



HPE FlexNetwork 7500 Switch Series



Product overview

The HPE FlexNetwork 7500 Switch Series comprises modular, multilayer chassis switches that meet the evolving needs of integrated services networks. The switches can be deployed in multiple network environments, including the enterprise LAN core, aggregation layer, and wiring closet edge. They offer 40GbE connectivity and cost-effective, wire-speed 10GbE ports to safeguard the throughput and bandwidth needed for your mission-critical data and high-speed communications.

A passive backplane, support for load sharing, and redundant management and fabrics help the switch series provide high availability. Moreover, these switches deliver wire-speed Layer 2 and Layer 3 routing services for the most demanding applications with hardware-based IPv4 and IPv6 support.

A summary of the highlights of the 7500 Switch Series:

- Versatile, high-performance modular switches
- Enterprise LAN core, aggregation, and edge
- Extensive switching and routing, IPv6, and multiprotocol label switching (MPLS)
- Advanced functionality with service modules
- Robust network and service virtualization

Features and benefits

QoS

- IEEE 802.1p prioritization
 - Delivers data to devices, based on the priority and type of traffic
- Class of service (CoS)
 - Sets the IEEE 802.1p priority tag based on the IP address, IP type of service (ToS), Layer 3 protocol, TCP/user datagram protocol (UDP) port number, source port, and DiffServ
- Bandwidth shaping
 - Port-based rate limiting
 - Enabled per-port ingress/egress-enforced bandwidth increase
 - Classifier-based rate limiting
 - Uses an access control list (ACL) to enforce increased bandwidth for ingress traffic on each port
 - Reduced bandwidth
 - Provides per-port per-queue egress-based bandwidth reduction
- Weighted random early detection (WRED)/random early detection
 - Delivers congestion avoidance capabilities through the use of queue management algorithms
- Powerful QoS feature
 - Provides support for these congestion actions: strict priority queuing, weighted round robin, weighted fair queuing, and WRED
- Traffic policing
 - Supports committed access rate and line rate

Intrusion detection system (IDS)/intrusion prevention system (IPS)

- Deep packet inspection
 - Examines the packet payload as well as the frame and packet headers; packets are dropped if attacks or intrusions are detected using signature-based or protocol-anomaly-based detection
- Signature-based detection
 - Detects attacks that have known attack patterns; IPS maintains a signature database that contains the pattern definitions for known attacks that can be updated automatically using a subscription service
- Protocol anomaly-based detection
 - Detects attacks that use anomalies in application protocol payloads
- Severity-based action policies
 - Involve action taken against attacks based on their severity; the actions include “allow”, “block”, and “terminate connection” to provide appropriate mitigation
- Signature update service
 - Provides regular updates to the signature database, helping ensure that the latest available signatures are installed

Virtual private network (VPN)

- IPsec

Provides secure tunneling over an untrusted network, such as the Internet or a wireless network; and offers data confidentiality, authenticity, and integrity between two network endpoints

- Generic routing encapsulation (GRE)

Transports Layer 2 connectivity over a Layer 3 path in a secured way; and enables the segregation of traffic from site to site

- Manual or automatic Internet Key Exchange (IKE)

Enables the manual or automatic key exchange required for the algorithms used in encryption or authentication; auto-IKE allows automated management of the public key exchange, helping ensure the highest levels of encryption

- **NEW** Virtual Extensible LAN (VXLAN)

Delivers network virtualization, enabling IP-based networks to support many VLAN overlays for use as a private collaboration network, or a single, end-to-end VLAN for Wi-Fi. Requires Comware v7 with specific hardware only. Refer to the hardware manuals for details

Management

- Management interface control

Provides management access through a modem port and terminal interface as well as in-band and out-of-band Ethernet ports; and offers access through the terminal interface, Telnet, or Secure Shell (SSH)

- Industry-standard CLI with a hierarchical structure

Reduces training time and expenses; and increases productivity in multivendor installations

- Management security

Restricts access to critical configuration commands; offers multiple privilege levels with password protection; uses ACLs to provide Telnet and SNMP access; and allows logging of all access with local and remote syslog capabilities

- SNMPv1, v2, and v3

Provide complete support of the SNMP and industry-standard management information base (MIB) as well as private extensions; SNMPv3 supports increased security using encryption

- sFlow® (RFC 3176)

Provides scalable ASIC-based wire-speed network monitoring and accounting with no impact on network performance; this allows network operators to gather a variety of sophisticated network statistics and information for capacity planning and real-time network monitoring purposes

- Remote monitoring (RMON)

Uses standard SNMP to monitor essential network functions; and supports events, alarms, history, and statistics groups as well as a private alarm extension group

- FTP, trivial FTP (TFTP), and secure FTP (SFTP) support

Offers different mechanisms for configuration updates; the FTP allows bidirectional transfers over a TCP/IP network; the TFTP is a simpler method that uses the UDP; and the SFTP runs over an SSH tunnel to provide additional security

- Debug and sampler utility
 - Supports ping and traceroute for both IPv4 and IPv6
- Network time protocol (NTP)
 - Synchronizes timekeeping among distributed time servers and clients; and keeps timekeeping consistent among all clock-dependent devices within the network, so that the devices can provide diverse applications, based on the consistent time
- Network quality analyzer
 - Analyzes network performance and service quality by sending test packets; provides network performance and service quality parameters such as jitter, TCP, or FTP connection delays and file transfer rates; and allows a network manager to determine the overall network performance as well as diagnose and locate network congestion points or failures
- Information center
 - Provides a central repository for system and network information; aggregates all logs, traps, and debugging information generated by the system and maintains them in the order of severity; and sends out the network information to multiple channels, based on user-defined rules
- 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
- Dual flash images
 - Provides independent primary and secondary operating system files for backup while upgrading
- Multiple configuration files
 - Are easily stored with a flash image

Connectivity

- High-density port connectivity
 - Provides up to 10 interface module slots and up to 44 40GbE ports, 176 10GbE ports, 480 Fiber Gigabit ports, or 480 PoE-enabled ports per HPE 7500 Switch Series system
- Jumbo frames
 - Allow high-performance remote backup and disaster-recovery systems with up to 9,216 bytes
- Loopback
 - Supports internal loopback testing for maintenance purposes and an increase in availability; loopback detection protects against incorrect cabling or network configurations and can be enabled on a per-port or per-VLAN basis for added flexibility

- Ethernet operations, administration, and maintenance (OAM)
Detects the data link layer problems that occur in the “last mile”, using the IEEE 802.3ah OAM standard; and monitors the status of the link between two devices
- Flexible port selection
Includes 100/1000BASE-X auto speed selection, 10/100/1000BASE-T auto speed detection, as well as auto duplex and MDI/MDI-X
- Monitor link
Collects statistics on performance and errors on physical links, increasing system availability
- IEEE 802.3af PoE
Provides up to 15.4 W per port to IEEE 802.3af-compliant PoE-powered devices such as IP phones, wireless access points, and security cameras
- Dual-personality functionality
JH210A and JH211A comes with SFP slots for optional fiber connectivity, such as Gigabit-SX, -LX, and -LH and 100-FX
- Packet storm protection
Protects against unknown broadcast, unknown multicast, or unicast storms with user-defined thresholds
- Flow control
Provides back pressure, using standard IEEE 802.3x—reducing congestion in heavy traffic situations
- IEEE 802.3at PoE+ support
Provides up to 30 W of power to the power sourcing equipment

Performance

- High-speed fully distributed architecture
Supports a maximum of 4,160Gbps switching capacity, providing enhanced performance and future expansion capability; delivers up to 2,380MPPS throughput with dual fabrics; performs all switching and routing functions in the I/O modules; and meets the current and future demand of an enterprise’s bandwidth-intensive applications
- Scalable system design
Provides investment protection to support future technologies and higher-speed connectivity with a backplane designed to accommodate bandwidth increases
- Flexible chassis selection
Enables you to tailor your product selections to your budget with a choice of four different chassis sizes, ranging from a 10-slot to a 2-slot chassis

Resiliency and high availability

- Redundant/load-sharing fabrics, management, fan assemblies, and power supplies
Increase total performance and power availability, while providing hitless, stateful failovers
- All hot-swappable modules
Allows replacement of modules without any impact on other modules
- Dual internal power supply
Provides high reliability
- Separate data and control paths
Separates control from services and keeps service processing isolated; and increases security and performance
- Passive design system
Delivers increased system reliability as the backplane has no active components
- IEEE 802.3ad Link Aggregation Control Protocol (LACP)
7500v7 line cards supports up to 1000 link aggregation groups each with 2 links or 64 link aggregation groups each with 32 links; and provides support for static or dynamic groups and a user-selectable hashing algorithm
- Intelligent Resilient Fabric (IRF)
Creates virtual resilient switching fabrics, where two or more switches perform as a single Layer 2 switch and Layer 3 router; switches don't have to be co-located and can be part of a disaster-recovery system; servers or switches can be attached using the standard LACP for automatic load balancing and high availability; it can help eliminate the need for complex protocols such as spanning tree protocol (STP), equal-cost multipath (ECMP), or virtual router redundancy protocol (VRRP)—simplifying network operations
- IRF capability
Provides single IP address management for a resilient virtual switching fabric of up to four switches
- Ring resiliency protection protocol (RRPP)
Provides standard sub-100 ms recovery for a ring Ethernet-based topology
- 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 easy maintenance

- Graceful restart

Supports graceful restart for the open-shortest path first (OSPF), IS-IS, border gateway protocol (BGP), LDP, and RSVP; the network remains stable during the active-standby switchover; after the switchover, the device quickly learns the network routes by communicating with adjacent routers; and forwarding remains uninterrupted during the switchover to achieve nonstop forwarding

- Ultrafast protocol convergence with standards-based failure detection—bidirectional forwarding detection

Enables link connectivity monitoring and reduces network convergence time for the routing information protocol (RIP), OSPF, BGP, IS-IS, VRRP, MPLS, and IRF

- Smart Link

Allows 50 ms failover between links

- IP/LDP FRR

Configures nodes with backup ports, routes, and LSPs; requires no cooperation of adjacent devices for local implementation—simplifying deployment; solves the traditional convergence faults in IP and MPLS forwarding—protecting the links, nodes, and paths without establishing respective backup LSPs for them; and realizes restoration within 50 ms—with the restoration time independent of the number of routes and fast link switchovers, without route convergence

Layer 2 switching

- VLAN

Supports up to 4,096 port-based or IEEE 802.1Q-based VLANs; and supports MAC-based VLANs, protocol-based VLANs, and IP-subnet-based VLANs for added flexibility

- Port isolation

Increases security by isolating ports within a VLAN, while still allowing them to communicate with other VLANs

- STP bridge protocol data unit (BPDU) tunneling

Transmits STP BPDUs transparently, allowing correct tree calculations across service providers, WANs, or MANs

- GARP VLAN registration protocol

Allows automatic learning and dynamic assignment of VLANs

- Port mirroring

Duplicates port traffic (ingress and egress) to a local or remote monitoring port; and supports four mirroring groups, with an unlimited number of ports per group

- STP

Supports the standard IEEE 802.1D STP, IEEE 802.1w rapid STP for faster convergence, and IEEE 802.1s multiple STP

- Internet Group Management Protocol (IGMP) and Multicast Listener Discovery (MLD) protocol snooping

Controls and manages the flooding of multicast packets in a Layer 2 network

- Device link detection protocol

Monitors link connectivity and shuts down ports at both ends if unidirectional traffic is detected, helping prevent loops in STP-based networks

- IEEE 802.1ad Q-in-Q and selective Q-in-Q

Increase the scalability of an Ethernet network by providing a hierarchical structure; and connect multiple LANs on a high-speed campus or metro network

- Super VLAN

Saves IP address space, using RFC 3069 standard (also called VLAN aggregation)

- Per-VLAN spanning tree plus

Allows each VLAN to build a separate spanning tree to improve link bandwidth usage in network environments with multiple VLANs

Layer 3 services

- Address resolution protocol (ARP)

Determines the MAC address of another IP host in the same subnet; includes support for static ARPs; a gratuitous ARP allows detection of duplicate IP addresses; and a proxy ARP allows normal ARP operation between subnets or when subnets are separated by a Layer 2 network

- UDP helper

Redirects UDP broadcasts to specific IP subnets to help prevent server spoofing

- Dynamic host configuration protocol (DHCP)

Simplifies the management of large IP networks and supports both clients and servers; DHCP relay enables DHCP operation across subnets

- Domain name system (DNS)

Provides a distributed database that translates domain names and IP addresses, simplifying network design; and supports clients and servers

Layer 3 routing

- Static IPv4 routing

Provides simple manually configured IPv4 routing

- RIP

Uses a distance vector algorithm with UDP packets for route determination; supports RIPv1 and RIPv2 routing; and includes loop protection

- 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

- Intermediate system to intermediate system (IS-IS)

Uses a path vector IGP, which is defined by the ISO organization for IS-IS routing and extended by IETF RFC 1195 to operate in both TCP/IP and the OSI reference model (integrated IS-IS)

- Border Gateway Protocol 4 (BGP-4)

Delivers an implementation of the exterior gateway protocol, utilizing path vectors; uses TCP for enhanced reliability for the route discovery process; reduces bandwidth consumption by advertising only incremental updates; supports extensive policies for increased flexibility; and scales to very large networks
- Policy-based routing

Makes routing decisions based on policies set by the network administrator
- IP performance optimization

Provides a set of tools to improve the performance of IPv4 networks; and includes directed broadcasts, customization of TCP parameters, support of ICMP error packets, and extensive display capabilities
- Unicast reverse path forwarding (uRPF)

Limits erroneous or malicious traffic in accordance with RFC 3074
- 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 design to an IPv6-only network design
- RIP next generation (RIPng)

Extends RIPv2 to support IPv6 addressing
- OSPFv3

Provides OSPF support for IPv6
- IS-IS for IPv6

Extends IS-IS to support IPv6 addressing
- BGP+

Extends BGP-4 to support multiprotocol BGP, including support for IPv6 addressing
- IPv6 tunneling

Allows IPv6 packets to traverse IPv4-only networks by encapsulating the IPv6 packet into a standard IPv4 packet; supports manually configured, 6-to-4, and Intra-Site Automatic Tunnel Addressing Protocol (ISATAP) tunnels; and is an important element for the transition from IPv4 to IPv6
- Multiprotocol Label Switching (MPLS)

Uses BGP to advertise routes across label switched paths (LSPs), but uses simple labels to forward packets from any Layer 2 or Layer 3 protocol—which reduces complexity and increases performance; supports graceful restart for reduced failure impact; and provides support for LSP tunneling and multilevel stacks

- MPLS Layer 3 VPN

Allows Layer 3 VPNs across a provider network; uses MP-BGP to establish private routes for increased security; and supports RFC 2547bis multiple autonomous system VPNs for added flexibility

- MPLS Layer 2 VPN

Establishes simple Layer 2 point-to-point VPNs across a provider network, using only MPLS Label Distribution Protocol (LDP); requires no routing—which decreases complexity, increases performance, and allows VPNs of non-routable protocols; uses no routing information for increased security; and supports circuit cross connect, static virtual circuits, a Martini draft, and Kompella-draft technologies

- Virtual Private LAN Service (VPLS)

Establishes point-to-multipoint Layer 2 VPNs across a provider network

- Service loopback

Allows any module to take advantage of other modules with higher features, including Open Application Architecture (OAA) modules, by redirecting traffic; reduces investment and enables higher bandwidth and load sharing; and supports IPv6, IPv6 multicast, tunneling, and MPLS

Security

- ACL enablement

Supports powerful ACLs for both IPv4 and IPv6; and helps filter traffic to prevent unauthorized users from accessing the network or control network traffic in order to save resources; rules can either deny or permit traffic to be forwarded; rules can be based on a Layer 2 header or a Layer 3 protocol header; and rules can be set to operate on specific dates or times

- Remote authentication Dial In User service (RADIUS)

Eases switch security access administration by using a password authentication server

- Terminal access controller access-control system (TACACS+)

Delivers an authentication tool, using TCP with encryption of the full authentication request, providing additional security

- Switch management logon security

Helps secure switch CLI logon by optionally requiring either RADIUS or TACACS+ authentication

- SSHv2

Uses external servers to securely log in to a remote device; protects against IP spoofing and plain-text password interception, with authentication and encryption; and increases the security of SFTP transfers

- DHCP snooping

Enables DHCP clients to receive IP addresses from authorized DHCP servers and maintains a list of DHCP entries for trusted ports; and helps prevent users from receiving fake IP addresses and reduces ARP attacks, improving security

- IP source guard
Filters packets on a per-port basis to help prevent illegal packets from being forwarded
- ARP attack protection
Protects from attacks using a large number of ARP requests with a host-specific, user-selectable threshold
- Port security
Allows access only to specified MAC addresses, which can be learned or specified by the administrator
- IEEE 802.1X support
Provides port-based user authentication, with support for the EAP-MD5, TLS, TTLS, and PEAP—with choice of AES, TKIP, and static or dynamic WEP encryption for protecting wireless traffic between authenticated clients and the access point
- MAC authentication
Provides simple authentication, based on a user's MAC address; and supports local or RADIUS-based authentication
- Multiple user authentication methods
 - IEEE 802.1X
Uses an IEEE 802.1X supplicant on the client, in conjunction with a RADIUS server, to authenticate in accordance with industry standards
 - Web-based authentication
Provides a browser-based environment, similar to IEEE 802.1X, to authenticate clients that do not support the IEEE 802.1X supplicant
 - MAC-based authentication
Authenticates the client with a RADIUS server, based on the client's MAC address
- DHCP protection
Blocks DHCP packets from unauthorized DHCP servers, helping preventing denial-of-service attacks
- Endpoint admission defense (EAD)
Assigns security policies to users accessing a network
- Port isolation
Secures and adds privacy; and helps prevent malicious attackers from obtaining user information
- IEEE 802.1AE MACsec
Provides IEEE MAC Security standard for data encryption of Ethernet connections using switch-to-switch, or switch-to-host with 802.1X

Convergence

- LLDP–media endpoint discovery (MED)

Defines a standard extension of LLDP that stores values for parameters such as QoS and VLAN to automatically configure network devices such as IP phones

- Protocol Independent Multicast (PIM)

Defines modes of Internet IPv4 and IPv6 multicasting to allow one-to-many and many-to-many transmission of information; and supports PIM dense mode (DM), sparse mode (SM), and source-specific mode (SSM)

- Multicast Source Discovery Protocol (MSDP)

Allows multiple PIM-SM domains to interoperate; is used for inter-domain multicast applications

- IGMP

Utilizes any-source multicast (ASM) or SSM to manage IPv4 multicast networks; and supports IGMPv1, v2, and v3

- Multicast BGP

Allows multicast traffic to be forwarded across BGP networks and kept separate from unicast traffic

- MLD protocol

Establishes, maintains, and manages IPv6 multicast groups and networks; supports v1 and v2; and utilizes ASM or SSM

- Multicast VLAN

Allows multiple VLANs to receive the same IPv4 or IPv6 multicast traffic, lessening network bandwidth demand by reducing or nearly eliminating multiple streams to each VLAN

- Voice VLAN

Assigns VLAN and priority for IP phones automatically, simplifying network configuration and maintenance

Integration

- Open Application Architecture (OAA)

Provides high-performance application-specific modules fully integrated with the switching architecture; uses the chassis high-speed backplane to access network-related data; and increases performance, reduces costs, and simplifies network management

- VPN 20 Gb/s firewall module

Provides enhanced stateful packet inspection and filtering; supports flexible security zones and virtual firewall containment; offers advanced VPN services with 3DES and AES encryption at high performance and low latency; facilitates Web content filtering; and enables application prioritization and optimization

Software-defined networking

- **NEW** OpenFlow 1.3

Enables SDN to provide an end-to-end solution to automate the network, allowing for rapid application deployments (Comware v7 only)

Additional information

- Green initiative support

Provides support for RoHS and WEEE regulations

- Low power-consumption switch

Is rated among the switches with the lowest power consumption in the industry by Miercom independent tests

- Unified Hewlett Packard Enterprise Comware operating system with modular architecture

Provides a feature set that's easy to enhance and extend—one that doesn't require whole-scale changes; all switching, routing, and security platforms leverage the Comware OS, which is a common unified modular operating system

- OPEX savings

Simplifies and streamlines deployment, management, and training through the use of a common operating system—cutting costs as well as reducing the risk of human errors associated with having to manage multiple operating systems across different platforms and network layers

Warranty and support

- 1-year warranty

See hpe.com/networking/warrantysummary for warranty and support information included with your product purchase.

- Software releases

To find software for your product, visit hpe.com/networking/support; for details on the software releases available with your product purchase, visit hpe.com/networking/warrantysummary.

HPE FlexNetwork 7500 Switch Series



Specifications	HPE FlexNetwork 7510 Switch with 2x2.4 Tbps Fabric and Main Processing Unit (JH333A)	HPE FlexNetwork 7506 Switch with 2x2.4 Tbps Fabric and Main Processing Unit (JH332A)	HPE FlexNetwork 7503 Switch with 2x2.4 Tbps Fabric and Main Processing Unit (JH331A)
Included accessories	1 HPE 7510 Spare Fan Assembly (JD216A) 2 HPE 7500 2.4 Tbps Fabric with 8-port 1/10GbE SFP+ and 2-port 40GbE QSFP+ Main Processing Unit (JH209A)	1 HPE 7506 Spare Fan Assembly (JD214A) 2 HPE 7500 2.4 Tbps Fabric with 8-port 1/10GbE SFP+ and 2-port 40GbE QSFP+ Main Processing Unit (JH209A)	1 HPE 7503 Spare Fan Assembly (JD212A) 2 HPE 7500 2.4 Tbps Fabric with 8-port 1/10GbE SFP+ and 2-port 40GbE QSFP+ Main Processing Unit (JH209A)
I/O ports and slots	10 I/O module slots Supports a maximum of 480 PoE/PoE+ ports, 480 Gigabit Ethernet ports or 480 autosensing 10/100/1000 ports or 480 1/10GbE ports or 480 10GbE ports or 44 40GbE ports, or a combination	6 I/O module slots Supports a maximum of 288 PoE/PoE+ ports, 288 Gigabit Ethernet ports or 288 autosensing 10/100/1000 ports or 288 1/10GbE ports or 288 10GbE ports or 28 40GbE ports, or a combination	3 I/O module slots Supports a maximum of 144 PoE/PoE+ ports, 144 Gigabit Ethernet ports or 144 autosensing 10/100/1000 ports or 144 1/10GbE ports or 144 10GbE ports or 16 40GbE ports, or a combination
Additional ports and slots	2 switch fabric slots	2 switch fabric slots	2 switch fabric slots
Power supplies	2 power supply slots 1 minimum power supply required (ordered separately)	2 power supply slots 1 minimum power supply required (ordered separately)	2 power supply slots 1 minimum power supply required (ordered separately)
Fan tray	Includes: 1 x JD216A 1 fan tray slot	Includes: 1 x JD214A 1 fan tray slot	Includes: 1 x JD212A 1 fan tray slot
Physical characteristics			
Dimensions	17.17(w) x 16.54(d) x 27.87(h) in. (43.6 x 42.0 x 70.8 cm) (16U height)	17.17(w) x 16.54(d) x 22.64(h) in. (43.6 x 42.0 x 57.5 cm) (13U height)	17.17(w) x 16.54(d) x 17.36(h) in. (43.6 x 42.0 x 44.1 cm) (10U height)
Weight	211 lb (95.71 kg) shipping weight	207 lb (93.9 kg) shipping weight	147 lb (66.68 kg) shipping weight
Memory and processor	MIPS64 @ 1GHz, 1GB Flash, 4GB SDRAM	MIPS64 @ 1GHz, 1GB Flash, 4GB SDRAM	MIPS64 @ 1GHz, 1GB Flash, 4GB SDRAM
Mounting and enclosure	Mounts in an EIA-standard 19 in. rack or other equipment cabinet (hardware included); horizontal surface mounting only	Mounts in an EIA-standard 19 in. rack or other equipment cabinet (hardware included); horizontal surface mounting only	Mounts in an EIA-standard 19 in. rack or other equipment cabinet (hardware included); horizontal surface mounting only
Reliability			
Availability	99.999%	99.999%	99.999%

Specifications (continued)	HPE FlexNetwork 7510 Switch with 2x2.4 Tbps Fabric and Main Processing Unit (JH333A)	HPE FlexNetwork 7506 Switch with 2x2.4 Tbps Fabric and Main Processing Unit (JH332A)	HPE FlexNetwork 7503 Switch with 2x2.4 Tbps Fabric and Main Processing Unit (JH331A)
Environment			
Operating temperature	32°F to 113°F (0°C to 45°C)	32°F to 113°F (0°C to 45°C)	32°F to 113°F (0°C to 45°C)
Operating relative humidity	10% to 95%, noncondensing	10% to 95%, noncondensing	10% to 95%, noncondensing
Nonoperating/Storage temperature	-40°F to 158°F (-40°C to 70°C)	-40°F to 158°F (-40°C to 70°C)	-40°F to 158°F (-40°C to 70°C)
Nonoperating/Storage relative humidity	5% to 95%, noncondensing	5% to 95%, noncondensing	5% to 95%, noncondensing
Acoustic	Low-speed fan: 53.5 dB, High-speed fan: 56.7 dB	Low-speed fan: 53.6 dB, High-speed fan: 57.7 dB	Low-speed fan: 51.6 dB, High-speed fan: 56.1 dB
Electrical characteristics			
Frequency	50/60 Hz	50/60 Hz	50/60 Hz
Description		Achieved Miercom Certified Green Award The H3C S7506E (HPE 7506) is Certified Green in the 2009 Miercom Green Switches Industry Assessment.	
Voltage	100–120/200–240 VAC, rated (depending on power supply chosen)	100–120/200–240 VAC, rated (depending on power supply chosen)	100–120/200–240 VAC, rated (depending on power supply chosen)
DC voltage	16/50 A	16/50 A	16/50 A
Power output	1400 W	1400 W	1400 W
Notes			
Based on a common power supply of 1400 W (AC/DC)			
Safety			
	UL 60950-1; IEC 60950-1; CAN/CSA-C22.2 No. 60950-1; EN 60950-1/A11	UL 60950-1; IEC 60950-1; CAN/CSA-C22.2 No. 60950-1; EN 60950-1/A11	UL 60950-1; IEC 60950-1; CAN/CSA-C22.2 No. 60950-1; EN 60950-1/A11
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	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	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	ETSI EN 300 386 V1.3.3	ETSI EN 300 386 V1.3.3
EN	EN 61000-4-2:1995+A1:1998+A2:2001	EN 61000-4-2:1995+A1:1998+A2:2001	EN 61000-4-2:1995+A1:1998+A2:2001
ESD	EN 61000-4-2	EN 61000-4-2	EN 61000-4-2
Radiated	EN 61000-4-3	EN 61000-4-3	EN 61000-4-3
EFT/Burst	EN 61000-4-4	EN 61000-4-4	EN 61000-4-4
Surge	EN 61000-4-5	EN 61000-4-5	EN 61000-4-5
Conducted	EN 61000-4-6	EN 61000-4-6	EN 61000-4-6
Power frequency magnetic field	IEC 61000-4-8	IEC 61000-4-8	IEC 61000-4-8
Voltage dips and interruptions	EN 61000-4-11	EN 61000-4-11	EN 61000-4-11
Harmonics	EN 61000-3-2, IEC 61000-3-2	EN 61000-3-2, IEC 61000-3-2	EN 61000-3-2, IEC 61000-3-2
Flicker	EN 61000-3-3, IEC 61000-3-3	EN 61000-3-3, IEC 61000-3-3	EN 61000-3-3, IEC 61000-3-3

Specifications (continued)

HPE FlexNetwork 7510 Switch with 2x2.4 Tbps Fabric and Main Processing Unit (JH333A)

HPE FlexNetwork 7506 Switch with 2x2.4 Tbps Fabric and Main Processing Unit (JH332A)

HPE FlexNetwork 7503 Switch with 2x2.4 Tbps Fabric and Main Processing Unit (JH331A)

Management

IMC—Intelligent Management Center; Command-line interface; Web browser; Out-of-band management (serial RS-232c); SNMP manager; Telnet; Terminal interface (serial RS-232c); Modem interface; IEEE 802.3 Ethernet MIB; Ethernet interface MIB

IMC—Intelligent Management Center; Command-line interface; Web browser; Out-of-band management (serial RS-232c); SNMP manager; Telnet; Terminal interface (serial RS-232c); Modem interface; IEEE 802.3 Ethernet MIB; Ethernet interface MIB

IMC—Intelligent Management Center; Command-line interface; Web browser; Out-of-band management (serial RS-232c); SNMP manager; Telnet; Terminal interface (serial RS-232c); Modem interface; IEEE 802.3 Ethernet MIB; Ethernet interface MIB

Notes

RFCs supported only in Comware v7: 1541, 1542, 1981, 2080, 2460, 2464, 2473, 2474, 2545, 2711, 2863, 2868, 3315, 3413, 3416, 3484, 3575, 3736, 3810, 3956, 4123, 4271, 4291, 4292, 4293, 4443, 4552, 4607, 4659, 4798, 4861, 4862, 5080, 5095, 5340, 5492, 5905, and 6192

For non-TAA environments, IKE/IPSec functionality is provided by the HPE 7500/10500 20Gbps VPN Firewall Module (JG372A).

Comware v7 MPUs (JH207A, JH208A, and JH209A) only support these LPUs:

- Comware v7 LPUs—JH209A, JH210A, JH211A, JH212A, JH213A, JH214A, and JH309A
- Comware v5 LPUs—JG663A, JD229B, JD230A, JD234A, JD237A, JD221A, JD231A, JD232A, JD233A, JD191A, JD235A, JD236A, JF290A, and JC792A

Performance depends on the MPU/Fabric installed, and when installed with two (2) JH209A the performances are as follows:

up to 2,380 MPPS for packet performance and 4,160 Gbps for total switching capacity.

RFCs supported only in Comware v7: 1541, 1542, 1981, 2080, 2460, 2464, 2473, 2474, 2545, 2711, 2863, 2868, 3315, 3413, 3416, 3484, 3575, 3736, 3810, 3956, 4123, 4271, 4291, 4292, 4293, 4443, 4552, 4607, 4659, 4798, 4861, 4862, 5080, 5095, 5340, 5492, 5905, and 6192

For non-TAA environments, IKE/IPSec functionality is provided by the HPE 7500/10500 20Gbps VPN Firewall Module (JG372A).

Comware v7 MPUs (JH207A, JH208A, and JH209A) only support these LPUs:

- Comware v7 LPUs—JH209A, JH210A, JH211A, JH212A, JH213A, JH214A, and JH309A
- Comware v5 LPUs—JG663A, JD229B, JD230A, JD234A, JD237A, JD221A, JD231A, JD232A, JD233A, JD191A, JD235A, JD236A, JF290A, and JC792A

Performance depends on the MPU/Fabric installed, and when installed with two (2) JH209A the performances are as follows:

up to 1,428 MPPS for packet performance and 2,880 Gbps for total switching capacity.

RFCs supported only in Comware v7: 1541, 1542, 1981, 2080, 2460, 2464, 2473, 2474, 2545, 2711, 2863, 2868, 3315, 3413, 3416, 3484, 3575, 3736, 3810, 3956, 4123, 4271, 4291, 4292, 4293, 4443, 4552, 4607, 4659, 4798, 4861, 4862, 5080, 5095, 5340, 5492, 5905, and 6192

For non-TAA environments, IKE/IPSec functionality is provided by the HPE 7500/10500 20Gbps VPN Firewall Module (JG372A).

Comware v7 MPUs (JH207A, JH208A, and JH209A) only support these LPUs:

- Comware v7 LPUs—JH209A, JH210A, JH211A, JH212A, JH213A, JH214A, and JH309A
- Comware v5 LPUs—JG663A, JD229B, JD230A, JD234A, JD237A, JD221A, JD231A, JD232A, JD233A, JD191A, JD235A, JD236A, JF290A, and JC792A

Performance depends on the MPU/Fabric installed, and when installed with two (2) JH209A the performances are as follows:

up to 714 MPPS for packet performance and 1,920 Gbps for total switching capacity.

Services

Refer to the Hewlett Packard Enterprise website at 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.

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Specifications (continued)

HPE FlexNetwork 7510 Switch Chassis (JD238C)**HPE FlexNetwork 7506 Switch Chassis (JD239C)****HPE FlexNetwork 7503 Switch Chassis (JD240C)**

	HPE FlexNetwork 7510 Switch Chassis (JD238C)	HPE FlexNetwork 7506 Switch Chassis (JD239C)	HPE FlexNetwork 7503 Switch Chassis (JD240C)
Included accessories	1 HPE 7510 Spare Fan Assembly (JD216A)	1 HPE 7506 Spare Fan Assembly (JD214A)	1 HPE 7503 Spare Fan Assembly (JD212A)
I/O ports and slots	10 I/O module slots Supports a maximum of 480 PoE/PoE+ ports, 480 Gigabit Ethernet ports or 480 autosensing 10/100/1000 ports or 480 1/10GbE ports or 480 10GbE ports or 44 40GbE ports, or a combination	6 I/O module slots Supports a maximum of 288 PoE/PoE+ ports, 288 Gigabit Ethernet ports or 288 autosensing 10/100/1000 ports or 288 1/10GbE ports or 288 10GbE ports or 28 40GbE ports, or a combination	3 I/O module slots Supports a maximum of 144 PoE/PoE+ ports, 144 Gigabit Ethernet ports or 144 autosensing 10/100/1000 ports or 144 1/10GbE ports or 144 10GbE ports or 16 40GbE ports, or a combination
Additional ports and slots	2 switch fabric slots	2 switch fabric slots	2 switch fabric slots
Power supplies	2 power supply slots 1 minimum power supply required (ordered separately)	2 power supply slots 1 minimum power supply required (ordered separately)	2 power supply slots 1 minimum power supply required (ordered separately)
Fan tray	Includes: 1 x JD216A 1 fan tray slot	Includes: 1 x JD214A 1 fan tray slot	Includes: 1 x JD212A 1 fan tray slot
Physical characteristics			
Dimensions	17.17(w) x 16.54(d) x 27.87(h) in. (43.6 x 42.0 x 70.8 cm) (16U height)	17.17(w) x 16.54(d) x 22.64(h) in. (43.6 x 42.0 x 57.5 cm) (13U height)	17.17(w) x 16.54(d) x 17.36(h) in. (43.6 x 42.0 x 44.1 cm) (10U height)
Weight	211 lb (95.71 kg) shipping weight	207 lb (93.9 kg) shipping weight	147 lb (66.68 kg) shipping weight
Mounting and enclosure	Mounts in an EIA-standard 19 in. rack or other equipment cabinet (hardware included); horizontal surface mounting only	Mounts in an EIA-standard 19 in. rack or other equipment cabinet (hardware included); horizontal surface mounting only	Mounts in an EIA-standard 19 in. rack or other equipment cabinet (hardware included); horizontal surface mounting only
Reliability			
Availability	99.999%	99.999%	99.999%

Specifications (continued)	HPE FlexNetwork 7510 Switch Chassis (JD238C)	HPE FlexNetwork 7506 Switch Chassis (JD239C)	HPE FlexNetwork 7503 Switch Chassis (JD240C)
Environment			
Operating temperature	32°F to 113°F (0°C to 45°C)	32°F to 113°F (0°C to 45°C)	32°F to 113°F (0°C to 45°C)
Operating relative humidity	10% to 95%, noncondensing	10% to 95%, noncondensing	10% to 95%, noncondensing
Nonoperating/Storage temperature	-40°F to 158°F (-40°C to 70°C)	-40°F to 158°F (-40°C to 70°C)	-40°F to 158°F (-40°C to 70°C)
Nonoperating/Storage relative humidity	5% to 95%, noncondensing	5% to 95%, noncondensing	5% to 95%, noncondensing
Acoustic	Low-speed fan: 53.5 dB, High-speed fan: 56.7 dB	Low-speed fan: 53.6 dB, High-speed fan: 57.7 dB	Low-speed fan: 51.6 dB, High-speed fan: 56.1 dB
Electrical characteristics			
Frequency	50/60 Hz	50/60 Hz	50/60 Hz
Description		Achieved Miercom Certified Green Award The H3C S7506E (HPE 7506) is Certified Green in the 2009 Miercom Green Switches Industry Assessment.	
Voltage	100–120/200–240 VAC, rated (depending on power supply chosen)	100–120/200–240 VAC, rated (depending on power supply chosen)	100–120/200–240 VAC, rated (depending on power supply chosen)
Current	16/50 A	16/50 A	16/50 A
Power output	1400 W	1400 W	1400 W
	Notes Based on a common power supply of 1400 W (AC/DC)	Based on a common power supply of 1400 W (AC/DC)	Based on a common power supply of 1400 W (AC/DC)
Safety			
	UL 60950-1; IEC 60950-1; CAN/CSA-C22.2 No. 60950-1; EN 60950-1/A11	UL 60950-1; IEC 60950-1; CAN/CSA-C22.2 No. 60950-1; EN 60950-1/A11	UL 60950-1; IEC 60950-1; CAN/CSA-C22.2 No. 60950-1; EN 60950-1/A11
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	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	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	ETSI EN 300 386 V1.3.3	ETSI EN 300 386 V1.3.3
EN	EN 61000-4-2:1995+A1:1998+A2:2001	EN 61000-4-2:1995+A1:1998+A2:2001	EN 61000-4-2:1995+A1:1998+A2:2001
ESD	EN 61000-4-2	EN 61000-4-2	EN 61000-4-2
Radiated	EN 61000-4-3	EN 61000-4-3	EN 61000-4-3
EFT/Burst	EN 61000-4-4	EN 61000-4-4	EN 61000-4-4
Surge	EN 61000-4-5	EN 61000-4-5	EN 61000-4-5
Conducted	EN 61000-4-6	EN 61000-4-6	EN 61000-4-6
Power frequency magnetic field	IEC 61000-4-8	IEC 61000-4-8	IEC 61000-4-8
Voltage dips and interruptions	EN 61000-4-11	EN 61000-4-11	EN 61000-4-11
Harmonics	EN 61000-3-2, IEC 61000-3-2	EN 61000-3-2, IEC 61000-3-2	EN 61000-3-2, IEC 61000-3-2
Flicker	EN 61000-3-3, IEC 61000-3-3	EN 61000-3-3, IEC 61000-3-3	EN 61000-3-3, IEC 61000-3-3

Specifications (continued)	HPE FlexNetwork 7510 Switch Chassis (JD238C)	HPE FlexNetwork 7506 Switch Chassis (JD239C)	HPE FlexNetwork 7503 Switch Chassis (JD240C)
Management	IMC—Intelligent Management Center; Command-line interface; Web browser; Out-of-band management (serial RS-232c); SNMP manager; Telnet; Terminal interface (serial RS-232c); Modem interface; IEEE 802.3 Ethernet MIB; Ethernet interface MIB	IMC—Intelligent Management Center; Command-line interface; Web browser; Out-of-band management (serial RS-232c); SNMP manager; Telnet; Terminal interface (serial RS-232c); Modem interface; IEEE 802.3 Ethernet MIB; Ethernet interface MIB	IMC—Intelligent Management Center; Command-line interface; Web browser; Out-of-band management (serial RS-232c); SNMP manager; Telnet; Terminal interface (serial RS-232c); Modem interface; IEEE 802.3 Ethernet MIB; Ethernet interface MIB
Notes	<p>RFCs supported only in Comware v7: 1541, 1542, 1981, 2080, 2460, 2464, 2473, 2474, 2545, 2711, 2863, 2868, 3315, 3413, 3416, 3484, 3575, 3736, 3810, 3956, 4123, 4271, 4291, 4292, 4293, 4443, 4552, 4607, 4659, 4798, 4861, 4862, 5080, 5095, 5340, 5492, 5905, and 6192</p> <p>For non-TAA environments, IKE/IPSec functionality is provided by the HPE 7500/10500 20Gbps VPN Firewall Module (JG372A).</p> <p>Comware v7 MPUs (JH207A, JH208A, and JH209A) only support these LPUs:</p> <ul style="list-style-type: none"> Comware v7 LPUs—JH209A, JH210A, JH211A, JH212A, JH213A, JH214A, and JH309A Comware v5 LPUs—JG663A, JD229B, JD230A, JD234A, JD237A, JD221A, JD231A, JD232A, JD233A, JD191A, JD235A, JD236A, JF290A, and JC792A <p>Performance depends on the MPU/Fabric installed, and when installed with two (2) JH209A the performances are as follows: up to 2,380 MPPS for packet performance and 4,160 Gbps for total switching capacity.</p>	<p>RFCs supported only in Comware v7: 1541, 1542, 1981, 2080, 2460, 2464, 2473, 2474, 2545, 2711, 2863, 2868, 3315, 3413, 3416, 3484, 3575, 3736, 3810, 3956, 4123, 4271, 4291, 4292, 4293, 4443, 4552, 4607, 4659, 4798, 4861, 4862, 5080, 5095, 5340, 5492, 5905, and 6192</p> <p>For non-TAA environments, IKE/IPSec functionality is provided by the HPE 7500/10500 20Gbps VPN Firewall Module (JG372A).</p> <p>Comware v7 MPUs (JH207A, JH208A, and JH209A) only support these LPUs:</p> <ul style="list-style-type: none"> Comware v7 LPUs—JH209A, JH210A, JH211A, JH212A, JH213A, JH214A, and JH309A Comware v5 LPUs—JG663A, JD229B, JD230A, JD234A, JD237A, JD221A, JD231A, JD232A, JD233A, JD191A, JD235A, JD236A, JF290A, and JC792A <p>Performance depends on the MPU/Fabric installed, and when installed with two (2) JH209A the performances are as follows: up to 1,428 MPPS for packet performance and 2,880 Gbps for total switching capacity.</p>	<p>RFCs supported only in Comware v7: 1541, 1542, 1981, 2080, 2460, 2464, 2473, 2474, 2545, 2711, 2863, 2868, 3315, 3413, 3416, 3484, 3575, 3736, 3810, 3956, 4123, 4271, 4291, 4292, 4293, 4443, 4552, 4607, 4659, 4798, 4861, 4862, 5080, 5095, 5340, 5492, 5905, and 6192</p> <p>For non-TAA environments, IKE/IPSec functionality is provided by the HPE 7500/10500 20Gbps VPN Firewall Module (JG372A).</p> <p>Comware v7 MPUs (JH207A, JH208A, and JH209A) only support these LPUs:</p> <ul style="list-style-type: none"> Comware v7 LPUs—JH209A, JH210A, JH211A, JH212A, JH213A, JH214A, and JH309A Comware v5 LPUs—JG663A, JD229B, JD230A, JD234A, JD237A, JD221A, JD231A, JD232A, JD233A, JD191A, JD235A, JD236A, JF290A, and JC792A <p>Performance depends on the MPU/Fabric installed, and when installed with two (2) JH209A the performances are as follows: up to 714 MPPS for packet performance and 1,920 Gbps for total switching capacity.</p>
Services	Refer to the Hewlett Packard Enterprise website at 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.	Refer to the Hewlett Packard Enterprise website at 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.	Refer to the Hewlett Packard Enterprise website at 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.

**Specifications (continued)****HPE FlexNetwork 7502 Switch Chassis (JD242C)**

Included accessories	1 HPE 7502 Spare Fan Assembly (JD213A)
I/O ports and slots	2 I/O module slots Supports a maximum of 96 Gigabit Ethernet ports or 96 autosensing 10/100/1000 ports or 96 1/10GbE ports or 96 10GbE ports or 8 40GbE ports, or a combination
Additional ports and slots	2 MPU (for management modules) slots
Power supplies	2 power supply slots 1 minimum power supply required (ordered separately)
Fan tray	Includes: 1 x JD213A 1 fan tray slot
Physical characteristics	
Dimensions	17.17(w) x 16.54(d) x 6.89(h) in. (43.6 x 42.0 x 17.5 cm) (4U height)
Weight	59 lb (26.76 kg) shipping weight
Mounting and enclosure	Mounts in an EIA-standard 19 in. rack or other equipment cabinet (hardware included); horizontal surface mounting only
Reliability	
Availability	99.999%
Environment	
Operating temperature	32°F to 113°F (0°C to 45°C)
Operating relative humidity	10% to 95%, noncondensing
Nonoperating/Storage temperature	-40°F to 158°F (-40°C to 70°C)
Nonoperating/Storage relative humidity	5% to 95%, noncondensing
Acoustic	Low-speed fan: 49.8 dB, High-speed fan: 56.7 dB
Electrical characteristics	
Frequency	50/60 Hz
Description	
Voltage	100–120/200–240 VAC, rated (depending on power supply chosen)
DC voltage	5/10 A
Power output	300 W
Notes	Based on a common power supply of 300 W (AC/DC)

Specifications (continued)	HPE FlexNetwork 7502 Switch Chassis (JD242C)
Safety	UL 60950-1; IEC 60950-1; CAN/CSA-C22.2 No. 60950-1; EN 60950-1/A11
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 61000-4-2:1995+A1:1998+A2:2001
ESD	EN 61000-4-2
Radiated	EN 61000-4-3
EFT/Burst	EN 61000-4-4
Surge	EN 61000-4-5
Conducted	EN 61000-4-6
Power frequency magnetic field	IEC 61000-4-8
Voltage dips and interruptions	EN 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; Web browser; Out-of-band management (serial RS-232c); SNMP manager; Telnet; Terminal interface (serial RS-232c); Modem interface; IEEE 802.3 Ethernet MIB; Ethernet interface MIB
Notes	<p>RFCs supported only in Comware v7: 1541, 1542, 1981, 2080, 2460, 2464, 2473, 2474, 2545, 2711, 2863, 2868, 3315, 3413, 3416, 3484, 3575, 3736, 3810, 3956, 4123, 4271, 4291, 4292, 4293, 4443, 4552, 4607, 4659, 4798, 4861, 4862, 5080, 5095, 5340, 5492, 5905, and 6192</p> <p>For non-TAA environments, IKE/IPSec functionality is provided by the HPE 7500/10500 20Gbps VPN Firewall Module (JG372A).</p> <p>IRF functionality is not supported on the HPE 7502 Switch Chassis.</p> <p>Comware v7 MPUs (JH207A, JH208A, and JH209A) only support these LPUs:</p> <ul style="list-style-type: none"> • Comware v7 LPUs—JH209A, JH210A, JH211A, JH212A, JH213A, JH214A, and JH309A • Comware v5 LPUs—JG663A, JD229B, JD230A, JD234A, JD237A, JD221A, JD231A, JD232A, JD233A, JD191A, JD235A, JD236A, JF290A, and JC792A <p>Performance depends on the MPU/Fabric installed, and when installed with two (2) JH208A the performances are as follows: up to 476 MPPS for packet performance and 640 Gbps for total switching capacity.</p>
Services	Refer to the Hewlett Packard Enterprise website at 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 1771 BGPv4 RFC 1772 Application of the BGP RFC 1997 BGP Communities Attribute RFC 1998 An Application of the BGP Community Attribute in Multi-Home Routing RFC 2385 BGP Session Protection via TCP MD5 RFC 2439 BGP Route Flap Damping RFC 2796 BGP Route Reflection RFC 2858 BGP-4 Multi-Protocol Extensions RFC 2918 Route Refresh Capability	RFC 3065 Autonomous System Confederations for BGP RFC 3392 Capabilities Advertisement with BGP-4 RFC 4271 A Border Gateway Protocol 4 (BGP-4) RFC 4272 BGP Security Vulnerabilities Analysis RFC 4273 Definitions of Managed Objects for BGP-4 RFC 4274 BGP-4 Protocol Analysis RFC 4275 BGP-4 MIB Implementation Survey	RFC 4276 BGP-4 Implementation Report RFC 4277 Experience with the BGP-4 Protocol RFC 4360 BGP Extended Communities Attribute RFC 4456 BGP Route Reflection: An Alternative to Full Mesh Internal BGP (IBGP) RFC 5291 Outbound Route Filtering Capability for BGP-4 RFC 5292 Address-Prefix-Based Outbound Route Filter for BGP-4 RFC 5492 Capabilities Advertisement with BGP-4
Denial of service protection	RFC 2267 Network Ingress Filtering	Automatic filtering of well-known denial-of-service packets	CPU DoS Protection Rate Limiting by ACLs
Device management	RFC 1157 SNMPv1/v2c RFC 1305 NTPv3 RFC 1902 (SNMPv2) RFC 2579 (SMIPv2 Text Conventions)	RFC 2580 (SMIPv2 Conformance) RFC 2580 (SMIPv2 Conformance) RFC 2819 (RMON groups Alarm, Event, History, and Statistics only) and Telnet	Multiple Configuration Files Multiple Software Images SSHv1/SSHv2 Secure Shell TACACS/TACACS+
General protocols	IEEE 802.1ad Q-in-Q IEEE 802.1ag Service Layer OAM IEEE 802.1AX-2008 Link Aggregation IEEE 802.1p Priority IEEE 802.1Q VLANs IEEE 802.1s Multiple Spanning Trees IEEE 802.1w Rapid Reconfiguration of Spanning Tree IEEE 802.1X PAE IEEE 802.3ab 100BASE-T IEEE 802.3ac (VLAN Tagging Extension) IEEE 802.3ad Link Aggregation Control Protocol (LACP) IEEE 802.3ae 10-Gigabit Ethernet IEEE 802.3af Power over Ethernet IEEE 802.3ah Ethernet in First Mile over Point to Point Fiber—EFMF IEEE 802.3at IEEE 802.3ba 40 and 100 Gigabit Ethernet Architecture IEEE 802.3u 100BASE-X IEEE 802.3x Flow Control IEEE 802.3z 1000BASE-X 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 894 IP over Ethernet RFC 903 RARP	RFC 906 TFTP Bootstrap RFC 925 Multi-LAN Address Resolution RFC 950 Internet Standard Subnetting Procedure RFC 951 BOOTP RFC 959 File Transfer Protocol (FTP) RFC 1027 Proxy ARP RFC 1035 Domain Implementation and Specification RFC 1042 IP Datagrams RFC 1058 RIPv1 RFC 1142 OSI IS-IS Intra-domain Routing Protocol RFC 1195 OSI IS-IS for IP and Dual Environments RFC 1213 Management Information Base for Network Management of TCP/IP-based Internets RFC 1256 ICMP Router Discovery Protocol (IRDP) RFC 1293 Inverse Address Resolution Protocol RFC 1305 NTPv3 RFC 1350 TFTP Protocol (revision 2) RFC 1393 Traceroute Using an IP Option RFC 1519 CIDR RFC 1531 Dynamic Host Configuration Protocol RFC 1533 DHCP Options and BOOTP Vendor Extensions	RFC 1591 DNS (client only) RFC 1624 Incremental Internet Checksum RFC 1701 Generic Routing Encapsulation RFC 1721 RIP-2 Analysis RFC 1723 RIPv2 RFC 1812 IPv4 Routing RFC 2030 Simple Network Time Protocol (SNTP) v4 RFC 2082 RIP-2 MD5 Authentication RFC 2091 Trigger RIP RFC 2131 DHCP RFC 2138 Remote Authentication Dial In User Service (RADIUS) RFC 2236 IGMP Snooping RFC 2338 VRRP RFC 2453 RIPv2 RFC 2460 IPv6 RFC 2464 Transmission of IPv6 Packets over Ethernet Networks RFC 2474 Definition of the Differentiated Services Field (DS Field) in the IPv4 and IPv6 Headers RFC 2644 Directed Broadcast Control RFC 2711 IPv6 Router Alert Option RFC 2763 Dynamic Name-to-System ID mapping support RFC 2784 Generic Routing Encapsulation (GRE) RFC 2865 Remote Authentication Dial In User Service (RADIUS)

Standards and protocols (continued)

(applies to all products in series)

General protocols (continued)			
General protocols (continued)	RFC 2868 RADIUS Attributes for Tunnel Protocol Support RFC 2966 Domain-wide Prefix Distribution with Two-Level IS-IS RFC 2973 IS-IS Mesh Groups RFC 3022 Traditional IP Network Address Translator (Traditional NAT) RFC 3277 IS-IS Transient Blackhole Avoidance RFC 3413 Simple Network Management Protocol (SNMP) Applications RFC 3416 Protocol Operations for SNMP RFC 3484 Default Address Selection for Internet Protocol version 6 (IPv6) RFC 3567 Intermediate System to Intermediate System (IS-IS) Cryptographic Authentication RFC 3575 IANA Considerations for RADIUS RFC 3719 Recommendations for Interoperable Networks using Intermediate System to Intermediate System (IS-IS) RFC 3736 Stateless Dynamic Host Configuration Protocol (DHCP) Service for IPv6	RFC 3784 IS-IS TE support RFC 3786 Extending the Number of IS-IS LSP Fragments Beyond the 256 Limit RFC 3787 Recommendations for Interoperable IP Networks using Intermediate System to Intermediate System (IS-IS) RFC 3847 Restart signaling for IS-IS RFC 3956 Embedding the Rendezvous Point (RP) Address in an IPv6 Multicast Address RFC 4123: Session Initiation Protocol (SIP)—H.323 Interworking Requirements RFC 4251 The Secure Shell (SSH) Protocol Architecture RFC 4271 A Border Gateway Protocol 4 (BGP-4) RFC 4291 IP Version 6 Addressing Architecture RFC 4292 IP Forwarding Table MIB RFC 4293 Management Information Base for the Internet Protocol (IP) RFC 4443 Internet Control Message Protocol (ICMPv6) for the Internet Protocol Version 6 (IPv6) Specification RFC 4486 Subcodes for BGP Cease Notification Message	RFC 4552 Authentication/Confidentiality for OSPFv3 RFC 4607 Source-Specific Multicast for IP RFC 4659 BGP-MPLS IP Virtual Private Network (VPN) Extension for IPv6 VPN RFC 4798 Connecting IPv6 Islands over IPv4 MPLS Using IPv6 Provider Edge Routers (6PE) RFC 4861 Neighbor Discovery for IP version 6 (IPv6) RFC 4862 IPv6 Stateless Address Auto-configuration RFC 4884 Extended ICMP to Support Multi-Part Messages RFC 4941 Privacy Extensions for Stateless Address Auto-configuration in IPv6 RFC 5095 Deprecation of Type 0 Routing Headers in IPv6 RFC 5130 A Policy Control Mechanism in IS-IS Using Administrative Tags RFC 5340 OSPF for IPv6 RFC 5492 Capabilities Advertisement with BGP-4 RFC 5905 Network Time Protocol Version 4: Protocol and Algorithms Specification
IP multicast	RFC 2236 IGMPv2 RFC 2283 Multiprotocol Extensions for BGP-4 RFC 2362 PIM Sparse Mode RFC 3376 IGMPv3 RFC 3446 Anycast Rendezvous Point (RP) mechanism using Protocol Independent Multicast (PIM) and Multicast Source Discovery Protocol (MSDP) RFC 3618 Multicast Source Discovery Protocol (MSDP)	RFC 3973 PIM Dense Mode RFC 4541 Considerations for Internet Group Management Protocol (IGMP) and Multicast Listener Discovery (MLD) Snooping Switches RFC 4601 PIM Sparse Mode RFC 4604 Using Internet Group Management Protocol Version 3 (IGMPv3) and Multicast Listener Discovery Protocol Version 2 (MLDv2) for Source-Specific Multicast	RFC 4605 IGMP/MLD Proxying RFC 4607 Source-Specific Multicast for IP RFC 4610 Anycast-RP Using Protocol Independent Multicast (PIM) RFC 5059 Bootstrap Router (BSR) Mechanism for Protocol Independent Multicast (PIM)
IPv6	RFC 1886 DNS Extension for IPv6 RFC 1887 IPv6 Unicast Address Allocation Architecture RFC 1981 IPv6 Path MTU Discovery RFC 2080 RIPng for IPv6 RFC 2081 RIPng Protocol Applicability Statement RFC 2292 Advanced Sockets API for IPv6 RFC 2373 IPv6 Addressing Architecture RFC 2375 IPv6 Multicast Address Assignments 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 2526 Reserved IPv6 Subnet Anycast Addresses RFC 2529 Transmission of IPv6 Packets over IPv4 RFC 2545 Use of MP-BGP-4 for IPv6 RFC 2553 Basic Socket Interface Extensions for IPv6 RFC 2710 Multicast Listener Discovery (MLD) for IPv6 RFC 2740 OSPFv3 for IPv6 RFC 2767 Dual stacks IPv4 & IPv6 RFC 2893 Transition Mechanisms for IPv6 Hosts and Routers	RFC 3056 Connection of IPv6 Domains via IPv4 Clouds RFC 3307 IPv6 Multicast Address Allocation RFC 3315 DHCPv6 (client and relay) RFC 3484 Default Address Selection for IPv6 RFC 3513 IPv6 Addressing Architecture RFC 3736 Stateless Dynamic Host Configuration Protocol (DHCP) Service for IPv6 RFC 3810 MLDv2 for IPv6 RFC 4214 Intra-Site Automatic Tunnel Addressing Protocol (ISATAP) RFC 4861 IPv6 Neighbor Discovery RFC 4862 IPv6 Stateless Address Auto-configuration

Standards and protocols (continued)

(applies to all products in series)

<p>MIBs</p>	<p>RFC 1156 (TCP/IP MIB) RFC 1157 A Simple Network Management Protocol (SNMP) RFC 1213 MIB II RFC 1215 A Convention for Defining Traps for use with the SNMP RFC 1229 Interface MIB Extensions RFC 1493 Bridge MIB RFC 1573 SNMP MIB II RFC 1643 Ethernet MIB RFC 1657 BGP-4 MIB RFC 1724 RIPv2 MIB RFC 1757 Remote Network Monitoring MIB RFC 1850 OSPFv2 MIB RFC 1907 SNMPv2 MIB RFC 2011 SNMPv2 MIB for IP RFC 2012 SNMPv2 MIB for TCP RFC 2013 SNMPv2 MIB for UDP RFC 2096 IP Forwarding Table MIB</p>	<p>RFC 2233 Interfaces MIB RFC 2452 IPV6-TCP-MIB RFC 2454 IPV6-UDP-MIB RFC 2465 IPV6 MIB RFC 2466 ICMPv6 MIB RFC 2571 SNMP Framework MIB RFC 2572 SNMP-MPD MIB RFC 2573 SNMP-Notification MIB RFC 2573 SNMP-Target MIB RFC 2578 Structure of Management Information Version 2 (SMIv2) RFC 2580 Conformance Statements for SMIv2 RFC 2618 RADIUS Client MIB RFC 2620 RADIUS Accounting MIB RFC 2665 Ethernet-Like-MIB RFC 2668 802.3 MAU MIB RFC 2674 802.1p and IEEE 802.1Q Bridge MIB RFC 2787 VRRP MIB RFC 2819 RMON MIB</p>	<p>RFC 2925 Ping MIB RFC 2932IP (Multicast Routing MIB) RFC 2933 IGMP MIB RFC 2934 Protocol Independent Multicast MIB for IPv4 RFC 3414 SNMP-User-based-SM MIB RFC 3415 SNMP-View-based-ACM MIB RFC 3417 Simple Network Management Protocol (SNMP) over IEEE 802 Networks RFC 3418 MIB for SNMPv3 RFC 3595 Textual Conventions for IPv6 Flow Label RFC 3621 Power Ethernet MIB RFC 3813 MPLS LSR MIB RFC 3814 MPLS FTN MIB RFC 3815 MPLS LDP MIB RFC 3826 AES for SNMP's USM MIB RFC 4133 Entity MIB (Version 3) RFC 4444 Management Information Base for Intermediate System to Intermediate System (IS-IS)</p>
<p>MPLS</p>	<p>RFC 2205 Resource Reservation Protocol RFC 2209 Resource Reservation Protocol (RSVP) RFC 2702 Requirements for Traffic Engineering Over MPLS RFC 2858 Multiprotocol Extensions for BGP-4 RFC 2961 RSVP Refresh Overhead Reduction Extensions RFC 3031 Multiprotocol Label Switching Architecture RFC 3032 MPLS Label Stack Encoding RFC 3107 Carrying Label Information in BGP-4 RFC 3209 RSVP-TE: Extensions to RSVP for LSP Tunnels</p>	<p>RFC 3212 Constraint-Based LSP Setup using LDP RFC 3479 Fault Tolerance for the Label Distribution Protocol (LDP) RFC 3487 Graceful Restart Mechanism for LDP RFC 3564 Requirements for Support of Differentiated Service-aware MPLS Traffic Engineering RFC 4364 BGP/MPLS IP Virtual Private Networks (VPNs) RFC 4379 Detecting Multi-Protocol Label Switched (MPLS) Data Plane Failures RFC 4447 Pseudowire Setup and Maintenance Using LDP</p>	<p>RFC 4448 Encapsulation Methods for Transport of Ethernet over MPLS Networks RFC 4664 Framework for Layer 2 Virtual Private Networks RFC 4665 Service Requirements for Layer 2 Provider Provisioned Virtual Private Networks RFC 4761 Virtual Private LAN Service (VPLS) Using BGP for Auto-Discovery and Signaling RFC 4762 Virtual Private LAN Service (VPLS) Using Label Distribution Protocol (LDP) Signaling RFC 5036 LDP Specification</p>
<p>Network management</p>	<p>IEEE 802.1AB Link Layer Discovery Protocol (LLDP) RFC 1155 Structure of Management Information RFC 1157 SNMPv1 RFC 1448 Protocol Operations for version 2 of the Simple Network Management Protocol (SNMPv2)</p>	<p>RFC 2211 Controlled-Load Network RFC 2819 Four groups of RMON: 1 (statistics), 2 (history), 3 (alarm), and 9 (events) RFC 3176 sFlow RFC 3411 SNMP Management Frameworks</p>	<p>RFC 3412 SNMPv3 Message Processing RFC 3414 SNMPv3 User-based Security Model (USM) RFC 3415 SNMPv3 View-based Access Control Model (VACM) ANSI/TIA-1057 LLDP Media Endpoint Discovery (LLDP-MED)</p>

Data sheet

Standards and protocols (continued)

(applies to all products in series)

OSPF	RFC 1245 OSPF protocol analysis RFC 1246 Experience with OSPF RFC 1765 OSPF Database Overflow RFC 1850 OSPFv2 Management Information Base (MIB), traps RFC 2154 OSPF with Digital Signatures (Password, MD-5) RFC 2328 OSPFv2 RFC 2370 OSPF Opaque LSA Option RFC 3101 OSPF NSSA	RFC 3137 OSPF Stub Router Advertisement RFC 3623 Graceful OSPF Restart RFC 3630 Traffic Engineering Extensions to OSPFv2 RFC 4061 Benchmarking Basic OSPF Single Router Control Plane Convergence RFC 4062 OSPF Benchmarking Terminology and Concepts RFC 4063 Considerations When Using Basic OSPF Convergence Benchmarks	RFC 4222 Prioritized Treatment of Specific OSPF Version 2 Packets and Congestion Avoidance 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 RFC 4812 OSPF Restart Signaling RFC 4813 OSPF Link-Local Signaling RFC 4940 IANA Considerations for OSPF
QoS/CoS	IEEE 802.1p (CoS) RFC 1349 Type of Service in the Internet Protocol Suite	RFC 2211 Specification of the Controlled-Load Network Element Service RFC 2212 Guaranteed Quality of Service	RFC 2474 DSCP DiffServ RFC 2475 DiffServ Architecture RFC 2597 DiffServ Assured Forwarding (AF) RFC 2598 DiffServ Expedited Forwarding (EF)
Security	IEEE 802.1X Port Based Network Access Control RFC 1321 The MD5 Message-Digest Algorithm RFC 1334 PPP Authentication Protocols (PAP) RFC 1492 TACACS+ RFC 1994 PPP Challenge Handshake Authentication Protocol (CHAP) RFC 2082 RIP-2 MD5 Authentication	RFC 2104 Keyed-Hashing for Message Authentication RFC 2408 Internet Security Association and Key Management Protocol (ISAKMP) RFC 2409 The Internet Key Exchange (IKE) RFC 2716 PPP EAP TLS Authentication Protocol RFC 2865 RADIUS Authentication RFC 2866 RADIUS Accounting RFC 2867 RADIUS Accounting	Modifications for Tunnel Protocol Support RFC 2868 RADIUS Attributes for Tunnel Protocol Support RFC 2869 RADIUS Extensions RFC 5080: Common Remote Authentication Dial In User Service (RADIUS) Implementation issues and Suggested Fixes Access Control Lists (ACLs) Guest VLAN for 802.1X MAC Authentication Port Security SSHv1/SSHv2 Secure Shell
VPN	RFC 2403—HMAC-MD5-96 RFC 2404—HMAC-SHA1-96 RFC 2405—DES-CBC Cipher algorithm	RFC 2407—Domain of interpretation RFC 2547 BGP/MPLS VPNs RFC 2917 A Core MPLS IP VPN Architecture	RFC 3947—Negotiation of NAT-Traversal in the IKE RFC 4302—IP Authentication Header (AH) RFC 4303—IP Encapsulating Security Payload (ESP)
IPSec	RFC 1828 IP Authentication using Keyed MD5 RFC 1829 The ESP DES-CBC Transform RFC 2085 HMAC-MD5 IP Authentication with Replay Prevention	RFC 2401 IP Security Architecture RFC 2402 IP Authentication Header RFC 2406 IP Encapsulating Security Payload	RFC 2410—The NULL Encryption Algorithm and its use with IPSec RFC 2411 IP Security Document Roadmap

HPE FlexNetwork 7500 Switch Series accessories

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 HPE FlexNetwork 7500 24-port GbE SFP Extended Module (JD234A)
 HPE FlexNetwork 7500 24-port GbE SFP/2-port 10GbE XFP Extended Module (JD230A)
 HPE FlexNetwork 7500 48-port GbE SFP Enhanced Module (JD221A)
 HPE FlexNetwork 7500 48-port GbE SFP Extended Module (JD237A)
 HPE FlexNetwork 7500 48-port Gig-T PoE+ Extended Module (JD229B)
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 HPE FlexNetwork 7500 2-port 10GbE XFP Extended Module (JD236A)
 HPE FlexNetwork 7500 4-port 10GbE XFP Enhanced Module (JD232A)
 HPE FlexNetwork 7500 4-port 10GbE XFP Extended Module (JD235A)
 HPE FlexNetwork 7500 8-port 10GbE XFP Extended Module (JD191A)
 HPE FlexNetwork 7500 8-port 10G SFP+ Module (JF290A)
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 HPE FlexNetwork 7500 4-port 40GbE CFP SC Module (JG373A)
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 HPE FlexNetwork 7500 48-port 1000BASE-T with PoE+ SE Module (JH213A)
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 HPE FlexNetwork 7500 12-port 1/10GbE SFP+ EC Module (JH309A)
 HPE FlexNetwork 7500 48-port 10GbE SFP/SFP+ M2RSG Module (JH430A)
 HPE FlexNetwork 7500 44-port GbE SFP/4-port 10GbE SFP/SFP+ with MACsec SE Module (JH431A)

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 HPE X120 1G SFP LC LH40 1550nm Transceiver (JD062A)
 HPE X125 1G SFP LC LH70 Transceiver (JD063B)
 HPE X120 1G SFP RJ45 T Transceiver (JD089B)
 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)
 HPE X170 1G SFP LC LH70 1550 Transceiver (JD109A)
 HPE X170 1G SFP LC LH70 1570 Transceiver (JD110A)
 HPE X170 1G SFP LC LH70 1590 Transceiver (JD111A)
 HPE X170 1G SFP LC LH70 1610 Transceiver (JD112A)
 HPE X170 1G SFP LC LH70 1510 Transceiver (JD115A)
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 HPE X120 1G SFP LC LX Transceiver (JD119B)
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 HPE X110 100M SFP LC LH80 Transceiver (JD091A)
 HPE X115 100M SFP LC BX 10-U Transceiver (JD100A)
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 HPE X110 100M SFP LC FX Transceiver (JD102B)
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 HPE X130 10G XFP LC SR Transceiver (JD117B)
 HPE X135 10G XFP LC ER Transceiver (JD121A)
 HPE X130 10G SFP+ LC SR Transceiver (JD092B)
 HPE X130 10G SFP+ LC LRM Transceiver (JD093B)
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