Hewlett Packard Enterprise

HPE FlexFabric 5930 Switch Series

Product overview

The HPE FlexFabric 5930 Switch Series provides a high performance and ultra-low-latency 40GbE top-of-rack (ToR) data center switches. The switch series is part of the HPE FlexFabric data center solution, which is a cornerstone of the Cloud-First Reference Architecture.

The FlexFabric 5930 Switch Series is ideally suited for deployment at the aggregation or server access layer of large enterprise data centers, or at the core layer of medium-sized enterprises.

With the increase 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 5930 is optimized to meet the increasing requirements for high-performance server connectivity, convergence of Ethernet and storage traffic, the capability to handle virtual environments, and ultra low latency.

A summary of the highlights of the FlexFabric 5930 Switch Series

- VXLAN VTEP support for virtualized environments
- OpenFlow support for investment protection and SDN environments
- High-density 40GbE for spine-and–leaf deployments
- Unified management of virtual and physical network with VEPA and IMC
- Data center convergence and resiliency with DCB, FC/FCoE, IRF, and TRILL

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 8 kbps granularity
  - Packet filtering and remarking

    Packet filtering at Layer 2 (L2) through Layer 4 (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 HPE FlexFabric 5930 Switch Series enables scaling of the server edge with 40GbE spine and ToR deployments to new heights with a high-density 32-port fixed port switch in a 1RU design.
- High-performance switching

  Cut-through and nonblocking architecture delivers low latency (1µs for 10GbE) for very demanding enterprise applications; the switch delivers high-performance switching capacity and wire-speed packet forwarding.
- Higher scalability

  The HPE Intelligent Resilient Framework (IRF) technology simplifies the architecture of server access networks; up to nine 5930 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 via IRF.
- TRILL, SPB, and EVB/VEPA

  TRansparent Interconnection of Lots of Links (TRILL) is supported including support of TRILL with IRF, TRILL ECMP up to eight paths. Support for Shortest Path Bridging (IEEE 802.1aq) with ECMP up to eight paths. Edge Virtual Bridging with Virtual Ethernet Port Aggregator (EVB/VEPA) provides connectivity into the virtual environment for a data center-ready environment.
- 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

  Provide 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.

- FCoE support

  Provides support for 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, NPV, NPIV, Fabric Name Server, RSCN, Login Services, and name server zoning, per-VSAN Fabric Services, FSPF, Standard Zoning, and Fibre Channel Ping.

- Jumbo frames

  With frame sizes of up to 10,000 bytes on Gigabit Ethernet and 40GbE, high-performance remote backup and disaster recovery services are enabled.

- VXLAN support

  VXLAN Layer 2 gateway support for up to 1K tunnels.

Manageability

- Full-featured console

  Provides complete control of the switch with a familiar command-line interface (CLI)

- Troubleshooting

  – Ingress and egress port monitoring

  Enable network problem solving

  – Traceroute and ping

  Enable testing of network connectivity

- Multiple configuration files

  Allow multiple configuration files to be stored to a flash image

- sFlow® (RFC 3176)

  Provides wire-speed traffic accounting and monitoring

- SNMPv1, v2c, and v3

  Facilitate 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 the **HPE Intelligent Management Center (IMC)**

- ISSU and hot patching

  Provides hitless software upgrades via IRF and hitless patching of the modular operating system

- Auto-configuration

  Provides automatic configuration via DHCP auto-configuration

- NTP, SNTP

  Synchronize timekeeping among distributed time servers and clients; support for Network Time Protocol (NTP), Secure Network Time Protocol (SNTP)

Resiliency and high availability

- HPE IRF technology

  Enables a FlexFabric solution to deliver resilient, scalable, and secured data center networks for physical and virtualized environments; groups up to nine 5930 switches in an IRF configuration, allowing them to be configured and managed as a single **switch** with a single IP address; and 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 two routers to dynamically back each other up to create highly available routed environments

- Bidirectional Forwarding (BFD)

  Enables link connectivity monitoring and reduces network convergence time for RIP, OSPF, BGP, 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, helping prevent 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; and supports OSPF, BGP, and IS-IS

L2 switching

- MAC-based VLAN

  Provides granular control and security; and uses RADIUS to map a MAC address/user to specific VLANs

- 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 of 32 ports; and 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 4096 VLANs based on the port, MAC address, IPv4 subnet, protocol, and guest VLAN; and supports VLAN mapping (only 4094 VLANs can be used)

- 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 (ARP)

  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 an 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); and provides additional monitoring that can be used for fast fault detection and recovery

L3 routing

- Virtual Router Redundancy Protocol (VRRP) and VRRP Extended

  Allow 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 speeds; and supports static routes, RIP and RIPv2, OSPF, BGP, and IS-IS

- Open shortest path first (OSPF)

  Delivers faster convergence; and 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; and 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, and Intra-Site Automatic Tunnel Addressing Protocol (ISATAP) tunnels; and is an important element for the transition from IPv4 to IPv6

- Policy routing

  Allows custom filters for increased performance and security; and 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, 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 speeds; and supports static routing, RIPng, 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; and 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

  Facilitate 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 wire-speed 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 (CLI)

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

  Provides local and remote logging of events via SNMP (v2c and v3) and syslog; and 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; and provides access through the terminal interface, telnet, or secure shell (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; and offers multiple privilege levels with password protection; ACLs provide telnet and SNMP access while 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 the order of severity; and sends out the network information to multiple channels based on user-defined rules

- Network management

  HPE Intelligent Management Center (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 Layer 3 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 automatically configure network devices such as IP phones

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 5930 Switch Series

Specifications	HPE FlexFabric 5930-32QSFP+ Switch (JG726A)
I/O ports and slots	32 QSFP+ 40GbE ports
Additional ports and slots	1 RJ45 serial console port 1 RJ45 out-of-band management port 1 USB 2.0 1 Mini USB 2.0
Power supplies	2 power supply slots 1 minimum power supply required (ordered separately)
Fan tray	2 fan tray slots The customer must order fan trays, as fan trays are not included with the switch. This system requires two same-direction airflow fan trays to function properly. The system should not be operated with only one fan tray for more than 24 hours. 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.
Physical characteristics	
Dimensions	17.32 (w) x 25.98 (d) x 1.72 (h) in. (44 x 66 x 4.36 cm) 35.27 lb (16 kg) shipping weight
Weight	28.66 lb (13 kg)
Memory and processor	1 GB flash; Packet buffer size: 12.2 MB, 4 GB SDRAM
Performance	
10 Gbps Latency	< 1 µs (64-byte packets)
Throughput	Up to 1904.64 Mpps
Routing/Switching capacity	2560 Gbps
Routing table size	120K (IPv4), 60K (IPv6) 188K
MAC address table size	
Reliability	
MTBF (years)	37.5
MTTR (hours)	1
Environment	
Operating temperature	32°F to 113°F (0°C to 45°C)
Operating relative humidity	10% to 95%, noncondensing
Acoustic	Low-speed fan: 59.8 dB, High-speed fan: 74.4 dB

Specifications (continued)	HPE FlexFabric 5930-32QSFP+ Switch (JG726A)
Electrical characteristics	
Frequency	50/60 Hz
Maximum heat dissipation	648/1396 BTU/hr (684.0/1472.4 kJ/hr)
Voltage	100–240 VAC, rated –40 to –60 VDC, rated (depending on power supply chosen)
Maximum power rating	409W
Idle power	190W
	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; EN 60825-1 Safety of Laser Products-Part 1; EN 60825-2 Safety of Laser Products-Part 2; IEC 60950-1; CAN/CSA-C22.2 No. 60950-1; Anatel; ULAR; GOST; EN 60950-1/A11; FDA 21 CFR Subchapter J; NOM; ROHS Compliance
Emissions	VCCI Class A; EN 55022 Class A; ICES-003 Class A; ANSI C63.4 2003; AS/NZS CISPR 22 Class A; EN 61000-3-2:2006; EN 61000-3-3:1995 + A1:2001 + A2:2005; EMC Directive 2004/108/EC; FCC (CFR 47, Part 15) Class A; ANSI/TIA-1057 LLDP-MED
Immunity	
Generic	ETSI EN 300 386 V1.3.3
EN	EN 55024:1998 + A1:2001 + A2:2003
ESD	EN 61000-4-2; IEC 61000-4-2
Radiated	EN 61000-4-3; IEC 61000-4-3
EFT/Burst	EN 61000-4-4; IEC 61000-4-4
Surge	EN 61000-4-5; IEC 61000-4-5
Conducted	EN 61000-4-6; IEC 61000-4-6
Voltage dips and interruptions	EN 61000-4-11; IEC 61000-4-11
Harmonics	EN 61000-3-2, IEC 61000-3-2
Flicker	EN 61000-3-3, IEC 61000-3-3
Power frequency magnetic field	IEC 61000-4-8; EN 61000-4-8
Management	Intelligent Management Center; Command-line interface; Out-of-band management; SNMP manager; Telnet; FTP
Notes	The customer must order a power supply, as the device does not come with one. At least one JC680A or JC681A is required.
Services	Refer to the Hewlett Packard Enterprise website at **hpe.com/us/en/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.

Standards and protocols
(applies to all products in series)

BGP	RFC 1163 Border Gateway Protocol (BGP) RFC 1771 BGPv4 RFC 1997 BGP Communities Attribute RFC 2918 Route Refresh Capability
Device management	RFC 1157 SNMPv1/v2c RFC 1305 NTPv3 RFC 1591 DNS (client) RFC 1902 (SNMPv2)
General protocols	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 802.1s 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 802.3ag 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 4594 Configuration Guidelines for DiffServ Service Classes RFC 4601 Protocol Independent Multicast—Sparse Mode (PIM-SM): Protocol Specification (Revised)
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 Auto-configuration RFC 2464 Transmission of IPv6 over Ethernet Networks RFC 2473 Generic Packet Tunneling in IPv6
MIBs	RFC 1213 MIB II RFC 1907 SNMPv2 MIB RFC 2571 SNMP Framework MIB RFC 2572 SNMP-MPD MIB
Network management	RFC 2580 Conformance Statements for SMIv2
OSPF	RFC 1587 OSPF NSSA RFC 2328 OSPFv2 RFC 3101 OSPF NSSA RFC 3137 OSPF Stub Router Advertisement
QoS/CoS	IEEE 802.1p (CoS) RFC 2475 DiffServ Architecture RFC 2597 DiffServ Assured Forwarding (AF)
Security	RFC 1321 The MD5 Message-Digest Algorithm

Standards and protocols (continued)
(applies to all products in series)

Transceivers	HPE X140 40G QSFP+ LC LR4 SM 10km 1310nm Transceiver (JG661A) HPE X140 40G QSFP+ MPO MM 850nm CSR4 300m Transceiver (JG709A) HPE X140 40G QSFP+ MPO SR4 Transceiver (JG325A) HPE X140 40G QSFP+ LC BiDi 100m MM Transceiver (JL251A) HPE X140 40G QSFP+ LC LR4L 2km SM Transceiver (JL286A) HPE X140 40G QSFP+ LC ER4 40km SM Transceiver (JL306A) HPE X240 40G QSFP+ QSFP+ 1m DAC Cable (JG326A) HPE X240 40G QSFP+ QSFP+ 3m DAC Cable (JG327A) HPE X240 40G QSFP+ QSFP+ 5m DAC Cable (JG328A) HPE X240 QSFP+ 4x10G SFP+ 1m DAC Cable (JG329A) HPE X240 QSFP+ 4x10G SFP+ 3m DAC Cable (JG330A) HPE X240 QSFP+ 4x10G SFP+ 5m DAC Cable (JG331A) 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)
Power supply	HPE 58x0AF 650W AC Power Supply (JC680A) HPE 58x0AF 650W DC Power Supply (JC681A)
HPE FlexFabric 5930-32QSFP+ Switch (JG726A)	HPE X711 Front (port side) to Back (power side) Airflow High Volume Fan Tray (JG552A) HPE X712 Back (power side) to Front (port side) Airflow High Volume Fan Tray (JG553A)

Learn more at
hpe.com/networking

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