HP 10500 Switch Series

Product overview

The HP 10500 series switches set a new benchmark for performance, reliability, and scalability with a next-generation CLOS architecture. Designed for enterprise campus core networks, the HP 10500 enables a cloud-connected and media-rich capable infrastructure. The 10500 provides industry leading 10GbE/40GbE port density, 3 microsecond latency, and very low energy consumption. With HP IRF technology, the HP 10500 scalability and resiliency can be extended and virtualized across up to 4-chassis with a single management interface enabling flatter, more agile networks. The HP 10500 along with the entire HP FlexNetwork achitecture can be seamlessly managed through a single-pane-of-glass with HP Intelligent Management Center (IMC).

Key features

- Advanced next-generation CLOS architecture
- More than 11 terabit-per-second switching capacity
- Feature-rich including IPv6 & MPLS functionality
- HP IRF technology virtualizes up to four chassis
- Ultra-high 1/10/40GbE density; 100GbE ready

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

- **Traffic policing**
  Supports Committed Access Rate (CAR) and line rate

- **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

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**
  Each of the following interfaces can be enabled or disabled depending on security preferences: console port, telnet port, or reset button

- **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

- **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 12 interface module slots; up to 48 40 GbE ports, 576 10 GbE ports, 576 gigabit fiber/electrical ports per system
- **Jumbo frames**
  Up to 9216 bytes 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**
  Provides a combination of fiber and copper interface modules, 100/1000BASE-X auto-speed selection, and 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
- **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

Performance

- **High-speed fully distributed architecture**
  Supports up to 11.52 Tbps switching capacity with Type D fabric modules, providing non-blocking wire-speed 10GbE/40GbE performance & future 100GbE expansion capability; with 4 fabrics, the switch delivers up to 8571 Mpps throughput; all switching and routing is performed in the I/O modules; meets today's and future demand of 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 product selections to their budgets with a choice of four chassis; 10504 (4 open module slots), 10508 (8 open module slots), 10508-V (8 vertical open module slots) and 10512 (12 open module slots)

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
- **Hot-swappable modules**
  Allow replacement of modules without any impact on other modules
- **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
- **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 Protocol, Equal-Cost Multipath (ECMP), or VRRP
- **IRF capability**
  Provides single IP address management for a resilient virtual switching fabric of up to four switches

- **Rapid Ring Protection Protocol (RRPP)**
  Provides standard sub 200 ms recovery for ring Ethernet-based topology
- **Virtual Router Redundancy Protocol (VRRP)**
  Allows groups of two routers to dynamically back each other up to create highly available routed environments
- **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
- **Hitless patch upgrades**
  Allow patches and new service features to be installed without restarting the equipment, increasing network uptime and facilitating maintenance
- **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
- **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 (sub second) 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 100ms failover between links
- **Multiple internal power supplies**
  Provides high reliability; 10504 provide 3+1 redundancy; 10508/10508-V/10512 provide 5+1 redundancy

Layer 2 switching

- **VLAN**
  Supports up to 4,094 port-based 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 Protocol**
  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
- **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
- **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) uses 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) uses 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 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**
  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
- **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
- **Super VLAN**
  RFC 3069 standard, also called VLAN aggregation, is used to save IP address space

- **Equal-Cost Multipath (ECMP)**
  Enables multiple equal-cost links in a routing environment to increase link redundancy and scale bandwidth
- **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, Intra-Site Automatic Tunnel Addressing Protocol (ISATAP) tunnels and 6VPE(IPv6 on VPN to Provider Edge Router) tunnel

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
- **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
- **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 reception of fake IP addresses and reduces ARP attacks, improving security
- **IP Source Guard**
  Filters packets on a per-port basis, which prevents 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 IGMPv1, 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 optimizes 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 security threats, as well as capacity planning information; supports NetFlow v5 and v9

Additional information

- **Green initiative support**
  Provides support for RoHS and WEEE regulations
- **OPEX savings**
  Is a common operating system that simplifies and streamlines deployment, management, and training, thereby cutting costs as well as reducing the chance for human errors associated with having to manage multiple operating systems across different platforms and network layers
- **Unified, modular Comware operating system with modular architecture**
  All switching, routing, and security platforms leverage Comware, a common unified modular operating system; provides an easy-to-enhance-and-extend feature set without wholesale changes

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; to reach our support centers, refer to **hp.com/networking/contact-support**; for details on the duration of support provided with your product purchase, refer to **hp.com/networking/warrantysummary**
- **Software releases**
  To find software for your product, refer to **hp.com/networking/support**; for details on the software releases available with your product purchase, refer to **hp.com/networking/warrantysummary**

HP 10500 Switch Series

Specifications

	HP 10504 Switch Chassis (JC613A)	HP 10508 Switch Chassis (JC612A)
Ports	2 MPU (for management modules) slots 4 switch fabric slots 4 I/O module slots Supports a maximum of 192 10-GbE ports or 192 Gigabit ports or 192 SFP ports or 16 40-GbE ports, or a combination	2 MPU (for management modules) slots 4 switch fabric slots 8 I/O module slots Supports a maximum of 384 10-GbE ports or 384 Gigabit ports or 384 SFP ports or 32 40-GbE ports, or a combination
Power supplies	4 power supply slots 1 minimum power supply required (ordered separately)	6 power supply slots 1 minimum power supply required (ordered separately)
Fan tray	includes: 1 x JC632A 1 fan tray slot	includes: 1 x JC633A 1 fan tray slot
Physical characteristics Dimensions Weight Full configuration weight	17.32(d) x 25.98(w) x 13.9(h) in (43.99 x 65.99 x 35.31 cm) (8U height) 184.28 lb (83.59 kg) 183.14 lb (83.07 kg)	17.32(d) x 25.98(w) x 24.41(h) in (43.99 x 65.99 x 62 cm) (14U height) 271.06 lb (122.95 kg) 285.34 lb (129.43 kg)
Memory and processor Management module	MIPS64 @ 1G MHz, 128 MB flash, 1024 MB DDR2 SDRAM	MIPS64 @ 1G MHz, 128 MB flash, 1024 MB DDR2 SDRAM
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
Performance Throughput Switching capacity Routing table size MAC address table size	2857 million pps (64-byte packets) 3.8 Tbps 512000 entries 256000 entries	5714 million pps (64-byte packets) 7.7 Tbps 512000 entries 256000 entries
Reliability Availability	99.999%	99.999%
Environment Operating temperature Operating relative humidity Nonoperating/Storage temperature Nonoperating/Storage relative humidity Altitude Acoustic	32°F to 113°F (0°C to 45°C) 10% to 95%, noncondensing −40°F to 158°F (−40°C to 70°C) 5% to 95%, noncondensing up to 13,123 ft (4 km) Low-speed fan: 62.3 dB, High-speed fan: 75.5 dB	32°F to 113°F (0°C to 45°C) 10% to 95%, noncondensing −40°F to 158°F (−40°C to 70°C) 5% to 95%, noncondensing up to 13,123 ft (4 km) Low-speed fan: 63 dB, High-speed fan: 75.8 dB
Electrical characteristics Voltage DC voltage Current Power output Frequency Notes	100–120/200–240 VAC −48 to −60 VDC 16/60 A 2500 W 50/60 Hz Based on common power supply 2,500 W (AC)	100–120/200–240 VAC −48 to −60 VDC 16/60 A 2500 W 50/60 Hz Based on common power supply 2,500 W (AC)
Safety	CAN/CSA 22.2 No. 60950-1; FCC Part 15, Subpart B; FDA 21 CFR Subchapter J; ROHS Compliance; IEC 60950-1 :Second Edition ; EN 60950-1:2006 + A11:2009; AS/NZS 60950-1; IEC 60825-1; UL 60950-1, 2nd Edition; EN60825-2:2004+A1:2007	CAN/CSA 22.2 No. 60950-1; FCC Part 15, Subpart B; FDA 21 CFR Subchapter J; ROHS Compliance; IEC 60950-1 :Second Edition ; EN 60950-1:2006 + A11:2009; AS/NZS 60950-1; IEC 60825-1; UL 60950-1, 2nd Edition; EN60825-2:2004+A1:2007
Emissions	VCCI Class A; EN 55022 Class A; CISPR 22 Class A; IEC/EN 61000-3-2; IEC/EN 61000-3-3; ICES-003 Class A; AS/NZS CISPR22 Class A; FCC (CFR 47, Part 15) Class A; GB9254	VCCI Class A; EN 55022 Class A; CISPR 22 Class A; IEC/EN 61000-3-2; IEC/EN 61000-3-3; ICES-003 Class A; AS/NZS CISPR22 Class A; FCC (CFR 47, Part 15) Class A; GB9254
Immunity Generic EN ESD Radiated EFT/Burst Surge Conducted Power frequency magnetic field Voltage dips and interruptions Harmonics Flicker	Directive 2004/108/EC EN 55024:1998+ A1:2001 + A2:2003; ETSI EN 300 386 V1.3.3 EN 61000-4-2 EN 61000-4-3 EN 61000-4-4 EN 61000-4-5 EN 61000-4-6 IEC 61000-4-8 EN 61000-4-11 EN 61000-3-2, IEC 61000-3-2 EN 61000-3-3, IEC 61000-3-3	Directive 2004/108/EC EN 55024:1998+ A1:2001 + A2:2003; ETSI EN 300 386 V1.3.3 EN 61000-4-2 EN 61000-4-3 EN 61000-4-4 EN 61000-4-5 EN 61000-4-6 IEC 61000-4-8 EN 61000-4-11 EN 61000-3-2, IEC 61000-3-2 EN 61000-3-3, IEC 61000-3-3

Specifications (continued)

	HP 10504 Switch Chassis (JC613A)	HP 10508 Switch Chassis (JC612A)
Management	IMC—Intelligent Management Center; command-line interface; 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; 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
Services	3-year, parts only, global next-day advance exchange (HT059E)	3-year, parts only, global next-day advance exchange (HT092E)
	3-year, 4-hour onsite, 13x5 coverage for hardware (HT060E)	3-year, 4-hour onsite, 13x5 coverage for hardware (HT093E)
	3-year, 4-hour onsite, 24x7 coverage for hardware (HT062E)	3-year, 4-hour onsite, 24x7 coverage for hardware (HT095E)
	3-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 SW phone support and SW updates (HT067E)	3-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 SW phone support and SW updates (HT100E)
	3-year, 24x7 SW phone support, software updates (HT066E)	3-year, 24x7 SW phone support, software updates (HT099E)
	Installation with minimum configuration, system-based pricing (UX033E)	Installation with minimum configuration, system-based pricing (UX033E)
	4-year, 4-hour onsite, 13x5 coverage for hardware (HT068E)	4-year, 4-hour onsite, 13x5 coverage for hardware (HT101E)
	4-year, 4-hour onsite, 24x7 coverage for hardware (HT070E)	4-year, 4-hour onsite, 24x7 coverage for hardware (HT103E)
	4-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone (HT075E)	4-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone (HT108E)
	4-year, 24x7 SW phone support, software updates (HT074E)	4-year, 24x7 SW phone support, software updates (HT107E)
	5-year, 4-hour onsite, 13x5 coverage for hardware (HT076E)	5-year, 4-hour onsite, 13x5 coverage for hardware (HT109E)
	5-year, 4-hour onsite, 24x7 coverage for hardware (HT078E)	5-year, 4-hour onsite, 24x7 coverage for hardware (HT111E)
	5-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone (HT083E)	5-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone (HT116E)
	5-year, 24x7 SW phone support, software updates (HT082E)	5-year, 24x7 SW phone support, software updates (HT115E)
	3 Yr 6 hr Call-to-Repair Onsite (HT064E)	3 Yr 6 hr Call-to-Repair Onsite (HT097E)
	4 Yr 6 hr Call-to-Repair Onsite (HT072E)	4 Yr 6 hr Call-to-Repair Onsite (HT105E)
	5 Yr 6 hr Call-to-Repair Onsite (HT080E)	5 Yr 6 hr Call-to-Repair Onsite (HT113E)
	1-year, 4-hour onsite, 13x5 coverage for hardware (HT051E)	1-year, 4-hour onsite, 13x5 coverage for hardware (HT084E)
	1-year, 4-hour onsite, 24x7 coverage for hardware (HT053E)	1-year, 4-hour onsite, 24x7 coverage for hardware (HT086E)
	1-year, 6 hour Call-To-Repair Onsite for hardware (HT055E)	1-year, 6 hour Call-To-Repair Onsite for hardware (HT088E)
	1-year, 24x7 software phone support, software updates (HT057E)	1-year, 24x7 software phone support, software updates (HT090E)
	1-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone support and software updates (HT058E)	1-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone support and software updates (HT091E)
	Refer to the HP website at **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.	Refer to the HP website at **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 10504 Switch Chassis (JC613A) and HP 10508 Switch Chassis (JC612A)		
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 802.3x 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 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 4486 Subcodes for BGP Cease Notification Message 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 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 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

Specifications (continued)

HP 10504 Switch Chassis (JC613A) and HP 10508 Switch Chassis (JC612A)

Standards and protocols
(applies to all products in series)

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 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 1724 RIPv2 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 Interface 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 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 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 10508-V Switch Chassis (JC611A)	HP 10512 Switch Chassis (JC748A)
Ports	2 MPU (for management modules) slots 4 switch fabric slots 8 I/O module slots Supports a maximum of 384 10-GbE ports or 384 Gigabit ports or 384 SFP ports or 32 40-GbE ports, or a combination	2 MPU (for management modules) slots 4 switch fabric slots 12 I/O module slots Supports a maximum of 576 10-GbE ports or 576 Gigabit ports or 576 SFP ports or 48 40-GbE ports, or a combination
Power supplies	6 power supply slots 1 minimum power supply required (ordered separately)	6 power supply slots 1 minimum power supply required (ordered separately)
Fan tray	includes: 1 x JC634A 1 fan tray slot	includes: 1 x JC758A, JC773A 2 fan tray slots
Physical characteristics Dimensions Weight Full configuration weight	17.32(d) x 25.98(w) x 34.88(h) in (43.99 x 65.99 x 88.6 cm) (20U height) 317.02 lb (143.8 kg) 331.31 lb (150.28 kg)	25.98(d) x 17.32(w) x 31.38(h) in (66.0 x 44.0 x 79.7 cm) (18U height) 166.23 lb (75.4 kg) chassis 380.95 lb (172.8 kg)
Memory and processor Management module	MIPS64 @ 1G MHz, 128 MB flash, 1024 MB DDR2 SDRAM	MIPS64 @ 1G MHz, 128 MB flash, 1024 MB DDR2 SDRAM
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
Performance Throughput Switching capacity Routing table size MAC address table size	5714 million pps (64-byte packets) 7.7 Tbps 512000 entries 256000 entries	8571 million pps (64-byte packets) 11.5 Tbps 512000 entries 256000 entries
Reliability Availability	99.999%	99.999%
Environment Operating temperature Operating relative humidity Nonoperating/Storage temperature Nonoperating/Storage relative humidity Altitude Acoustic	32°F to 113°F (0°C to 45°C) 10% to 95%, noncondensing −40°F to 158°F (−40°C to 70°C) 5% to 95%, noncondensing up to 13,123 ft (4 km) Low-speed fan: 61.6 dB, High-speed fan: 72.6 dB	32°F to 113°F (0°C to 45°C) 10% to 95%, noncondensing −40°F to 158°F (−40°C to 70°C) 5% to 95%, noncondensing up to 13,123 ft (4 km) Low-speed fan: 66 dB, High-speed fan: 79 dB
Electrical characteristics Voltage DC voltage Current Power output Frequency Notes	100–120/200–240 VAC −48 to −60 VDC 16/60 A 2500 W 50/60 Hz Based on common power supply 2,500 W (AC)	100–120/200–240 VAC −48 to −60 VDC 16/60 A 2500 W 50/60 Hz Based on common power supply 2,500 W (AC)
Safety	CAN/CSA 22.2 No. 60950-1; FCC Part 15, Subpart B; FDA 21 CFR Subchapter J; ROHS Compliance; IEC 60950-1 :Second Edition ; EN 60950-1:2006 + A11:2009; AS/NZS 60950-1; IEC 60825-1; UL 60950-1, 2nd Edition; EN60825-2:2004+A1:2007	CAN/CSA 22.2 No. 60950-1; FCC Part 15, Subpart B; FDA 21 CFR Subchapter J; ROHS Compliance; IEC 60950-1 :Second Edition ; EN 60950-1:2006 + A11:2009; AS/NZS 60950-1; IEC 60825-1; UL 60950-1, 2nd Edition; EN60825-2:2004+A1:2007
Emissions	VCCI Class A; EN 55022 Class A; CISPR 22 Class A; IEC/EN 61000-3-2; IEC/EN 61000-3-3; ICES-003 Class A; AS/NZS CISPR22 Class A; FCC (CFR 47, Part 15) Class A; GB9254	VCCI Class A; EN 55022 Class A; CISPR 22 Class A; IEC/EN 61000-3-2; IEC/EN 61000-3-3; ICES-003 Class A; AS/NZS CISPR22 Class A; FCC (CFR 47, Part 15) Class A; GB9254
Immunity Generic EN ESD Radiated EFT/Burst Surge Conducted Power frequency magnetic field Voltage dips and interruptions Harmonics Flicker	Directive 2004/108/EC EN 55024:1998+ A1:2001 + A2:2003; ETSI EN 300 386 V1.3.3 EN 61000-4-2 EN 61000-4-3 EN 61000-4-4 EN 61000-4-5 EN 61000-4-6 IEC 61000-4-8 EN 61000-4-11 EN 61000-3-2, IEC 61000-3-2 EN 61000-3-3, IEC 61000-3-3	Directive 2004/108/EC EN 55024:1998+ A1:2001 + A2:2003; ETSI EN 300 386 V1.3.3 EN 61000-4-2 EN 61000-4-3 EN 61000-4-4 EN 61000-4-5 EN 61000-4-6 IEC 61000-4-8 EN 61000-4-11 EN 61000-3-2, IEC 61000-3-2 EN 61000-3-3, IEC 61000-3-3

Specifications (continued)

	HP 10508-V Switch Chassis (JC611A)	HP 10512 Switch Chassis (JC748A)
Management	IMC—Intelligent Management Center; command-line interface; 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; 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
Services	3-year, parts only, global next-day advance exchange (HT092E) 3-year, 4-hour onsite, 13x5 coverage for hardware (HT093E) 3-year, 4-hour onsite, 24x7 coverage for hardware (HT095E) 3-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 SW phone support and SW updates (HT100E) 3-year, 24x7 SW phone support, software updates (HT099E) Installation with minimum configuration, system-based pricing (UX033E) 4-year, 4-hour onsite, 13x5 coverage for hardware (HT101E) 4-year, 4-hour onsite, 24x7 coverage for hardware (HT103E) 4-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone (HT108E) 4-year, 24x7 SW phone support, software updates (HT107E) 5-year, 4-hour onsite, 13x5 coverage for hardware (HT109E) 5-year, 4-hour onsite, 24x7 coverage for hardware (HT111E) 5-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone (HT116E) 5-year, 24x7 SW phone support, software updates (HT115E) 3 Yr 6 hr Call-to-Repair Onsite (HT097E) 4 Yr 6 hr Call-to-Repair Onsite (HT105E)	Refer to the HP website at **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 10508-V Switch Chassis (JC611A) and HP 10512 Switch Chassis (JC748A)

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 802.3x 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 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 4486 Subcodes for BGP Cease Notification Message
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 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 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

Specifications (continued)

	HP 10508-V Switch Chassis (JC611A) and HP 10512 Switch Chassis (JC748A)		
Standards and protocols (applies to all products in series)	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 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 1724 RIPv2 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 Interface 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 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 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 10500 Switch Series accessories

Modules

HP 10500 Main Processing Unit (JC614A)

HP 10500 16-port GbE SFP/8-port GbE Combo/2-port 10GbE XFP SE Module (JC617A)

HP 10500 48-port Gig-T SE Module (JC618A)

HP 10500 48-port GbE SFP SE Module (JC619A)

HP 10500 4-port 10GbE XFP SE Module (JC620A)

HP 10500 16-port GbE SFP/8-port GbE Combo/2-port 10GbE XFP EA Module (JC621A)

HP 10500 48-port GbE SFP EA Module (JC622A)

HP 10500 48-port Gig-T EA Module (JC623A)

HP 10500 4-port 10GbE XFP EA Module (JC624A)

HP 10500 48-port GbE SFP EB Module (JC625A)

HP 10500 16-port GbE SFP/8-port GbE Combo/2-port 10GbE XFP EB Module (JC626A)

HP 10500 4-port 10GbE XFP EB Module (JC627A)

HP 10500 16-port 10GbE SFP+ SC Module (JC628A)

HP 10500 8-port 10GbE SFP+ EB Module (JC629A)

HP 10500 8-port 10GbE SFP+ EA Module (JC630A)

HP 10500 8-port 10GbE SFP+ SE Module (JC631A)

HP 10500 32-port 10GbE SFP+ SF Module (JC755A)

HP 10500 48-port 10GbE SFP+ SF Module (JC756A)

HP 10500 4-port 40GbE QSFP+ SF Module (JC757A)

HP 10500 16-port GbE SFP / 8-port GbE Combo SE Module (JC763A)

Transceivers

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

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

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

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

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

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

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

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

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

HP X125 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 X120 1G SFP RJ45 T Transceiver (JD089B)

HP X110 100M SFP LC LH40 Transceiver (JD090A)

HP X110 100M SFP LC LH80 Transceiver (JD091A)

HP X130 10G SFP+ LC SR Transceiver (JD092B)

HP X130 10G SFP+ LC LRM Transceiver (JD093B)

HP X130 10G SFP+ LC LR Transceiver (JD094B)

HP X240 10G SFP+ to SFP+ 0.65m Direct Attach Copper Cable (JD095C)

HP X240 10G SFP+ to SFP+ 1.2m Direct Attach Copper Cable (JD096C)

HP X240 10G SFP+ to SFP+ 3m Direct Attach Copper Cable (JD097C)

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

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

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 X120 1G SFP LC LH100 Transceiver (JD103A)

HP X130 10G XFP LC ZR Transceiver (JD107A)

HP X130 10G XFP LC LR Transceiver (JD108B)

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 X130 10G XFP LC SR Transceiver (JD117B)

HP X120 1G SFP LC SX Transceiver (JD118B)

HP X120 1G SFP LC LX Transceiver (JD119B)

HP X110 100M SFP LC LX Transceiver (JD120B)

HP X135 10G XFP LC ER Transceiver (JD121A)

HP X240 10G SFP+ to SFP+ 5m Direct Attach Copper Cable (JG081C)

HP X140 40G QSFP+ MPO SR4 Transceiver (JG325A)

HP X240 40G QSFP+ to QSFP+ 1m Direct Attach Copper Cable (JG326A)

HP X240 40G QSFP+ to QSFP+ 3m Direct Attach Copper Cable (JG327A)

HP X240 40G QSFP+ to QSFP+ 5m Direct Attach Copper Cable (JG328A)

HP X240 40G QSFP+ to 4x10G SFP+ 1m Direct Attach Copper Splitter Cable (JG329A)

HP X240 40G QSFP+ to 4x10G SFP+ 3m Direct Attach Copper Splitter Cable (JG330A)

HP X240 40G QSFP+ to 4x10G SFP+ 5m Direct Attach Copper Splitter Cable (JG331A)

Security Modules

HP 10500/7500 Load Balancing Module (JD252A)

Power Supply

HP 10500 2500W AC Power Supply (JC610A)

Mounting Kit

HP X421 Chassis Universal 4-post Rack Mounting Kit (JC665A)

HP 10500 Switch Series accessories (continued)

License
HP 10500/7500 SSL VPN 1000-user License (JD257A)

HP 10500/7500 SSL VPN 5000-user License (JD258A)

Appliance
HP 10500/7500 Advanced VPN Firewall Module (JD249A)

HP 10500/7500 SSL VPN Module with 500-user License (JD253A)

HP 10500/7500 NetStream Monitoring Module (JD254A)

HP 10504 Switch Chassis (JC613A)
HP 10504 400 Gbps Type A Fabric Module (JC615A)

HP 10504 880 Gbps Type B Fabric Module (JC751A)

HP 10504 1.2 Tbps Type D Fabric Module (JC752A)

HP 10504 Spare Fan Assembly (JC632A)

HP 10508-V Switch Chassis (JC611A)
HP 10508/10508-V 720 Gbps Type A Fabric Module (JC616A)

HP 10508/10508-V 1.04 Tbps Type B Fabric Module (JC753A)

HP 10508/10508-V 2.32 Tbps Type D Fabric Module (JC754A)

HP 10508-V Spare Fan Assembly (JC634A)

HP 10508 Switch Chassis (JC612A)
HP 10508/10508-V 720 Gbps Type A Fabric Module (JC616A)

HP 10508/10508-V 1.04 Tbps Type B Fabric Module (JC753A)

HP 10508/10508-V 2.32 Tbps Type D Fabric Module (JC754A)

HP 10508 Spare Fan Assembly (JC633A)

HP 10512 Switch Chassis (JC748A)
HP 10512 1.52 Tbps Type B Fabric Module (JC749A)

HP 10512 3.44 Tbps Type D Fabric Module (JC750A)

HP 10512 Spare Top Fan Tray Assembly (JC758A)

HP 10512 Spare Bottom Fan Tray Assembly (JC773A)

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