HP A7500 Switch Series

Data sheet

Product overview

The HP A7500 Switch Series comprises 10 Gigabit modular chassis switches designed for campus LAN and small/midsize enterprise data center applications. These multilayer switches meet the evolving needs of integrated services networks and can be deployed in multiple network environments, including the enterprise LAN core, aggregation layer, and wiring closet edge, as well as in metropolitan area networks (MANs) and data centers. They feature cost-effective wire-speed 10 Gigabit Ethernet ports to provide the throughput and bandwidth necessary for mission-critical data and high-speed communications. A passive backplane, support for load sharing, and redundant management and fabrics help HP A7500 series switches offer high availability. Moreover, these switches deliver wire-speed Layer 2 and Layer 3 routing services for the most demanding applications.

Key features

- High-end modular chassis
- For enterprise LAN core, data centers, MANs
- Extensive switching and routing, IPv6, MPLS
- Added functionality with service modules
- Robust network and service virtualization

Features and benefits

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

- **Bandwidth shaping:**
  - **Port-based rate limiting:** provides per-port ingress-/egress-enforced maximum bandwidth
  - **Classifier-based rate limiting:** uses an access control list (ACL) to enforce maximum bandwidth for ingress traffic on each port
  - **Guaranteed minimum:** provides per-port, per-queue egress-based guaranteed minimum bandwidth

- **Congestion avoidance:** Weighted Random Early Detection(WRED)/Random Early Detection (RED)

- **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 automatically updated 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

Firewall

- **Stateful firewall:** enforces firewall policies to control traffic and filter access to network services; maintains session information for every connection passing through it, enabling the firewall to control packets based on existing sessions

- **Zone-based access policies:** logically groups virtual LANs (VLANs) into zones that share common security policies; allows both unicast and multicast policy settings by zones instead of by individual VLANs

- **Application-level gateway (ALG):** deep packet inspection in the firewall discovers the IP address and service port information embedded in the application data; the firewall then dynamically opens appropriate connections for specific applications

- **NAT/PAT:** choice of dynamic or static network address translation (NAT) preserves a network's IP address pool or conceals the private address of network resources, such as Web servers, which are made accessible to users of a guest or public wireless LAN

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 endpoints of the network

- **Generic Routing Encapsulation (GRE):** can be used to transport 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

Management

- **Management interface control:** provides management access through modem port, 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:** multiple privilege levels with password protection restrict access to critical configuration commands; 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

- **Web management:** embedded HTML management tool with secure access (SSHv2)

- **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:** FTP allows bidirectional transfers over a TCP/IP network and is used for configuration updates; Trivial FTP is a simpler method using User Datagram Protocol (UDP)

- **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 consistent timekeeping 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 network manager to determine overall network performance and to diagnose and locate network congestion points or failures

- **Info center:** provides a central information center 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):** automated device discovery protocol provides easy mapping by network management applications

- **Dual flash images:** provide independent primary and secondary operating system files for backup while upgrading

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

Connectivity

- **High-density port connectivity:** up to 10 interface module slots; up to 84 10-GbE ports, 480 Fiber Gigabit, or 480 PoE-enabled ports per A7500 series system

- **Jumbo frames:** are supported on 10 GbE and GbE ports; up to 9,000 sizes allow high-performance backups and disaster recovery systems

- **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 OAM:** provides a Layer 2 link performance and fault detection monitoring tool, which reduces failover and network convergence times

- **Flexible port selection:** 100/1000BASE-X auto speed selection, 10/100/1000BASE-T auto speed detection plus 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:** using standard IEEE 802.3x, it provides back pressure to reduce 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)

Performance

- **High-speed fully distributed architecture:**
  – 2.4 Tbps backplane supports 1152 Gbps switching capacity maximum, providing enhanced performance and future expansion capability; with dual fabrics, the switch delivers up to 714 Mpps throughput
  – All switching and routing performed in the I/O modules
  – Meets today's and future demand of enterprise's bandwidth-intensive applications

- **Scalable system design:** backplane is designed for bandwidth increases; provides investment protection to support future technologies and higher-speed connectivity

- **Flexible chassis selection:** enables customers to tailor their product selection to their budget with a choice of six chassis, ranging from a 10-slot to a 2-slot

Resiliency and high availability

- **Redundant/Load-sharing fabrics, management, fan assemblies, and power supplies:** increase total performance and power available while providing hitless, stateful failover

- **All modules are hot swappable:** allows replacement of modules without any impact on other modules

- **Dual internal power supply:** provides high reliability

- **Separate data and control paths:** keeps control separated from services and keeps service processing isolated; increases security and performance

- **Passive design system:** backplane has no active components for increased system reliability

- **IEEE 802.3ad Link Aggregation Control Protocol (LACP):** supports up to 128 trunks, each with 8 links per trunk; supports static or dynamic groups and user-selectable hashing algorithm

- **Intelligent Resilient Framework (IRF):** creates virtual resilient switching fabrics, where two or more switches perform as a single Layer 2 switch and Layer 3 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; simplifies network operation by eliminating the complexity of Spanning Tree, Equal-Cost Multipath (ECMP), or VRRP

- **Ring Resiliency Protection Protocol (RRPP):** provides standard sub-100 ms recovery for 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

- **Hitless patch upgrades:** allow patches and new service features to be installed without restarting the equipment, increasing network uptime and facilitating maintenance

- **Graceful restart:** features are fully supported, including graceful restart for OSPF, IS-IS, BGP, LDP, and RSVP; 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 realize nonstop forwarding (NSF)

- **Ultrafast protocol convergence with standard-based failure detection—Bidirectional Forwarding Detection (BFD):** enables link connectivity monitoring and reduces network convergence time for RIP, OSPF, BGP, IS-IS, VRRP, MPLS, and IRF

- **Smart link:** allows 50 ms failover between links

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- **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

Layer 2 switching

- **VLAN:** supports up to 4096 port or IEEE 802.1Q-based VLANs; also 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; supports four mirroring groups, with an unlimited number of ports per group

- **Spanning Tree:** fully supports standard IEEE 802.1D Spanning Tree Protocol, IEEE 802.1w Rapid Spanning Tree Protocol for faster convergence, and IEEE 802.1s Multiple Spanning Tree Protocol

- **Internet Group Management Protocol (IGMP) and Multicast Listener Discovery (MLD) protocol snooping:** effectively control and manage 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 uni-directional 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:** RFC 3069 standard, also called VLAN aggregation, is used to save IP address space

- **Per-VLAN Spanning Tree Plus (PVST+):** allows each virtual LAN (VLAN) to build a separate spanning tree to improve link bandwidth usage in network environments where multiple VLANs exist

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):** is a distributed database that provides translation between a domain name and an IP address, which simplifies network design; supports client and server

Layer 3 routing

- **Static IPv4 routing:** provides simple, manually configured IPv4 routing

- **Routing Information Protocol:** uses a distance vector algorithm with UDP packets for route determination; supports RIPv1 and RIPv2 routing; includes loop protection

- **OSPF:** Interior Gateway Protocol (IGP) using link-state protocol for faster convergence; supports ECMP, NSSA, and MD5 authentication for increased security and graceful restart for faster failure recovery

- **Intermediate system to intermediate system (IS-IS):** Interior Gateway Protocol (IGP) using path-vector protocol, 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):** Exterior Gateway Protocol (EGP) with path vector protocol uses TCP for enhanced reliability for the route discovery process, reduces bandwidth consumption by advertising only incremental updates, and supports extensive policies for increased flexibility, as well as scales to very large networks

- **Policy-based routing:** makes routing decisions based on policies set by the network administrator

- **IP performance optimization:** is a set of tools to improve the performance of IPv4 networks; includes directed broadcasts, customization of TCP parameters, support of ICNP error packets, and extensive display capabilities

- **Unicast Reverse Path Forwarding (uRPF):** is defined by RFC 3704 and limits erroneous or malicious traffic

- **Static IPv6 routing:** provides simple, manually configured IPv6 routing

- **Dual IP stack:** maintains separate stacks for IPv4 and IPv6 to ease 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:** 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:** is an important element for the transition from IPv4 to IPv6; 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

- **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, thus reducing complexity and increasing 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, including Open Application Architecture (OAA) modules, by redirecting traffic; reduces investment and enables higher bandwidth and load sharing; supported for 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 illegal 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

- **RADIUS:** eases switch security access administration by using a password authentication server

- **TACACS+:** is an authentication tool using TCP with encryption of the full authentication request that provides additional security

- **Switch management logon security:** can require either RADIUS or TACACS+ authentication for secure switch CLI logon

- **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

- **Dynamic Host Configuration Protocol (DHCP) snooping:** helps ensure that DHCP clients receive IP addresses from authorized DHCP servers and maintain a list of DHCP entries for trusted ports; prevents 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

- **ARP attack protection:** protects from attacks using a large number of ARP requests by using 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:** 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:** is an industry-standard method of user authentication using an IEEE 802.1X supplicant on the client in conjunction with a RADIUS server
  - **Web-based authentication:** similar to IEEE 802.1X, it provides a browser-based environment to authenticate clients that do not support the IEEE 802.1X supplicant
  - **MAC-based authentication:** client is authenticated 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

- **Port isolation:** secures and adds privacy, and prevents malicious attackers from obtaining user information

Convergence

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

- **Multicast Source Discovery Protocol (MSDP):** is used for inter-domain multicast applications, allowing multiple PIM-SM domains to interoperate

- **Internet Group Management Protocol (IGMP):** is used by IP hosts to establish and maintain multicast groups; supports v1, v2, and v3; utilizes Any-Source Multicast (ASM) or Source-Specific Multicast (SSM) to manage IPv4 multicast networks

- **Protocol Independent Multicast (PIM):** is used for IPv4 and IPv6 multicast applications; supports PIM Dense Mode (PIM-DM), Sparse Mode (PIM-SM), and Source-Specific Mode (PIM-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:** is used by IP hosts to establish and maintain multicast groups; supports v1 and v2 and utilizes Any-Source Multicast (ASM) or Source-Specific Multicast (SSM) to manage IPv6 multicast networks

- **Multicast VLAN:** allows multiple VLANs to receive the same IPv4 or IPv6 multicast traffic, reducing network bandwidth demand by eliminating multiple streams to each VLAN

- **Voice VLAN:** automatically assigns VLAN and priority for IP phones, 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; increases performance, reduces costs, and simplifies network management

- **VPN firewall module:**
  - Provides enhanced stateful packet inspection and filtering; supports flexible security zones and virtual firewall containment
  - Advanced VPN services with 3DES and AES encryption at high performance and low latency
  - Web content filtering
  - Application prioritization and optimization

- **Load-balancing module:** local and global server load-balancing module improves traffic distribution using powerful scheduling algorithms, including Layer 4 to 7 services; monitors the health status of servers and firewalls

- **NetStream module:** provides traffic analysis and statistics capture to allow network administrators to rapidly identify network anomalies and B105 security threats, as well as capacity planning information; supports NetFlow v5 and v9

- **Wireless controller module:**
  - Integrated wireless controller module supporting up to 640 access points per module
  - Supports IEEE 802.11a/b/g/n access points (APs)
  - Provides full user access management and QoS policies on a per-user basis; supports enterprise-class encryption
  - Supports radio frequency monitoring and control, managed access point (MAP) control, rogue AP detection, and location policy enforcement

Additional information

- **Green initiative support:** provides support for RoHS and WEEE regulations

- **Low power consumption:** is rated as one of the lowest in power consumption in the industry by Miercom independent tests

- **Unified, modular Comware operating system with modular architecture:** all switching, routing, and security platforms leverage a common, unified modular operating system—Comware; provides an easy-to-enhance-and-extend feature set without wholesale changes

- **OPEX savings:** a common operating system simplifies and streamlines deployment, management, and training, thereby cutting costs as well as reducing the chance for human error associated with having to manage multiple operating systems across different platforms and network layers

Warranty and support

- **1-year warranty:** with advance replacement and 10-calendar-day delivery (available in most countries)

- **Electronic and telephone support:** limited electronic and telephone support is available from HP; refer to www.hp.com/networking/warranty for details on the support provided and the period during which support is available

- **Software releases:** refer to www.hp.com/networking/warranty for details on the software releases provided and the period during which software releases are available for your product(s)

Specifications

	HP A7510 Switch Chassis (JD238B)	HP A7506-V Switch Chassis (JD241B)	HP A7506 Switch Chassis (JD239B)
Included accessories	1 HP A7510 Spare Fan Assembly (JD216A)	1 HP A7506-V Spare Fan Assembly (JD215A)	1 HP A7506 Spare Fan Assembly (JD214A)
Ports	2 switch fabric slots	2 switch fabric slots	2 switch fabric slots
	10 I/O module slots	6 I/O module slots	6 I/O module slots
	Supports a maximum of 84 10-GbE ports or 480 autosensing 10/100/1000 ports or 480 SFP ports, or a combination	Supports a maximum of 52 10-GbE ports or 288 autosensing 10/100/1000 ports or 288 SFP ports, or a combination	Supports a maximum of 52 10-GbE ports or 288 autosensing 10/100/1000 ports or 288 SFP ports, or a combination
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 JD215A 1 fan tray slot	includes: 1 x JD214A 1 fan tray slot
Physical characteristics			
Dimensions	16.54(d) x 17.17(w) x 27.87(h) in. (42.0 x 43.6 x 70.8 cm) (16U height)	16.54(d) x 17.17(w) x 36.61(h) in. (42.0 x 43.6 x 93.0 cm) (21U height)	16.54(d) x 17.17(w) x 22.64(h) in. (42.0 x 43.6 x 57.5 cm) (13U height)
Weight	211 lb. (95.71 kg), Fully loaded chassis, two fabrics, two power supplies, and a full complement of typical I/O modules	222 lb. (100.7 kg), Fully loaded chassis, two fabrics, two power supplies, and a full complement of typical I/O modules	207 lb. (93.9 kg), Fully loaded chassis, two fabrics, two power supplies, and a full complement of typical I/O modules
Memory and processor			
Fabric	MIPS64 @ 600 MHz, 64 MB flash, 512 MB RAM	MIPS64 @ 600 MHz, 64 MB flash, 512 MB RAM	MIPS64 @ 600 MHz, 64 MB flash, 512 MB RAM
I/O module	MIPS64 @ 400 MHz, 512 MB RAM	MIPS64 @ 400 MHz, 512 MB RAM	MIPS64 @ 400 MHz, 512 MB RAM
Mounting	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
Performance			
Throughput	714 million pps	488 million pps	488 million pps
Routing/Switching capacity	1152 Gbps	768 Gbps	768 Gbps
Routing table size	256000 entries	256000 entries	256000 entries
MAC address table size	512000 entries	512000 entries	512000 entries
Reliability			
MTBF (years)	19	19	19
Availability	99.999%	99.999%	99.999%
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: 52.1 dB, High-speed fan: 56.2 dB	Low-speed fan: 53.6 dB, High-speed fan: 57.7 dB
Electrical characteristics			
Description	*Achieved Miercom Certified Green Award* The H3C S7506E (HP A7606) is Certified Green in the 2009 Miercom Green Switches Industry Assessment.	*Achieved Miercom Certified Green Award* The H3C S7506E (HP A7606) is Certified Green in the 2009 Miercom Green Switches Industry Assessment.	*Achieved Miercom Certified Green Award* The H3C S7506E (HP A7606) is Certified Green in the 2009 Miercom Green Switches Industry Assessment.
Voltage	100-120/200-240 VAC	100-120/200-240 VAC	100-120/200-240 VAC
DC voltage	-48 V / -60 V	-48 V / -60 V	-48 V / -60 V
Current	16/50 A	16/50 A	16/50 A
Power output	1400 W	1400 W	1400 W
Frequency	50/60 Hz	50/60 Hz	50/60 Hz
Notes	Based on common power supply 1400 W (AC/DC)	Based on common power supply 1400 W (AC/DC)	Based on common power supply 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 CISPR22 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 CISPR22 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 CISPR22 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

Specifications (continued)

	HP A7510 Switch Chassis (JD238B)	HP A7506-V Switch Chassis (JD241B)	HP A7506 Switch Chassis (JD239B)
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
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	For non-TAA environment, IPS/IDS functionality provide by HP S1200E IPS A7500 Module (JC527A) For non-TAA environment, IKE/IPsec functionality provide by HP A7500 VPN Firewall Module (JD249A) IRF functionality does not support on A7502 and A7503-S chassis	For non-TAA environment, IPS/IDS functionality provide by HP S1200E IPS A7500 Module (JC527A) For non-TAA environment, IKE/IPsec functionality provide by HP A7500 VPN Firewall Module (JD249A) IRF functionality does not support on A7502 and A7503-S chassis	For non-TAA environment, IPS/IDS functionality provide by HP S1200E IPS A7500 Module (JC527A) For non-TAA environment, IKE/IPsec functionality provide by HP A7500 VPN Firewall Module (JD249A) IRF functionality does not support on A7502 and A7503-S chassis
Services	3-year, parts only, global next-day advance exchange (HP781E) 3-year, 4-hour onsite, 13x5 coverage for hardware (HP782E) 3-year, 4-hour onsite, 24x7 coverage for hardware (HP785E) 3-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 SW phone support and SW updates (HP788E) 3-year, 24x7 SW phone support, software updates (HP791E) 1-year, post-warranty, 4-hour onsite, 13x5 coverage for hardware (HR509E) 1-year, post-warranty, 4-hour onsite, 24x7 coverage for hardware (HR510E) 1-year, post-warranty, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone support (HR511E) Installation with minimum configuration, system-based pricing (UX032E) 4-year, 4-hour onsite, 13x5 coverage for hardware (HP783E) 4-year, 4-hour onsite, 24x7 coverage for hardware (HP786E) 4-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone (HP789E) 4-year, 24x7 SW phone support, software updates (HP792E) 5-year, 4-hour onsite, 13x5 coverage for hardware (HP784E) 5-year, 4-hour onsite, 24x7 coverage for hardware (HP787E) 5-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone (HP790E) 5-year, 24x7 SW phone support, software updates (HP793E) 3 Yr 6 hr Call-to-Repair Onsite (HP795E) 3 Yr 6 hr Call-to-Repair Onsite (HP794E) 5 Yr 6 hr Call-to-Repair Onsite (HP796E) 1-year, 6 hour Call-To-Repair Onsite for hardware (HR513E) 1-year, 24x7 software phone support, software updates (HR512E) Refer to the HP website at www.hp.com/networking/services for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local HP sales office.	3-year, parts only, global next-day advance exchange (UW999E) 3-year, 4-hour onsite, 13x5 coverage for hardware (UX001E) 3-year, 4-hour onsite, 24x7 coverage for hardware (UX004E) 3-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 SW phone support and SW updates (UX007E) 3-year, 24x7 SW phone support, software updates (UX010E) 1-year, post-warranty, 4-hour onsite, 13x5 coverage for hardware (HR514E) 1-year, post-warranty, 4-hour onsite, 24x7 coverage for hardware (HR515E) 1-year, post-warranty, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone support (HR516E) Installation with minimum configuration, system-based pricing (UX032E) 4-year, 4-hour onsite, 13x5 coverage for hardware (UX002E) 4-year, 4-hour onsite, 24x7 coverage for hardware (UX005E) 4-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone (UX008E) 4-year, 24x7 SW phone support, software updates (UX011E) 5-year, 4-hour onsite, 13x5 coverage for hardware (UX003E) 5-year, 4-hour onsite, 24x7 coverage for hardware (UX006E) 5-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone (UX009E) 5-year, 24x7 SW phone support, software updates (UX012E) 3 Yr 6 hr Call-to-Repair Onsite (UX013E) 4 Yr 6 hr Call-to-Repair Onsite (UX014E) 5 Yr 6 hr Call-to-Repair Onsite (UX015E) 1-year, 6 hour Call-To-Repair Onsite for hardware (HR518E) 1-year, 24x7 software phone support, software updates (HR517E) Refer to the HP website at www.hp.com/networking/services for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local HP sales office.	3-year, parts only, global next-day advance exchange (UW999E) 3-year, 4-hour onsite, 13x5 coverage for hardware (UX001E) 3-year, 4-hour onsite, 24x7 coverage for hardware (UX004E) 3-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 SW phone support and SW updates (UX007E) 3-year, 24x7 SW phone support, software updates (UX010E) 1-year, post-warranty, 4-hour onsite, 13x5 coverage for hardware (HR514E) 1-year, post-warranty, 4-hour onsite, 24x7 coverage for hardware (HR515E) 1-year, post-warranty, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone support (HR516E) Installation with minimum configuration, system-based pricing (UX032E) 4-year, 4-hour onsite, 13x5 coverage for hardware (UX002E) 4-year, 4-hour onsite, 24x7 coverage for hardware (UX005E) 4-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone (UX008E) 4-year, 24x7 SW phone support, software updates (UX011E) 5-year, 4-hour onsite, 13x5 coverage for hardware (UX003E) 5-year, 4-hour onsite, 24x7 coverage for hardware (UX006E) 5-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone (UX009E) 5-year, 24x7 SW phone support, software updates (UX012E) 3 Yr 6 hr Call-to-Repair Onsite (UX013E) 4 Yr 6 hr Call-to-Repair Onsite (UX014E) 5 Yr 6 hr Call-to-Repair Onsite (UX015E) 1-year, 6 hour Call-To-Repair Onsite for hardware (HR518E) 1-year, 24x7 software phone support, software updates (HR517E) Refer to the HP website at www.hp.com/networking/services for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local HP sales office.

Specifications (continued)

	HP A7510 Switch Chassis (JD238B)	HP A7506-V Switch Chassis (JD241B)	HP A7506 Switch Chassis (JD239B)
Standards and protocols (applies to all products in series)	**BGP** RFC 1771 BGPv4 RFC 1772 Application of the BGP RFC 1965 BGP4 confederations 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 **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 2271 FrameWork RFC 2579 (SMIv2 Text Conventions) RFC 2580 (SMIv2 Conformance) RFC 2819 (RMON groups Alarm, Event, History and Statistics only) HTTP, SSHv1, and Telnet Multiple Configuration Files Multiple Software Images SSHv1/SSHv2 Secure Shell TACACS/TACACS+ Web UI **General protocols** IEEE 802.1ad Q-in-Q IEEE 802.1ag Service Layer OAM 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 802.3u 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 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 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 RIP v2 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 2644 Directed Broadcast Control 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 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 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 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 3847 Restart signaling for IS-IS RFC 4251 The Secure Shell (SSH) Protocol Architecture RFC 4884 Extended ICMP to Support Multi-Part Messages RFC 4941 Privacy Extensions for Stateless Address Autoconfiguration in IPv6 RFC 5130 A Policy Control Mechanism in IS-IS Using Administrative Tags	**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) **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 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 **MIBs** 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

Specifications (continued)

	HP A7510 Switch Chassis (JD238B)	HP A7506-V Switch Chassis (JD241B)	HP A7506 Switch Chassis (JD239B)
Standards and protocols (applies to all products in series)	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 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 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) **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 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 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 **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 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 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 1850 OSPFv2 Management Information Base (MIB), traps RFC 2154 OSPF w/ 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 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

Specifications (continued)

	HP A7503 Switch Chassis (JD240B)	HP A7503-S Switch Chassis (JD243B)	HP A7502 Switch Chassis (JD242B)
Included accessories	1 HP A7503 Spare Fan Assembly (JD212A)	1 HP A7503-S Spare Fan Assembly (JC672A)	1 HP A7502 Spare Fan Assembly (JD213A)
Ports	2 switch fabric slots	1 switch fabric slot	2 MPU (for management modules) slots
	3 I/O module slots	2 I/O module slots	2 I/O module slots
	Supports a maximum of 28 10-GbE ports or 144 autosensing 10/100/1000 ports or 144 SFP ports, or a combination	Supports a maximum of 16 10-GbE ports or 120 autosensing 10/100/1000 ports or 120 SFP ports, or a combination	Supports a maximum of 16 10-GbE ports or 96 autosensing 10/100/1000 ports or 96 SFP ports, or a combination
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 JD212A 1 fan tray slot	includes: 1 x JD213A 1 fan tray slot	includes: 1 x JD213A 1 fan tray slot
Physical characteristics			
Dimensions	16.54(d) x 17.17(w) x 17.36(h) in. (42.0 x 43.6 x 44.1 cm) (10U height)	16.54(d) x 17.17(w) x 6.89(h) in. (42.0 x 43.6 x 17.5 cm) (4U height)	16.54(d) x 17.17(w) x 6.89(h) in. (42.0 x 43.6 x 17.5 cm) (4U height)
Weight	147 lb. (66.68 kg), Fully loaded chassis, two fabrics, two power supplies, and a full complement of typical I/O modules	59 lb. (26.76 kg), Fully loaded chassis, one fabric, two power supplies, and a full complement of typical I/O modules	59 lb. (26.76 kg), Fully loaded chassis, two management modules, two power supplies, and a full complement of typical I/O modules
Memory and processor			
Fabric	MIPS64 @ 600 MHz, 64 MB flash, 512 MB RAM	MIPS64 @ 400 MHz, 64 MB flash, 512 MB RAM	MIPS64 @ 600 MHz, 64 MB flash, 512 MB RAM
I/O module	MIPS64 @ 400 MHz, 512 MB RAM	MIPS64 @ 400 MHz, 512 MB RAM	MIPS64 @ 400 MHz, 512 MB RAM
Mounting	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
Performance			
Throughput	274 million pps	107 million pps	143 million pps
Routing/Switching capacity	480 Gbps	144 Gbps	192 Gbps
Routing table size	256000 entries	256000 entries	256000 entries
MAC address table size	512000 entries	512000 entries	512000 entries
Reliability			
MTBF (years)	19	16	20
Availability	99.999%	99.999%	99.999%
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: 51.6 dB, High-speed fan: 56.1 dB	High-speed fan: 56.7 dB	Low-speed fan: 49.8 dB, High-speed fan: 56.7 dB
Electrical characteristics			
Description	*Achieved Miercom Certified Green Award* The H3C S7506E (HP A7606) is Certified Green in the 2009 Miercom Green Switches Industry Assessment.	*Achieved Miercom Certified Green Award* The H3C S7506E (HP A7606) is Certified Green in the 2009 Miercom Green Switches Industry Assessment.	*Achieved Miercom Certified Green Award* The H3C S7506E (HP A7606) is Certified Green in the 2009 Miercom Green Switches Industry Assessment.
Voltage	100-120/200-240 VAC	100-120/200-240 VAC	100-120/200-240 VAC
DC voltage	-48 V / -60 V	-48 V / -60 V	-48 V / -60 V
Current	16/50 A	5/10 A	5/10 A
Power output	1400 W	300 W	300 W
Frequency	50/60 Hz	50/60 Hz	50/60 Hz
Notes	Based on common power supply 1400 W (AC/DC)	Based on common power supply 300 W (AC/DC)	Based on common power supply 300 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 CISPR22 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 CISPR22 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 CISPR22 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

Specifications (continued)

	HP A7503 Switch Chassis (JD240B)	HP A7503-S Switch Chassis (JD243B)	HP A7502 Switch Chassis (JD242B)
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
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	For non-TAA environment, IPS/IDS functionality provide by HP S1200E IPS A7500 Module (JC527A) For non-TAA environment, IKE/IPsec functionality provide by HP A7500 VPN Firewall Module (JD249A) IRF functionality does not support on A7502 and A7503-S chassis	For non-TAA environment, IPS/IDS functionality provide by HP S1200E IPS A7500 Module (JC527A) For non-TAA environment, IKE/IPsec functionality provide by HP A7500 VPN Firewall Module (JD249A) IRF functionality does not support on A7502 and A7503-S chassis	For non-TAA environment, IPS/IDS functionality provide by HP S1200E IPS A7500 Module (JC527A) For non-TAA environment, IKE/IPsec functionality provide by HP A7500 VPN Firewall Module (JD249A) IRF functionality does not support on A7502 and A7503-S chassis
Services	3-year, parts only, global next-day advance exchange (HP799E) 3-year, 4-hour onsite, 13x5 coverage for hardware (HP800E) 3-year, 4-hour onsite, 24x7 coverage for hardware (HP803E) 3-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 SW phone support and SW updates (HP806E) 3-year, 24x7 SW phone support, software updates (HP809E) 1-year, post-warranty, 4-hour onsite, 13x5 coverage for hardware (HR519E) 1-year, post-warranty, 4-hour onsite, 24x7 coverage for hardware (HR520E) 1-year, post-warranty, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone support (HR521E) Installation with minimum configuration, system-based pricing (UX032E) 4-year, 4-hour onsite, 13x5 coverage for hardware (HP801E) 4-year, 4-hour onsite, 24x7 coverage for hardware (HP804E) 4-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone (HP807E) 4-year, 24x7 SW phone support, software updates (HP810E) 5-year, 4-hour onsite, 13x5 coverage for hardware (HP802E) 5-year, 4-hour onsite, 24x7 coverage for hardware (HP805E) 5-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone (HP808E) 5-year, 24x7 SW phone support, software updates (HP811E) 3 Yr 6 hr Call-to-Repair Onsite (HP812E) 4 Yr 6 hr Call-to-Repair Onsite (HP813E) 5 Yr 6 hr Call-to-Repair Onsite (HP814E) 1-year, 6 hour Call-To-Repair Onsite for hardware (HR523E) 1-year, 24x7 software phone support, software updates (HR522E) Refer to the HP website at www.hp.com/networking/services for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local HP sales office.	3-year, parts only, global next-day advance exchange (HP799E) 3-year, 4-hour onsite, 13x5 coverage for hardware (HP800E) 3-year, 4-hour onsite, 24x7 coverage for hardware (HP803E) 3-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 SW phone support and SW updates (HP806E) 3-year, 24x7 SW phone support, software updates (HP809E) 1-year, post-warranty, 4-hour onsite, 13x5 coverage for hardware (HR519E) 1-year, post-warranty, 4-hour onsite, 24x7 coverage for hardware (HR520E) 1-year, post-warranty, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone support (HR521E) Installation with minimum configuration, system-based pricing (UX032E) 4-year, 4-hour onsite, 13x5 coverage for hardware (HP801E) 4-year, 4-hour onsite, 24x7 coverage for hardware (HP804E) 4-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone (HP807E) 4-year, 24x7 SW phone support, software updates (HP810E) 5-year, 4-hour onsite, 13x5 coverage for hardware (HP802E) 5-year, 4-hour onsite, 24x7 coverage for hardware (HP805E) 5-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone (HP808E) 5-year, 24x7 SW phone support, software updates (HP811E) 3 Yr 6 hr Call-to-Repair Onsite (HP812E) 4 Yr 6 hr Call-to-Repair Onsite (HP813E) 5 Yr 6 hr Call-to-Repair Onsite (HP814E) 1-year, 6 hour Call-To-Repair Onsite for hardware (HR523E) 1-year, 24x7 software phone support, software updates (HR522E) Refer to the HP website at www.hp.com/networking/services for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local HP sales office.	3-year, parts only, global next-day advance exchange (HP799E) 3-year, 4-hour onsite, 13x5 coverage for hardware (HP800E) 3-year, 4-hour onsite, 24x7 coverage for hardware (HP803E) 3-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 SW phone support and SW updates (HP806E) 3-year, 24x7 SW phone support, software updates (HP809E) 1-year, post-warranty, 4-hour onsite, 13x5 coverage for hardware (HR519E) 1-year, post-warranty, 4-hour onsite, 24x7 coverage for hardware (HR520E) 1-year, post-warranty, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone support (HR521E) Installation with minimum configuration, system-based pricing (UX032E) 4-year, 4-hour onsite, 13x5 coverage for hardware (HP801E) 4-year, 4-hour onsite, 24x7 coverage for hardware (HP804E) 4-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone (HP807E) 4-year, 24x7 SW phone support, software updates (HP810E) 5-year, 4-hour onsite, 13x5 coverage for hardware (HP802E) 5-year, 4-hour onsite, 24x7 coverage for hardware (HP805E) 5-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone (HP808E) 5-year, 24x7 SW phone support, software updates (HP811E) 3 Yr 6 hr Call-to-Repair Onsite (HP812E) 4 Yr 6 hr Call-to-Repair Onsite (HP813E) 5 Yr 6 hr Call-to-Repair Onsite (HP814E) 1-year, 6 hour Call-To-Repair Onsite for hardware (HR523E) 1-year, 24x7 software phone support, software updates (HR522E) Refer to the HP website at www.hp.com/networking/services for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local HP sales office.

Specifications (continued)

	HP A7503 Switch Chassis (JD240B)	HP A7503-S Switch Chassis (JD243B)	HP A7502 Switch Chassis (JD242B)
Standards and protocols (applies to all products in series)	**BGP** RFC 1771 BGPv4 RFC 1772 Application of the BGP RFC 1965 BGP4 confederations 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 **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 2271 FrameWork RFC 2579 (SMIv2 Text Conventions) RFC 2580 (SMIv2 Conformance) RFC 2819 (RMON groups Alarm, Event, History and Statistics only) HTTP, SSHv1, and Telnet Multiple Configuration Files Multiple Software Images SSHv1/SSHv2 Secure Shell TACACS/TACACS+ Web UI **General protocols** IEEE 802.1ad Q-in-Q IEEE 802.1ag Service Layer OAM 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 802.3u 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 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 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 RIP v2 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 2644 Directed Broadcast Control 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 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 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 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 3847 Restart signaling for IS-IS RFC 4251 The Secure Shell (SSH) Protocol Architecture RFC 4884 Extended ICMP to Support Multi-Part Messages RFC 4941 Privacy Extensions for Stateless Address Autoconfiguration in IPv6 RFC 5130 A Policy Control Mechanism in IS-IS Using Administrative Tags	**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) **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 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 **MIBs** 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

Specifications (continued)

	HP A7503 Switch Chassis (JD240B)	HP A7503-S Switch Chassis (JD243B)	HP A7502 Switch Chassis (JD242B)
Standards and protocols (applies to all products in series)	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 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 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) **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 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 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 **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 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 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 1850 OSPFv2 Management Information Base (MIB), traps RFC 2154 OSPF w/ 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 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

HP A7500 Switch Series accessories

Modules

HP A7500 48-port 100Base-FX SA Module (JD197B)

HP A7500 48-port 10/100Base-TX PoE-upgradable SA Module (JD198B)

HP A7500 48-port Gig-T PoE-upgradable SA Module (JD199B)

HP A7500 16-port GbE SFP / 8-port GbE Combo SA Module (JC667A)

HP A7500 20-port Gig-T / 4-port GbE PoE-upgradable Combo SA Module (JC668A)

HP A7500 2-port 10-GbE XFP SC Module (JD201A)

HP A7500 24-port GbE SFP SC Module (JD203B)

HP A7500 24-port Gig-T SC Module (JD204B)

HP A7500 24-port GbE SFP/2-port 10-GbE XFP SC Module (JD205A)

HP A7500 12-port GbE SFP SC Module (JD207A)

HP A7500 24-port Gig-T/2-port 10-GbE XFP SC Module (JD206A)

HP A7500 48-port Gig-T PoE-upgradable SC Module (JD210A)

HP A7500 48-port GbE SFP SC Module (JD211B)

HP A7500 16-port GbE SFP/8-port GbE Combo SC Module (JD223A)

HP A7500 40-port Gig-T/8-port GbE SFP PoE-upgradable SC Module (JD228B)

HP A7500 8-port 10-GbE SFP+ SC Module (JF290A)

HP A7500 20-port Gig-T / 4-port GbE Combo PoE-upgradable SC Module (JC669A)

HP A7500 8-port 10-GbE XFP SD Module (JD191A)

HP A7500 48-port Gig-T PoE+ SD Module (JD229B)

HP A7500 24-port GbE SFP/2-port 10-GbE XFP SD Module (JD230A)

HP A7500 16-port GbE SFP/8-port GbE Combo SD Module (JD234A)

HP A7500 4-port 10-GbE XFP SD Module (JD235A)

HP A7500 2-port 10-GbE XFP SD Module (JD236A)

HP A7500 48-port GbE SFP SD Module (JD237A)

HP A7500 12-port GbE SFP EA Module (JD202A)

HP A7500 1-port 10-GbE XFP EA Module (JD200A)

HP A7500 48-port GbE SFP EB Module (JD221A)

HP A7500 16-port GbE SFP / 8-port GbE Combo EB Module (JD231A)

HP A7500 4-port 10-GbE XFP EB Module (JD232A)

HP A7500 2-port 10-GbE XFP EB Module (JD233A)

Transceivers

HP X124 1G SFP LC LH40 1310nm Transceiver (JD061A)

HP X120 1G SFP LC LH40 1550nm Transceiver (JD062A)

HP X125 1G SFP LC LH70 Transceiver (JD063B)

HP X125 1G SFP RJ45 T Transceiver (JD089B)

HP X120 1G SFP LC BX 10-U Transceiver (JD098B)

HP X120 1G SFP LC BX 10-D Transceiver (JD099B)

HP X120 1G SFP LC LH100 Transceiver (JD103A)

HP X170 1G SFP LC LH70 1550 Transceiver (JD109A)

HP X170 1G SFP LC LH70 1570 Transceiver (JD110A)

HP X170 1G SFP LC LH70 1590 Transceiver (JD111A)

HP X170 1G SFP LC LH70 1610 Transceiver (JD112A)

HP X170 1G SFP LC LH70 1470 Transceiver (JD113A)

HP X170 1G SFP LC LH70 1490 Transceiver (JD114A)

HP X170 1G SFP LC LH70 1510 Transceiver (JD115A)

HP X170 1G SFP LC LH70 1530 Transceiver (JD116A)

HP X120 1G SFP LC SX Transceiver (JD118B)

HP X120 1G SFP LC LX Transceiver (JD119B)

HP X110 100M SFP LC LH40 Transceiver (JD090A)

HP X110 100M SFP LC LH80 Transceiver (JD091A)

HP X115 100M SFP LC BX 10-U Transceiver (JD100A)

HP X115 100M SFP LC BX 10-D Transceiver (JD101A)

HP X110 100M SFP LC FX Transceiver (JD102B)

HP X110 100M SFP LC LX Transceiver (JD120B)

HP X130 10G XFP LC ZR Transceiver (JD107A)

HP X130 10G XFP LC LR Transceiver (JD108B)

HP X130 10G XFP LC SR Transceiver (JD117B)

HP X135 10G XFP LC ER Transceiver (JD121A)

HP X130 SFP+ LC SR Transceiver (JD092B)

HP X130 SFP+ LC LRM Transceiver (JD093B)

HP X130 SFP+ LC LR Transceiver (JD094B)

HP X240 SFP+ SFP+ 0.65 m Direct Attach Cable (JD095B)

HP X240 SFP+ SFP+ 1.2 m Direct Attach Cable (JD096B)

HP X240 SFP+ SFP+ 3 m Direct Attach Cable (JD097B)

HP X240 SFP+ SFP+ 5 m Direct Attach Copper Cable (JG081B)

HP X180 10G XFP LC LH 80km 1538.98nm DWDM Transceiver (JG226A)

HP X180 10G XFP LC LH 80km 1539.77nm DWDM Transceiver (JG227A)

HP X180 10G XFP LC LH 80km 1540.56nm DWDM Transceiver (JG228A)

HP X180 10G XFP LC LH 80km 1542.14nm DWDM Transceiver (JG229A)

HP X180 10G XFP LC LH 80km 1542.94nm DWDM Transceiver (JG230A)

HP X180 10G XFP LC LH 80km 1558.98nm DWDM Transceiver (JG231A)

HP X180 10G XFP LC LH 80km 1559.79nm DWDM Transceiver (JG232A)

HP X180 10G XFP LC LH 80km 1560.61nm DWDM Transceiver (JG233A)

HP X130 10G SFP+ LC ER 40km Transceiver (JG234A)

Cables

HP 50 m Multimode OM3 LC/LC Optical Cable (AJ839A)

HP 30 m Multimode OM3 LC/LC Optical Cable (AJ838A)

HP 15 m Multimode OM3 LC/LC Optical Cable (AJ837A)

HP 5 m Multimode OM3 LC/LC Optical Cable (AJ836A)

HP 2 m Multimode OM3 LC/LC Optical Cable (AJ835A)

HP 1 m Multimode OM3 LC/LC Optical Cable (AJ834A)

HP A7500 Switch Series accessories (continued)

HP 0.5 m Multimode OM3 LC/LC Optical Cable (AJ833A)
NEW HP 0.5 m PremierFlex OM3+ LC/LC Optical Cable (BK837A)
NEW HP 1 m PremierFlex OM3+ LC/LC Optical Cable (BK838A)
NEW HP 2 m PremierFlex OM3+ LC/LC Optical Cable (BK839A)
NEW HP 5 m PremierFlex OM3+ LC/LC Optical Cable (BK840A)
NEW HP 15 m PremierFlex OM3+ LC/LC Optical Cable (BK841A)
NEW HP 30 m PremierFlex OM3+ LC/LC Optical Cable (BK842A)
NEW HP 50 m PremierFlex OM3+ LC/LC Optical Cable (BK843A)

License

HP A-WX Blade 128 AP License Upgrade (JD464B)

WLAN

HP A7500 Access Controller Module (JD440A)

Appliance

HP TippingPoint S1200N IPS A7500 Module (JC527A)

Memory

HP A7500 48-Port PoE DIMM (JD192B)
HP A7500 24-port PoE DIMM (JC671A)
HP A7500 1G Compact Flash Card (JC684A)
HP A7500 512M Compact Flash Card (JC685A)
HP A7500 256M Compact Flash Card (JC686A)

HP A7510 Switch Chassis (JD238B)

HP A7500 384Gbps Fabric/Main Processing Unit with 2 10-GbE XFP Ports (JD193B)
HP A7500 384Gbps Fabric/Main Processing Unit (JD194B)
HP A7500 384Gbps Fabric/Advanced Main Processing Unit (JD195A)
HP A7510 768Gbps Fabric/Main Processing Unit (JD220A)
HP A7500 1400W DC Power Supply (JD208A)
HP A7500 1400W AC Power Supply (JD218A)
HP A7500 2800W AC Power Supply (JD219A)
HP A7500 6000W AC Power Supply (JD227A)
HP A7510 Spare Fan Assembly (JD216A)

HP A7506-V Switch Chassis (JD241B)

HP A7500 384Gbps Fabric/Main Processing Unit with 2 10-GbE XFP Ports (JD193B)
HP A7500 384Gbps Fabric/Main Processing Unit (JD194B)
HP A7500 384Gbps Fabric/Advanced Main Processing Unit (JD195A)
HP A7510 768Gbps Fabric/Main Processing Unit (JD220A)
HP A7500 1400W DC Power Supply (JD208A)
HP A7500 1400W AC Power Supply (JD218A)
HP A7500 2800W AC Power Supply (JD219A)

HP A7500 6000W AC Power Supply (JD227A)
HP A7506-V Spare Fan Assembly (JD215A)

HP A7506 Switch Chassis (JD239B)

HP A7500 384Gbps Fabric/Main Processing Unit with 2 10-GbE XFP Ports (JD193B)
HP A7500 384Gbps Fabric/Main Processing Unit (JD194B)
HP A7500 384Gbps Fabric/Advanced Main Processing Unit (JD195A)
HP A7510 768Gbps Fabric/Main Processing Unit (JD220A)
HP A7500 1400W DC Power Supply (JD208A)
HP A7500 1400W AC Power Supply (JD218A)
HP A7500 2800W AC Power Supply (JD219A)
HP A7500 6000W AC Power Supply (JD227A)
HP A7506 Spare Fan Assembly (JD214A)

HP A7503 Switch Chassis (JD240B)

HP A7500 384Gbps Fabric/Main Processing Unit with 2 10-GbE XFP Ports (JD193B)
HP A7500 384Gbps Fabric/Main Processing Unit (JD194B)
HP A7500 384Gbps Fabric/Advanced Main Processing Unit (JD195A)
HP A7510 768Gbps Fabric/Main Processing Unit (JD220A)
HP A7500 1400W DC Power Supply (JD208A)
HP A7500 1400W AC Power Supply (JD218A)
HP A7500 2800W AC Power Supply (JD219A)
HP A7500 6000W AC Power Supply (JD227A)
HP A7503 Spare Fan Assembly (JD212A)

HP A7503-S Switch Chassis (JD243B)

HP A7503-S 144Gbps Fabric/Main Processing Unit with 16 GbE SFP Ports and 8 GbE Combo Ports (JD222A)
HP A7503-S 144 Gbps Fabric / Main Processing Unit with PoE-upgradable 20p Gig-T / 4p GbE Combo (JC666A)
HP A7503-S 144 Gbps TAA Fabric/Main Processing Unit with 16 GbE SFP Ports and 8 GbE Combo Ports (JC698A)
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HP A7503-S Spare Fan Assembly (JC672A)

HP A7502 Switch Chassis (JD242B)

HP A7502 Main Processing Unit (JD196A)
HP A7502 TAA-compliant Main Processing Unit (JC697A)
HP A7500 650W AC Power Supply (JD217A)
HP A7500 650W DC Power Supply (JD209A)
HP A7502 300W AC Power Supply (JD226A)
HP A7502 300W DC Power Supply (JD225A)
HP A-RPS800 Redundant Power System (JD183A)
HP A7502 Spare Fan Assembly (JD213A)

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