HP 5900 Switch Series
Data sheet

Product overview
The HP 5900 Switch Series is a family of high-density 10 GbE ultra-low latency top-of-rack (ToR) switches. The 5900 series is part of the HP FlexFabric solution module of the HP FlexNetwork architecture. The 5900 switch is ideally suited for deployment at the server access layer of large enterprise data centers and is also designed for deployment at the data center core layer of medium-sized enterprises. With the increase in virtualized applications and server-to-server traffic, customers now require ToR switch innovations that will meet their needs for higher-performance server connectivity, convergence of Ethernet and storage traffic, the capability to handle virtual environments, and ultra-low latency all in a single device.

Key features
• Cut-through design for ultra-low 10 GbE latency
• HP IRF for virtualization/two-tier architecture
• High 10 GbE ToR port density with 40 GbE uplink
• IPv6 support in ToR with full L2/L3 features
• Convergence ready for DCB and FCoE
Features and benefits

Quality of Service (QoS)

• **Powerful QoS feature**: creates traffic classes based on access control lists (ACLs), IEEE 802.1p precedence, IP, and DSCP or Type of Service (ToS) precedence; supports filter, redirect, mirror, or remark; supports the following congestion actions: strict priority (SP) queuing, weighted random early discard (WRED), weighted deficit round robin (WDRR), and SP+WDRR

Data center optimized

• **Flexible 10 GbE high port density**: the 5900AF switch enables customers to scale their server-edge 10 GbE ToR deployments to new heights with high-density 48 x 10 GbE ports delivered in a 1RU design; the high server port density is backed by 4 x 40 GbE uplinks to deliver availability of needed bandwidth for demanding applications; the 5900AF switch can also be configured as a 64 x 10 GbE port device by using a 40G-to-10 GbE splitter cable that turns each 40 GbE port into four 10-GbE ports

• **High-performance 10 GbE switching**: the 5900AF switch’s cut-through and nonblocking architecture delivers industry-leading low latency (~1 microsecond) and very demanding enterprise applications; the switch delivers a 1.28 Tbps switching capacity and 952.32 Mpps packet forwarding rate in addition to incorporating 9 MB of packet buffers

• **Higher scalability**: HP Intelligent Resilient Framework (IRF) technology radically simplifies the architecture of server access networks; the HP 5900AF family can deliver unmatched scalability of virtualized access layer switches; in addition, the HP series delivers FlexFabric flatter, two-tier networks using IRF that reduce cost and complexity

• **Advanced modular operating system**: modular design and multiple processes bring native high stability and independent process monitoring and restart; the OS also allows the upgrading of individual software modules for higher availability, as well as supports enhanced serviceability functions

• **TRILL and VEPA-ready**: TRILL and VEB/VEPA-ready for virtualized networks and data center convergence

• **Reversible airflow**: enhanced for DC hot-cold isle deployment with reversible airflow—for either front-to-back or back-to-front airflow

• **Redundant fans and power supplies**: 1+1 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

Management

• **IEEE 802.1ab LLDP discovery**: advertises and receives management information from adjacent devices on a network

• **USB support**:
  - File copy: allows users to copy switch files to and from a USB flash drive

• **Multiple configuration files**: can be stored to the flash image

• **SNMPv1, v2c, and v3**: facilitate centralized discovery, monitoring, and secure management of networking devices

• **Network Time Protocol (NTP)**: synchronizes timekeeping among distributed time servers and clients; keeps consistent timekeeping among all clock-dependent devices within the network so that the devices can provide diverse applications based on the consistent time

• **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 command-line interface (CLI)

Connectivity

• **Jumbo frames**: on Gigabit Ethernet and 10-Gigabit ports, they allow high-performance remote backup and disaster-recovery services

Performance

• **Hardware-based wire-speed access control lists (ACLs)**: feature-rich ACL implementation (TCAM-based) helps ensure high levels of security and ease of administration without impacting network performance
Resiliency and high availability
• Intelligent Resilient Framework (IRF): the 5900AF switch fully supports HP IRF technology, which enables HP FlexFabric to deliver resilient, scalable, and secured data center networks for physical and virtualized environments; up to four 5900AF switches can be grouped together in an IRF configuration, which allows them to be configured and managed as a single switch with a single IP address; this simplifies ToR deployment and management, reducing data center deployment and operating expenses

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
  – Tracert and Ping: enable testing of network connectivity
  – Virtual Cable Tests: provide visibility to cable problems

Layer 2 switching
• 4,094 port-based VLANs: provide security between workgroups
• Gigabit Ethernet port aggregation: allows grouping of ports to increase overall data throughput to a remote device
• 10 GbE port aggregation: allows grouping of ports to increase overall data throughput to a remote device
• Spanning Tree/MSTP, RSTP, and STP Root Guard: prevent network loops

Layer 3 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 a Layer 2 network

Layer 3 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
• Layer 3 IPv4 routing: provides routing of IPv4 at media speed; supports static routes, RIP and RIPv2, OSPF, and BGP

Additional information
• Green IT and power: use the latest advances in silicon development, shut off unused ports, and use variable-speed fans to improve energy efficiency
• Low power consumption: is rated to have one of the lowest power usages in the industry by Miercom independent tests

Warranty and support
• 1-year warranty: with advance replacement and 10-calendar-day delivery (available in most countries)
• Electronic and telephone support: limited electronic and telephone support is available from HP; to reach our support centers, refer to www.hp.com/networking/contact-support; for details on the duration of support provided with your product purchase, refer to www.hp.com/networking/warrantysummary
• Software releases: to find software for your product, refer to www.hp.com/networking/support; for details on the software releases available with your product purchase, refer to www.hp.com/networking/warrantysummary
### HP 5900 Switch Series Specifications

#### HP 5900AF-48XG-4QSFP+ Switch (JC772A)

**Ports**
- 48 fixed 1000/10000 SFP+ ports
- 4 QSFP+ 40-GbE ports
- 1 RJ-45 serial console port
- 1 RJ-45 out-of-band management port
- 1 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 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**
- 17.32(w) x 25.98(d) x 1.72(h) in (43.99 x 65.99 x 4.37 cm)
- Weight: 28.66 lb (13 kg), Fully loaded

**Memory and processor**
- 512 MB flash, 2 GB SDRAM; packet buffer size: 9 MB

**Performance**
- 10 Gbps latency: < 1.5 µs (64-byte packets)
- Throughput: 952 million pps
- Routing/Switching capacity: 1280 Gbps
- Routing table size: 16000 entries
- MAC address table size: 128000 entries

**Environment**
- Operating temperature: 32°F to 113°F (0°C to 45°C)
- Operating relative humidity: 10% to 90%, noncondensing
- Acoustic: Low-speed fan: 65.7 dB, High-speed fan: 70.6 dB

**Electrical characteristics**
- Maximum heat dissipation: 887 BTU/hr (935.79 W)
- Voltage: 100-240 VAC
- DC voltage: -36 to -72 VDC
- Idle power: 200 W
- Maximum power rating: 260 W
- Frequency: 50/60 Hz

**Management**
- IMC - 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 HP website at [www.hp.com/networking/services](http://www.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.
### Standards and protocols

**BGP**
- 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

**Device management**
- RFC 1305 NTPv3

**General protocols**
- IEEE 802.1Q VLANs
- IEEE 802.1s Multiple Spanning Trees
- IEEE 802.1w Rapid Reconfiguration of Spanning Tree
- IEEE 802.1p Priority
- IEEE 802.3ad Link Aggregation (LAG)
- IEEE 802.3ae 10-Gigabit Ethernet
- RFC 768 UDP
- RFC 791 IP
- RFC 792 ICMP
- RFC 826 ARP
- RFC 854 TELNET
- RFC 856 TELNET
- RFC 896 Congestion Control in IP/TCP Internetworks

**IPv6**
- RFC 2460 IPv6 Specification
- RFC 2711 IPv6 Router Alert Option
- RFC 3247 Supplemental Information for the New Definition of the EF PHB (Expedited Forwarding Per-Hop Behavior)
- RFC 4291 IP Version 6 Addressing Architecture
- 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 2574 SNMP-Target MIB
- RFC 2575 SNMP USM MIB
- RFC 2737 Entity MIB (Version 2)
- RFC 3414 SNMP User based-SM MIB
- RFC 3415 SNMP View based-ACM MIB

**Network management**
- RFC 3164 BSD syslog Protocol
- RFC 3274 Supplemental Information for the New Definition of the EF PHB (Expedited Forwarding Per-Hop Behavior)
- RFC 3260 New Terminology and Clarifications for DiffServ

**QoS/CoS**
- IEEE 802.1P (CoS)
- RFC 2475 DiffServ Architecture
- RFC 2597 DiffServ Assured Forwarding (AF)

**Security**
- Access Control Lists (ACLs)
- SSHv2 Secure Shell
Transceivers
HP X120 1G SFP LC LH40 1550nm Transceiver (JD062A)
HP X120 1G SFP LC BX 10-U Transceiver (JD098B)
HP X120 1G SFP LC BX 10-D Transceiver (JD099B)
HP X120 1G SFP LC LX Transceiver (JD119B)
HP X120 1G SFP RJ45 T Transceiver (JD089B)
HP X120 1G SFP LC SX Transceiver (JD118B)
HP X125 1G SFP LC LH40 1310nm Transceiver (JD061A)
HP X125 1G SFP LC LH70 Transceiver (JD063B)
HP X130 10G SFP+ LC SR Transceiver (JD092B)
HP X130 10G SFP+ LC LRM Transceiver (JD093B)
HP X130 10G SFP+ LC LR Transceiver (JD094B)
HP X130 10G SFP+ LC ER 40km Transceiver (JG234A)
HP X140 40G QSFP+ MPO SR4 Transceiver (JG325A)
HP X240 10G SFP+ to SFP+ 0.65m Direct Attach Copper Cable (JD095C)
HP X240 10G SFP+ to SFP+ 1.2m Direct Attach Copper Cable (JD096C)
HP X240 10G SFP+ to SFP+ 3m Direct Attach Copper Cable (JD097C)
HP X240 10G SFP+ to SFP+ 5m Direct Attach Copper Cable (JG081C)
HP X240 40G QSFP+ to QSFP+ 1m Direct Attach Copper Cable (JG326A)
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)

Power Supply
HP 58x0AF 650W AC Power Supply (JC680A)
HP 58x0AF 650W DC Power Supply (JC681A)

Fan Tray
HP 58x0AF Back (power side) to Front (port side) Airflow Fan Tray (JC682A)
HP 58x0AF Front (port side) to Back (power side) Airflow Fan Tray (JC683A)