Overview

HPE FlexNetwork 7500X Switch Series

The HPE FlexNetwork 7500X Switch Series is a versatile, multi-layered, high performance, modular switch for enterprise LAN edge, aggregation, and core layers.

The 7500X combination of Chassis, MPUs and LPUs offers 1/10/40/100GbE connectivity, with PoE/PoE+, meets existing and future requirements, IoT, etc. Higher switching bandwidth (480Gbps/slot) and L2/L3 routing services dramatically improve performance and increases support for mission-critical environments.

Customers can take advantage of Virtual Extensible LAN (VXLAN) and Ethernet VPN (BGP EVPN) to provide greater scalability and better utilization of available network paths and leverage HPE Intelligent Resilient Fabric (IRF) to enable flatter, more agile and highly available networks.

HPE Intelligent Management Center (IMC) provides a single view of the entire network. Support for IPv4/IPv6, and MPLS/VPLS features provide investment protection and an easy transition from IPv4 to IPv6 networks and ease of maintenance is assured with Graceful Insertion and Removal (GIR) and In Service Software Update (ISSU).

HPE FlexNetwork 7500X Switch Series

From left to right- HPE 7503X Ethernet Switch Chassis, HPE 7510X PoE Ethernet Switch Chassis, HPE 7506X PoE Ethernet Switch Chassis

Overview

Chassis Models

HPE FlexNetwork 7510X PoE Ethernet Switch 10 slots Chassis	R8N47A
HPE FlexNetwork 7506X PoE Ethernet Switch 6 slots Chassis	R8N48A
HPE FlexNetwork 7503X Ethernet Switch 3 slots Chassis	R8N49A

Key features

- Higher bandwidth of 480 Gbps/slot and higher scalability with up to 288K MAC, up to 104K ARP and up to 256K FIB (depending on the LPU and operational mode chosen) for enhanced switch performance.
- Multiple interface options of 1/10/40/100 GbE with higher port counts of upto 40*100G across the 3 models to meet varying network scale demands.
- Virtual Extensible LAN (VXLAN) with Ethernet VPN (BGP EVPN) allows greater flexibility, better performance with wire speed, better scalability and enhanced security.
- Enhanced programmability for faster time to service and integration into modern tools (Puppet/Chef/Ansible) with CLI, SNMPv2/v3, full Netconf/Yang models, REST APIs and scripting (python).
- Comprehensive security approach at every layer including micro-segmentation which enables grouping of endpoints based on a specific criteria.
- Enhanced Media Delivery Index (eMDI) to monitor audio and video service quality and locate faults.
- Multicast DNS (mDNS) for enabling endpoint devices to locate a device or service by name in small local networks without using preconfigured name servers.

Standard Features

Management

- **HPE intelligent Management Center**
  The HPE FlexNetwork 7500X Switch Series can be seamlessly managed with HPE Intelligent Management Center (IMC) to provide end-to-end network transparency with a consistent network experience.
- **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
- **SNMPv1, v2, and v3**
  Provide complete support of SNMP; provide full support of industry-standard Management Information Base (MIB) plus 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; supports events, alarm, history, and statistics group plus a private alarm extension group
- **FTP, TFTP, and SFTP support**
  Offers different mechanisms for configuration updates; FTP allows bidirectional transfers over a TCP/IP network; trivial FTP (TFTP) is a simpler method using User Datagram Protocol (UDP); Secure File Transfer Protocol (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; 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 (NQA)**
  Analyzes network performance and service quality by sending test packets, and provides network performance and service quality parameters such as jitter, TCP, or FTP connection delays and file transfer rates; allows a network manager to determine overall network performance and to 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 order of severity; outputs 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**
  Stores easily to the flash image
- **Programmability**
  Supports entire set of programming tools from legacy CLI/SNMP, to full Netconf/Yang model. RestAPIs combined with scripting (python) allow inclusion of these switches into modern toolchains (Puppet/Chef/Ansible playbooks)

Standard Features

Software-Defined Networking
- **OpenFlow 1.3**
  Enables SDN to provide an end-to-end solution to automate the network, allowing for rapid application deployments (Comware v7 only)

Resiliency And High Availability
- **Redundant/load-sharing fabrics, management, fan assemblies, and power supplies**
  Increase total performance and power availability while providing hitless, stateful failover
- **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**
  Separate control from services and keeps service processing isolated; 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)**
  Supports up to 128 trunks, each with 8 links per trunk; 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 L2 switch and L3 router; switches do not have to be co-located and can be part of a disaster-recovery system; servers or switches can be attached using standard LACP for automatic load balancing and high availability; can eliminate the need for complex protocols like Spanning Tree Protocol, Equal-Cost Multipath (ECMP), or VRRP, thereby simplifying network operation
- **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
- **Virtual Router Redundancy Protocol (VRRP)**
  Allows a group of routers to dynamically back each other up to create highly available routed environments
- **Graceful restart**
  Supports graceful restart for OSPF, IS-IS, 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; forwarding remains uninterrupted during the switchover to achieve nonstop forwarding (NSF)
- **Graceful Insertion and Removal**
  Graceful Insertion and Removal (GIR) minimizes service interruption by instructing affected protocols to isolate the device for maintenance/upgrade and alter to the redundant path. GIR supports: LACP, BGP, IS-IS, OSPF, and OSPFv3.
- **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**
  Nodes are configured with backup ports, routes, and LSPs; local implementation requires no cooperation of adjacent devices, simplifying the deployment; solves the traditional convergence faults in IP forwarding and MPLS forwarding, protecting the links, nodes, and paths without establishing respective backup LSPs for them; realizes restoration within 50 ms, with the restoration time independent of the number of routes and fast link switchovers, without route convergence
- **In-Service Software Upgrade (ISSU)**
  Applies patches and new service features to be installed without restarting the system, increasing network uptime and simplifying maintenance. Requires use of IRF, and R7169P01 or later releases.

Standard Features

Performance

- **High-speed fully distributed architecture**
  The HPE FlexNetwork 7500X Switch series offers up to 480 Gbps of switching capacity per slot (three times the switching capacity of HPE FlexNetwork 7500 Switch series at 160 Gbps per slot.
  It offers up to 40x100GbE/ 240x40GbE / 480x10GbE / 480x1GbE ports or a combination of these, along with PoE/PoE+ support for IP phones, cameras, and future high-density Internet of Things (IoT) deployments.
  Supports a switching capacity of up to 9.6Tbps for enhanced performance of mission critical environments. Up to 288K MAC, up to 104K ARP, and up to 256K FIB tables allow higher scalability, depending on the LPU and operational mode chosen during first installation.
- **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 six chassis, ranging from a 10-slot to a 3slot chassis
- **Fully distributed forwarding in all I/O Modules**
  The 7500X is based on a distributed forwarding architecture, with one of several ASICs per line card responsible for forwarding decisions. The control plane, which can be made fully redundant with the addition of a secondary MPU, is used only for the initial learning (MAC, ARP, RIB...) before the information is propagated to each and every line card ASIC. This distributed forwarding architecture provides the best possible results in term of throughput, performance and latency

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
- **Bridge Protocol Data Unit (BPDU) tunneling**
  Transmits Spanning Tree Protocol 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
- **Spanning Tree Protocol (STP)**
  Supports standard IEEE 802.1D STP, IEEE 802.1w Rapid Spanning Tree Protocol (RSTP) for faster convergence, and IEEE 802.1s Multiple Spanning Tree Protocol (MSTP)
- **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 (DLDP)**
  Monitors link connectivity and shuts down ports at both ends if unidirectional traffic is detected, preventing loops in STP-based networks
- **IEEE 802.1ad QinQ and selective QinQ**
  Increase the scalability of an Ethernet network by providing a hierarchical structure; 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 (PVST+)**
  Allows each VLAN to build a separate spanning tree to improve link bandwidth usage in network environments with multiple VLANs

Standard Features

Quality of Service (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 IP address, IP Type of Service (ToS), Layer 3 protocol, TCP/UDP port number, source port, and DiffServ

- **Micro-segmentation**
  Micro-segmentation enables grouping of endpoints based on a specific criteria for application of a group-based policy, implemented by using PBR / QoS / PacketFilter.
- **Enhanced Media Delivery Index (eMDI)**
  Enhanced Media Delivery Index (eMDI) monitors audio and video service quality. It locate faults by analyzing specific TCP/RTP packets of each node in an IP network in real time to solve packet loss, packet sequence errors, and jitters.
- **Multicast DNS**
  Multicast DNS (mDNS) is a zero-configuration networking (zeroconf) protocol. It enables endpoint devices to automatically discover available services advertised by mDNS service providers without using preconfigured name severs such as DNS.Multicast.
- **Bandwidth shaping**
  - **Port-based rate limiting**
    Provides per-port ingress-/egress-enforced increased bandwidth
  - **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 reduced bandwidth
- **Weighted random early detection (WRED)/random early detection (RED)**
  Delivers congestion avoidance capabilities through the use of queue management algorithms
- **Powerful QoS feature**
  Supports the following congestion actions: strict priority (SP) queuing, weighted round robin (WRR), weighted fair queuing (WFQ), and WRED
- **Traffic policing**
  Supports Committed Access Rate (CAR) and line rate

Intrusion Detection/Prevention System (IDS/IPS)

- **Deep packet inspection**
  Module supports deep packet inspection and 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; available actions are "allow," "block," and "terminate connection" to provide appropriate mitigation
- **Signature update service**
  Provides regular updates to the signature database, helping to ensure that the latest available signatures are installed

Standard Features

Connectivity

- **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 data link layer problems that occurred in the "last mile" using the IEEE 802.3ah OAM standard; 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 Power over Ethernet (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**
  Includes four 10/100/1000 ports or SFP slots for optional fiber connectivity such as Gigabit-SX, -LX, and -LH, or 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 Power over Ethernet (PoE+) support**
  Provides up to 30 watts of power at the power sourcing equipment (PSE)

Layer 3 Routing

- **Static IPv4 routing**
  Provides simple manually configured IPv4 routing
- **Routing Information Protocol (RIP)**
  Uses a distance vector algorithm with UDP packets for route determination; supports RIPv1 and RIPv2 routing; includes loop protection
- **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
- **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)
- **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
- **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 ICNP 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

Standard Features

- **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
- **IS-IS for IPv6**
  Extends IS-IS to support IPv6 addressing
- **BGP+**
  Extends BGP-4 to support Multiprotocol BGP (MBGP), 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, 6to4, and Intra-Site Automatic Tunnel Addressing Protocol (ISATAP) tunnels; 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; supports LSP tunneling and multilevel stacks
- **Multiprotocol Label Switching (MPLS) Layer 3 VPN**
  Allows Layer 3 VPNs across a provider network; uses MP-BGP to establish private routes for increased security; supports RFC 2547bis multiple autonomous system VPNs for added flexibility
- **Multiprotocol Label Switching (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 and therefore decreases complexity, increases performance, and allows VPNs of non-routable protocols; uses no routing information for increased security; supports Circuit Cross Connect (CCC), Static Virtual Circuits (SVCs), 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 higher-featured modules, by redirecting traffic; reduces investment and enables higher bandwidth and load sharing; supports IPv6, IPv6 multicast, tunneling, and MPLS

Security

- **Access control list (ACL)**
  Supports powerful ACLs for both IPv4 and IPv6; ACLs are used for filtering traffic to prevent unauthorized users from accessing the network, or for controlling network traffic 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; 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
- **Secure shell (SSHv2)**
  Uses external servers to securely log in to a remote device; with authentication and encryption, it protects against IP spoofing and plain-text password interception; increases the security of Secure FTP (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; prevents users from receiving fake IP addresses and reduces ARP attacks, improving security
- **IP source guard**
  Filters packets on a per-port basis to prevent illegal packets from being forwarded

Standard Features

- **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 Extensible Authentication Protocol (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
- **Media access control (MAC) authentication**
  Provides simple authentication based on a user's MAC address; 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 the RADIUS server based on the client's MAC address
- **DHCP protection**
  Blocks DHCP packets from unauthorized DHCP servers, preventing denial-of-service attacks
- **Endpoint Admission Defense (EAD)**
  Provides security policies to users accessing a network
- **Advanced distributed denial of service (DDOS)**
  DHCP Snooping, IP Source Guard, and ARP Protection, and flexible traffic controls, such as policy-based routing, QoS, and ACLs are available to manage end-to-end application priorities.
- **Port isolation**
  Secures and adds privacy, and prevents malicious attackers from obtaining user information
- **IEEE 802.1AE MACsec**
  Provides switch-to-host with IEEE 802.1X or switch-to-switch hardware encryption, and authentication. Requires Comware v7 with specific hardware only. Refer to the hardware manuals for details.
  No hidden costs with the license-free L2 / L3 feature set which includes IPv6, MPLS functionality and robust QoS. It also supports varying security management login, RADIUS, SSH, TACACS/TACACS+ to protect and control change management access.

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 an easy-to-enhance-and-extend feature set, which doesn't require whole-scale changes; all switching, routing, and security platforms leverage the Comware OS, a common unified modular operating system
- **OPEX savings**
  Simplifies and streamlines deployment, management, and training through the use of a common operating system, thereby 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

Convergence

- **LLDP-MED (Media Endpoint Discovery)**
  Defines a standard extension of LLDP that stores values for parameters such as QoS and VLAN to automatically configure network devices such as IP phones
- **Multicast Source Discovery Protocol (MSDP)**
  Allows multiple PIM-SM domains to interoperate; is used for inter-domain multicast applications

Standard Features

- **Internet Group Management Protocol (IGMP)**
  Utilizes Any-Source Multicast (ASM) or Source-Specific Multicast (SSM) to manage IPv4 multicast networks; supports IGMPv1, v2, and v3
- **Protocol Independent Multicast (PIM)**
  Defines modes of Internet IPv4 and IPv6 multicasting to allow one-to-many and many-to-many transmission of information; supports PIM Dense Mode (DM), Sparse Mode (SM), and Source-Specific Multicast(SSM)
- **Multicast Border Gateway Protocol (MBGP)**
  Allows multicast traffic to be forwarded across BGP networks and kept separate from unicast traffic
- **Multicast Listener Discovery (MLD) protocol**
  Establishes, maintains, and manages IPv6 multicast groups and networks; supports v1 and v2 and utilizes Any-Source Multicast (ASM) or Source-Specific Multicast (SSM)
- **Multicast VLAN**
  Allows multiple VLANs to receive the same IPv4 or IPv6 multicast traffic, lessening network bandwidth demand by reducing or eliminating multiple streams to each VLAN
- **Voice VLAN**
  Automatically assigns VLAN and priority for IP phones, simplifying network configuration and maintenance

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
- **User Datagram Protocol (UDP) helper**
  Redirects UDP broadcasts to specific IP subnets to prevent server spoofing
- **Dynamic Host Configuration Protocol (DHCP)**
  Simplifies the management of large IP networks and supports client and server; DHCP Relay enables DHCP operation across subnets
- **Domain Name System (DNS)**
  Provides a distributed database that translates domain names and IP addresses, which simplifies network design; supports client and server

Virtual Private Network (VPN)
- **IPSec**
  Provides secure tunneling over an untrusted network such as the Internet or a wireless network; 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; enables the segregation of traffic from site to site
- **Manual or Automatic Internet Key Exchange (IKE)**
  Provides both manual or automatic key exchange required for the algorithms used in encryption or authentication; auto-IKE allows automated management of the public key exchange, providing the highest levels of encryption
- **Virtual Extensible LAN (VXLAN) and Ethernet VPN (BGP EVPN)**
  Enables greater network integration flexibility, improved performance, better scalability without redesigning the underlay network, restrict attacks with enhanced security, especially in spine-leaf architectures.

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

Configuration Information

BTO Models

HPE 7510X PoE Ethernet Switch Chassis

Rule #	Description	SKU
	HPE FlexNetwork 7510X PoE Ethernet Switch 10 slots Chassis	R8N47A

- 2 - MPUx Slots (Management Modules Slots)(Must select Min1)
- 10 - I/O module slots(Must select Min1)
- 2 - power module slots(Must select qty 1)
- 16U - Height

	HPE FlexNetwork 7506X PoE Ethernet Switch 6 slots Chassis	R8N48A

- 2 - MPUx Slots (Management Modules Slots)(Must select Min1)
- 6 - I/O module slots(Must select Min1)
- 2- power module slots(Must select qty 1)
- 13U - Height

	HPE FlexNetwork 7503X Ethernet Switch 3 slots Chassis	R8N49A

- 2 - MPUx Slots (Management Modules Slots)(Must select Min1)
- 3 - I/O module slots(Must select Min1)
- 2- power module slots(Must select qty 1)
- 5U - Height

Notes:
- BTO Models should never receive a 0D1 and therefore can not be factory integrated into a rack.
- OCA Only Model Selection Form - HPE Offering > Aruba > Switches - FlexNetwork: HPE FlexNetwork 7500X Switch Series

Modules

Management Modules

(Switch 7503X, 7506X, 7510X) System (std 0 // max 2) User Selection (min 1 // max 2) per Switch

Rule #	Description	SKU
1, 4	HPE FlexNetwork 7503X Type A Main Processing Unit	
	• HPE FlexNetwork 7503X Type A Main Processing Unit	R8N52A
2, 4	HPE FlexNetwork 7506X Type C Fabric/Main Processing Unit	R8N51A
	• min=0 \ max=2 SFP Transceivers	
3, 4	HPE FlexNetwork 7510X Type C Fabric/Main Processing Unit	R8N50A
	• min=0 \ max=2 SFP Transceivers	

Configuration Rules

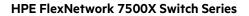| Rule #	Description	
1	This module is for use with the following switches:	
	HPE FlexNetwork 7503X Ethernet Switch 3 slots Chassis	R8N49A
2	This module is for use with the following switches:	
	R8N48A HPE 7506X PoE Ethernet Switch Chassis.	
	HPE FlexNetwork 7506X PoE Ethernet Switch 6 slots Chassis	R8N48A
3	This module is for use with the following switches:	
	R8N47A HPE 7510X PoE Ethernet Switch Chassis.	
	HPE FlexNetwork 7510X PoE Ethernet Switch 10 slots Chassis	R8N47A
4	This module supports the following transceiver modules:	
	HPE X120 1G SFP LC SX Transceiver	JD118B
	HPE X120 1G SFP LC LX Transceiver	JD119B
	HPE X120 1G SFP LC BX 10-D Transceiver	JD099B
	HPE X120 1G SFP LC BX 10-U Transceiver	JD098B
	HPE X120 1G SFP LC LH100 Transceiver	JD103A

Configuration Information

Ethernet Modules

(Switch 7503X) System (std 0 // max 3) User Selection (min 1 // max 3) per Switch
(Switch 7506X) System (std 0 // max 6) User Selection (min 1 // max 6) per Switch
(Switch 7510X) System (std 0 // max 10) User Selection (min 1 // max 10) per Switch

Rule #	Description	SKU
	HPE FlexNetwork 7500X 48-port 1000BASE-T RJ-45 FD Module	R8N53A
1, 2, 5, 7, 8	HPE FlexNetwork 7500X 40 port 1G SFP 8 port 10G SFP+ FD Module	R8N54A
	• min=0 \ max=40 SFP Transceivers	
	• min=0 \ max=8 SFP/SFP+ Transceivers	
	HPE FlexNetwork 7500X 24-port 10GBASE-T RJ-45 FD Module	R8N55A
1, 2, 8, 9	HPE FlexNetwork 7500X 48 port 10G SFP+ SG Module	R8R43A
	• min=0 \ max=48 SFP/SFP+ Transceivers	
1, 2, 3, 4, 12, 7, 8, 9, 10, 15	HPE FlexNetwork 7500X 24-port 10G SFP+ 2 40G/1 100G QSFP28 FD Module	R8N56A
	• min=0 \ max=48 SFP/SFP+ Transceivers min=0 \ max=2 QSFP+ or min=0 \ max=1 QSFP28 Transceivers	
3, 11, 14	HPE FlexNetwork 7500X 24-port 40G QSFP+ SG Module	R8N57A
	• min=0 \ max=24 QSFP+ Transceivers	
3, 4, 12, 13, 16	HPE FlexNetwork 7500X 12-port 40G/4-port 100G QSFP28 SG Module	R8N58A
	• min=0 \ max=12 QSFP+ or min=0 \ max=4 QSFP28 Transceivers	
1, 2, 5, 6	HPE FlexNetwork 7500 44-port SFP/4-port SFP+ SE Module	JH210A
	• min=0 \ max=44 SFP Transceivers min=0 \ max=4 SFP/SFP+ Transceivers	
1, 2, 5, 6	HPE FlexNetwork 7500 24-port SFP/4-port SFP+ SE Module	JH211A
	• min=0 \ max=24 SFP Transceivers min=0 \ max=4 SFP/SFP+ Transceivers	
	HPE FlexNetwork 7500 48-port 1000BASE-T SE Module	JH212A
	HPE FlexNetwork 7500 48-port 1000BASE-T with PoE+ SE Module	JH213A
1, 2, 5, 6, 9	HPE FlexNetwork 7500 44-port GbE SFP/4-port 10GbE SFP/SFP+ with MACsec SE Module	JH431A
	• min=0 \ max=44 SFP Transceivers min=0 \ max=4 SFP/SFP+ Transceivers	

Configuration Rules

Rule #	Description	
1	This module supports the following transceiver modules:	
	HPE X120 1G SFP LC SX Transceiver	JD118B
	HPE X120 1G SFP LC LX Transceiver	JD119B
	HPE X120 1G SFP LC BX 10-D Transceiver	JD099B
	HPE X120 1G SFP LC BX 10-U Transceiver	JD098B
	HPE X120 1G SFP LC LH100 Transceiver	JD103A
	HPE X120 1G SFP RJ45 T Transceiver	JD089B
2	This module supports the following transceiver modules:	
	HPE X130 10G SFP+ LC SR Transceiver	JD092B
	HPE X130 10G SFP+ LC LR Transceiver	JD094B
	HPE X130 10G SFP+ LC ER 40km Transceiver	JG234A
	HPE X130 10G SFP+ LC LH 80km Transceiver	JG915A
	HPE FlexNetwork X240 10G SFP+ to SFP+ 3m Direct Attach Copper Cable	JD097C
	HPE FlexNetwork X240 10G SFP+ to SFP+ 0.65m Direct Attach Copper Cable	JD095C
	HPE FlexNetwork X240 10G SFP+ to SFP+ 1.2m Direct Attach Copper Cable	JD096C
3	This module supports the following transceiver modules:	
	HPE X140 40G QSFP+ MPO SR4 Transceiver	JG325B
	HPE FlexNetwork X240 40G QSFP+ QSFP+ 1m Direct Attach Copper Cable	JG326A

Configuration Information

	HPE FlexNetwork X240 40G QSFP+ QSFP+ 3m Direct Attach Copper Cable	JG327A
	HPE FlexNetwork X240 40G QSFP+ QSFP+ 5m Direct Attach Copper Cable	JG328A
	HPE X140 40G QSFP+ LC LR4 SM 10km 1310nm Transceiver	JG661A
	HPE X140 40G QSFP+ MPO MM 850nm CSR4 300m Transceiver	JG709A
	HPE X140 40G QSFP+ LC BiDi 100m MM Transceiver	JL251A
	HPE X140 40G QSFP+ LC LR4L 2km SM Transceiver	JL286A
	HPE X140 40G QSFP+ LC ER4 40km SM Transceiver	JL306A
	HPE X2A0 40G QSFP+ to QSFP+ 7m Active Optical Cable	JL287A
	HPE X2A0 40G QSFP+ to QSFP+ 10m Active Optical Cable	JL288A
	HPE X2A0 40G QSFP+ to QSFP+ 20m Active Optical Cable	JL289A
	HPE FlexNetwork X240 40G QSFP+ to 4x10G SFP+ 1m Direct Attach Copper Splitter Cable	JG329A
	HPE FlexNetwork X240 40G QSFP+ to 4x10G SFP+ 3m Direct Attach Copper Splitter Cable	JG330A
	HPE FlexNetwork X240 40G QSFP+ to 4x10G SFP+ 5m Direct Attach Copper Splitter Cable	JG331A
4	This module supports the following transceiver modules:	
	HPE X150 100G QSFP28 MPO SR4 100m MM Transceiver	JL274A
	HPE X150 100G QSFP28 eSR4 300m MM Transceiver	JH672A
	HPE X150 100G QSFP28 MPO PSM4 500m SM Transceiver	JH420A
	HPE X150 100G QSFP28 LC SWDM4 100m MM Transceiver	JH419A
	HPE X150 100G QSFP28 CWDM4 2km SM Transceiver	JH673A
5	The transceiver module is supported on all ports except for the 10GE ports:	
	HPE X120 1G SFP RJ45 T Transceiver	JD089B
6	The transceiver module is supported on all ports except for the 10GE ports:	
	HPE X115 100M SFP LC FX Transceiver	JD102B
	HPE X110 100M SFP LC LX Transceiver	JD120B
	HPE X115 100M SFP LC BX 10-U Transceiver	JD100A
	HPE X115 100M SFP LC BX 10-D Transceiver	JD101A
7	This module supports the following transceiver modules:	
	HPE X130 10G SFP+ LC BiDi 10km-Uplink Transceiver	JL737A
	HPE X130 10G SFP+ LC BiDi 10km-Downlink Transceiver	JL738A
8	This module supports the following transceiver modules:	
	HPE X130 10G SFP+ LC BiDi 40km-Uplink Transceiver	JL739A
	HPE X130 10G SFP+ LC BiDi 40km-Downlink Transceiver	JL740A
9	This module supports the following transceiver modules:	
	HPE FlexNetwork X240 10G SFP+ to SFP+ 5m Direct Attach Copper Cable	JG081C
10	This module supports the following transceiver modules:	
	HPE FlexNetwork X240 10G SFP+ SFP+ 7m Direct Attach Copper Cable	JC784C
11	This module is only for use with ports 1 through 16:	
	HPE FlexNetwork X240 40G QSFP+ to 4x10G SFP+ 1m Direct Attach Copper Splitter Cable	JG329A
	HPE FlexNetwork X240 40G QSFP+ to 4x10G SFP+ 3m Direct Attach Copper Splitter Cable	JG330A
	HPE FlexNetwork X240 40G QSFP+ to 4x10G SFP+ 5m Direct Attach Copper Splitter Cable	JG331A
12	OCA Display Notes: A QSFP28 port cannot be split into four 25G SFP28 ports	
13	This module supports the following transceiver modules:	
	HPE X240 100G QSFP28 to QSFP28 1m Direct Attach Copper Cable	JL271A
	HPE X240 100G QSFP28 to QSFP28 3m Direct Attach Copper Cable	JL272A
	HPE X150 100G QSFP28 LC LR4 10km SM Transceiver	JL275A
14	For the following transceiver modules, Ports 1 through 16 each of R8N57A can be split into four breakout ports. Ports 17 through 24 do not support this splitting:	
	HPE X140 40G QSFP+ MPO MM 850nm CSR4 300m Transceiver	JG709A
	HPE X140 40G QSFP+ MPO SR4 Transceiver	JG325B
15	If a 40G port of R8N56A switches to 100G, only Port 25 supports 100G transceivers	
16	If 40G port of R8N58A switch to 100G, only Port 1,4,7,10 supports 100G transceivers	

Configuration Information

Transceivers

SFP Transceivers

Rule #	Description	SKU
	HPE X120 1G SFP LC SX Transceiver	JD118B
	HPE X120 1G SFP LC LX Transceiver	JD119B
	HPE X120 1G SFP RJ45 T Transceiver	JD089B
	HPE X120 1G SFP LC BX 10-D Transceiver	JD099B
	HPE X120 1G SFP LC BX 10-U Transceiver	JD098B
	HPE X120 1G SFP LC LH100 Transceiver	JD103A

SFP+ Transceivers

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

QSFP+ Transceivers

Rule #	Description	SKU
	HPE X140 40G QSFP+ MPO SR4 Transceiver	JG325B
	HPE FlexNetwork X240 40G QSFP+ QSFP+ 1m Direct Attach Copper Cable	JG326A
	HPE FlexNetwork X240 40G QSFP+ QSFP+ 3m Direct Attach Copper Cable	JG327A
	HPE FlexNetwork X240 40G QSFP+ QSFP+ 5m Direct Attach Copper Cable	JG328A
	HPE FlexNetwork X240 40G QSFP+ to 4x10G SFP+ 1m Direct Attach Copper Splitter Cable	JG329A
	HPE FlexNetwork X240 40G QSFP+ to 4x10G SFP+ 3m Direct Attach Copper Splitter Cable	JG330A
	HPE FlexNetwork X240 40G QSFP+ to 4x10G SFP+ 5m Direct Attach Copper Splitter Cable	JG331A
	HPE X140 40G QSFP+ LC LR4 SM 10km 1310nm Transceiver	JG661A
	HPE X140 40G QSFP+ MPO MM 850nm CSR4 300m Transceiver	JG709A
	HPE X140 40G QSFP+ LC BiDi 100m MM Transceiver	JL251A
	HPE X140 40G QSFP+ LC LR4L 2km SM Transceiver	JL286A
	HPE X140 40G QSFP+ LC ER4 40km SM Transceiver	JL306A
	HPE X2A0 40G QSFP+ to QSFP+ 7m Active Optical Cable	JL287A
	HPE X2A0 40G QSFP+ to QSFP+ 10m Active Optical Cable	JL288A
	HPE X2A0 40G QSFP+ to QSFP+ 20m Active Optical Cable	JL289A

QSFP28 Transceivers

Rule #	Description	SKU
	HPE X150 100G QSFP28 MPO SR4 100m MM Transceiver	JL274A
	HPE X150 100G QSFP28 LC LR4 10km SM Transceiver	JL275A
	HPE X150 100G QSFP28 CWDM4 2km SM Transceiver	JH673A
	HPE X150 100G QSFP28 LC SWDM4 100m MM Transceiver	JH419A
	HPE X150 100G QSFP28 eSR4 300m MM Transceiver	JH672A
	HPE X150 100G QSFP28 MPO PSM4 500m SM Transceiver	JH420A
	HPE X240 100G QSFP28 to QSFP28 1m Direct Attach Copper Cable	JL271A
	HPE X240 100G QSFP28 to QSFP28 3m Direct Attach Copper Cable	JL272A

Configuration Information

Power Supplies

(Switch 7503X, 7506X, 7510X) System (std 0 // max 2) User Selection (min 1 // max 2) per switch Switch

Rule #	Description	SKU
1, 3, 4, 5, 8	HPE FlexNetwork 7500 6000W AC Power Supply	JD227A
	• includes 4 x c19, 6000w	
	HPE FlexNetwork 7500 6000W AC Power Supply PDU Cable NA/JP/TW	JD227A#B2B
	• C19 PDU Jumper Cord (NA/MEX/TW/JP)	
	HPE FlexNetwork 7500 6000W AC Power Supply PDU Cable ROW	JD227A#B2C
	• C19 PDU Jumper Cord (ROW)	
	HPE FlexNetwork 7500 6000W AC Power Supply 220V N.A. - english localized	JD227A#B2E
	• NEMA L6-20P Cord (NA/MEX/JP/TW)	
	HPE 7500 6000W AC Power Supply	JD227A#AC3
	• No Power Cord	
1, 3, 4, 5	HPE FlexNetwork 7503/7506/7506 V 650W AC Power Supply Unit	JH215A
	• includes 1 x c13, 650w	
	HPE FlexNetwork 7503/7506/7506 V 650W AC Power Supply Unit PDU Cable NA/JP/TW	JH215A#B2B
	• C13 PDU Jumper Cord (NA/MEX/TW/JP)	
	HPE FlexNetwork 7503/7506/7506 V 650W AC Power Supply Unit PDU Cable ROW	JH215A#B2C
	• C13 PDU Jumper Cord (ROW)	
	HPE FlexNetwork 7503/7506/7506 V 650W AC Power Supply Unit 220V N.A. - english localized	JH215A#B2E
	• NEMA L6-20P Cord (NA/MEX/JP/TW)	
	HPE 7503/7506/7506-V 650W AC PSU	JH215A#AC3
	• No Power Cord	
1. 2, 5	HPE FlexNetwork 7502 300W AC Power Supply	JD226A
	• includes 1 x c13, 300w	
	HPE FlexNetwork 7502 300W AC Power Supply PDU Cable NA/JP/TW	JD226A#B2B
	• C15 PDU Jumper Cord (NA/MEX/TW/JP)	
	HPE FlexNetwork 7502 300W AC Power Supply PDU Cable ROW	JD226A#B2C
	• C15 PDU Jumper Cord (ROW)	
	HPE 7502 300W AC Power Supply	JD226A#AC3
	• No Power Cord	
1. 2, 5	HPE FlexNetwork 7500 650W AC Power Supply	JD217A
	• includes 1 x c13, 650w	
	HPE FlexNetwork 7500 650W AC Power Supply PDU Cable NA/JP/TW	JD217A#B2B
	• C15 PDU Jumper Cord (NA/MEX/TW/JP)	
	HPE FlexNetwork 7500 650W AC Power Supply PDU Cable ROW	JD217A#B2C
	• C15 PDU Jumper Cord (ROW)	
	HPE 7500 650W AC Power Supply	JD217A#AC3
	• No Power Cord	
1, 3, 4, 5	HPE FlexNetwork 7500 1400W AC Power Supply	JD218A
	• includes 1 x c19, 1400w	
	HPE FlexNetwork 7500 1400W AC Power Supply PDU Cable NA/JP/TW	JD218A#B2B
	• C19 PDU Jumper Cord (NA/MEX/TW/JP)	
	HPE FlexNetwork 7500 1400W AC Power Supply PDU Cable ROW	JD218A#B2C
	• C19 PDU Jumper Cord (ROW)	
	HPE FlexNetwork 7500 1400W AC Power Supply 220V N.A. - english localized	JD218A#B2E
	• NEMA L6-20P Cord (NA/MEX/JP/TW)	
	HPE 7500 1400W AC Power Supply	JD218A#AC3
	• No Power Cord	
1, 3, 4, 5	HPE FlexNetwork 7500 2800W AC Power Supply	JD219A
	• includes 2 x c19, 2800w	
	HPE FlexNetwork 7500 2800W AC Power Supply PDU Cable NA/JP/TW	JD219A#B2B

Configuration Information

- C19 PDU Jumper Cord (NA/MEX/TW/JP)

HPE FlexNetwork 7500 2800W AC Power Supply PDU Cable ROW	JD219A#B2C

- C19 PDU Jumper Cord (ROW)

HPE FlexNetwork 7500 2800W AC Power Supply 220V N.A. - english localized	JD219A#B2E

- NEMA L6-20P Cord (NA/MEX/JP/TW)

HPE 7500 2800W AC Power Supply	JD219A#AC3

- No Power Cord

Configuration Rules

Rule #	Description	
1	Power supplies in a Switch Chassis cannot be mixed	
2	These Power Supplies are for use with the following switches:	
	HPE FlexNetwork 7503X Ethernet Switch 3 slots Chassis	R8N49A
3	These Power Supplies are for use with the following switches:	
	HPE FlexNetwork 7506X PoE Ethernet Switch 6 slots Chassis	R8N48A
4	These Power Supplies are for use with the following switches:	
	HPE FlexNetwork 7510X PoE Ethernet Switch 10 slots Chassis	R8N47A
5	Localization (Wall Power Cord) required on orders without #B2B, #B2C (PDU Power Cord),#B2E or #AC3. (See Localization Menu)	
	OCA Display	
	Notes: If Switches will be Field Racked, then #B2B, #B2C should be the Defaulted Power Cable option on the Switches.	
8	This PSU is only supported in US and Canada when configured with 7500X Switch Chassis.	
	OCA Display Notes: "At the time of GA, November 1st, only US and Canada support this 6K PSU. For more information please consult your HPE representative"	
Notes:	– Drop down under power supply should offer the following options and results:	
	o Switch to PDU Power Cord - #B2B in North America, Mexico, Taiwan, and Japan or #B2C ROW. (Watson Default B2B or B2C for Rack Level CTO)	
	o Switch to Wall Power Cord - Localized Option (Watson Default for BTO and Box Level CTO)	
	o High Volt Power Electrical Module to Wall Power Cord - #B2E Option. (Offered only in North America, Mexico, Taiwan, and Japan)	
	o No Power Cord Selected - #AC3	
	– For R8N49A Switch Chassis, default qty 1 of the JD215A	
	– For R8N48A and R8N47A Switch Chassis, default qty 1 of the JD219A	

Spare Fan Trays

(Switch 7503X, 7506X, 7510X) System (std 1 // max 99) User Selection (min 0 // max 99) per switch Switch

Rule #	Description	SKU
Notes:	Spare Part	
1	HPE FlexNetwork 7503X Fan Tray Assembly	R8N61A
2	HPE FlexNetwork 7506X Fan Tray Assembly	R8N60A
3	HPE FlexNetwork 7510 Spare Fan Assembly	JD216A
	Configuration Rules	

Rule #	Description
1	This item is only for use with R8N49A Switch Chassis
2	This item is only for use with R8N48A Switch Chassis
3	This item is only for use with R8N47A Switch Chassis
Notes:	OCA Display Notes: Every Switch includes qty 1 Fan Tray by Default

Technical Specifications

HPE 7510X PoE Ethernet Switch Chassis (R8N47A)

Included accessories	1 HPE 7510X Fan Tray Assembly (JD216A)	
I/O ports and slots	10 I/O module slots Supports a maximum of 40 100 GbE ports or 240 40GbE ports or 480 10GbE ports or 480 1GbE ports or 480 Fiber Ethernet ports, or a combination	
Additional ports and slots	2 switch fabric slots	
Power supplies	2 power supply slots	
	1 minimum power supply required (ordered separately)	
Fan tray	includes: 1 x JD216A	
	1 fan tray slot	
Physical characteristics	**Dimensions**	17.17 (w) x 16.54 (d) x 27.87 (h) in. 43.6 (w) X 42 (d) X 70.8 (h) cm (16 RU height)
	Weight	< 95 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
	Non-operating/Storage temperature	-40°F to 158°F (-40°C to 70°C)
	Non-operating/Storage relative humidity	5% to 95%, noncondensing
	Acoustic	Low-speed fan: 53.5 dB, High-speed fan: 56.7 dB
Electrical characteristics	**Frequency**	50/60 Hz
	Voltage	100 - 120 / 200 - 240 VAC, rated -48 to -60 VDC, rated (depending on power supply chosen)
	Current	16/117A
	Power output	1400 W
	Notes	Based on a common power supply of 1400 W AC
Safety	UL 62368-1; IEC 62368-1; CAN/CSA-C22.2 No. 62368-1; EN 62368-1/A11	
Emissions	VCCI Class A; FCC Part 15 Subpart B, Class A, ICES-003 Class A; EN 55032 CLASS A, CISPR 32 CLASS A; AS/NZS CISPR 32 Class A; EN 61000-3-2, EN 61000-3-3	
Immunity	**Generic**	ETSI EN 300 386
	EN	EN55035
	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

Technical Specifications

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. Supported IMC versions are: iMC BIMS 7.3 (E0501) iMC EAD 7.3 (E0502). iMC EIA 7.3 (E0503), iMC MVM 7.3 (E0501). iMC NTA 7.3 （E0502, iMC PLAT 7.3 (E0705), iMC QoSM 7.3 (E0502), iMC SHM 7.3 (E0502P04), iMC UBA 7.3 （E0502）

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, 4271, 4291, 4292, 4293, 4443, 4552, 4607, 4659, 4798, 4861, 4862, 5080, 5095, 5340, 5492, 5905 and 6192
	 – Comware v7 MPU HPE 7510X Fabric/MPU Type C (R8N50A) only supports these LPUs:
	     Comware v7 LPUs— R8N43A, R8N53A, R8N54A, R8N55A, R8N56A, R8N57A, R8N58A, JH210A, JH211A, JH212A, JH213A, JH431A
	 – Performance depends on the MPU/Fabric installed, and when installed with two (2) R8N50A the performances are as follows: up to 7,200 MPPS for packet performance and 9.6 Tbps for total switching capacity.

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

HPE FlexNetwork 7506X PoE Ethernet Switch Chassis (R8N48A)

Included accessories	1 HPE 7506X Fan Tray Assembly (R8N60A)	
I/O ports and slots	6 I/O module slots Supports a maximum of 24 100 GbE ports or 144 40GbE ports or 288 10GbE ports or 288 1GbE ports or 288 Fiber Ethernet ports, or a combination	
Additional ports and slots	2 switch fabric slots	
Power supplies	2 power supply slots	
	1 minimum power supply required (ordered separately)	
Fan tray	includes: 1 x R8N60A	
	1 fan tray slot	
Physical characteristics	**Dimensions**	17.17 (w) x 16.54 (d) x 22.64 (h) in. 43.6 (w) X 42 (d) X 57.5 (h) cm (13 RU height)
	Weight	< 75 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
	Non-operating/Storage temperature	-40°F to 158°F (-40°C to 70°C)
	Non-operating/Storage relative humidity	5% to 95%, noncondensing
	Acoustic	Low-speed fan: 53.6 dB, High-speed fan: 57.7 dB
Electrical characteristics	**Frequency**	50/60 Hz
	Voltage	100 - 120 / 200 - 240 VAC, rated -48 to -60 VDC, rated (depending on power supply chosen)
	Current	16A/117 A

Technical Specifications

	Power output	1400W
	Notes	Based on a common power supply of 1400W AC
Safety	UL 62368-1; IEC 62368-1; CAN/CSA-C22.2 No. 62368-1; EN 62368-1/A11	
Emissions	VCCI Class A; FCC Part 15 Subpart B Class A; ICES-003 Class A; EN 55032 CLASS A; CISPR 32 CLASS A; AS/NZS CISPR 32 Class A; EN 61000-3-2; EN 61000-3-3	
;Immunity	**Generic**	ETSI EN 300 386
	EN	EN55035
	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
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. Supported IMC versions are: iMC BIMS 7.3 (E0501) iMC EAD 7.3 (E0502). iMC EIA 7.3 (E0503), iMC MVM 7.3 (E0501). iMC NTA 7.3 （E0502, iMC PLAT 7.3 (E0705), iMC QoSM 7.3 (E0502), iMC SHM 7.3 (E0502P04), iMC UBA 7.3 （E0502）	
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 – Comware v7 MPU HPE 7506X Fabric/MPU Type C (R8N51A) only supports these LPUs: Comware v7 LPUs— R8N43A, R8N53A, R8N54A, R8N55A, R8N56A, R8N57A, R8N58A, JH210A, JH211A, JH212A, JH213A, JH431APerformance depends on the MPU/Fabric installed, and when installed with two (2) – R8N51A the performances are as follows: up to 4,320 MPPS for packet performance and 5.76 Tbps for total switching capacity.	
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	

HPE FlexNetwork 7503X Ethernet Switch Chassis (R8N49A)

Included accessories	1 HPE 7503X Fan Tray Assembly (R8N61A)
I/O ports and slots	3 I/O module slots Supports a maximum of 12 100 GbE ports or 72 40GbE ports or 144 10GbE ports or 144 1GbE ports or 144 Fiber Ethernet ports, or a combination
Additional ports and slots	2 switch fabric slots
Power supplies	2 power supply slots
	1 minimum power supply required (ordered separately)
Fan tray	includes: 1 x R8N61A
	1 fan tray slot
Physical characteristics	**Dimensions** 17.17 (w) x 16.54 (d) x 8.5 (h) in. 43.6 (w) X 42 (d) X 21.6 (h) cm (5 RU height)
	Weight < 35 kg shipping weight

Technical Specifications

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
	Non-operating/Storage temperature	-40°F to 158°F (-40°C to 70°C)
	Non-operating/Storage relative humidity	5% to 95%, noncondensing
	Acoustic	Low-speed fan: 52.2 dB, High-speed fan: 56.0 dB
Electrical characteristics	**Frequency**	50/60 Hz
	Voltage	100 - 120 / 200 - 240 VAC, rated -48 to -60 VDC, rated (depending on power supply chosen)
	Current	10A/54A
	Power output	650W
	Notes	Based on a common power supply of 650W AC
Safety	UL 62368-1; IEC 62368-1; CAN/CSA-C22.2 No. 62368-1; EN 62368-1/A11UL	
Emissions	VCCI Class A; FCC Part 15 Subpart B Class A; ICES-003 Class A; EN 55032 CLASS A; CISPR 32 CLASS A; AS/NZS CISPR 32 Class A; EN 61000-3-2; EN 61000-3-3	
Immunity	**Generic**	ETSI EN 300 386
	EN	EN55035
	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
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. Supported IMC versions are: iMC BIMS 7.3 (E0501) iMC EAD 7.3 (E0502). iMC EIA 7.3 (E0503), iMC MVM 7.3 (E0501). iMC NTA 7.3 （E0502, iMC PLAT 7.3 (E0705), iMC QoSM 7.3 (E0502), iMC SHM 7.3 (E0502P04), iMC UBA 7.3 （E0502）	
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, 4271, 4291, 4292, 4293, 4443, 4552, 4607, 4659, 4798, 4861, 4862, 5080, 5095, 5340, 5492, 5905 and 6192 — Comware v7 MPU HPE 7503X Supervisor Engine Type A (R8N52A) only supports these LPUs: Comware v7 LPUs— R8N43A, R8N53A, R8N54A, R8N55A, R8N56A, R8N57A, R8N58A, JH210A, JH211A, JH212A, JH213A, JH431APerformance depends on the MPU/Fabric installed, and when installed with two (2) — R8N52A the performances are as follows: up to 2,160 MPPS for packet performance and 2.88 Tbps for total switching capacity.	

Technical Specifications

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 1771 BGPv4
- RFC 1772 Application of the BGP
- RFC 1997 BGP Communities Attribute
- RFC 1998 PPP Gandalf FZA Compression Protocol
- 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

MPLS
- 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
- 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
- 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

Technical Specifications

- 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

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 1000BASE-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 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 1058 RIPv1
- RFC 1142 OSI IS-IS Intra-domain Routing Protocol
- RFC 1195 OSI ISIS 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 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

Technical Specifications

- RFC 1591 DNS (client only)
- RFC 1624 Incremental Internet Checksum
- RFC 1701 Generic Routing Encapsulation
- RFC 1721 RIP-2 Analysis
- RFC 1723 RIP v2
- RFC 1812 IPv4 Routing
- RFC 1981 Path MTU Discovery for IP version 6
- 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)
- 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 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 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 ISIS 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 3810 Multicast Listener Discovery Version 2 (MLDv2) for IPv6
- RFC 3847 Restart signaling for IS-IS
- 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 Autoconfiguration

Technical Specifications

- RFC 4941 Privacy Extensions for Stateless Address Autoconfiguration 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 Draft 10 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)

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)

Denial of Service Protection
-
- Automatic filtering of well-known denial-of-service packets
- CPU DoS Protection
- Rate Limiting by ACLs

IPv6
- RFC 1886 DNS Extension for IPv6
- 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

Technical Specifications

- 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 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 Pv6
- RFC 2740 OSPFv3 for IPv6
- RFC 2767 Dual stacks IPv46 & 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

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

MIBs
- 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 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

Technical Specifications

- 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
- RFC 2925 Ping MIB
- RFC 2932 IP (Multicast Routing MIB)
- RFC 2933 IGMP MIB
- 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 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)

QoS/CoS
- IEEE 802.1p (CoS)
- RFC 1349 Type of Service in the Internet Protocol Suite
- RFC 2474 DSCP DiffServ
- RFC 2475 DiffServ Architecture
- RFC 2597 DiffServ Assured Forwarding (AF)
- RFC 2598 DiffServ Expedited Forwarding (EF)

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

Technical Specifications

- RFC 4133 Entity MIB (Version 3)
- RFC 4444 Management Information Base for Intermediate System to Intermediate System (IS-IS)

Device Management
- RFC 1157 SNMPv1/v2c
- RFC 1305 NTPv3
- RFC 1902 (SNMPv2)
- RFC 2579 (SMIv2 Text Conventions)
- RFC 2580 (SMIv2 Conformance)
- RFC 2819 (RMON groups Alarm, Event, History and Statistics only)
- Multiple Configuration Files
- Multiple Software Images
- SSHv1/SSHv2 Secure Shell
- TACACS/TACACS+ telnet

Network Management
- 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)
- RFC 2819 Four groups of RMON: 1 (statistics), 2 (history), 3 (alarm) and 9 (events)
- RFC 3176 sFlow
- RFC 3411 SNMP Management Frameworks
- 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)

OSPF
- RFC 1245 OSPF protocol analysis
- RFC 1246 Experience with OSPF
- RFC 1765 OSPF Database Overflow
- 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

Security
- IEEE 802.1X Port Based Network Access Control
- RFC 1321 The MD5 Message-Digest Algorithm

Technical Specifications

- 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

QuickSpecs   **HPE FlexNetwork 7500X Switch Series**

Summary of Changes

Date	Version History	Action	Description of Change:
13-Dec-2021	Version 3	Changed	Standard Features and Configuration Information sections were updated.
15-Nov-2021	Version 2	Changed	Configuration Information section was updated.
15-Sep-2010	Version 1	New	New QuickSpecs

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