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HPE Networking Comware Switch Series 5940 QuickSpecs

The HPE Networking Comware Switch Series 5940 is a family of high performance and low-latency 10GbE, 40GbE top-of-rack (ToR) data center switches.

The switch series includes 100G uplink technology and a 2-slot and 4-slot modular form factor, providing ultimate flexibility for ever-changing data center requirements. This entire series is part of the Hewlett Packard Enterprise HPE Networking Comware data center solution, which is a cornerstone of the HPE Networking Comware architecture.

The HPE Networking Comware 5940 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.

Overview

With the increased pace of deploying virtualized applications, adopting software-defined networking, and server-to-server traffic, many data centers now require spine and ToR switch innovations that will meet their requirements. The HPE Networking Comware 5940 is optimized to meet the increasing requirements for higher-performance server connectivity, convergence of Ethernet and storage traffic, the capability to handle virtual environments, and low-latency.



HPE Networking Comware Switch Series 5940

Key features

- VXLAN L2 and L3 and EVPN support for virtualized environments
- OpenFlow support for investment protection and SDN environments
- High-density 10GbE, 40GbE with 40G or 100G uplink and modular for spine-and–leaf deployments
- Unify management of virtual and physical network with VEPA and IMC
- Includes Distributed Resilient Network Interconnect (DRNI) that offers high availability and resiliency by combining multiple physical switches into one virtual distributed-relay (DR) system.
- Data center convergence and resiliency with SPB, ISSU, DCB, FC/FCoE, IRF, and TRILL

Standard Features

Data center optimized

- **Flexible high port density**
  5940 switch enables customers to scale their server-edge 10/40/100 GbE ToR deployments to new heights with high-density 48 x 10 GbE ports with 6 ports of 40G, 48 x 10 GbE ports with 6 ports of 100G and 32 x 40 GbE delivered in a 1RU design; the 5940 32 ports of 40G switch can also be configured as a 72 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. The 48 ports models comes in SFP+ or BASE-T
- **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**
  Hewlett Packard Enterprise Intelligent Resilient Fabric (IRF) technology simplifies the architecture of server access networks; up to nine HPE 5940 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 like hitless software upgrades
- **Reversible airflow**
  Enhanced for data center hot-cold aisle deployment with reversible airflow—for either front-to-back or back-to-front airflow
- **Redundant fans and power supplies**
  Internal redundant and hot-pluggable power supplies and dual fan trays enhance reliability and availability
- **Lower OPEX and greener data center**
  Provide reversible airflow and advanced chassis power management
- **Data Center Bridging (DCB) protocols**
  Provides support for IEEE 802.1Qbb Priority Flow Control (PFC), Data Center Bridging Exchange (DCBX), IEEE 802.1Qaz Enhanced Transmission Selection (ETS), Explicit Congestion Notification (ECN) for converged FCoE, iSCSI and RoCE environments
- **FCoE support**
  Provides support for T11 standards-compliant FC-BB-5 Fibre Channel over Ethernet (FCoE), including FCoE initialization protocol (FIP), FCP, 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, allows high-performance remote backup and disaster-recovery services to be enabled
- **VXLAN hardware support**
  VXLAN Layer 2 and Layer 3 gateway support for up to 4k tunnels
- **Dynamic VXLAN configuration**
  OVSDB & ML2 support for dynamic VXLAN configuration

- **EVPN**
  Control plane protocol for VXLAN based on industry standards. It enables Layer-2 and Layer-3 control-plane learning of end-host reachability information, enabling organizations to scale their VXLAN infrastructure better. Integration with Openstack Neutron plugin for overlay automation/orchestration

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 L2 (Layer 2) through L4 (Layer 4); flow classification based on source MAC address, destination MAC address, source IP (IPv4/IPv6) address, destination IP (IPv4/IPv6) address, port, protocol, and VLAN.
  Provides no blocking, lossless Clos architecture with VOQs and large buffers with the flexibility and scalability for future growth

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
- **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**
  Delivered through a secure command-line interface (CLI) over Telnet and SSH; role-cased 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 and hitless patching of the modular operating system
- **Autoconfiguration**
  Provides automatic configuration via DHCP autoconfiguration
- **NTP, SNTP**
  Synchronizes timekeeping among distributed time servers and clients; support for network time protocol (NTP), secure network time protocol (SNTP)

Standard Features

Resiliency and high availability

- **IRF technology**
  Enables an Hewlett Packard Enterprise Networking Comware to deliver resilient, scalable, and secured data center networks for physical and virtualized environments; groups up to nine HPE 5940 switches in an IRF configuration, allowing them to be configured and managed as a single switch with a single IP address; simplifies ToR deployment and management, reducing data center deployment and operating expenses
- **IEEE 802.1w Rapid Convergence Spanning Tree Protocol**
  Increases network uptime through faster recovery from failed links
- **IEEE 802.1s Multiple Spanning Tree**
  Provides high link availability in multiple VLAN environments by allowing multiple spanning trees
- **Virtual Router Redundancy Protocol (VRRP)**
  Allows groups of two routers to back each other up dynamically to create highly available routed environments
- **Hitless patch upgrades**
  Allows patches and new service features to be installed without restarting the equipment, increasing network uptime and facilitating maintenance
- **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, 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

Additional information

- **Green IT and power**
  Improves energy efficiency through the use of the latest advances in silicon development; shuts off unused ports and utilizes variable-speed fans, reducing energy costs

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 Interior Gateway Protocol (IGP), which supports ECMP, NSSA, and MD5 authentication for increased security and graceful restart for faster failure recovery
- **Border Gateway Protocol 4 (BGP-4)**
  Delivers an implementation of the Exterior Gateway Protocol (EGP) utilizing path vectors; uses TCP for enhanced reliability for the route discovery process; reduces bandwidth consumption by advertising only incremental updates; supports extensive policies for increased flexibility; scales to very large networks
- **Intermediate system to intermediate system (IS-IS)**
  Uses a path vector 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
- **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, 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

Standard Features

- **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
- **Layer 3 IPv6 routing**
  Provides routing of IPv6 at media speed; supports static routing, RIPng, OSPFv3, BGP4+ for IPv6, and IS-ISv6

Layer 2 switching

- **MAC-based VLAN**
  Provides granular control and security; 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 32 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)**
  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 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

Standard Features

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 configure automatically network devices such as IP phones

Management

- **USB support**
  - **File copy:** Allows users to copy switch files to and from a USB flash drive
- **Port mirroring**
  Enables traffic on a port to be simultaneously sent to a network analyzer for monitoring
- **Remote configuration and management**
  Is available through a CLI
- **IEEE 802.1AB Link Layer Discovery Protocol (LLDP)**
  Advertises and receives management information from adjacent devices on a network, facilitating easy mapping by network management applications
- **sFlow (RFC 3176)**
  Provides scalable ASIC-based 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; 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

Standard Features

- **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
- **Information center**
  Provides a central repository for system and network information; aggregates all logs, traps, and debugging information generated by the system and maintains them in order of severity; outputs the network information to multiple channels based on user-defined rules
- **Network management**
  HPE IMC centrally configures, updates, monitors, and troubleshoots
- **Remote intelligent mirroring**
  Mirrors ingress/egress ACL-selected traffic from a switch port or VLAN to a local or remote switch port anywhere on the network

Warranty and support

- **1-year warranty**
  See Warranty and support summary 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 Warranty and support summary.

Configuration Information

BTO Models

Standard Switch Enclosures

Description	SKU
HPE Networking Comware Switch 48SFP+ 6QSFP28 5940	JH390A
HPE Networking Comware Switch 48XGT 6QSFP28 5940	JH391A

Rack Level Integration CTO Models

CTO Switch Chassis

Description	SKU
HPE Networking Comware Switch 48SFP+ 6QSFP28 5940	JH390A
HPE Networking Comware Switch 48XGT 6QSFP28 5940	JH391A

Transceivers

Description	SKU
SFP Transceivers	
HPE Networking X120 1G SFP RJ45 T Transceiver	JD089B
HPE Networking X120 1G SFP LC SX Transceiver	JD118B
HPE Networking X120 1G SFP LC LX Transceiver	JD119B
HPE Networking X120 1G SFP LC LH100 Transceiver	JD103A
SFP+ Transceivers	
HPE Networking X130 10G SFP+ LC BiDi 10km-Uplink Transceiver	JL737A
HPE Networking X130 10G SFP+ LC BiDi 10km-Downlink Transceiver	JL738A
HPE Networking X130 10G SFP+ LC BiDi 40km-Uplink Transceiver	JL739A
HPE Networking X130 10G SFP+ LC BiDi 40km-Downlink Transceiver	JL740A
HPE Networking X130 10G SFP+ LC SR Transceiver	JD092B
HPE Networking X130 10G SFP+ LC LR Transceiver	JD094B
HPE Networking X130 10G SFP+ LC LH 80km Transceiver	JG915A
HPE Networking Comware 10GBASE-T SFP+ RJ45 30m Cat6A Transceiver	S2N61A
HPE Networking X240 10G SFP+ SFP+ 0.65m DAC Cable	JD095C
HPE Networking X240 10G SFP+ SFP+ 1.2m DAC Cable	JD096C
HPE Networking X240 10G SFP+ SFP+ 3m DAC Cable	JD097C
HPE Networking X240 10G SFP+ SFP+ 5m DAC Cable	JG081C
HPE Networking X2A0 10G SFP+ to SFP+ 7m Active Optical Cable	JL290A
HPE Networking X2A0 10G SFP+ to SFP+ 10m Active Optical Cable	JL291A
HPE Networking X2A0 10G SFP+ to SFP+ 20m Active Optical Cable	JL292A

Configuration Information

FC SFP+ Transceivers

HPE 16Gb FC/10GbE 100m SR SFP+ Transceiver	H6Z42A

QSFP+ Transceivers

HPE Networking X140 40G QSFP+ MPO SR4 Transceiver	JG325B
HPE Networking X140 40G QSFP+ CSR4 300m Transceiver	JG709A
HPE Networking X140 40G QSFP+ LC LR4 SM 10km 1310nm Transceiver	JG661A
HPE Networking X140 40G QSFP+ LC ER4 40km SM Transceiver	JL306A
HPE Networking Comware X240 40G QSFP+ QSFP+ 1m Direct Attach Copper Cable	JG326A
HPE Networking Comware X240 40G QSFP+ QSFP+ 3m Direct Attach Copper Cable	JG327A
HPE Networking Comware X240 40G QSFP+ QSFP+ 5m Direct Attach Copper Cable	JG328A
HPE Networking X140 40G QSFP+ LC BiDi 100m MM Transceiver	JL251A
HPE Networking X140 40G QSFP+ LC LR4L 2km SM Transceiver	JL286A
HPE Networking X2A0 40G QSFP+ to QSFP+ 7m Active Optical Cable	JL287A
HPE Networking X2A0 40G QSFP+ to QSFP+ 10m Active Optical Cable	JL288A
HPE Networking X2A0 40G QSFP+ to QSFP+ 20m Active Optical Cable	JL289A

QSFP28 Transceivers

HPE Networking X150 100G QSFP28 MPO SR4 100m MM Transceiver	JL274A
HPE Networking X150 100G QSFP28 LC BiDi 100m MM Transceiver	JQ344A
HPE Networking X150 100G QSFP28 eSR4 300m MM Transceiver	JH672A
HPE Networking X150 100G QSFP28 LC LR4 10km SM Transceiver	JL275A
HPE Networking X2A0 100G QSFP28 to QSFP28 7m Active Optical Cable	JL276A
HPE Networking X2A0 100G QSFP28 to QSFP28 10m Active Optical Cable	JL277A
HPE Networking X2A0 100G QSFP28 to QSFP28 20m Active Optical Cable	JL278A
HPE Networking X150 100G QSFP28 PSM4 500m SM Transceiver	JH420A
HPE Networking X150 100G QSFP28 CWDM4 2km SM Transceiver	JH673A
HPE Networking X150 100G QSFP28 LC SWDM4 100m MM Transceiver	JH419A
HPE Networking Comware 100G FR1 QSFP28 LC 2km SMF Transceiver	S2P29A
HPE Networking Comware 100G DR QSFP28 LC 500m SM Transceiver	S4J89A
HPE Networking X2A0 100G QSFP28 to QSFP28 7m Active Optical Cable	JL276A
HPE Networking X2A0 100G QSFP28 to QSFP28 10m Active Optical Cable	JL277A
HPE Networking X2A0 100G QSFP28 to QSFP28 20m Active Optical Cable	JL278A
HPE Networking X240 100G QSFP28 1m DAC Cable	JL271A
HPE Networking X240 100G QSFP28 3m DAC Cable	JL272A
HPE Networking X240 100G QSFP28 5m DAC Cable	JL273A
HPE Networking X2A0 100G QSFP28 30m Active Optical Cable	JL795A
HPE Networking X2A0 100G QSFP28 5m Active Optical Cable	JL796A

Configuration Information

Cables

Description	SKU
Multi-Mode Cables	
HPE LC to LC Multi-mode OM3 2-Fiber 0.5m 1-Pack Fiber Optic Cable	AJ833A
HPE LC to LC Multi-mode OM3 2-Fiber 1.0m 1-Pack Fiber Optic Cable	AJ834A
HPE LC to LC Multi-mode OM3 2-Fiber 2.0m 1-Pack Fiber Optic Cable	AJ835A
HPE LC to LC Multi-mode OM3 2-Fiber 5.0m 1-Pack Fiber Optic Cable	AJ836A
HPE LC to LC Multi-mode OM3 2-Fiber 15.0m 1-Pack Fiber Optic Cable	AJ837A
HPE LC to LC Multi-mode OM3 2-Fiber 30.0m 1-Pack Fiber Optic Cable	AJ838A
HPE LC to LC Multi-mode OM3 2-Fiber 50.0m 1-Pack Fiber Optic Cable	AJ839A
HPE Premier Flex LC/LC Multi-mode OM4 2 Fiber 1m Cable	QK732A
HPE Premier Flex LC/LC Multi-mode OM4 2 Fiber 2m Cable	QK733A
HPE Premier Flex LC/LC Multi-mode OM4 2 Fiber 5m Cable	QK734A
HPE Premier Flex LC/LC Multi-mode OM4 2 Fiber 15m Cable	QK735A
HPE Premier Flex LC/LC Multi-mode OM4 2 Fiber 30m Cable	QK736A
HPE Premier Flex LC/LC Multi-mode OM4 2 Fiber 50m Cable	QK737A
MPO Cables	
HPE Premier Flex MPO8 to 4xLC Multi-mode OM4 5m Fiber Cable	K2Q46A
HPE Premier Flex MPO8 to 4xLC Multi-mode OM4 15m Fiber Cable	K2Q47A
HPE Premier Flex MPO12/MPO12 Multi-mode OM4 10m Fiber Cable	QK729A
HPE Premier Flex MPO12/MPO12 Multi-mode OM4 50m Fiber Cable	QK731A
HPE Premier Flex MPO12/MPO12 Multi-mode OM4 100m Fiber Cable	H6Z30A

Internal Power Supplies

Description	SKU
(JH390A, JH391A) System (std 0 // max 2) User Selection (min 1 // max 2)	
HPE Networking A58x0AF 300W AC Power Supply	JG900A
HPE A58x0AF Back (Power Side) to Front (Port Side) Airflow 300W AC Power Supply PDU Cable NA/JP/TW	JG900A#B2B
HPE Networking A58x0AF 300W DC Power Supply	JG901A
HPE Networking 58x0AF 650W AC Power Supply	JC680A
HPE 58x0AF 650W AC Power Supply PDU Cable NA/JP/TW	JC680A#B2B
HPE Networking 58x0AF 650W AC Power Supply	JC680A
HPE 58x0AF 650W AC Power Supply PDU Cable NA/JP/TW	JC680A#B2B
HPE 58x0AF 650W AC Power Supply PDU Cable ROW	JC680A#B2C
HPE A58x0AF 650W AC Power Supply	JC680A#AC3
HPE Networking SW 650W 48V NEBS DC Power Supply Unit	JH336A

Configuration Information

Fan Trays

Description	SKU
HPE Networking 58x0AF Bck(pwr) Frt(prt) Fan Tray	JC682A
HPE Networking 58x0AF Frt(prt) Bck(pwr) Fan Tray	JC683A
HPE Networking X711 Frt(prt) Bck(pwr) HV Fan Tray	JG552A
HPE Networking X712 Bck(pwr) Frt(prt) HV Fan Tray	JG553A

Technical Specifications

HPE FlexFabric 5940 48SFP+ 6QSFP28 Switch (JH390A)		
I/O ports and slots	48 fixed 1G/10G SFP+ ports	
	6 QSFP28 100GbE ports	
Additional ports and slots	1 RJ-45 serial console port	
	1 RJ-45 out-of-band management port 1 SFP out-of-band management port	
	1 SFP GbE port	
	1 USB 2.0	
	1 Mini USB 2.0	
Power supplies	2 power supply slots 1 minimum power supply required (ordered separately)	
Fan tray	2 fan tray slots The customer must order fan trays, as fan trays are not included with the switch. This system requires two same-direction airflow fan trays to function properly. The system should not be operated with only one fan tray for more than 24 hours. The system should not be operated without a fan tray for more than two minutes. The system should not be operated outside of the temperature range of 32°F (0°C) to 113°F (45°C). Failure to comply with these operating requirements may void the product warranty.	
Physical characteristics	**Dimensions**	17.32(w) x 18.11(d) x 1.72(h) in (44 x 46 x 4.36 cm)
	Weight	24.25 lb (11 kg) shipping weight
Memory and processor	1 GB flash; Packet buffer size: 16 MB, 4 GB SDRAM	
Performance	**10 Gbps Latency**	< 1 µs (64-byte packets)
	Throughput	up to 1607 Mpps
	Routing/Switching capacity	2160 Gbps
	Routing table size	250000 entries (IPv4), 64000 entries (IPv6)
	MAC address table size	288000 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 kJ/hr)
	Voltage	100 - 240 VAC, rated -40 to -60 VDC, rated (depending on power supply chosen)
	Maximum power rating	196 W
	Frequency	50/60 Hz
	Notes:	Maximum power rating and maximum heat dissipation are the worst-case theoretical maximum numbers provided for

Technical Specifications

		planning the infrastructure with fully loaded PoE (if equipped), 100% traffic, all ports plugged in, and all modules populated.
Safety	UL 60950-1; EN 60825-1 Safety of Laser Products-Part 1; EN 60825-2 Safety of Laser Products-Part 2; IEC 60950-1; CAN/CSA-C22.2 No. 60950-1; Anatel; ULAR; GOST; EN 60950-1/A11; FDA 21 CFR Subchapter J; NOM; ROHS Compliance	
Emissions	VCCI Class A; EN 55022 Class A; ICES-003 Class A; ANSI C63.4 2003; AS/NZS CISPR 22 Class A; EN 61000-3-2:2006; EN 61000-3-3:1995 +A1:2001+A2:2005; EMC Directive 2004/108/EC; FCC (CFR 47, Part 15) Class A; ANSI/TIA-1057 LLDP Media Endpoint Discovery (LLDP-MED)	
Immunity	**Generic**	ETSI EN 300 386 V1.3.3
	EN	EN 55024:1998+ A1:2001 + A2:2003
	ESD	EN 61000-4-2; IEC 61000-4-2
	Radiated	EN 61000-4-3; IEC 61000-4-3
	EFT/Burst	EN 61000-4-4; IEC 61000-4-4
	Surge	EN 61000-4-5; IEC 61000-4-5
	Conducted	EN 61000-4-6; IEC 61000-4-6
	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 one JC680A or JC681A is required.	
Services	Refer to the Hewlett Packard Enterprise 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.	

Technical Specifications

HPE FlexFabric 5940 48XGT 6QSFP28 Switch (JH391A)		
I/O ports and slots	48 100M/1G/10GBASE-T ports	
	6 QSFP28 100GbE ports	
Additional ports and slots	1 RJ-45 serial console port	
	1 RJ-45 out-of-band management port	
	1 SFP out-of-band management port 1 SFP GbE port	
	1 USB 2.0	
	1 Mini USB 2.0	
Power supplies	2 power supply slots 1 minimum power supply required (ordered separately)	
Fan tray	2 fan tray slots The customer must order fan trays, as fan trays are not included with the switch. This system requires two same-direction airflow fan trays to function properly. The system should not be operated with only one fan tray for more than 24 hours. The system should not be operated without a fan tray for more than two minutes. The system should not be operated outside of the temperature range of 32°F (0°C) to 113°F (45°C). Failure to comply with these operating requirements may void the product warranty.	
Physical characteristics	**Dimensions**	17.32(w) x 25.98(d) x 1.72(h) in (44 x 66 x 4.36 cm)
	Weight	28.66 lb (13 kg) shipping weight
Memory and processor	1 GB flash; Packet buffer size: 16 MB, 4 GB SDRAM	
Performance	**10 Gbps Latency**	< 1 µs (64-byte packets)
	Throughput	up to 1607 Mpps
	Routing/Switching capacity	2160 Gbps
	Routing table size	250000 entries (IPv4), 64000 entries (IPv6)
	MAC address table size	288000 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 kJ/hr)
	Voltage	100 - 240 VAC, rated -40 to -60 VDC, rated (depending on power supply chosen)
	Maximum power rating	320 W
	Frequency	50/60 Hz
	Notes	Maximum power rating and maximum heat dissipation are the worst-case theoretical maximum numbers provided for planning the infrastructure with fully loaded PoE (if equipped), 100% traffic, all ports plugged in, and all modules populated.

Technical Specifications

Safety	UL 60950-1; EN 60825-1 Safety of Laser Products-Part 1; EN 60825-2 Safety of Laser Products-Part 2; IEC 60950-1; CAN/CSA-C22.2 No. 60950-1; Anatel; ULAR; GOST; EN 60950-1/A11; FDA 21 CFR Subchapter J; NOM; ROHS Compliance	
Emissions	VCCI Class A; EN 55022 Class A; ICES-003 Class A; ANSI C63.4 2003; AS/NZS CISPR 22 Class A; EN 61000-3-2:2006; EN 61000-3-3:1995 +A1:2001+A2:2005; EMC Directive 2004/108/EC; FCC (CFR 47, Part 15) Class A; ANSI/TIA-1057 LLDP Media Endpoint Discovery (LLDP-MED)	
Immunity	**Generic**	ETSI EN 300 386 V1.3.3
	EN	EN 55024:1998+ A1:2001 + A2:2003
	ESD	EN 61000-4-2; IEC 61000-4-2
	Radiated	EN 61000-4-3; IEC 61000-4-3
	EFT/Burst	EN 61000-4-4; IEC 61000-4-4
	Surge	EN 61000-4-5; IEC 61000-4-5
	Conducted	EN 61000-4-6; IEC 61000-4-6
	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 one JC680A or JC681A is required.	
Services	Refer to the Hewlett Packard Enterprise 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
- RFC 7432 BGP MPLS-Based Ethernet VPN

Device Management

- RFC 1157 SNMPv1/v2c
- RFC 1305 NTPv3
- RFC 1591 DNS (client)
- RFC 1902 (SNMPv2)
- RFC 1908 (SNMP v1/2 Coexistence)
- RFC 2573 (SNMPv3 Applications)
- RFC 2576 (Coexistence between SNMP V1, V2, V3)
- RFC 2819 RMON
- Multiple Configuration Files
- Multiple Software Images
- SSHv1/SSHv2 Secure Shell
- TACACS/TACACS+

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

Technical Specifications

General Protocols

- IEEE 802.1ad Q-in-Q
- IEEE 802.1AX-2008 Link Aggregation
- IEEE 802.1D MAC Bridges
- IEEE 802.1p Priority
- IEEE 802.1Q VLANs
- IEEE 802.1s Multiple Spanning Trees
- IEEE 802.1w Rapid Reconfiguration of Spanning Tree
- IEEE 802.3ad Link Aggregation Control Protocol (LACP)
- IEEE 802.3ae 10-Gigabit Ethernet
- IEEE 802.3ag Ethernet OAM
- IEEE 802.3ah Ethernet in First Mile over Point to Point Fiber - EFMF
- IEEE 802.3x Flow Control
- RFC 768 UDP
- RFC 783 TFTP Protocol (revision 2)
- RFC 791 IP
- RFC 792 ICMP
- RFC 793 TCP
- RFC 826 ARP
- RFC 854 TELNET
- RFC 856 TELNET
- RFC 868 Time Protocol
- RFC 896 Congestion Control in IP/TCP Internetworks
- RFC 950 Internet Standard Subnetting Procedure
- RFC 1027 Proxy ARP
- RFC 1058 RIPv1
- RFC 1091 Telnet Terminal-Type Option
- RFC 1141 Incremental updating of the Internet checksum
- RFC 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 1542 Clarifications and Extensions for the Bootstrap Protocol
- 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

Technical Specifications

- RFC 2581 TCP Congestion Control
- RFC 2644 Directed Broadcast Control
- RFC 2767 Dual Stack Hosts using BIS
- RFC 2865 Remote Authentication Dial In User Service (RADIUS)
- RFC 2868 RADIUS Attributes for Tunnel Protocol Support
- RFC 2890 Key and Sequence Number Extensions to GRE
- RFC 2929 DNS IANA Considerations
- RFC 3046 DHCP Relay Agent Information Option
- RFC 3411 An Architecture for Describing Simple Network Management Protocol (SNMP) Management Frameworks
- RFC 3412 Message Processing and Dispatching for the Simple Network Management Protocol (SNMP)
- RFC 3413 Simple Network Management Protocol (SNMP) Applications
- RFC 3416 Protocol Operations for SNMP
- RFC 3417 Transport Mappings for the Simple Network Management Protocol (SNMP)
- RFC 3418 Management Information Base (MIB) for the Simple Network Management Protocol (SNMP)
- RFC 3768 Virtual Router Redundancy Protocol (VRRP)
- RFC 4250 The Secure Shell (SSH) Protocol Assigned Numbers
- RFC 4251 The Secure Shell (SSH) Protocol Architecture
- RFC 4252 The Secure Shell (SSH) Authentication Protocol
- RFC 4253 The Secure Shell (SSH) Transport Layer Protocol
- RFC 4254 The Secure Shell (SSH) Connection Protocol
- RFC 4292 IP Forwarding Table MIB
- RFC 4293 Management Information Base for the Internet Protocol (IP)
- RFC 4364 BGP/MPLS IP Virtual Private Networks (VPNs)
- RFC 4419 Diffie-Hellman Group Exchange for the Secure Shell (SSH) Transport Layer Protocol
- RFC 4594 Configuration Guidelines for DiffServ Service Classes
- RFC 4601 Protocol Independent Multicast - Sparse Mode (PIM-SM): Protocol Specification (Revised)
- RFC 4604 Using Internet Group Management Protocol Version 3 (IGMPv3) and Multicast Listener Discovery Protocol Version 2 (MLDv2) for Source-Specific Multicast
- RFC 4607 Source-Specific Multicast for IP
- RFC 4941 Privacy Extensions for Stateless Address Autoconfiguration in IPv6
- RFC 5340 OSPF for IPv6
- RFC 5905 Network Time Protocol Version 4: Protocol and Algorithms Specification

Network Management

- RFC 2580 Conformance Statements for SMIv2
- RFC 3164 BSD syslog Protocol

OSPF

- RFC 1587 OSPF NSSA
- RFC 2328 OSPFv2
- RFC 3101 OSPF NSSA
- RFC 3137 OSPF Stub Router Advertisement
- RFC 3623 Graceful OSPF Restart
- RFC 4577 OSPF as the Provider/Customer Edge Protocol for BGP/MPLS IP Virtual Private Networks (VPNs)
- RFC 4811 OSPF Out-of-Band LSDB Resynchronization

Technical Specifications

- RFC 4812 OSPF Restart Signaling
- RFC 4813 OSPF Link-Local Signaling

QoS/CoS

- IEEE 802.1p (CoS)
- RFC 2475 DiffServ Architecture
- RFC 2597 DiffServ Assured Forwarding (AF)
- RFC 3247 Supplemental Information for the New Definition of the EF PHB (Expedited Forwarding Per-Hop Behavior)
- RFC 3260 New Terminology and Clarifications for DiffServ

IPv6

- RFC 2080 RIPng for IPv6
- RFC 2460 IPv6 Specification
- RFC 2461 IPv6 Neighbor Discovery
- RFC 2462 IPv6 Stateless Address Auto-configuration
- RFC 2463 ICMPv6
- RFC 2464 Transmission of IPv6 over Ethernet Networks
- RFC 2473 Generic Packet Tunneling in IPv6
- RFC 2545 Use of MP-BGP-4 for IPv6
- RFC 2563 ICMPv6
- RFC 2711 IPv6 Router Alert Option
- RFC 2740 OSPFv3 for IPv6
- RFC 2767 Dual Stack Hosts using BIS
- RFC 3315 DHCPv6 (client and relay)
- RFC 3484 Default Address Selection for IPv6
- RFC 3810 Multicast Listener Discovery Version 2 (MLDv2) for IPv6
- RFC 4213 Basic Transition Mechanisms for IPv6 Hosts and Routers
- RFC 4291 IP Version 6 Addressing Architecture
- RFC 4443 ICMPv6
- RFC 4552 Authentication/Confidentiality for OSPFv3
- RFC 4862 IPv6 Stateless Address Auto-configuration
- RFC 5095 Deprecation of Type 0 Routing Headers in IPv6

Security

- RFC 1321 The MD5 Message-Digest Algorithm
- RFC 2818 HTTP Over TLS
- RFC 6192 Partial Support - Protecting the Router Control Plane
- Access Control Lists (ACLs)
- SSHv2 Secure Shell

Summary of Changes

Date	Version History	Action	Description of Change
15-Jun-2026	Version 28	Changed	New QSFP28 transceivers SKUs added in Configuration Information section.
27-Feb-2026	Version 27	Changed	Rebranding update applied to QuickSpecs
28-Apr-2025	Version 26	Changed	Configuration Information section was updated.
04-Dec-2023	Version 25	Changed	Series name was updated.
21-Aug-2023	Version 24	Changed	Technical Specifications section was updated.
06-Feb-2023	Version 23	Changed	Configuration Information section was updated.
15-Aug-2022	Version 22	Changed	Overview section was updated.
06-Dec-2021	Version 21	Changed	Configuration Information section was updated and obsolete SKUs were removed.
03-Aug-2020	Version 20	Changed	SKU descriptions were updated.
04-May-2020	Version 19	Changed	Configuration Information and Related Options was updated. Obsolete SKUs were removed.
16-Dec-2019	Version 18	Changed	Configuration Information was updated. Obsolete SKUs were removed.
03-Sep-2019	Version 17	Changed	Configuration Information and Related Options were updated. Obsolete SKUs were removed. New SKUs were added.
04-Feb-2019	Version 16	Removed	Switch Bundles removed: JH684A, JH685A, JH686A, JH691A, JH692A SKU removed: JL250A Removed Box Level CTO SSP Section and logic from menu and configurators
17-Dec-2018	Version 15	Changed	Technical Specifications and Configuration section updated
01-Oct-2018	Version 14	Changed	Configuration Information section was updated
06-Aug-2018	Version 13	Changed	Configuration Information section was updated
04-Jun-2018	Version 12	Removed	SKUs removed: JD093B, JL438A
07-May-2018	Version 11	Added	SKU added: JH419A
02-Apr-2018	Version 10	Changed	Configuration Information section was updated
04-Dec-2017	Version 9	Added	SKU added: JH957A, JQ041A, JQ042A, JQ043A, JQ044A
05-Jun-2017	Version 8	Added	SKU added: JH673A
03-Apr-2017	Version 7	Changed	Configuration Information section was updated
06-Mar-2017	Version 6	Changed	SKUs added: JL437A; JL438A; JL439A Configuration Information section was updated
06-Feb-2017	Version 5	Changed	Related Options was updated
09-Jan-2017	Version 4	Added	Models added: JH684A, JH685A, JH686A, JH691A, JH692A SKUs added: JH689A, JH690A, JH409A, JH677A, JH678A, JH679A, JH680A, JH681A, JH682A, JH683A, JH693A, JH694A, JH695A, JH696A, JH697A, JH698A, JH699A, JH700A, JH701A, JH702A, JH703A
07-Nov-2016	Version 3	Changed	Models added: JH397A; JH398A Edits made on Configuration and Accessories sections
05-Sep-2016	Version 2	Changed	SKUs added: JL273A, JL282A, JL283A, JL284A Overview and Technical Specifications updated
01-Aug-2016	Version 1	New	New QuickSpecs

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