Hewlett Packard Enterprise

HPE FlexFabric 5980 Switch Series

Key features

- Lossless architecture with deep buffer ensures network continuity

- Large buffers deliver high performance through scalable packet processing

- High-density 10GbE with 100 G uplink for spine and leaf deployments, supporting a 40 G on the 100 G ports with the appropriate optics

- L2/L3 VXLAN and EVPN support for virtualized environments

- OpenFlow support for investment protection and SDN environments

- Data center convergence and resiliency with Intelligent Resilient Fabric (IRF)

Product overview

The HPE FlexFabric 5980 Switch is a high-performance and low-latency 10GbE top-of-rack (ToR) data center switch with 100 G uplinks. The switch provides a powerful solution for higher performance leaf requirements and is part of the Hewlett Packard Enterprise FlexFabric data center solution, which is a cornerstone of the Cloud-First Reference Architecture (CFRA).

The FlexFabric 5980 Switch is ideally suited for deployment at the server access layer of large enterprise data centers, or at the core layer of smaller enterprises.

With the increased pace of deploying virtualized applications, adopting software-defined networking, and the server-to-server traffic, many data centers now require spine and ToR switch innovations that will meet their requirements. The HPE FlexFabric 5980 is optimized to meet the increasing requirements for higher-performance server connectivity, convergence of Ethernet and storage traffic, the capability to handle virtual environments, and low latency.

Features and benefits

Quality of Service (QoS)
- **Powerful QoS features**

  – Flexible queue scheduling
  Including strict priority (SP), WRR, WDRR, WFQ, SP+WRR, SP+WDRR, SP+WFQ, configurable buffer, time range, queue shaping, CAR with 24 Kbps granularity

  – Packet filtering and remarking
  Packet filtering at L2 through L4; flow classification based on source MAC address, destination MAC address, source IP (IPv4/IPv6) address, destination IP (IPv4/IPv6) address, port, protocol, and VLAN

Data center optimized
- **Flexible high port density**
  The 5980 Switch enables customers to scale their server-edge 10/100GbE ToR deployments with high-density 48 fixed x 10GbE SFP+ ports with 6 ports of 100 G delivered in a 1 RU design. The 5980 100 G ports can also be configured each as a 40GbE port

- **High-performance switching**
  Cut-through and non-blocking architecture delivers low latency (~10 microsecond for 10GbE) for very demanding enterprise applications; the switch delivers high-performance switching capacity and packet forwarding

- **Higher scalability**
  Hewlett Packard Enterprise Intelligent Resilient Fabric (IRF) technology simplifies the architecture of server access networks; up to two HPE 5980 switches can be combined to deliver unmatched scalability of virtualized access layer switches and flatter two-tier networks using 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

- **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 fan trays enhance reliability and availability

- **Lower OPEX and greener data center**
  Provides reversible airflow and advanced chassis power management, and 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

- **Jumbo frames**
  With frame sizes of up to 10,000 bytes on Gigabit Ethernet and 10 and 100 Gigabit ports, allows high-performance remote backup and disaster recovery services to be enabled

- **VXLAN hardware support**
  VXLAN L2 and L3 gateway support for up to 4K tunnels
  Dynamic VXLAN configuration OVSDB and ML2 support for dynamic VXLAN configuration

- **EVPN**
  Control plane protocol for VXLAN based on industry standards. It enables L2 and L3 control-plane learning of end-host reachability information, enabling organizations to scale their VXLAN infrastructure better. Integration with OpenStack® Neutron plugin for overlay automation or orchestration

- **VXLAN enabled Policy-Based Routing (PBR)** allows the user to leverage not just the traditional functionalities available to PBR, it provides the flexibility that the next-hop can now exist behind a VXLAN tunnel endpoint. With this approach, routing decisions can be influenced to forward across a VXLAN fabric. Redirecting specific traffic to a Firewall without VLAN or VRF stitching is only one of many Use Cases enabled with this additional support—supported with static VXLAN.

- **Centralized Route Leaking**
  Multi-Protocol BGP supports safe route-leaking between Virtual Routing and Forwarding (VRF) instances by defining Route-Target policies for import and/or export respectively. Centralized Route Leaking also supports VXLAN BGP EVPN enabling customers to leak routes at one centralized point in the fabric, typically at the border leaf, which reduces the potential for introducing routing loops. Route leaking leverages the use of route-targets to control the import and export of routes.

Manageability

- Full-featured console

- Provides complete control of the switch with a familiar CLI

- Troubleshooting

  – Ingress and egress port monitoring enable network problem solving

  – Traceroute and ping Enable testing of network connectivity

- **Multiple configuration files**
  Allows multiple configuration files to be stored to a 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

- **Remote configuration and management**
  Delivered through a secure command-line interface (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

- **ISSU and hot patching**
  In Services Software Upgrade (ISSU) provides software upgrades and hitless patching of the modular operating system

- **Auto-configuration**
  Provides automatic configuration via DHCP auto-configuration

- **NTP and SNTP support**
  Synchronizes timekeeping among distributed time servers and clients; support for network time protocol (NTP), secure network time protocol (SNTP)

Resiliency and high availability
- **IRF technology**
  Enables an Hewlett Packard Enterprise FlexFabric to deliver resilient, scalable, and secured **data center networks** for physical and virtualized environments; groups up to two HPE 5980 switches in an 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** 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 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, BGP, IS-IS, VRRP, 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

Layer 2 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 1024 groups with up to 64 ports per group; support for LACP, LACP Local Forwarding First, and LACP short time provides a fast, resilient environment that is ideal for the data center

- **Spanning Tree Protocol (STP)**
Supports STP (IEEE 802.1D), Rapid STP (RSTP, IEEE 802.1w), and Multiple STP (MSTP, IEEE 802.1s)

- **VLAN support**
Provides support for 4,094 VLANs based on port and VLAN mapping

- **IGMP support**
Provides support for IGMP Snooping, Fast-Leave, and Group-Policy; IPv6 IGMP Snooping provides L2 optimization of multicast traffic

- **DHCP support**
Provides full DHCP Snooping support for DHCP Snooping Option 82, DHCP Relay Option 82, DHCP Snooping trust, and DHCP Snooping item backup

- **FC-BB-5 Fibre Channel over Ethernet (FCoE)**
Provides support T11 standards-compliant FC-BB-5 Fibre Channel over Ethernet (FCoE), including FCoE Initialization Protocol (FIP), FCP, Fibre Channel enhanced port types VE, TE and VF, Fabric Name Server, RSCN, Login Services, and name-server zoning, per-VSAN Fabric Services, FSPF, Standard Zoning, and Fibre Channel Ping

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 (DHCP)**
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
- **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 (OSPF)**
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 (BGP-4)**
Delivers an implementation of the Exterior Gateway Protocol (EGP) 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 (IS-IS)**
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 (RIPng)**
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 tunnels, 4 over 4 tunnels, and GRE tunnels

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

- **Bidirectional Forwarding Detection (BFD)** Enables link connectivity monitoring and reduces network convergence time for RIP, OSPF, BGP, IS-IS, VRRP, 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, RIPng, OSPFv3

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

- **USB support**

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

- **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 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 (ACLs)**
Provide IP L3 filtering based on source or destination IP address or subnet and source or 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

• **RADIUS network logins**
Controls port-based access for authentication and accountability

Convergence

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

• **Data Center Bridging (DCB)**
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 RoCE environments.

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, refer to **hpe.com/networking/support**; for details on the software releases available with your product purchase, refer to **hpe.com/ networking/warrantysummary**.

HPE FlexFabric 5980 Switch Series

Specifications

HPE FlexFabric 5980 48SFP+ 6QSFP28 Switch (JQ026A)

I/O ports and slots	48 fixed 1000/10000 SFP+ ports 6 QSFP28 100GbE ports
Additional ports and slots	1 × 10M/100M/1000M Base-T copper port 1 × SFP port 1 × mini USB console port (USB 2.0) 1 × USB port (USB 2.0) 1 × serial console port
Power supplies	2 power supply slots 1 minimum power supply required (ordered separately)
Fan tray	5 fan tray slots To ensure good ventilation of the switch, follow these guidelines to install and remove fan trays: • The switch comes with the fan tray slots empty. Before powering on the switch, make sure all fan tray slots have fan trays installed and the fan trays are the same model. • Make sure all slots have a module or filler panel installed when the switch is operating. • If multiple fan trays fail on an operating switch, do not remove the fan trays at the same time. Replace the fan trays one after another and finish replacing a fan tray within 3 minutes.

Physical characteristics

Dimensions	17.32 x 18.11(d) x 1.72(h) in. (44 x 46 x 4.36 cm)
Weight	≤ 28.66 lb. (13 kg.) shipping weight

Memory and processor	1 GB flash; Packet buffer size: 4 GB SDRAM

Performance

10 Gbps Latency	< 10 μs (64-byte packets)
Throughput	720 Mpps
Routing/Switching capacity	800 Gbps
Routing table size	250K entries (IPv4), 128K entries (IPv6)
MAC address table size	350K entries

HPE FlexFabric 5980 Switch Series

Specifications (continued)

HPE FlexFabric 5980 48SFP+ 6QSFP28 Switch (JQ026A)

Environment

Operating temperature	32°F to 113°F (0°C to 45°C)
Operating relative humidity	10% to 90%, noncondensing
Acoustic	Low-speed fan: 63.3 dB, High-speed fan: 77.6 dB

Electrical characteristics

Frequency	50/60 Hz
Maximum heat dissipation	986 BTU/hr (1040.29 kJ/hr)
Voltage	100–240 VAC, rated
	-40 to -60 VDC, rated (depending on power supply chosen)
Maximum power rating	340 W
Notes	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, EN 60950-1, AS/NZS 60950-1, FDA 21 CFR Subchapter J
Emissions	FCC Part 15 (CFR 47) CLASS A, ICES-003 CLASS A, VCCI CLASS A, CISPR 22 CLASS A, EN 55022 CLASS A, AS/NZS CISPR22 CLASS A, CISPR 32 CLASS A, EN 55032 CLASS A, AS/NZS CISPR32 CLASS A, EN 61000-3-2, EN 61000-3-3, ETSI EN 300 386
Immunity	CISPR 24, EN 55024, ETSI EN 300 386
Management	Intelligent Management Center (IMC); Command-line interface; Out-of-band management; SNMP manager; Telnet; FTP
Notes	The customer must order at least one power supply and at least 4 fan kits as the device does not come with any power supplies or fan kits.
Services	Refer to the Hewlett Packard Enterprise website at **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.

HPE FlexFabric 5980 Switch Series

Standards and Protocols

BGP	RFC 1163 Border Gateway Protocol (BGP) RFC 1771 BGPv4 RFC 1997 BGP Communities Attribute RFC 2918 Route Refresh Capability	RFC 3392 Capabilities Advertisement with BGP-4 RFC 4271 A Border Gateway Protocol 4 (BGP-4) RFC 4360 BGP Extended Communities Attribute	RFC 4456 BGP Route Reflection: An Alternative to Full Mesh Internal BGP (IBGP) RFC 4760 Multiprotocol Extensions for BGP-4 RFC 7432 BGP MPLS-Based Ethernet VPN
Device management	RFC 1157 SNMPv1/v2c RFC 1305 NTPv3 RFC 1591 DNS (client) RFC 1902 (SNMPv2)	RFC 1908 (SNMPv1/2 Coexistence) RFC 2573 (SNMPv3 Applications) RFC 2576 (Coexistence between SNMPv1, v2, and v3) RFC 2819 RMON	Multiple Configuration Files Multiple Software Images SSHv1/SSHv2 Secure Shell TACACS/TACACS+
General protocols	IEEE 802.1AB: LLDP IEEE 802.1ad Q-in-Q IEEE 802.1AX-2008 Link Aggregation IEEE 802.1D MAC Bridges IEEE 802.1p Priority IEEE 802.1Q VLANs IEEE 802.1Qaz: ETS IEEE 802.1Qbb: PFC IEEE 802.1Qbg: EVB IEEE 802.1s Multiple Spanning Trees IEEE 802.1w Rapid Reconfiguration of Spanning Tree IEEE 802.3ad Link Aggregation Control Protocol (LACP) IEEE 802.3ae 10-Gigabit Ethernet IEEE 802.3ba: 100GbE, 40GbE IEEE 802.3by: 25GbE IEEE 802.3ag Ethernet OAM IEEE 802.3ah Ethernet in First Mile over Point to Point Fiber—EFMF IEEE 802.3x Flow Control RFC 768 UDP RFC 783 TFTP Protocol (revision 2) RFC 791 IP RFC 792 ICMP RFC 793 TCP RFC 826 ARP RFC 854 TELNET RFC 856 TELNET RFC 868 Time Protocol RFC 896 Congestion Control in IP/TCP Internetworks RFC 950 Internet Standard Subnetting Procedure RFC 1027 Proxy ARP RFC 1058 RIPv1 RFC 1091 Telnet Terminal-Type Option RFC 1141 Incremental updating of the Internet checksum RFC 1142 OSI IS-IS Intra-domain Routing Protocol RFC 1191 Path MTU discovery	RFC 1213 Management Information Base for Network Management of TCP/IP-based Internets RFC 1253 (OSPFv2) RFC 1531 Dynamic Host Configuration Protocol RFC 1533 DHCP Options and BOOTP Vendor Extensions RFC 1534 DHCP/BOOTP Interoperation RFC 1541 DHCP RFC 1542 Clarifications and Extensions for the Bootstrap Protocol RFC 1591 DNS (client only) RFC 1624 Incremental Internet Checksum RFC 1723 RIPv2 RFC 1812 IPv4 Routing RFC 2030 Simple Network Time Protocol (SNTP) v4 RFC 2131 DHCP RFC 2236 IGMP Snooping RFC 2338 VRRP RFC 2453 RIPv2 RFC 2581 TCP Congestion Control RFC 2644 Directed Broadcast Control RFC 2767 Dual Stacks IPv4 & IPv6 RFC 2865 Remote Authentication Dial In User Service (RADIUS) RFC 2868 RADIUS Attributes for Tunnel Protocol Support RFC 2890 Key and Sequence Number Extensions to GRE RFC 3046 DHCP Relay Agent Information Option RFC 3411 an Architecture for Describing Simple Network Management Protocol (SNMP) Management Frameworks RFC 3412 Message Processing and Dispatching for the Simple Network Management Protocol (SNMP)	RFC 3413 Simple Network Management Protocol (SNMP) Applications RFC 3416 Protocol Operations for SNMP RFC 3417 Transport Mappings for the Simple Network Management Protocol (SNMP) RFC 3418 Management Information Base (MIB) for the Simple Network Management Protocol (SNMP) RFC 3768 Virtual Router Redundancy Protocol (VRRP) RFC 4250 The Secure Shell (SSH) Protocol Assigned Numbers RFC 4251 The Secure Shell (SSH) Protocol Architecture RFC 4252 The Secure Shell (SSH) Authentication Protocol RFC 4253 The Secure Shell (SSH) Transport Layer Protocol RFC 4254 The Secure Shell (SSH) Connection Protocol RFC 4292 IP Forwarding Table MIB RFC 4293 Management Information Base for the Internet Protocol (IP) RFC 4364 BGP/MPLS IP Virtual Private Networks (VPNs) RFC 4419 Diffie-Hellman Group Exchange for the Secure Shell (SSH) Transport Layer Protocol RFC 4594 Configuration Guidelines for DiffServ Service Classes RFC 4601 Protocol Independent Multicast-Sparse Mode (PIM-SM): Protocol Specification (revised) RFC 4604 Using Internet Group Management Protocol Version 3 (IGMPv3) and Multicast Listener Discovery Protocol Version 2 (MLDv2) for Source-Specific Multicast RFC 4607 Source-Specific Multicast for IP RFC 4941 Privacy Extensions for Stateless Address Auto-configuration in IPv6 RFC 5340 OSPF for IPv6 RFC 5905 Network Time Protocol Version 4: Protocol and Algorithms Specification RFC 2929 DNS IANA Considerations

HPE FlexFabric 5980 Switch Series

Standards and Protocols (continued)

IPv6	RFC 2080 RIPng for IPv6 RFC 2460 IPv6 Specification RFC 2461 IPv6 Neighbor Discovery RFC 2462 IPv6 Stateless Address Auto-configuration RFC 2463 ICMPv6 RFC 2464 Transmission of IPv6 over Ethernet Networks RFC 2473 Generic Packet Tunneling in IPv6 RFC 2545 Use of MP-BGP-4 for IPv6	RFC 2563 ICMPv6 RFC 2711 IPv6 Router Alert Option RFC 2740 OSPFv3 for IPv6 RFC 2767 Dual Stack Hosts using BIS RFC 3315 DHCPv6 (client and relay) RFC 3484 Default Address Selection for IPv6 RFC 3810 Multicast Listener Discovery Version 2 (MLDv2) for IPv6	RFC 4213 Basic Transition Mechanisms for IPv6 Hosts and Routers RFC 4291 IP Version 6 Addressing Architecture RFC 4443 ICMPv6 RFC 4552 Authentication/Confidentiality for OSPFv3 RFC 4862 IPv6 Stateless Address Auto-configuration RFC 5095 Deprecation of Type 0 Routing Headers in IPv6
MIBs	RFC 1213 MIB II RFC 1907 SNMPv2 MIB RFC 2571 SNMP Framework MIB RFC 2572 SNMP-MPD MIB	RFC 2573 SNMP-Notification MIB RFC 2573 SNMP-Target MIB RFC 2574 SNMP USM MIB RFC 2737 Entity MIB (version 2) RFC 3176: sFlow	RFC 3414 SNMP-User-based-SM MIB RFC 3415 SNMP-View-based-ACM MIB RFC 7348 VXLAN LLDP-EXT-DOT1-MIB LLDP-EXT-DOT3-MIB LLDP-MIB OpenFlow 1.3
Network management	RFC 2580 Conformance Statements for SMIv2	RFC 3164 BSD syslog Protocol	
OSPF	RFC 1587 OSPF NSSA RFC 2328 OSPFv2 RFC 3101 OSPF NSSA	RFC 3137 OSPF Stub Router Advertisement RFC 3623 Graceful OSPF Restart RFC 4577 OSPF as the Provider/Customer Edge Protocol for BGP/MPLS IP Virtual Private Networks (VPNs)	RFC 4811 OSPF Out-of-Band LSDB Resynchronization RFC 4812 OSPF Restart Signaling RFC 4813 OSPF Link-Local Signaling
QoS/CoS	IEEE 802.1p (CoS) RFC 2475 DiffServ Architecture	RFC 2597 DiffServ Assured Forwarding (AF)	RFC 3247 Supplemental Information for the New Definition of the EF PHB (Expedited Forwarding Per-Hop Behavior) RFC 3260 New Terminology and Clarifications for DiffServ
Security	RFC 1321 The MD5 Message-Digest Algorithm RFC 2818 HTTP Over TLS	RFC 6192 Partial Support—Protecting the Router Control Plane	Access control lists (ACLs) SSHv2 Secure Shell

HPE FlexFabric 5980 Switch Series accessories

HPE FlexFabric 5980 48SFP+ 6QSFP28 Switch (JQ026A)

HPE 58x0AF 650W AC Power Supply (JC680A)

HPE FlexFabric Switch 650W 48V Hot Plug NEBS-compliant DC Power Supply (JH336A)

HPE X711 Front (Port Side) to Back (Power Side) Airflow High Volume 2 Fan Tray (JH388A)

HPE X712 Back (Power Side) to Front (Port Side) Air flow High Volume 2 Fan Tray (JH389A)

HPE X115 100M SFP LC FX Transceiver (JD102B)—Management Port

HPE X110 100M SFP LC LX Transceiver (JD120B)—Management Port

HPE X125 1G SFP LC LH40 1310nm Transceiver (JD061A)

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)

HPE X125 1G SFP LC LH80 Transceiver (JD063B)

HPE X240 10G SFP+ SFP+ 5m DAC Cable (JG081C)

HPE X130 10G SFP+ LC SR DC XCVR (JL437A)

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)

HPE X130 10G SFP+ LC LR Transceiver (JL439A)

HPE X240 10G SFP+ SFP+ 0.65m DA Cable (JD095C)

HPE X240 10G SFP+ to SFP+ 1.2m Direct Attach Copper Cable (JD096C)

HPE X240 10G SFP+ to SFP+ 3m Direct Attach Copper Cable (JD097C)

HPE X140 40G QSFP+ LC BiDi 100m MM Transceiver (JL251A)

HPE X2A0 40G QSFP+ to QSFP+ 7m Active Optical Cable (JL287A)

HPE X2A0 40G QSFP+ to QSFP+ 10m Active Optical Cable (JL288A)

HPE X2A0 40G QSFP+ to QSFP+ 20m Active Optical Cable (JL289A)

HPE X140 40G QSFP+ LC LR4L 2km SM Transceiver (JL286A)

HPE X140 40G QSFP+ MPO SR4 Transceiver (JG325B)

HPE X240 40G QSFP+ to QSFP+ 1m Direct Attach Copper Cable (JG326A)

HPE X240 40G QSFP+ to QSFP+ 3m Direct Attach Copper Cable (JG327A)

HPE X240 40G QSFP+ to QSFP+ 5m Direct Attach Copper Cable (JG328A)

HPE X140 40G QSFP+ LC LR4 SM 10km 1310nm Transceiver (JG661A)

HPE X140 40G QSFP+ MPO MM 850nm CSR4 300m Transceiver (JG709A)

HPE X240 100G QSFP28 1m DAC Cable (JL271A)

HPE X240 100G QSFP28 3m DAC Cable (JL272A)

HPE X240 100G QSFP28 to QSFP28 5m Direct Attach Copper Cable (JL273A)

HPE X150 100G QSFP28 SR4 100m MM Transceiver (JL274A)

HPE FlexFabric 5980 Switch Series accessories

HPE FlexFabric 5980 48SFP+ 6QSFP28 Switch (JQ026A) (continued)

HPE X150 100G QSFP28 LC LR4 10km SM Transceiver (JL275A)

HPE X150 100G QSFP28 LC SWDM4 100m MM Transceiver (JH419A)

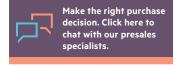HPE X2A0 100G QSFP28 7m AOC Cable (JL276A)

HPE X2A0 100G QSFP28 10m AOC Cable (JL277A)

HPE X2A0 100G QSFP28 20m AOC Cable (JL278A)

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