Product overview

The HP FlexFabric 5930 Switch Series is a family of high performance and ultra-low-latency 10GbE and 40GbE top-of-rack (ToR) data center switches. The switch series is part of the HP FlexFabric data center solution, which is a cornerstone of the FlexNetwork 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 and server-to-server traffic, many data centers now require spine and ToR switch innovations that will meet their requirements. The HP FlexFabric 5930 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 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 10GbE and 40GbE for spine-and-leaf deployments
• Unify 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 8kbps 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 HP FlexFabric 5930 Switch Series enables scaling of the server edge with 10GbE and 40GbE spine and ToR deployments to new heights with a high-density 32-port fixed port switch in a 1RU design, a 2 Slot Modular design with Two 40GbE QSFP+ ports and a 4 Slot Design. Support for 10GbE SFP+, 10GBASE-T, Converged Port 1/10GbE or 4/8Gbps Fiber Channel, and 40GbE ports
• High-performance switching
  Cut-through and nonblocking architecture delivers low latency (1 microsecond for 10GbE) for very demanding enterprise applications; the switch delivers high-performance switching capacity and wire-speed packet forwarding
• Higher scalability
  The HP 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 with single-chassis ISSU
  • TRILL, SPB, and EVB/VEPA
    TRansparent Interconnection of Lots of Links (TRILL) is supported including support of TRILL with IRF, TRILL ECMP up to 8 paths. Support for Shortest Path Bridging (IEEE 802.1aq) with ECMP up to 8 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 T11 standards-compliant FC-BB-5 Fibre Channel over Ethernet (FCoE), including FCoE Initialization Protocol (FIP), FCP, Fiber 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 Fiber Channel Ping.

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

• **VXLAN support**
  VXLAN Layer 2 gateway support for up to 4k 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 HP Intelligent Management Center (IMC)

• **ISSU and hot patching**
  Provides hitless software upgrades with single-unit In Services Software Upgrade (ISSU) and hitless patching of the modular operating system

• **Autoconfiguration**
  Provides automatic configuration via DHCP autoconfiguration

• **NTP, SNTP, and PTP Support**
  Synchronize timekeeping among distributed time servers and clients; Support for Network Time Protocol (NTP), Secure Network Time Protocol (SNTP), and Precision Time Protocol (PTP) IEEE 1588v2 (2008)
Resiliency and high availability

• HP 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

• Hitless patch upgrades
  Allows patches and new service features to be installed without restarting the equipment, increasing network uptime and facilitating maintenance

• Ultrafast protocol convergence (< 50 ms) 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, 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 128 groups of 16 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 4,096 VLANs based on the port, MAC address, IPv4 subnet, protocol, and guest VLAN; and supports 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 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 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 (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
  HP 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
  Advance hardware replacement with 10-calendar-day delivery (please consult your HP representative for regional support details.)

• Electronic and telephone support
  Limited electronic and business-hour telephone support is available from HP for the entire warranty period; to reach our support centers, visit hp.com/networking/contact-support; for details on the duration of support provided with your product purchase, visit hp.com/networking/warrantysummary

• Software releases
  To find software for your product, visit hp.com/networking/support; for details on the software releases available with your product purchase, visit hp.com/networking/warrantysummary
# HP FlexFabric 5930 Switch Series

## Specifications

### I/O ports and slots
- **HP FlexFabric 5930-32QSFP+ Switch (J6726A)**: 32 QSFP+ 40GbE ports
- **HP FlexFabric 5930 4-slot Switch (J179A)**: 4 module slots
- **HP FlexFabric 5930 2QSFP+ 2-slot Switch (J178A)**: 2 module slots

### Additional ports and slots
- **HP FlexFabric 5930-32QSFP+ Switch (J6726A)**: 1 RJ-45 serial console port, 1 RJ-45 out-of-band management port, 1 USB 2.0
- **HP FlexFabric 5930 4-slot Switch (J179A)**: 1 RJ-45 serial console port, 1 RJ-45 out-of-band management port, 1 USB 2.0
- **HP FlexFabric 5930 2QSFP+ 2-slot Switch (J178A)**: 1 RJ-45 serial console port, 1 RJ-45 out-of-band management port, 1 USB 2.0

### Power supplies
- **HP FlexFabric 5930-32QSFP+ Switch (J6726A)**: 2 power supply slots, 1 minimum power supply required (ordered separately)
- **HP FlexFabric 5930 4-slot Switch (J179A)**: 4 power supply slots, 2 minimum power supplies required (ordered separately)
- **HP FlexFabric 5930 2QSFP+ 2-slot Switch (J178A)**: 2 power supply slots, 1 minimum power supply required (ordered separately)

### Fan tray
- **HP FlexFabric 5930-32QSFP+ Switch (J6726A)**: 2 fan tray slots
- **HP FlexFabric 5930 4-slot Switch (J179A)**: 2 fan tray slots
- **HP FlexFabric 5930 2QSFP+ 2-slot Switch (J178A)**: 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

<table>
<thead>
<tr>
<th>Dimension</th>
<th>HP FlexFabric 5930-32QSFP+ Switch (J6726A)</th>
<th>HP FlexFabric 5930 4-slot Switch (J179A)</th>
<th>HP FlexFabric 5930 2QSFP+ 2-slot Switch (J178A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions</td>
<td>17.32(w) x 25.98(d) x 1.72(h) in. (44.00 x 66.0 x 4.36 cm)</td>
<td>17.32(w) x 25.98(d) x 3.47(h) in. (44.00 x 66.0 x 8.81 cm) (2U height)</td>
<td>17.32(w) x 25.98(d) x 1.74(h) in. (44.00 x 66.0 x 4.42 cm) (1U height)</td>
</tr>
<tr>
<td>Weight</td>
<td>35.27 lb (16 kg) shipping weight</td>
<td>66.14 lb (30 kg) shipping weight</td>
<td>39.68 lb (18 kg) shipping weight</td>
</tr>
<tr>
<td>Full configuration weight</td>
<td>28.66 lb (13 kg)</td>
<td>59.52 lb (27 kg)</td>
<td>35.27 lb (16 kg)</td>
</tr>
</tbody>
</table>

### Memory and processor

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<tbody>
<tr>
<td>1 GB flash; Packet buffer size: 12.2 MB, 4 GB SDRAM</td>
<td>1 GB flash; Packet buffer size: 12.2 MB, 4 GB SDRAM</td>
<td>1 GB flash; Packet buffer size: 12.2 MB, 4 GB SDRAM</td>
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### Performance

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</tr>
</thead>
<tbody>
<tr>
<td>10 Gbps Latency up to 1429 Mpps up to 1429 Mpps</td>
<td>&lt; 1 μs (64-byte packets)</td>
<td>&lt; 1 μs (64-byte packets)</td>
<td>&lt; 1 μs (64-byte packets) up to 1071 Mpps up to 1071 Mpps</td>
</tr>
<tr>
<td>2560 Gbps 120000 entries (IPv4), 60000 entries (IPv6)</td>
<td>2560 Gbps 120000 entries (IPv4), 60000 entries (IPv6)</td>
<td>120000 entries (IPv4), 60000 entries (IPv6)</td>
<td>120000 entries (IPv4), 60000 entries (IPv6)</td>
</tr>
<tr>
<td>MAC address table size</td>
<td>288000 entries</td>
<td>288000 entries</td>
<td>288000 entries</td>
</tr>
</tbody>
</table>

### Reliability

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</tr>
</thead>
<tbody>
<tr>
<td>MTBF (years)</td>
<td>37.5</td>
<td>35.8</td>
<td>47.2</td>
</tr>
<tr>
<td>MTTR (hours)</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

### Environment

<table>
<thead>
<tr>
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</thead>
<tbody>
<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>
<td>32°F to 113°F (0°C to 45°C)</td>
</tr>
<tr>
<td>Operating relative humidity</td>
<td>10% to 95%, noncondensing</td>
<td>10% to 90%, noncondensing</td>
<td>10% to 90%, noncondensing</td>
</tr>
<tr>
<td>Acoustic</td>
<td>74.4 dB</td>
<td>74.4 dB</td>
<td>74.4 dB</td>
</tr>
</tbody>
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## Electrical characteristics

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<tbody>
<tr>
<td><strong>Frequency</strong></td>
<td>50/60 Hz</td>
<td>50/60 Hz</td>
<td>50/60 Hz</td>
</tr>
<tr>
<td><strong>Maximum heat dissipation</strong></td>
<td>597/1361 BTU/hr (629.83/1435.86 kJ/hr)</td>
<td>474/3010 BTU/hr (500.07/3196.65 kJ/hr)</td>
<td>358/1733 BTU/hr (377.69/1828.31 kJ/hr)</td>
</tr>
<tr>
<td><strong>Voltage</strong></td>
<td>90–264 VAC, rated</td>
<td>90–264 VAC, rated</td>
<td>90–264 VAC, rated</td>
</tr>
<tr>
<td><strong>Maximum power rating</strong></td>
<td>-40 to -75 VDC, rated</td>
<td>-40 to -75 VDC, rated</td>
<td>-40 to -75 VDC, rated</td>
</tr>
<tr>
<td><strong>Idle power</strong></td>
<td>(depending on power supply chosen)</td>
<td>(depending on power supply chosen)</td>
<td>(depending on power supply chosen)</td>
</tr>
<tr>
<td><strong>Power consumption</strong></td>
<td>139 W</td>
<td>139 W</td>
<td>105 W</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

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<tr>
<td><strong>UL</strong></td>
<td>EN 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 60950-1/1/A1; FTA 21 C FR Subchapter 1; NOM; RDHS Compliance</td>
<td>EN 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 60950-1/1/A1; FTA 21 C FR Subchapter 1; NOM; RDHS Compliance</td>
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## Emissions

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<tr>
<td><strong>VCCI</strong></td>
<td>VCCI Class A; ANSI C63.4:3:2003; AS/NZS CISPR Class A</td>
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## Immunity

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<tr>
<td><strong>Generic</strong></td>
<td>ETSI EN 300 386 V1.3.3</td>
<td>ETSI EN 300 386 V1.3.3</td>
<td>ETSI EN 300 386 V1.3.3</td>
</tr>
<tr>
<td><strong>ESD</strong></td>
<td>EN 61100-1-4; 2; IEC 61000-4-2</td>
<td>EN 61100-1-4; 2; IEC 61000-4-2</td>
<td>EN 61100-1-4; 2; IEC 61000-4-2</td>
</tr>
<tr>
<td><strong>Radiated</strong></td>
<td>EN 61100-1-3; 4; IEC 61000-4-3</td>
<td>EN 61100-1-3; 4; IEC 61000-4-3</td>
<td>EN 61100-1-3; 4; IEC 61000-4-3</td>
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<td>EN 61100-1-4; 4; IEC 61000-4-4</td>
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<td><strong>Surge</strong></td>
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<td>EN 61100-1-4; 4; IEC 61000-4-5</td>
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<td><strong>Conducted</strong></td>
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<td>EN 61100-1-4; 4; IEC 61000-4-6</td>
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<tr>
<td><strong>Voltage dips and interruptions</strong></td>
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<td>EN 61000-3-2; IEC 61000-3-2</td>
<td>EN 61000-3-2; IEC 61000-3-2</td>
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<td>EN 61000-3-3; IEC 61000-3-3</td>
<td>EN 61000-3-3; IEC 61000-3-3</td>
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## Management

- IMC—Intelligent Management Center; Command-line interface; Out-of-band management; SNMP manager; Telnet; FTP
- SNMP manager; Telnet; FTP
- SNMP manager; Telnet; FTP

## Services

- Refer to the HP website at hp.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 HP sales office.
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## Standards and Protocols

### (applies to all products in series)

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<td>RFC 1157 SNMPv1/v2c&lt;br&gt; RFC 1305 NTPv3&lt;br&gt; RFC 1591 DNS (client)&lt;br&gt; RFC 1902 (SNMPv2)&lt;br&gt; RFC 1908 (SNMPv1/2 Coexistence)&lt;br&gt; RFC 2573 (SNMPv3 Applications)&lt;br&gt; RFC 2576 (Coexistence between SNMPv1, v2, v3)</td>
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<td><strong>MIBs</strong></td>
<td>RFC 1213 MIB II&lt;br&gt; RFC 1907 SNMPv2 MIB&lt;br&gt; RFC 2571 SNMP Framework MIB&lt;br&gt; RFC 2572 SNMP-MPD MIB&lt;br&gt; RFC 2573 SNMP-Notification MIB&lt;br&gt; RFC 2573 SNMP-Target MIB&lt;br&gt; RFC 2574 SNMP-UDM MIB&lt;br&gt; RFC 2737 Entity MIB (Version 2)</td>
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<tr>
<td><strong>Network management</strong></td>
<td>RFC 3164 BSD syslog Protocol</td>
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<td><strong>OSPF</strong></td>
<td>RFC 1587 OSPF NSSA&lt;br&gt; RFC 2328 OSPFv2&lt;br&gt; RFC 3101 OSPF NSSA&lt;br&gt; RFC 3137 OSPF Stub Router Advertisement&lt;br&gt; RFC 3623 Graceful OSPF Restart&lt;br&gt; RFC 4577 OSPF as the Provider/Customer Edge Protocol for BGP/MPLS IP Virtual Private Networks (VPNs)</td>
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<td><strong>Security</strong></td>
<td>Access Control Lists (ACLs)&lt;br&gt; SSHv2 Secure Shell</td>
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</tbody>
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### HP FlexFabric 5930 Switch Series accessories

#### Transceivers
- HP X240 40G QSFP+ to QSFP+ 3m Direct Attach Copper Cable (JG327A)
- HP X240 40G QSFP+ to QSFP+ 5m Direct Attach Copper Cable (JG328A)
- HP X240 40G QSFP+ to 4x10G SFP+ 1m Direct Attach Copper Splitter Cable (JG329A)
- HP X240 40G QSFP+ to 4x10G SFP+ 3m Direct Attach Copper Splitter Cable (JG330A)
- HP X240 40G QSFP+ to 4x10G SFP+ 5m Direct Attach Copper Splitter Cable (JG331A)
- HP X140 40G QSFP+ LC LR4 S 10km 1310nm Transceiver (JG661A)
- HP X140 40G QSFP+ MPO SR4 Transceiver (JG325B)
- HP X140 40G QSFP+ MPO MM 850nm CSR4 Transceiver (JG709A)
- HP X240 10G SFP+ to SFP+ 3m Direct Attach Copper Cable (JC874C)
- HP X140 40G CFP LC LR4 10km SM Transceiver (JC857A)
- HP X125 1G SFP LC LH40 1310nm Transceiver (JG661A)
- HP X120 1G SFP LC LH40 1550nm Transceiver (JG662A)
- HP X125 1G SFP LC LH70 Transceiver (JG663B)
- HP X120 1G SFP RJ45 T Transceiver (JG689B)
- HP X130 10G SFP+ LC SR Transceiver (JG692B)
- HP X130 10G SFP+ LC LRM Transceiver (JG693B)
- HP X130 10G SFP+ LC LR Transceiver (JG694B)
- HP X240 10G SFP+ to SFP+ 0.65m Direct Attach Copper Cable (JG095C)
- HP X240 10G SFP+ to SFP+ 1.2m Direct Attach Copper Cable (JG096C)
- HP X240 10G SFP+ to SFP+ 3m Direct Attach Copper Cable (JG097C)
- HP X120 1G SFP LC LH100 Transceiver (JD091A)
- HP X130 10G XFP LC ZR Transceiver (JD107A)
- HP X130 10G XFP LC LR Transceiver (JD108B)
- HP X120 1G SFP LC SX Transceiver (JD118B)
- HP X120 1G SFP LC LX Transceiver (JD119B)
- HP X240 10G SFP+ to SFP+ 5m Direct Attach Copper Cable (JG081C)
- HP X130 10G SFP+ LC ER 40km Transceiver (JG234A)
- HP X130 10G SFP+ LC ER 40km Transceiver (JG234A)
- HP X130 10G SFP+ LC LH 80km Transceiver (JG915A)
- HP X240 40G QSFP+ to QSFP+ 1m Direct Attach Copper Cable (JG326A)

#### Power supply
- HP 58x0AF 460W DC Power Supply (JC680A)
- HP 58x0AF 460W DC Power Supply (JC681A)

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