provides support for IGMP Snooping, fast-leave, and group policy; IPv6 IGMP Snooping provides L2 optimization of multicast traffic
• DHCP support at L2
  Provides full DHCP Snooping support for DHCP Snooping Option 82, DHCP Relay Option 82, DHCP Snooping Trust, and DHCP Snooping Item Backup

**L3 services**

• Address Resolution Protocol
  Determines the MAC address of another IP host in the same subnet; supports static ARPs; gratuitous ARP allows detection of duplicate IP addresses; proxy ARP allows normal ARP operation between subnets or when subnets are separated by a L2 network
• Dynamic Host Configuration Protocol
  Simplifies the management of large IP networks and supports client and server; DHCP Relay enables DHCP operation across subnets
• Operations, administration, and maintenance (OAM) support
  Provides support for Connectivity Fault Management (IEEE 802.1AG) and Ethernet in the First Mile (IEEE 802.3AH); provides additional monitoring that can be used for fast fault detection and recovery

**L3 routing**

• EVPN and EVPN-DCI
  Can act as a VTEP, EVPN Gateway, or Border Gateway enabling virtual multipoint-bridged connectivity between different Layer 2 domains over an IP network
• VRRP and VRRP Extended
  Allows quick failover of router ports
• Policy-based routing
  Makes routing decisions based on policies set by the network administrator
• Equal-Cost Multipath (ECMP)
  Enables multiple equal-cost links in a routing environment to increase link redundancy and scale bandwidth
• L3 IPv4 routing
  Provides routing of IPv4 at media speed; supports static routes, RIP and RIPv2, OSPF, BGP, and IS-IS
• Open shortest path first
  Delivers faster convergence; uses this link-state routing interior gateway protocol (IGP), which supports ECMP, NSSA, and MD5 authentication for increased security and graceful restart for faster failure recovery
• Border Gateway Protocol 4
  Delivers an implementation of the BGP utilizing path vectors; uses TCP for enhanced reliability for the route discovery process; reduces bandwidth consumption by advertising only incremental updates; supports extensive policies for increased flexibility; scales to very large networks
• Intermediate system to intermediate system
  Uses a path vector IGP, which is defined by the ISO organization for IS-IS routing and extended by IETF RFC 1195 to operate in both TCP/IP and the OSI reference model (integrated IS-IS)
• Static IPv6 routing
  Provides simple manually configured IPv6 routing
• Dual IP stack
  Maintains separate stacks for IPv4 and IPv6 to ease the transition from an IPv4-only network to an IPv6-only network design

• Routing Information Protocol next generation (RIPv2)
  Extends RIPv2 to support IPv6 addressing

• OSPFv3
  Provides OSPF support for IPv6

• BGP+
  Extends BGP-4 to support Multiprotocol BGP (MBGP), including support for IPv6 addressing

• IS-IS for IPv6
  Extends IS-IS to support IPv6 addressing

• IPv6 tunneling
  Allows IPv6 packets to traverse IPv4-only networks by encapsulating the IPv6 packet into a standard IPv4 packet; supports manually configured, 6 to 4, and intra-site automatic tunnel addressing protocol (ISATAP) tunnels; is an important element for the transition from IPv4 to IPv6

• Policy routing
  Allows custom filters for increased performance and security; supports ACLs, IP prefix, AS paths, community lists, and aggregate policies

• Bidirectional Forwarding Detection
  Enables link connectivity monitoring and reduces network convergence time for RIP, OSPF, BGP, IS-IS, VRRP, MPLS, and IRF

• Multicast routing PIM dense and sparse modes
  Provides robust support of multicast protocols

• L3 IPv6 routing
  Provides routing of IPv6 at media speed; supports static routing, RIPv2, OSPFv3, BGP4+ for IPv6, and IS-ISv6

Additional information

• Green IT and power
  Improves energy efficiency through the use of the latest advances in silicon development; shuts off unused ports and utilizes variable-speed fans, reducing energy costs

Management

USB support

• File copy
  Allows users to copy switch files to and from a USB flash drive

• Multiple configuration files
  Stores easily to the flash image

SNMPv1, v2c, and v3
  Facilitates centralized discovery, monitoring, and secure management of networking devices

• 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

• Port mirroring
  Enables traffic on a port to be simultaneously sent to a network analyzer for monitoring

• Remote configuration and management is available through a CLI

• IEEE 802.1AB Link Layer Discovery Protocol (LLDP)
  Advertises and receives management information from adjacent devices on a network, facilitating easy mapping by network management applications

• sFlow (RFC 3176)
  Provides scalable ASIC-based wirespeed network monitoring and accounting with no impact on network performance; this allows network operators to gather a variety of sophisticated network statistics and information for capacity planning and real-time network monitoring purposes

• Command authorization
  Leverages RADIUS to link a custom list of CLI commands to an individual network administrator’s login; an audit trail documents activity

• Dual flash images
  Provides independent primary and secondary operating system files for backup while upgrading

• Command-line interface
  Provides a secure, easy-to-use CLI for configuring the module via SSH or a switch console; provides direct real-time session visibility

• Logging
  Provides local and remote logging of events via SNMP (v2c and v3) and syslog; provides log throttling and log filtering to reduce the number of log events generated

• Management interface control
  Provides management access through a modem port and terminal interface, as well as in-band and out-of-band Ethernet ports; provides access through terminal interface, Telnet, or SSH

• Industry-standard CLI with a hierarchical structure
  Reduces training time and expenses, and increases productivity in multivendor installations

• Management security
  restricts access to critical configuration commands; offers multiple privilege levels with password protection; ACLs provide Telnet and SNMP access; local and remote syslog capabilities allow logging of all access

• Information center
  Provides a central repository for system and network information; aggregates all logs, traps, and debugging information generated by the system and maintains them in order of severity; outputs the network information to multiple channels based on user-defined rules
• Network management
  HPE IMC centrally configures, updates, monitors, and troubleshoots

• Remote intelligent mirroring
  Mirrors ingress/egress ACL-selected traffic from a switch port or VLAN to a local or remote switch port anywhere on the network

Security
• Access control lists
  Provides IP L3 filtering based on source/destination IP address/subnet, and source/destination TCP/UDP port number

• RADIUS/TACACS+
  Eases switch management security administration by using a password authentication server

• Secure shell
  Encrypts all transmitted data for secure remote CLI access over IP networks

• IEEE 802.1X and RADIUS network logins
  Controls port-based access for authentication and accountability

• Port security
  Allows access only to specified MAC addresses, which can be learned or specified by the administrator

Convergence
• LLDP-MED (Media Endpoint Discovery)
  Defines a standard extension of LLDP that stores values for parameters such as QoS and VLAN to configure network devices such as IP phones automatically

Warranty and support
• 1-year warranty
  See hpe.com/networking/warrantysummary for warranty and support information included with your product purchase

• Software releases
  To find software for your product, see hpe.com/networking/support; for details on the software releases available with your product purchase, see hpe.com/networking/warrantysummary
### HPE FlexFabric 5945 Switch Series

#### Specifications

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<th>I/O ports and slots</th>
<th>HPE FlexFabric 5945 48SFP28 8QSFP28 Switch (JQ074A)</th>
<th>HPE FlexFabric 5945 4-slot Switch (JQ076A)</th>
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<tr>
<td>48 x 25 Gb SFP28 ports</td>
<td>Supports 48 x 10/25GbE and 8 x 100GbE fixed ports, or up to 80 x 10GbE ports when using splitter cables</td>
<td>Supports up to a maximum of 96 x 10/25GbE and 8 x 100GbE ports, or up to 32 x 100GbE ports</td>
</tr>
<tr>
<td>8 x 100 Gb QSFP28 ports</td>
<td>8 module slots (IEEE 802.3ae Type 10GBASE-ER), IEEE 802.3ae Type 10GBASE-LR, IEEE 802.3ae Type 10GBASE-SR, IEEE 802.3z Type 1000BASE-SX, IEEE 802.3z Type 1000BASE-LX</td>
<td></td>
</tr>
<tr>
<td>2 x 1 Gb SFP ports (IEEE 802.3ae Type 10GBASE-ER), IEEE 802.3ae Type 10GBASE-LR, IEEE 802.3ae Type 10GBASE-SR, IEEE 802.3z Type 1000BASE-SX, IEEE 802.3z Type 1000BASE-LX</td>
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<table>
<thead>
<tr>
<th>Additional ports and slots</th>
<th>HPE FlexFabric 5945 48SFP28 8QSFP28 Switch (JQ074A)</th>
<th>HPE FlexFabric 5945 4-slot Switch (JQ076A)</th>
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</thead>
<tbody>
<tr>
<td>1 x console port</td>
<td>1 x console port</td>
<td></td>
</tr>
<tr>
<td>1 x mini USB port</td>
<td>1 x mini USB port</td>
<td></td>
</tr>
<tr>
<td>1 x USB port</td>
<td>1 x USB port</td>
<td></td>
</tr>
<tr>
<td>2 x out-of-band management ports (one fiber port and one copper port)</td>
<td>2 x out-of-band management ports (one fiber port and one copper port)</td>
<td></td>
</tr>
</tbody>
</table>

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<tr>
<th>Power supplies</th>
<th>HPE FlexFabric 5945 48SFP28 8QSFP28 Switch (JQ074A)</th>
<th>HPE FlexFabric 5945 4-slot Switch (JQ076A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 power supply slots</td>
<td>4 power supply slots</td>
<td></td>
</tr>
<tr>
<td>1 minimum power supply required (ordered separately)</td>
<td>2 minimum power supplies required (ordered separately)</td>
<td></td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Fan tray</th>
<th>HPE FlexFabric 5945 48SFP28 8QSFP28 Switch (JQ074A)</th>
<th>HPE FlexFabric 5945 4-slot Switch (JQ076A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 fan tray slots</td>
<td>Failure to comply with these operating requirements may void the product warranty</td>
<td>The system should not be operated without a fan tray for more than two minutes. The system should not be operated outside of the temperature range of 32°F (0°C) to 113°F (45°C). Failure to comply with these operating requirements may void the product warranty</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Physical characteristics</th>
<th>HPE FlexFabric 5945 48SFP28 8QSFP28 Switch (JQ074A)</th>
<th>HPE FlexFabric 5945 4-slot Switch (JQ076A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions</td>
<td>43.6 x 440 x 460 mm (1.72 x 17.32 x 18.11 in.)</td>
<td>88.1 x 440 x 660 mm (3.47 x 17.32 x 25.98 in.) (2U height)</td>
</tr>
<tr>
<td>Weight</td>
<td>10.10 kg (22.27 lb) shipping weight</td>
<td>18.10 kg (39.90 lb) shipping weight</td>
</tr>
<tr>
<td>Full configuration weight</td>
<td>15 kg (33.07 lb)</td>
<td>27 kg (59.52 lb)</td>
</tr>
</tbody>
</table>

<table>
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<tr>
<th>Memory and processor</th>
<th>HPE FlexFabric 5945 48SFP28 8QSFP28 Switch (JQ074A)</th>
<th>HPE FlexFabric 5945 4-slot Switch (JQ076A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 GB flash; packet buffer size: 32 MB, 8 GB SDRAM</td>
<td>1 GB flash; packet buffer size: 32 MB, 8 GB SDRAM</td>
<td></td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>Performance latency</th>
<th>HPE FlexFabric 5945 48SFP28 8QSFP28 Switch (JQ074A)</th>
<th>HPE FlexFabric 5945 4-slot Switch (JQ076A)</th>
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</thead>
<tbody>
<tr>
<td>Throughput</td>
<td>&lt; 1 μs (64-byte packets) up to 2003 Mpps 2 Tbps</td>
<td>&lt; 1 μs (64-byte packets) up to 2003 Mpps 3.2 Tbps</td>
</tr>
<tr>
<td>Routing/switching capacity</td>
<td>2024 Mpps</td>
<td>2024 Mpps</td>
</tr>
<tr>
<td>Routing table size</td>
<td>128K entries (IPv4), 84K entries (IPv6)</td>
<td>128K entries (IPv4), 84K entries (IPv6)</td>
</tr>
<tr>
<td>MAC address table size</td>
<td>288K entries</td>
<td>288K entries</td>
</tr>
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## HPE FlexFabric 5945 Switch Series (continued)

### Specifications (continued)

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<th>HPE FlexFabric 5945 4-slot Switch (JQ076A)</th>
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<tr>
<td>Operating temperature</td>
<td>32°F to 113°F (0°C to 45°C)</td>
<td>32°F to 113°F (0°C to 45°C)</td>
</tr>
<tr>
<td>Operating relative humidity</td>
<td>5% to 95%, noncondensing</td>
<td>5% to 95%, noncondensing</td>
</tr>
<tr>
<td>Acoustic</td>
<td>Low-speed fan: 62.1 dB, high-speed fan: 77.9 dB</td>
<td>Low-speed fan: 70.8 dB, high-speed fan: 83.2 dB</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Electrical characteristics</th>
<th>HPE FlexFabric 5945 48SFP28 8QSFP28 Switch (JQ074A)</th>
<th>HPE FlexFabric 5945 4-slot Switch (JQ076A)</th>
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<tbody>
<tr>
<td>Frequency</td>
<td>50/60 Hz</td>
<td>50/60 Hz</td>
</tr>
<tr>
<td>Maximum heat dissipation</td>
<td>1381 BTU/hr (1458 kJ/hr)</td>
<td>2348 BTU/hr (2478 kJ/hr)</td>
</tr>
<tr>
<td>Voltage</td>
<td>100 VAC to 240 VAC V rated, 90 VAC to 264 VAC max., –40 VDC to –60 VDC rated</td>
<td>100 VAC to 240 VAC V rated, 90 VAC to 264 VAC max., –40 VDC to –60 VDC rated</td>
</tr>
<tr>
<td>Maximum power rating</td>
<td>650W</td>
<td>650W</td>
</tr>
<tr>
<td>Idle power</td>
<td>179W</td>
<td>185W</td>
</tr>
</tbody>
</table>

**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.

**Safety**

UL 60950-1, CAN/CSA C22.2 No. 60950-1, IEC 60950-1, AS/NZS 60950-1, FDA 21 CFR Subchapter J

**Emissions**


**Immunity**

CISPR 24, EN 55024, ETSI EN 300 386

**Management**

IMC, CLI, out-of-band management, SNMP Manager, Telnet, FTP

**Notes**

The customer must install a minimum of one power supply, as the device does not come with one.

The customer must install five fan kits, as the device does not come with one.

**Services**

See the HPE website at [hpe.com/networking/services](http://hpe.com/networking/services) for details on the service-level descriptions and product numbers. For details about services and response times in your area, contact your local HPE sales office.

The customer must install a minimum of two power supplies, as the device does not come with one.

The customer must install two fan kits, as the device does not come with one.

See the HPE website at [hpe.com/networking/services](http://hpe.com/networking/services) for details on the service-level descriptions and product numbers. For details about services and response times in your area, contact your local HPE sales office.
### Standards and protocols

**Appplies to all products in series**

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<td>RFC 1771 BGPv4</td>
<td>RFC 3392 Capabilities Advertisement with BGP-4</td>
<td>RFC 4456 BGP Route Reflection: An alternative to full mesh Internal BGP (IBGP)</td>
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<td>RFC 1997 BGP Communities Attribute</td>
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<td>RFC 2573 (SNMPv3 applications)</td>
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<td>RFC 1591 DNS (client)</td>
<td>RFC 2576 (coexistence between SNMPv1, v2, v3)</td>
<td>SSHv1/SSHv2</td>
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<td>RFC 1902 (SNMPv2)</td>
<td>RFC 2819 RMON</td>
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<td>IEEE 802.3ad Link Aggregation Control Protocol (LACP)</td>
<td>RFC 1591 DNS (client only)</td>
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- HPE 58x0AF 650W AC Power Supply (JC680A)
- HPE FlexFabric Switch 650W 48V Hot Plug NEBS Compliant DC Power Supply (JH336A)
- HPE X712 Back (Power Side) to Front (Port Side) Airflow High Volume 2 Fan Tray (JH389A)
- HPE X711 Front (Port Side) to Back (Power Side) Airflow High Volume 2 Fan Tray (JH388A)

HPE FlexFabric 5945 4-slot Switch (JQ076A) accessories
- HPE FlexFabric 5950 24-port SFP28 2-port QSFP28 Module (JH450A)
- HPE FlexFabric 5950 8-port QSFP28 Module (JH406A)
- HPE 58x0AF 650W AC Power Supply (JC680A)
- HPE FlexFabric Switch 650W 48V Hot Plug NEBS Compliant DC Power Supply (JH336A)
- HPE X930 4-slot Back (Power Side) to Front (Port Side) Airflow Fan Tray (JH185A)
- HPE X930 4-slot Front (Port Side) to Back (Power Side) Airflow Fan Tray (JH186A)

HPE 5945 48SFP28 8QSFP28 Switch (JQ074A) and HPE 5945 4-slot Switch (JQ076A) Optics

Gigabit SFP transceiver modules
- 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 X125 1G SFP LC LH40 1310nm Transceiver (JD061A)
- HPE X120 1G SFP LC LH40 1550nm Transceiver (JD062A)
- HPE X125 1G SFP LC LH80 Transceiver (JD063B)

100-Megabit SFP transceiver modules
- HPE X115 100M SFP LC FX Transceiver (JD102B)
- HPE X110 100M SFP LC LX Transceiver (JD108B)
- HPE X110 100M SFP LC LH40 Transceiver (JD090A)

Note: These are only supported on the management SFP ports

10-Gigabit SFP+ modules and cables
10-Gigabit SFP+ transceiver modules available for the SFP+ ports and SFP28 ports
- HPE X130 10G SFP+ LC SR Data Center Transceiver (JL437A)
- HPE X130 10G SFP+ LC LR Data Center Transceiver (JL439A)

10-Gigabit SFP+ fiber cables available for the SFP+ ports and SFP28 ports
- HPE X2A0 10G SFP+ to SFP+ 7m Active Optical Cable (JL290A)
- HPE X2A0 10G SFP+ to SFP+ 10m Active Optical Cable (JL291A)
- HPE X2A0 10G SFP+ to SFP+ 20m Active Optical Cable (JL292A)

10-Gigabit SFP+ copper cables available for the SFP+ ports and SFP28 ports
- 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 (JD097C)
- HPE FlexNetwork X240 10G SFP+ to SFP+ 5m Direct Attach Copper Cable (JG081C)

25-Gigabit QSFP+ modules and cables
QSFP+ transceiver modules available for the QSFP+ and QSFP28 ports
- HPE X190 25G QSFP+ MPO SR4 Transceiver (JG325B)
- HPE X190 25G QSFP+ MPO MM 850nm CSR4 300m Transceiver (JG709A)
- HPE X190 25G QSFP+ LC BiDi 100m MM Transceiver (JL251A)
- HPE X190 25G QSFP+ LC LR4 SM 10km 1310nm Transceiver (JG661A)
- HPE X190 25G QSFP+ LC LR4L 2km SM Transceiver (JL286A)

QSFP+ fiber cables available for the QSFP+ and QSFP28 ports
- HPE X2A0 25G QSFP+ to QSFP+ 7m Active Optical Cable (JL287A)
- HPE X2A0 25G QSFP+ to QSFP+ 10m Active Optical Cable (JL288A)
- HPE X2A0 25G QSFP+ to QSFP+ 20m Active Optical Cable (JL289A)

QSFP+ copper cables available for the QSFP+ and QSFP28 ports
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- HPE X2A0 25G QSFP+ to QSFP+ 10m Active Optical Cable (JL288A)
- HPE X2A0 25G QSFP+ to QSFP+ 20m Active Optical Cable (JL289A)
QSFP+ to 4 x SFP+ copper cables available for the QSFP+ and QSFP28 ports
- HPE X240 40G QSFP+ to 4x10G SFP+ 1m Direct Attach Copper Splitter Cable (JG329A)
- HPE X240 40G QSFP+ to 4x10G SFP+ 3m Direct Attach Copper Splitter Cable (JG330A)
- HPE X240 40G QSFP+ to 4x10G SFP+ 5m Direct Attach Copper Splitter Cable (JG331A)

QSFP28 fiber cables available for the QSFP28 ports
- HPE X150 100G QSFP28 LC LR4 10km SM Transceiver (JL275A)
- HPE X150 100G QSFP28 CWDM4 2km SM Transceiver (JH673A)

QSFP28 copper cables available for the QSFP28 ports
- HPE X150 100G QSFP28 LC LR4 10km MM Transceiver (JL275A)
- HPE X150 100G QSFP28 CWDM4 2km SM Transceiver (JH673A)

100-Gigabit QSFP28 modules and cables
QSFP28 transceiver modules available for the QSFP28 ports
- HPE X150 100G QSFP28 MPO SR4 100m MM Transceiver (JL274A)
- HPE X150 100G QSFP28 MPO PSM4 500m SM Transceiver (JH420A)
- HPE X240 100G QSFP28 to QSFP28 3m Direct Attach Copper Cable (JL272A)
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QSFP28 to SFP28 copper cables available for the QSFP28 ports
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- HPE X240 40G QSFP+ to 4x10G SFP+ 5m Direct Attach Copper Splitter Cable (JG331A)

QSFP28 copper cables available for the QSFP28 ports
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QSFP28 fiber cables available for the QSFP28 ports
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- HPE X2A0 100G QSFP28 to QSFP28 10m Active Optical Cable (JL277A)
- HPE X2A0 100G QSFP28 to QSFP28 20m Active Optical Cable (JL278A)

QSFP28 copper cables available for the QSFP28 ports
- HPE X2A0 100G QSFP28 to QSFP28 3m Direct Attach Copper Cable (JL272A)
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- HPE X240 40G QSFP+ to 4x10G SFP+ 3m Direct Attach Copper Splitter Cable (JG330A)
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