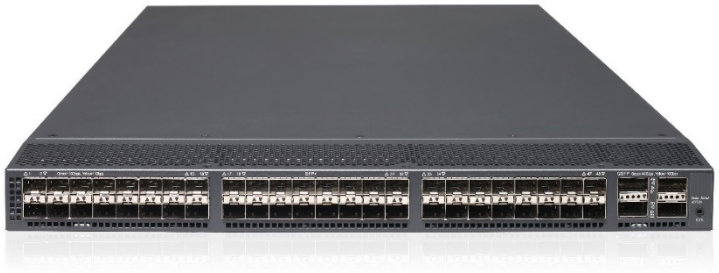
Overview

HPE FlexFabric 5900 Switch Series

The HPE FlexFabric 5900 Switch series include high density, ultra-low latency Top-of-Rack (ToR) switches suited for deployment at the access layer and management network of medium-sized and large enterprise data centers.

To meet the increased demand for virtualization, scalability and programmability, these switches provide high performance switching with low latency and user-friendly OS (Comware v7). Intelligent Resilient Fabric (IRF) helps in simpler, flatter, and agile networks by combining multiple physical switches into a logical device. Network and security features storage convergence coupled with dual, redundant hot swappable power-supplies ensure investment protection, reliability, availability and allow advanced chassis power management.

The HPE FlexFabric 5900 Switch series supports HPE Intelligent Management Center (IMC) with multi-vendor management for complete network visibility.



HPE FlexFabric 5900 Switch



HPE FlexFabric 5901AF Switch

Models

HPE FlexFabric 5900AF 48G 4XG 2QSFP+ Switch	JG510A
HPE FlexFabric 5901AF 48G 4XG 2QSFP+ Switch	JL864A

Overview

Key features

- New SKU JL864A with high performance, improved energy efficiency of 39-45% (Max/Idle 96W/70W in 5901AF vs 175W/115W in 5900AF), and reduced heat dissipation of 83% (327 BTU/hr in 5901AF vs 597 BTU/hr in 5900AF).
- High-density, high-performance Top-of-Rack (ToR) switch with 48 x 10/100/1000Mbps RJ-45 ports, 4 x 1/10 SFP+ ports and 2 x 40 QFSP+ ports that bridges the gap between legacy and modern networks
- Cut-through with low latency and varying wire speed performance
- HPE Intelligent Resilient Fabric (IRF) for virtualization leading to greater resilience and scalability
- IPv4 and IPv6 support in ToR with full L2/L3 and QoS/ACL features
- OpenFlow and NETCONF for automating manual tasks and improving service delivery
- Dual, redundant hot-pluggable power supplies help in reduced power consumption.

Standard Features

Data center optimized

- **Flexible high port density**
  The HPE FlexFabric 5900 Switch Series provides highly dense 48 port solutions delivered in a 1RU design with multiple wire-speed of 10/100/1000BASE-T, 1/10/40G fiber ports for high performance and flexible deployments thereby bridging the gap between legacy and modern networks. each 40 GbE QSFP+ port can also be configured as four 10GbE ports by using a 40-GbE-to-10GbE splitter cable
- **High-performance switching**
  Cut-through and nonblocking architecture delivers low latency (~3 microsecond for 10GbE) for very demanding enterprise applications; the switch delivers high-performance switching capacity and wire-speed packet forwarding
- **Higher scalability**
  Hewlett Packard Enterprise (HPE) Intelligent Resilient Fabric (IRF) technology simplifies the architecture of server access networks; up to nine HPE FlexFabric 5900 switches can be combined to deliver unmatched scalability of virtualized access layer switches and flatten 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 like hitless software upgrades with single-chassis ISSU
- **Front-to-back or back-to-front airflow**
  Enhanced for data center hot-cold aisle deployment with different 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
- **Jumbo frames**
  With frame sizes of up to 9216 bytes on Gigabit Ethernet and 10/40-Gigabit ports, allows high-performance remote backup and disaster-recovery services to be enabled

Additional information

- **Green IT and power**
  Improve energy efficiency using latest advances in silicon development; shuts off unused ports and utilizes variable-speed fans, reducing energy costs
- **Low power consumption**
  Is rated to have one of the lowest power usages in the industry

Convergence

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

Quality of Service (QoS)

Powerful QoS features

- **Flexible classification**
  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, remark, and logging
- **Feature support**
  Provides support for Strict Priority Queuing (SP), Weighted Fair Queuing (WFQ), Weighted Deficit Round Robin (WDRR), SP+WDRR together, configurable buffers, and Weighted Random Early Detection (WRED)
- **Simplified deployment**
  It supports Zero Touch Provisioning by eliminating human errors and automatically setting up network devices leading to accelerated RoI.

Standard Features

Layer 2 switching

- **MAC-based, Protocol-based, and Subnet-based VLANs**
  Provides granular control and security; uses RADIUS to map a MAC address/user to specific VLANs, map protocols to specific VLANs or subnets to specific VLANs.
- **Address Resolution Protocol (ARP)**
  Supports static, dynamic, and reverse ARP and ARP proxy
- **Flow Control**
  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; 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)**
  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 port, MAC address, IPv4 subnet, protocol, and guest VLAN; supports VLAN mapping
- **IGMP support**
  Provides support for IGMP Snooping, Fast-Leave, and Group-Policy; IPv6 IGMP Snooping provides Layer 2 optimization of multicast traffic
- **DHCP support at Layer 2**
  Provides full DHCP Snooping support for DHCP Snooping Option 82, DHCP Relay Option 82, DHCP Snooping Trust, and DHCP Snooping Item Backup

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
- **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

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, BGP, and IS-IS
- **Open shortest path first (OSPF)**
  Delivers faster convergence; uses this link-state routing InteriorGateway Protocol (IGP), which supports ECMP, NSSA, and MD5 authentication for increased security and graceful restart for faster failure recovery
- **Border Gateway Protocol 4 (BGP4)**
  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

Standard Features

- **Intermediate system to intermediate system (IS-IS)**
  Uses a path vector Interior Gateway Protocol (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
- **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, 6to4, and Intra-Site Automatic Tunnel Addressing Protocol (ISATAP) tunnels; is an important element for the transition from IPv4 to IPv6
- **Policy routing**
  Allows custom filters for increased performance and security; supports ACLs, IP prefix, AS paths, community lists, and aggregate policies
- **Bidirectional Forwarding Detection (BFD)**
  Enables link connectivity monitoring and reduces network convergence time for RIP, OSPF, BGP, IS-IS, VRRP, and IRF
- **Multicast Routing**
  Provides robust support of multicast protocols PIM-SM, PIM-DM, PIM-SSM and PIM-BIDIR
- **Layer 3 IPv6 routing**
  Provides routing of IPv6 at media speed; supports static routing, OSPFv3, BGP4+ for IPv6, and IS-ISv6

Management

- **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 timekeeping consistent 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)
- **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

Standard Features

- **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**
  Provide 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; 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 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; offers multiple privilege levels with password protection; ACLs provide Telnet and SNMP access; local and remote syslog capabilities allow logging of all access
- **Network management**
  HPE Intelligent Management Center (IMC) centrally configures, updates, monitors, and 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
- **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

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**
  Allow multiple configuration files to be stored to a flash image
- **sFlow (RFC 3176)**
  Provides wire-speed traffic accounting and monitoring
- **SNMP v1, 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**
  Is available 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 sFlow and SNMP v1/v2/v3, and is fully supported in HPE Intelligent Management Center (IMC)
- **ISSU and hot patching**
  In Services Software Upgrade (ISSU) provides hitless software upgrades with IRF.Hot patching provides hitless patching for individual systems or IRF
- **Autoconfiguration**
  Provides automatic configuration via DHCP autoconfiguration, NETCONF and Python Scripting

Standard Features

- **Network Time Protocol (NTP), Secure Network Time Protocol (SNTP)**
  Synchronize timekeeping among distributed time servers and clients; keep consistent timekeeping among all clock-dependent devices within the network so that the devices can provide diverse applications based on the consistent time.

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**
  Control 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

Resiliency and high availability

- **HPE Intelligent Resilient Fabric (IRF) technology**
  Enables an HPE FlexFabric to deliver resilient, scalable, and secured data center networks for physical and virtualized environments; groups up to nine HPE FlexFabric 5900 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
- **Per VLAN Spanning Tree (PVST)**
  Provides high link availability in multiple VLAN environments by allowing spanning tree instances per VLAN
- **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, 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

Warranty and support

- **1-year warranty**
  See **http://www.hpe.com/networking/warrantysummary** for warranty and support information included with your product purchase.
- **Software releases**
  To find software for your product, refer to **http://www.hpe.com/networking/support**; for details on the software releases available with your product purchase, refer to **http://www.hpe.com/networking/warrantysummary**

Configuration Information

BTO Models

Standard Switch Enclosures

Rule#	Description	SKU
	5900AF	
1, 2, 8	HPE FlexFabric 5900AF 48G 4XG 2QSFP+ Switch • 48 autosensing 10/100/1000 ports (RJ45) • 4 fixed 1000/10000 SFP+ ports (min=0 \ max=4) • 2 QSFP+ 40-GbE ports (min=0 \ max=2) • Must select min 1 Power Supply • Must select min 2 Fan Tray • 1U - Height	JG510A

Configuration Rules

Rule#	Description	SKU
1	The following Transceivers install into this switch:	
	HPE X130 10G SFP+ LC SR Transceiver	JD092B
	HPE X130 10G SFP+ LC LR Transceiver	JD094B
	HPE X130 10G SFP+ LC ER 40km Transceiver	JG234A
	HPE FlexNetwork X240 10G SFP+ to SFP+ 0.65m Direct Attach Copper Cable	JD095C
	HPE FlexNetwork X240 10G SFP+ to SFP+ 1.2m Direct Attach Copper Cable	JD096C
	HPE FlexNetwork X240 10G SFP+ to SFP+ 3m Direct Attach Copper Cable	JD097C
	HPE FlexNetwork X240 10G SFP+ to SFP+ 5m Direct Attach Copper Cable	JG081C
	HPE FlexNetwork X240 10G SFP+ SFP+ 7m Direct Attach Copper Cable	JC784C
	HPE X120 1G SFP RJ45 T Transceiver	JD089B
	HPE X120 1G SFP LC SX Transceiver	JD118B
	HPE X120 1G SFP LC LX Transceiver	JD119B
2	The following 40G Transceivers install into this switch:	
	HPE X140 40G QSFP+ LC LR4 SM 10km 1310nm Transceiver	JG661A
	HPE X140 40G QSFP+ LC BiDi 100m MM Transceiver	JL251A
	HPE X140 40G QSFP+ MPO SR4 Transceiver	JG325B
	HPE X140 40G QSFP+ MPO MM 850nm CSR4 300m Transceiver	JG709A
	HPE FlexNetwork X240 40G QSFP+ QSFP+ 1m Direct Attach Copper Cable	JG326A
	HPE FlexNetwork X240 40G QSFP+ QSFP+ 3m Direct Attach Copper Cable	JG327A
	HPE FlexNetwork X240 40G QSFP+ QSFP+ 5m Direct Attach Copper Cable	JG328A
	HPE FlexNetwork X240 40G QSFP+ to 4x10G SFP+ 1m Direct Attach Copper Splitter Cable	JG329A
	HPE FlexNetwork X240 40G QSFP+ to 4x10G SFP+ 3m Direct Attach Copper Splitter Cable	JG330A
	HPE FlexNetwork X240 40G QSFP+ to 4x10G SFP+ 5m Direct Attach Copper Splitter Cable	JG331A
8	The following 10G Transceivers install into this Module's SFP+ Ports:	
	HPE X2A0 10G SFP+ to SFP+ 7m Active Optical Cable	JL290A
	HPE X2A0 10G SFP+ to SFP+ 10m Active Optical Cable	JL291A
	HPE X2A0 10G SFP+ to SFP+ 20m Active Optical Cable	JL292A

Configuration Information

Rack Level Integration CTO Models

CTO Switch Chassis

Rule#	Description	SKU
	5900AF	
1, 2, 5, 11	HPE FlexFabric 5900AF 48G 4XG 2QSFP+ Switch • 48 autosensing 10/100/1000 ports (RJ45) • 4 fixed 1000/10000 SFP+ ports (min=0 \ max=4) • 2 QSFP+ 40-GbE ports (min=0 \ max=2) • Must select min 1 Power Supply • Must select min 2 Fan Tray • 1U - Height	JG510A
1	The following Transceivers install into this switch: (Use #0D1 or #B01 quoted to switch if switch is CTO) - if applicable	
	HPE X130 10G SFP+ LC SR Transceiver	JD092B
	HPE X130 10G SFP+ LC LR Transceiver	JD094B
	HPE X130 10G SFP+ LC ER 40km Transceiver	JG234A
	HPE FlexNetwork X240 10G SFP+ to SFP+ 0.65m Direct Attach Copper Cable	JD095C
	HPE FlexNetwork X240 10G SFP+ to SFP+ 1.2m Direct Attach Copper Cable	JD096C
	HPE FlexNetwork X240 10G SFP+ to SFP+ 3m Direct Attach Copper Cable	JD097C
	HPE FlexNetwork X240 10G SFP+ to SFP+ 5m Direct Attach Copper Cable	JG081C
	HPE FlexNetwork X240 10G SFP+ SFP+ 7m Direct Attach Copper Cable	JC784C
	HPE X120 1G SFP RJ45 T Transceiver	JD089B
	HPE X120 1G SFP LC SX Transceiver	JD118B
	HPE X120 1G SFP LC LX Transceiver	JD119B
2	The following 40G Transceivers install into this switch: (Use #0D1 or #B01 quoted to switch if switch is CTO) - if applicable	
	HPE X140 40G QSFP+ LC LR4 SM 10km 1310nm Transceiver	JG661A
	HPE X140 40G QSFP+ LC BiDi 100m MM Transceiver	JL251A
	HPE X140 40G QSFP+ MPO SR4 Transceiver	JG325B
	HPE X140 40G QSFP+ MPO MM 850nm CSR4 300m Transceiver	JG709A
	HPE FlexNetwork X240 40G QSFP+ QSFP+ 1m Direct Attach Copper Cable	JG326A
	HPE FlexNetwork X240 40G QSFP+ QSFP+ 3m Direct Attach Copper Cable	JG327A
	HPE FlexNetwork X240 40G QSFP+ QSFP+ 5m Direct Attach Copper Cable	JG328A
	HPE FlexNetwork X240 40G QSFP+ to 4x10G SFP+ 1m Direct Attach Copper Splitter Cable	JG329A
	HPE FlexNetwork X240 40G QSFP+ to 4x10G SFP+ 3m Direct Attach Copper Splitter Cable	JG330A
	HPE FlexNetwork X240 40G QSFP+ to 4x10G SFP+ 5m Direct Attach Copper Splitter Cable	JG331A
5	The following 10G Transceivers install into this Module's SFP+ Ports: (Use #0D1 or #B01 if switch is CTO) - if applicable	
	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
11	If HPE CTO Switch Chassis is selected for Rack Level Integration, Then the Switch needs to integrate (with #0D1) to the Rack.	
Notes:	Click UNB - If an option is ordered with #0D1/#B01, then the switch must have #0D1 option.	

Configuration Information

Enter the following menu selections as integrated to the CTO Model X server above if order is factory built.

Transceivers

Rule#	Description	SKU
	SFP Transceivers	
	HPE X120 1G SFP RJ45 T Transceiver	JD089B
	HPE X120 1G SFP LC SX Transceiver	JD118B
	HPE X120 1G SFP LC LX Transceiver	JD119B
	SFP+ Transceivers	
	HPE X130 10G SFP+ LC SR Transceiver	JD092B
	HPE X130 10G SFP+ LC LR Transceiver	JD094B
	HPE FlexNetwork X240 10G SFP+ to SFP+ 0.65m Direct Attach Copper Cable	JD095C
	HPE FlexNetwork X240 10G SFP+ to SFP+ 1.2m Direct Attach Copper Cable	JD096C
	HPE FlexNetwork X240 10G SFP+ to SFP+ 3m Direct Attach Copper Cable	JD097C
	HPE FlexNetwork X240 10G SFP+ to SFP+ 5m Direct Attach Copper Cable	JG081C
	HPE FlexNetwork X240 10G SFP+ SFP+ 7m Direct Attach Copper Cable	JC784C
	HPE X130 10G SFP+ LC ER 40km Transceiver	JG234A
	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
	QSFP+ Transceivers	
	HPE X140 40G QSFP+ LC LR4 SM 10km 1310nm Transceiver	JG661A
	HPE X140 40G QSFP+ LC BiDi 100m MM Transceiver	JL251A
	HPE X140 40G QSFP+ MPO SR4 Transceiver	JG325B
	HPE X140 40G QSFP+ MPO MM 850nm CSR4 300m Transceiver	JG709A
	HPE FlexNetwork X240 40G QSFP+ QSFP+ 1m Direct Attach Copper Cable	JG326A
	HPE FlexNetwork X240 40G QSFP+ QSFP+ 3m Direct Attach Copper Cable	JG327A
	HPE FlexNetwork X240 40G QSFP+ QSFP+ 5m Direct Attach Copper Cable	JG328A
	HPE FlexNetwork X240 40G QSFP+ to 4x10G SFP+ 1m Direct Attach Copper Splitter Cable	JG329A
	HPE FlexNetwork X240 40G QSFP+ to 4x10G SFP+ 3m Direct Attach Copper Splitter Cable	JG330A
	HPE FlexNetwork X240 40G QSFP+ to 4x10G SFP+ 5m Direct Attach Copper Splitter 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

Cables

	MPO Cables	
	HPE Multi Fiber Push On to 4 x Lucent Connector 5m Cable	K2Q46A
	HPE Multi Fiber Push On to 4 x Lucent Connector 15m Cable	K2Q47A
	HPE Premier Flex MPO/MPO Multi-mode OM4 12 Fiber 10m Cable	QK729A
	HPE Premier Flex MPO/MPO Multi-mode OM4 8 Fiber 50m Cable	QK731A
	HPE Premier Flex MPO/MPO OM4 100m Cable	H6Z30A

Configuration Information

Internal Power Supplies

(JG510A) System (std 0 // max 2) User Selection (min 1 // max 2) per switch
(JG848A and JG849A) System (std 2 // max 2) User Selection (min 0 // max 0) per switch

Rule#	Description	SKU
1, 2, 3	HPE 58x0AF 650W AC Power Supply • includes 1 x c13, 300w	JC680A
	HPE 58x0AF 650W AC Power Supply PDU Cable NA/JP/TW • C15 PDU Jumper Cord (NA/MEX/TW/JP)	JC680A#B2B
	HPE 58x0AF 650W AC Power Supply PDU Cable ROW • C15 PDU Jumper Cord (ROW)	JC680A#B2C
1, 3, 4	HPE A58x0AF Back (Power Side) to Front (Port Side) Airflow 300W AC Power Supply • C15 PDU Jumper Cord (NA/MEX/TW/JP)	JG900A
	HPE A58x0AF Back (Power Side) to Front (Port Side) Airflow 300W AC Power Supply PDU Cable NA/JP/TW • C15 PDU Jumper Cord (ROW)	JG900A#B2B
	HPE A58x0AF Back (Power Side) to Front (Port Side) Airflow 300W AC Power Supply 220V N.A. - en local • C15 PDU Jumper Cord (ROW)	JG900A#B2E
1, 3, 5	HPE A58x0AF Back (Power Side) to Front (Port Side) Airflow 300W DC Power Supply	JG901A
1, 3	HPE FlexFabric Switch 650W 48V Hot Plug NEBS-compliant DC Power Supply	JH336A

Configuration Rules

1 If 2 power supplies are selected they must be the same SKU number.

2 Localization (Wall Power Cord) required on orders without #B2B, #B2C (PDU Power Cord) . (See Localization Menu)
Notes: When Switches/Routers are Factory Racked, Then #B2B, or #B2C should be the Defaulted Power Cable option on the Switches/Routers.

3 Only supported on JG510A.

4 Localization (Wall Power Cord) required on orders without #B2B, #B2C (PDU Power Cord) or #B2E. (See Localization Menu) REMARK: When Switches/Routers are Factory Racked, Then #B2B, #B2C should be the Defaulted Power Cable option on the Switches/Routers.

5 Watson Only - Add "(NEBS)" after the description on the PS table

Notes:
- Drop down under power supply should offer the following options and results:
- Switch/Router/Power Supply to PDU Power Cord - #B2B in North America, Mexico, Taiwan, and Japan or #B2C ROW. (Watson Default B2B or B2C for Rack Level CTO)
- Switch/Router/Power Supply to Wall Power Cord - Localized Option (Watson Default for BTO and Box Level CTO)
- High Volt Power Electrical Module to Wall Power Cord - #B2E Option. (Offered only in North America, Mexico, Taiwan, and Japan)
- Switch JG510A should default selection of Power Supply as JC680A but allow selection of JG900A and JG901A

Configuration Information

Switch Options

Fan Trays

(JG510A) System (std 0 // max 2) User Selection (min 2 // max 2) per switch
(JG848A and JG849A) System (std 2 // max 2) User Selection (min 0 // max 0) per switch

Rule#	Description	SKU
1, 2	HPE 58x0AF Back (Power Side) to Front (Port Side) Airflow Fan Tray	JC682A
1, 2	HPE 58x0AF Front (Port Side) to Back (Power Side) Airflow Fan Tray	JC683A
1, 2	HPE X711 Front (Port Side) to Back (Power Side) Airflow High Volume Fan Tray	JG552A
1, 2	HPE X712 Back (Power Side) to Front (Port Side) Airflow High Volume Fan Tray	JG553A

Configuration Rules

1 Fan Trays cannot be mixed in the same switch enclosure

2 Only supported on JG510A.

Notes: If there is any empty space below the switch in a rack when using Back to Front Fan Trays, JC682A, the rack will receive an Air Plenum kit that takes up 1U of additional space in the rack. The Air Plenum kit is not required on fully configured racks. This only applies for CTO Rack Level Integration. The Air Plenum Kit is a non-saleable SKU, and is brought in automatically for CTO Factory Rack Level Integration.

Configuration Information

BTO Models

Standard Switch Enclosures

Rule #	Description	SKU
	5901AF	
1, 2, 3	HPE FlexFabric 5901AF 48-Port 1GBaseT 4XG 2QSFP+ Switch • 48 autosensing 10/100/1000 ports (RJ45) • 4 fixed 1000/10000 SFP+ ports (min=0 \ max=4) • 2 QSFP+ 40-GbE ports (min=0 \ max=2) • Must select min 1 Power Supply (Max 2) • Must select min 2 Fan Tray • 1U - Height	JL864A

Configuration Rules

Rule #	Description	
1	The following Transceivers install into this switch:	
	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 BX 10-U Transceiver	JD098B
	HPE X120 1G SFP LC BX 10-D Transceiver	JD099B
	HPE X120 1G SFP LC LH100 Transceiver	JD103A
2	The following Transceivers install into this switch:	
	HPE X130 10G SFP+ LC SR Transceiver	JD092B
	HPE X130 10G SFP+ LC LR Transceiver	JD094B
	HPE X130 10G SFP+ LC BiDi 40km-Downlink Transceiver	JL740A
	HPE X130 10G SFP+ LC ER 40km Transceiver	JG234A
	HPE X130 10G SFP+ LC BiDi 40km-Uplink Transceiver	JL739A
	HPE X130 10G SFP+ LC LH 80km Transceiver	JG915A
	HPE X130 10G SFP+ LC BiDi 10km-Uplink Transceiver	JL737A
	HPE X130 10G SFP+ LC BiDi 10km-Downlink Transceiver	JL738A
	HPE FlexNetwork X240 10G SFP+ to SFP+ 0.65m Direct Attach Copper Cable	JD095C
	HPE FlexNetwork X240 10G SFP+ to SFP+ 1.2m Direct Attach Copper Cable	JD096C
	HPE FlexNetwork X240 10G SFP+ to SFP+ 3m Direct Attach Copper Cable	JD097C
	HPE FlexNetwork X240 10G SFP+ to SFP+ 5m Direct Attach Copper Cable	JG081C
	HPE FlexNetwork X240 10G SFP+ SFP+ 7m Direct Attach Copper Cable	JC784C
	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
3	The following 40G Transceivers install into this switch:	
	HPE X140 40G QSFP+ LC BiDi 100m MM Transceiver	JL251A
	HPE X140 40G QSFP+ MPO SR4 Transceiver	JG325B
	HPE X140 40G QSFP+ MPO MM 850nm CSR4 300m Transceiver	JG709A
	HPE X140 40G QSFP+ LC LR4 SM 10km 1310nm Transceiver	JG661A
	HPE FlexNetwork X240 40G QSFP+ QSFP+ 1m Direct Attach Copper Cable	JG326A
	HPE FlexNetwork X240 40G QSFP+ QSFP+ 3m Direct Attach Copper Cable	JG327A
	HPE FlexNetwork X240 40G QSFP+ QSFP+ 5m Direct Attach Copper Cable	JG328A
	HPE FlexNetwork X240 40G QSFP+ to 4x10G SFP+ 1m Direct Attach Copper Splitter Cable	JG329A
	HPE FlexNetwork X240 40G QSFP+ to 4x10G SFP+ 3m Direct Attach Copper Splitter Cable	JG330A
	HPE FlexNetwork X240 40G QSFP+ to 4x10G SFP+ 5m Direct Attach Copper Splitter 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

Notes: OCA Only Model Selection Form - HPE Offering > Aruba > Switches > FlexFabric > Access: 5901 Switch Series

Configuration Information

Rack Level Integration CTO Models

CTO Switch Chassis

Rule #	Description	SKU
1, 2, 3, 4	HPE FlexFabric 5901AF 48-Port 1GBaseT 4XG 2QSFP+ Switch • 48 1G BASE-T ports • 4 fixed 1000/10000 SFP+ ports (min=0 \ max=4) • 2 QSFP+ 40-GbE ports (min=0 \ max=2) • Must select min 1 Power Supply (Max 2) • Must select min 2 Fan Tray • 1U - Height	JL864A

Configuration Rules

Rule #	Description	
1	The following Transceivers install into this switch: (Use #0D1 or #B01 quoted to switch if switch is CTO) - if applicable	
	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 BX 10-U Transceiver	JD098B
	HPE X120 1G SFP LC BX 10-D Transceiver	JD099B
	HPE X120 1G SFP LC LH100 Transceiver	JD103A
2	The following Transceivers install into this switch: (Use #0D1 or #B01 quoted to switch if switch is CTO) - if applicable	
	HPE X130 10G SFP+ LC SR Transceiver	JD092B
	HPE X130 10G SFP+ LC LR Transceiver	JD094B
	HPE X130 10G SFP+ LC BiDi 40km-Downlink Transceiver	JL740A
	HPE X130 10G SFP+ LC ER 40km Transceiver	JG234A
	HPE X130 10G SFP+ LC BiDi 40km-Uplink Transceiver	JL739A
	HPE X130 10G SFP+ LC LH 80km Transceiver	JG915A
	HPE X130 10G SFP+ LC BiDi 10km-Uplink Transceiver	JL737A
	HPE X130 10G SFP+ LC BiDi 10km-Downlink Transceiver	JL738A
	HPE FlexNetwork X240 10G SFP+ to SFP+ 0.65m Direct Attach Copper Cable	JD095C
	HPE FlexNetwork X240 10G SFP+ to SFP+ 1.2m Direct Attach Copper Cable	JD096C
	HPE FlexNetwork X240 10G SFP+ to SFP+ 3m Direct Attach Copper Cable	JD097C
	HPE FlexNetwork X240 10G SFP+ to SFP+ 5m Direct Attach Copper Cable	JG081C
	HPE FlexNetwork X240 10G SFP+ SFP+ 7m Direct Attach Copper Cable	JC784C
	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 SR Transceiver	JD092B
3	The following 40G Transceivers install into this switch: (Use #0D1 or #B01 quoted to switch if switch is CTO) - if applicable	
	HPE X140 40G QSFP+ LC BiDi 100m MM Transceiver	JL251A
	HPE X140 40G QSFP+ MPO SR4 Transceiver	JG325B
	HPE X140 40G QSFP+ MPO MM 850nm CSR4 300m Transceiver	JG709A
	HPE X140 40G QSFP+ LC LR4 SM 10km 1310nm Transceiver	JG661A
	HPE FlexNetwork X240 40G QSFP+ QSFP+ 1m Direct Attach Copper Cable	JG326A
	HPE FlexNetwork X240 40G QSFP+ QSFP+ 3m Direct Attach Copper Cable	JG327A
	HPE FlexNetwork X240 40G QSFP+ QSFP+ 5m Direct Attach Copper Cable	JG328A
	HPE FlexNetwork X240 40G QSFP+ to 4x10G SFP+ 1m Direct Attach Copper Splitter Cable	JG329A
	HPE FlexNetwork X240 40G QSFP+ to 4x10G SFP+ 3m Direct Attach Copper Splitter Cable	JG330A
	HPE FlexNetwork X240 40G QSFP+ to 4x10G SFP+ 5m Direct Attach Copper Splitter 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

Configuration Information

4 If HP CTO Switch Chassis is selected for Rack Level Integration, Then the Switch needs to integrate (with #0D1) to the Rack.

Notes: Clic UNB - If an option is ordered with #0D1/#B01, then the switch must have #0D1 option.

Transceivers

SFP Transceivers

Rule #	Description	SKU
	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 BX 10-U Transceiver	JD098B
	HPE X120 1G SFP LC BX 10-D Transceiver	JD099B
	HPE X120 1G SFP LC LH100 Transceiver	JD103A

SFP+ Transceivers

Rule #	Description	SKU
	HPE X130 10G SFP+ LC SR Transceiver	JD092B
	HPE X130 10G SFP+ LC LR Transceiver	JD094B
	HPE X130 10G SFP+ LC BiDi 40km-Downlink Transceiver	JL740A
	HPE X130 10G SFP+ LC ER 40km Transceiver	JG234A
	HPE X130 10G SFP+ LC BiDi 40km-Uplink Transceiver	JL739A
	HPE X130 10G SFP+ LC LH 80km Transceiver	JG915A
	HPE X130 10G SFP+ LC BiDi 10km-Uplink Transceiver	JL737A
	HPE X130 10G SFP+ LC BiDi 10km-Downlink Transceiver	JL738A
	HPE FlexNetwork X240 10G SFP+ to SFP+ 0.65m Direct Attach Copper Cable	JD095C
	HPE FlexNetwork X240 10G SFP+ to SFP+ 1.2m Direct Attach Copper Cable	JD096C
	HPE FlexNetwork X240 10G SFP+ to SFP+ 3m Direct Attach Copper Cable	JD097C
	HPE FlexNetwork X240 10G SFP+ to SFP+ 5m Direct Attach Copper Cable	JG081C
	HPE FlexNetwork X240 10G SFP+ SFP+ 7m Direct Attach Copper Cable	JC784C
	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

QSFP+ Transceivers

Rule #	Description	SKU
	HPE X140 40G QSFP+ LC BiDi 100m MM Transceiver	JL251A
	HPE X140 40G QSFP+ MPO SR4 Transceiver	JG325B
	HPE X140 40G QSFP+ MPO MM 850nm CSR4 300m Transceiver	JG709A
	HPE X140 40G QSFP+ LC LR4 SM 10km 1310nm Transceiver	JG661A
	HPE X140 40G QSFP+ LC LR4L 2km SM Transceiver	JL286A
	HPE FlexNetwork X240 40G QSFP+ QSFP+ 1m Direct Attach Copper Cable	JG326A
	HPE FlexNetwork X240 40G QSFP+ QSFP+ 3m Direct Attach Copper Cable	JG327A
	HPE FlexNetwork X240 40G QSFP+ QSFP+ 5m Direct Attach Copper Cable	JG328A
	HPE FlexNetwork X240 40G QSFP+ to 4x10G SFP+ 1m Direct Attach Copper Splitter Cable	JG329A
	HPE FlexNetwork X240 40G QSFP+ to 4x10G SFP+ 3m Direct Attach Copper Splitter Cable	JG330A
	HPE FlexNetwork X240 40G QSFP+ to 4x10G SFP+ 5m Direct Attach Copper Splitter 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

Configuration Information

Internal Power Supplies

Rule #	Description	SKU
1, 2	HPE X361 150W 100-240VAC to 12VDC Power Supply includes 1 x c13, 300w	JD362B
	HPE X361 150W 100-240VAC to 12VDC Power Supply C15 PDU Jumper Cord (NA/MEX/TW/JP)	JD362B
	HPE X361 150W 100-240VAC to 12VDC Power Supply C15 PDU Jumper Cord (ROW)	JD362B
	HPE X361 150W 100-240VAC to 12VDC Power Supply No Localized Power Cord Selected	JD362B
1	HPE X361 150W 48-60VDC to 12VDC Power Supply	JD366B

Configuration Rules

Rule #	Description
1	If 2 power supplies are selected they must be the same Sku number.
2	Localization (Wall Power Cord) required on orders without #B2B, #B2C (PDU Power Cord) or #B2E. (See Localization Menu) REMARK: When Switches/Routers are Factory Racked, Then #B2B, #B2C should be the Defaulted Power Cable option on the Switches/Routers.

Notes:

- Drop down under power supply should offer the following options and results:
  - Switch/Router/Power Supply to PDU Power Cord - #B2B in North America, Mexico, Taiwan, and Japan or #B2C ROW. (Watson Default B2B or B2C for Rack Level CTO)
  - Switch/Router/Power Supply to Wall Power Cord - Localized Option (Watson Default for BTO and Box Level CTO)
  - High Volt Power Electrical Module to Wall Power Cord - #B2E Option. (Offered only in North America, Mexico, Taiwan, and Japan)
  - No Power Cord Selected - #AC3 Option
- Switches should default selection of Power Supply as JD362B but allow selection of JD366B.

Switch Options

Fan Trays

Rule #	Description	SKU
1	HPE FlexFabric 5944 Power to Port Airflow (Back to Front) Fan Module	JL838A
1	HPE FlexFabric 5944 Port to Power Airflow (Front to Back) Fan Module	JL837A

Notes: Fan Trays cannot be mixed in the same switch enclosure

Technical Specifications

HPE FlexFabric 5901AF 48G 4XG 2QSFP+ Switch (JL864A)		
I/O ports and slots	48 autosensing 10/100/1000 ports (IEEE 802.3 Type 10BASE-T, IEEE 802.3u Type 100BASE-TX, IEEE 802.3ab Type 1000BASE-T) Duplex: 10BASE-T/100BASE-TX: half or full; 1000BASE-T: full only 4 fixed 1000/10000 SFP+ ports; Half Duplex: SFP+ 2 QSFP+ 40-GbE ports	
Additional ports and slots	1 x RJ45 console port 1 x mini-USB port 1 x USB port 2 x out-of-band management ports (1 x SFP GbE port and one copper port)	
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 23°F (-5°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 14.17(d) x 1.73(h) in (43.99 x 36.0 x 4.4 cm) (1U height)
	Weight	16.535 lb (<7.5kg) shipping weight
Memory and processor	1 GB flash; Packet buffer size: 8 MB, 2 GB SDRAM	
Performance	**Latency**	1GE < 5 µs, 10GE < 3 µs and 40GE <1,2 µs (64-byte packets)
	Throughput	up to 250 Mpps (64-byte packets)
	Routing/Switching capacity	336 Gbps
	Routing table size	16000 entries (IPv4), 8000 entries (IPv6)
	MAC address table size	110000 entries
Environment	**Operating temperature**	23°F to 113°F (-5°C to 45°C)
	Operating relative humidity	10% to 95%, noncondensing
	Acoustic	Low-speed fan: 43.6dB, High-speed fan: 56.9dB
Electrical characteristics	**Frequency**	50/60 Hz
	Maximum heat dissipation	327.6 BTU/hr (345.63 kJ/hr)
	Voltage	100 - 240 VAC, rated -48 to -60 VDC, rated (depending on power supply chosen)
	Maximum power rating	96 W (Dual AC)
	Idle power	70 W (Dual AC)
	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	

Technical Specifications

Emissions	CISPR 32:2015 Class A; VCCI Class A; EN 55032 Class A; ICES-003 Class A; AS/NZS CISPR 32 Class A; EN 61000-3-2:2014; EN 61000-3-3:2013;; FCC (CFR 47, Part 15 B) Class A

HPE FlexFabric 5900AF 48G 4XG 2QSFP+ Switch (JG510A)		
I/O ports and slots	48 autosensing 10/100/1000 ports (IEEE 802.3 Type 10BASE-T, IEEE 802.3u Type 100BASE-TX, IEEE 802.3ab Type 1000BASE-T) Duplex: 10BASE-T/100BASE-TX: half or full; 1000BASE-T: full only4 fixed 1000/10000 SFP+ ports 2 QSFP+ 40-GbE ports	
Additional ports and slots	1 RJ-45 serial console port 1 RJ-45 out-of-band management port1 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 requirestwo 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 18.11(d) x 1.72(h) in (43.99 x 46.0 x 4.37 cm) (1U height)
	Weight	<10 kg
Memory and processor	512 MB flash; Packet buffer size: 9 MB, 2 GB SDRAM	
Performance	**10 Gbps Latency**	< 1.5 µs (64-byte packets)
	Throughput	up to 250 Mpps (64-byte packets)
	Routing/Switching capacity	336 Gbps
	Routing table size	16000 entries (IPv4), 8000 entries (IPv6)
	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	**Frequency**	50/60 Hz
	Maximum heat dissipation	597 BTU/hr
	Voltage	100 - 240 VAC, rated -40 to -60 VDC, rated (depending on power supply chosen)
	Maximum power rating	175 W (Dual AC)
	Idle power	115 W (Dual AC)
	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 allmodules populated.
Safety	UL 60950-1; EN 60825-1 Safety of Laser Products-Part 1; EN 60825-2 Safety of Laser Products-Part2; 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	

Technical Specifications

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	
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
	Power frequency magnetic field	IEC 61000-4-8; EN 61000-4-8
	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
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 oneJC680A or JC681A is required.	
Services	Refer to the Hewlett Packard Enterprise sales website at: **http://www.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.	

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
- 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 1157 SNMPv1/v2c
- RFC 1305 NTPv3
- RFC 1591 DNS (client)
- RFC 1902 (SNMPv2)
- RFC 1908 (SNMP v1/2 Coexistence)
- RFC 2573 (SNMPv3 Applications)
- RFC 2576 (Coexistence between SNMP V1, V2, V3)
- Multiple Configuration Files
- Multiple Software Images
- SSHv1/SSHv2 Secure Shell
- TACACS/TACACS+

Technical Specifications

General Protocols

- 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 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 (OSPF v2)
- RFC 1531 Dynamic Host Configuration Protocol
- RFC 1533 DHCP Options and BOOTP Vendor Extensions
- RFC 1534 DHCP/BOOTP Interoperation
- RFC 1541 DHCP
- RFC 1591 DNS (client only)
- RFC 1624 Incremental Internet Checksum
- RFC 1723 RIP v2
- 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 3046 DHCP Relay Agent Information Option
- 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 4419 Diffie-Hellman Group Exchange for the Secure Shell (SSH) Transport Layer Protocol

Technical Specifications

- RFC 4594 Configuration Guidelines for DiffServ Service Classes
- RFC 4941 Privacy Extensions for Stateless Address Autoconfiguration in IPv6

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 stacks IPv46 & IPv6
- RFC 3315 DHCPv6 (client and relay)
- 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 2573 SNMP-Target MIB
- RFC 2574 SNMP USM MIB
- RFC 2737 Entity MIB (Version 2)
- RFC 3414 SNMP-User based-SM MIB
- RFC 3415 SNMP-View based-ACM MIB
- LLDP-EXT-DOT1-MIB
- LLDP-EXT-DOT3-MIB
- LLDP-MIB

Network Management

- 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
- RFC 4811 OSPF Out-of-Band LSDB
- Resynchronization
- RFC 4812 OSPF Restart Signaling
- RFC 4813 OSPF Link-Local Signaling

Technical Specifications

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

- Access Control Lists (ACLs)SSHv2 Secure Shell

Summary of Changes

Date	Version History	Action	Description of Change
04-Oct-2021	Version 40	Changed	Overview, Standard Features, Configuration Information, and Technical Specifications sections were updated.
03-Aug-2020	Version 39	Changed	SKU description were updated. Obsolete SKUs were removed.
04-Feb-2019	Version 38	Changed	Removed Box Level CTO SSP Section and logic from menu and configurators
21-Sep-2018	Version 37	Changed	Recommended and Extended markings removed from the document. Features and benefits updated
06-Aug-2018	Version 36	Changed	Configuration section updated: Added 10G AOC Cable compatibility
07-May-2018	Version 35	Changed	Configuration section updated
06-Mar-2017	Version 34	Added	SKUs added: JL437A, JL438A, JL439A
11-Nov-2016	Version 33	Removed	Removed not supported transceivers: JD098B; JD099B
19-Aug-2016	Version 32	Changed	Configuration section updated (#AC3 option added)
01-Aug-2016	Version 31	Changed	SKUs added: JL287A, JL288A, JL289A, JL290A, JL291A, JL292A, JL250A, JL286A. Overview and Technical Specifications updated.
06-Jun-2016	Version 30	Changed	Document name changed to HPE FlexFabric 5900 Switch Series. Product description updated.
15-Apr-2016	Version 29	Changed	SKUs descriptions updated on all the document.
16-Feb-2016	Version 28	Changed	SKU added: JL251A Overview, Technical Specifications and Accessories updated,
08-Jan-2016	Version 27	Changed	Warranty and support updated
12-Oct-2015	Version 26	Changed	Overview, Technical Specifications and Accessories updated,
12-Dec-2014	Version 25	Removed	Deleted SKU JG325A
01-Dec-2014	Version 24	Added	Accessories section added
		Changed	Changes made on the entire document
09-Jun-2014	Version 23	Changed	Overview section revised.
31-Mar-2014	Version 22	Changed	Transceivers were revised.
19-Mar-2014	Version 21	Changed	Configuration was revised
04-Mar-2014	Version 20	Changed	Transceivers and Switch Options were revised.
25-Feb-2014	Version 19	Changed	Transceivers and Switch Options were revised.
18-Feb-2014	Version 18	Added	HPE FF 5900CP-48XG -4QSFP+ Switch was added to Configuration.
12-Nov-2013	Version 17	Changed	Build to Order, Box Level Integration CTO Models, Rack Level Integration CTO Models, Internal Power Supplies, and Switch Options were revised.
14-Oct-2013	Version 16	Added	Added a new Transceiver in two locations in the Configuration section.
09-Aug-2013	Version 15	Changed	Configuration was revised.
19-Jul-2013	Version 14	Changed	Configuration was revised.
02-Jul-2013	Version 13	Changed	The description of model JG336A was corrected throughout.
12-Jun-2013	Version 9	Changed	Build-to-Order was revised.
10-Jun-2013	Version 8	Changed	Configuration was revised.
25-Mar-2013	Version 7	Changed	Added Part numbers and descriptions to the following Sections: Build to Order, Box Level Integration CTO Models, Rack Level Integration CTO Models , Switch Options Added Notes 3, and 4 to the Switch Options Section Deleted several part numbers to the Standards and Protocols Section
27-Feb-2013	Version 6	Changed	The formatting of the new Configuration section was revised.
19-Feb-2013	Version 5	Added	The configuration section was added. Line art was added.
		Changed	Product overview, Features and benefits, Model specifications, and Accessories were revised.
04-Dec-2012	Version 3	Changed	Updated Features and Benefits and made minor updates to the model specifications and accessories.
02-Apr-2011	Version 2	Changed	Part number was revised.
16-Nov-2011	Version 1	New	New QuickSpecs

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