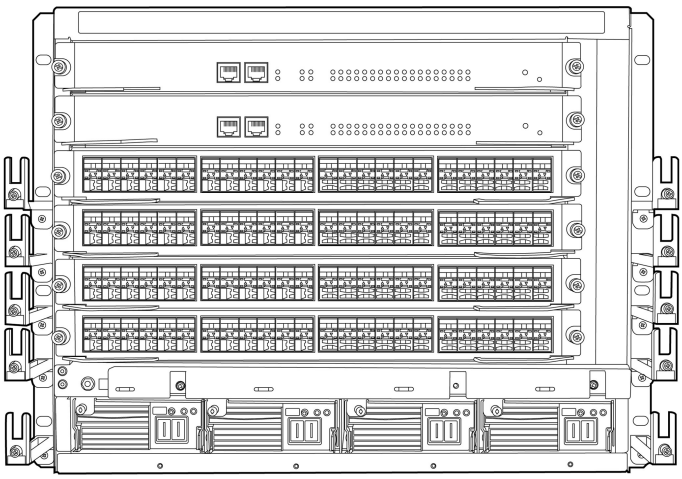
Product overview

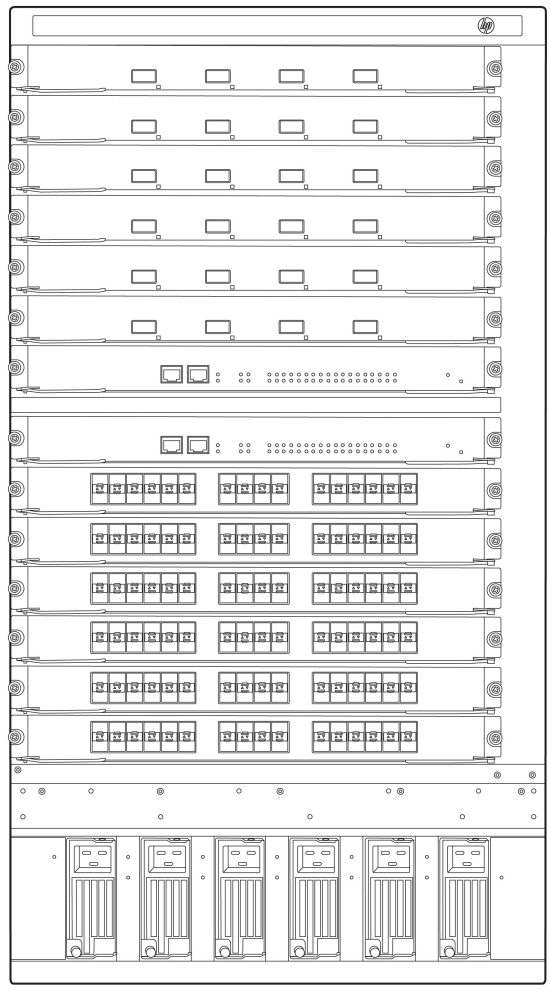
The HP 10500 Switch Series sets a new benchmark for performance, reliability, and scalability with a next-generation Clos architecture.

Designed for enterprise campus core networks, the HP 10500 Switch Series enables a cloud-connected and media-rich capable infrastructure. The 10500 series provides industry-leading 10GbE/40GbE port density, 3-microsecond latency, and very low energy consumption. With HP Intelligent Resilient Framework (IRF) technology, the scalability and resiliency of the 10500 switch series can be extended and virtualized across up to four chassis with a single management interface, enabling flatter, more agile networks.

The HP 10500 Switch Series, along with the entire HP FlexNetwork architecture, can be seamlessly managed through single-pane-of-glass management with HP Intelligent Management Center (IMC).

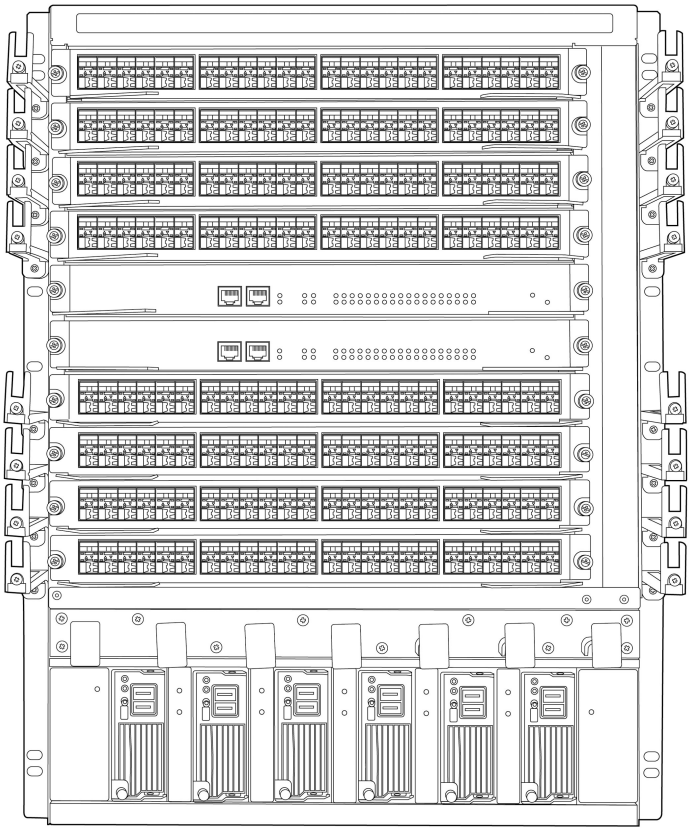


HP 10504 Switch Chassis

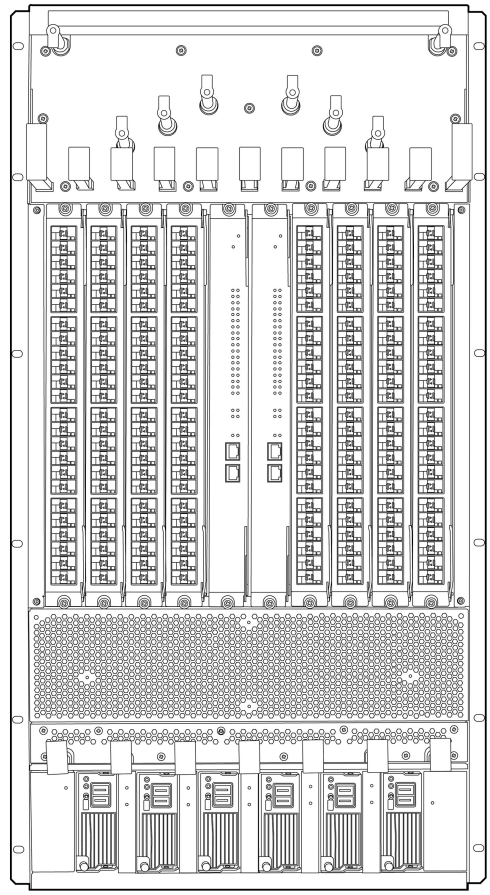


HP 10512 Switch Chassis

Overview



HP 10508 Switch Chassis



HP 10508-V Switch Chassis

Key features

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

Features and benefits

Product architecture

- **Advanced Comware modular operating system**
  brings native high stability, independent process monitoring, and restart through the modular design and multiple processes of HP Comware v7 software; allows individual software modules to be upgraded for higher availability and supports enhanced serviceability functions
- **In-service software upgrade (ISSU)**
  provides an upgrade of the entire chassis, or an individual task or process, with zero packet loss
- **Distributed architecture with separation of data and control**
  delivers enhanced fault tolerance and facilitates continuous operation and zero service disruption during planned or unplanned

Overview

control-plane events

- **NEW** Multitenant Device Context (MDC)
  virtualizes a physical switch into multiple logical devices, with each logical switch having its own processes, configuration, and administration

Performance

- **High-speed fully distributed architecture**
  provides up to 11.52 Tb/s switching capacity with released line cards and up to 13.72 Tb/s switching fabric capacity with Type D fabric; modules provide nonblocking wirespeed 10GbE/40GbE performance and future 100GbE expansion capability; with four fabrics, the switch delivers up to 8.571 billion pps throughput; all switching and routing is performed in the I/O modules; meets the demand of bandwidth-intensive applications today and in the future
- **Scalable system design**
  provides investment protection to support future technologies and higher-speed connectivity, as the switch is designed for increased backplane bandwidth
- **Flexible chassis selection**
  enables you to tailor product selections to your budget with a choice of four chassis: the 10504 switch (four open module slots), 10508 switch (eight open module slots), 10508-V switch (eight vertical open module slots), and 10512 switch (12 open module slots)

Connectivity

- **High-density port connectivity**
  offers up to 12 interface module slots; provides up to 96 40GbE ports, 576 10GbE ports, and 576 gigabit fiber/electrical ports per system
- **Jumbo frames**
  allow high-performance backups and disaster-recovery systems; provide a maximum frame size of 9K bytes
- **Loopback**
  supports internal loopback testing for maintenance purposes and an increase in availability; loopback detection protects against incorrect cabling or network configurations and can be enabled on a per-port or per-VLAN basis for added flexibility
- **Ethernet operations, administration and maintenance (OAM):**
  detects data link layer problems that occurred in the "last mile" using the IEEE 802.3ah OAM standard; monitors the status of the link between two devices
- **Flexible port selection**
  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 (Comware v5 only)
- **Dual-personality functionality**
  includes four 10/100/1000 ports or SFP slots for optional fiber connectivity such as Gigabit-SX, -LX, and -LH, or 100-FX
- **Packet storm protection**
  protects against unknown broadcast, unknown multicast, or unicast storms with user-defined thresholds
- **Flow control**
  provides back pressure using standard IEEE 802.3x, reducing congestion in heavy traffic situations

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

Overview

port, and DiffServ

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

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**
  keep control separated from services and keep service processing isolated; increase 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 L2 switch and L3 router; switches do not have to be co-located and can be part of a disaster-recovery system; servers or switches can be attached using standard LACP for automatic load balancing and high availability; can eliminate the need for complex protocols like Spanning Tree Protocol, Equal-Cost Multipath (ECMP), or VRRP, thereby simplifying network operation
- **IRF capability**
  provides single IP address management for a resilient virtual switching fabric of up to four switches
- **Rapid Ring Protection Protocol (RRPP)**
  provides standard sub 200 ms recovery for ring-based Ethernet topology (Comware v5 only)
- **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 1024 trunk groups and up to 16 members per trunk; supports static or dynamic groups and a user-selectable hashing algorithm
- **Graceful restart**
  supports graceful restart for OSPF, IS-IS, BGP, LDP, and RSVP; the network remains stable during the active-standby switchover; after the switchover, the device quickly learns the network routes by communicating with adjacent routers; forwarding remains uninterrupted during the switchover to achieve nonstop forwarding (NSF)

Overview

- **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 100 ms failover between links
- **Multiple internal power supplies**
  provides high reliability; 10504 switch provides 3+1 redundancy; 10508, 10508-V, and 10512 switches provide 5+1 redundancy

Virtual private network (VPN)

- **IPSec**
  provides secure tunneling over an untrusted network such as the Internet or a wireless network; offers data confidentiality, authenticity, and integrity between two network endpoints
- **Generic Routing Encapsulation (GRE)**
  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 wirespeed network monitoring and accounting with no impact on network performance; this allows network operators to gather a variety of sophisticated network statistics and information for capacity planning and real-time network monitoring purposes
- **Remote monitoring (RMON)**
  uses standard SNMP to monitor essential network functions; supports events, alarm, history, and statistics group plus a private alarm extension group (Comware v5 only)
- **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); Secure File Transfer Protocol (SFTP) runs over an SSH tunnel to provide additional security
- **Debug and sampler utility**
  supports ping and traceroute for both IPv4 and IPv6
- **Network Time Protocol (NTP)**
  synchronizes timekeeping among distributed time servers and clients; keeps timekeeping consistent among all clock-dependent devices within the network so that the devices can provide diverse applications based on the consistent time
- **Network Quality Analyzer (NQA)**
  analyzes network performance and service quality by sending test packets, and provides network performance and service

Overview

quality parameters such as jitter, TCP, or FTP connection delays and file transfer rates; allows a network manager to determine overall network performance and to diagnose and locate network congestion points or failures

- **Information center**
  provides a central repository for system and network information; aggregates all logs, traps, and debugging information generated by the system and maintains them in order of severity; outputs the network information to multiple channels based on user-defined rules
- **IEEE 802.1AB Link Layer Discovery Protocol (LLDP)**
  advertises and receives management information from adjacent devices on a network, facilitating easy mapping by network management applications
- **Dual flash images**
  provide independent primary and secondary operating system files for backup while upgrading
- **Multiple configuration files**
  can be stored to the flash image

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 (Comware v7 supports port-based VLANs only)
- **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 VLAN to build a separate spanning tree to improve link bandwidth usage in network environmentswith multiple VLANs (Comware v5 only)

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

Overview

- **Dynamic Host Configuration Protocol (DHCP)**
  simplifies the management of large IP networks and supports client and server; DHCP Relay enables DHCP operation across subnets
- **Domain Name System (DNS)**
  provides a distributed database that translates domain names and IP addresses, which simplifies network design; supports client and server

Layer 3 routing

- **Static IPv4 routing**
  provides simple manually configured IPv4 routing
- **Routing Information Protocol (RIP)**
  uses a distance vector algorithm with UDP packets for route determination; supports RIPv1 and RIPv2 routing; includes loop protection
- **Open shortest path first (OSPF):**
  delivers faster convergence; uses this link-state routing Interior Gateway Protocol (IGP), which supports ECMP, NSSA, and MD5 authentication for increased security and graceful restart for faster failure recovery
- **Intermediate system to intermediate system (IS-IS)**
  uses a path vector Interior Gateway Protocol (IGP), which is defined by the ISO organization for IS-IS routing and extended by IETF RFC 1195 to operate in both TCP/IP and the OSI reference model (Integrated IS-IS)
- **Border Gateway Protocol 4 (BGP-4)**
  delivers an implementation of the Exterior Gateway Protocol (EGP) utilizing path vectors; uses TCP for enhanced reliability for the route discovery process; reduces bandwidth consumption by advertising only incremental updates; supports extensive policies for increased flexibility; scales to very large networks
- **Policy-based routing**
  makes routing decisions based on policies set by the network administrator
- **IP performance optimization**
  provides a set of tools to improve the performance of IPv4 networks; includes directed broadcasts, customization of TCP parameters, support of ICNP error packets, and extensive display capabilities
- **Unicast Reverse Path Forwarding (uRPF)**
  limits erroneous or malicious traffic in accordance with RFC 3074
- **Static IPv6 routing**
  provides simple, manually configured IPv6 routing
- **Dual IP stack**
  maintains separate stacks for IPv4 and IPv6 to ease the transition from an IPv4-only network to an IPv6-only network design
- **Routing Information Protocol next generation (RIPng)**
  extends RIPv2 to support IPv6 addressing
- **OSPFv3**
  provides OSPF support for IPv6
- **IS-IS for IPv6**
  extends IS-IS to support IPv6 addressing
- **BGP+**
  extends BGP-4 to support Multiprotocol BGP (MBGP), including support for IPv6 addressing
- **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

Overview

- **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**
  saves IP address space using the RFC 3069 standard (also called VLAN Aggregation)
- **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 IPv6 on VPN to Provider Edge (6VPE) 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
- **Remote Authentication Dial-In User Service (RADIUS)**
  eases switch security access administration by using a password authentication server
- **Terminal Access Controller Access-Control System (TACACS+)**
  delivers an authentication tool using TCP with encryption of the full authentication request, providing additional security
- **Switch management logon security**
  helps secure switch CLI logon by optionally requiring either RADIUS or TACACS+ authentication
- **Secure shell (SSHv2)**
  uses external servers to securely log in to a remote device; with authentication and encryption, it protects against IP spoofing and plain-text password interception; increases the security of Secure FTP (SFTP) transfers
- **DHCP snooping**
  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

Overview

  - **Web-based authentication**
    is similar to IEEE 802.1X and provides a browser-based environment to authenticate clients that do not support the IEEE 802.1X supplicant
  - **MAC-based authentication**
    authenticates the client with the RADIUS server based on the client's MAC address
- **DHCP protection**
  blocks DHCP packets from unauthorized DHCP servers, preventing denial-of-service attacks
- **Endpoint Admission Defense (EAD)**
  provides security policies to users accessing a network

Convergence

- **LLDP-MED (Media Endpoint Discovery)**
  defines a standard extension of LLDP that stores values for parameters such as QoS and VLAN to automatically configure network devices such as IP phones
- **Multicast Source Discovery Protocol (MSDP)**
  allows multiple PIM-SM domains to interoperate; is used for inter-domain multicast applications (Comware v5 only)
- **Internet Group Management Protocol (IGMP)**
  utilizes Any-Source Multicast (ASM) or Source-Specific Multicast (SSM) to manage IPv4 multicast networks; supports IGMPv1, v2, and v3
- **Protocol Independent Multicast (PIM)**
  defines modes of Internet IPv4 and IPv6 multicasting to allow one-to-many and many-to-many transmission of information; supports PIM Dense Mode (DM), Sparse Mode (SM), and Source-Specific Mode (SSM)
- **Multicast Border Gateway Protocol (MBGP)**
  allows multicast traffic to be forwarded across BGP networks and kept separate from unicast traffic
- **Multicast Listener Discovery (MLD) protocol**
  establishes, maintains, and manages IPv6 multicast groups and networks; supports v1 and v2 and utilizes Any-Source Multicast (ASM) or Source-Specific Multicast (SSM)
- **Multicast VLAN**
  allows multiple VLANs to receive the same IPv4 or IPv6 multicast traffic, lessening network bandwidth demand by reducing or eliminating multiple streams to each VLAN
- **Voice VLAN**
  automatically assigns VLAN and priority for IP phones, simplifying network configuration and maintenance (Comware v5 only)

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 (JD249A; Comware v5 only)
- **Load-balancing module**
  local and global server load-balancing module helps improve traffic distribution using powerful scheduling algorithms, including Layer 4 to 7 services; monitors the health status of servers and firewalls (JD254A; Comware v5 only)
- **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 (JD254A; Comware v5 only)
- **Unified wired-WLAN module**:

Overview

- supports up to 1,024 access points per module
- is for use with selected HP APs (see the HP 10500/7500 20G Unified Wired-WLAN Module data sheet for more details)
- provides N+1, N+N, and 1+1 redundancy with subsecond failover
- provides IPv4/IPv6 and end-to-end QoS
- includes flexible forwarding modes, as well as Wi-Fi Clear Connect Radio Frequency (RF) optimization and integrated IDS

- **VPN 20Gbps 10500 Firewall Module**
  - provides enhanced stateful packet inspection and filtering
  - supports flexible security zones and virtual firewall containment
  - delivers advanced VPN services with 3DES and AES encryption at high performance and low latency
  - offers Web content filtering and application prioritization and optimization

Additional information

- **Green initiative support**
  provides support for RoHS and WEEE regulations
- **OPEX savings**
  simplifies and streamlines deployment, management, and training through the use of a common operating system, thereby cutting costs as well as reducing the risk of human errors associated with having to manage multiple operating systems across different platforms and network layers
- **Unified HP Comware operating system with modular architecture**
  provides an easy-to-enhance-and-extend feature set, which doesn't require whole-scale changes; all switching, routing, and security platforms leverage the Comware OS, a common unified modular operating system

Warranty and support

- **1-year Warranty 2.0**
  advance hardware replacement with 10-calendar-day delivery (available in most countries)
- **Electronic and telephone support (for Warranty 2.0)**
  limited electronic and 24x7 telephone support is available from HP for the entire warranty period; to reach our support centers, refer to **www.hp.com/networking/contact-support**; for details on the duration of support provided with your product purchase, refer to **www.hp.com/networking/warrantysummary**
- **Software releases**
  to find software for your product, refer to **www.hp.com/networking/support**; for details on the software releases available with your product purchase, refer to **www.hp.com/networking/warrantysummary**

Configuration

Build To Order: BTO is a standalone unit with no integration. BTO products ship standalone are not part of a CTO or Rack-Shippable solution.

HP 10504 Switch Chassis JC613A
- Must select min 1 Interface Module
- Must select min 4 Fabric Modules
- Must select min 1 Management Module
- Must select min 1 Power Supply
- 8U - Height

HP 10508 Switch Chassis JC612A
- Must select min 1 Interface Module
- Must select min 4 Fabric Modules
- Must select min 1 Management Module
- Must select min 1 Power Supply
- 14U - Height

HP 10508-V Switch Chassis JC611A
- Must select min 1 Interface Module
- Must select min 4 Fabric Modules
- Must select min 1 Management Module
- Must select min 1 Power Supply
- 20U - Height

HP 10512 Switch Chassis JC748A
- Must select min 1 Interface Module
- Must select min 4 Fabric Modules
- Must select min 1 Management Module
- Must select min 1 Power Supply
- 18U - Height

Box Level Integration CTO Models

CTO Solution Sku

HP 105xx CTO Switch Solution JG504A
- SSP trigger sku

CTO Switch Chassis

HP 10504 Switch Chassis JC613A
- Must select min 1 Interface Module
- Must select min 4 Fabric Modules
- Must select min 1 Management Module
- Must select min 1 Power Supply
- 8U - Height

See Configuration Note:1, 2

Configuration

HP 10508 Switch Chassis — JC612A

- Must select min 1 Interface Module
- Must select min 4 Fabric Modules
- Must select min 1 Management Module
- Must select min 1 Power Supply
- 14U - Height

See Configuration Note:1, 2

HP 10508-V Switch Chassis — JC611A

- Must select min 1 Interface Module
- Must select min 4 Fabric Modules
- Must select min 1 Management Module
- Must select min 1 Power Supply
- 20U - Height

See Configuration Note:1, 2

HP 10512 Switch Chassis — JC748A

- Must select min 1 Interface Module
- Must select min 4 Fabric Modules
- Must select min 1 Management Module
- Must select min1 Power Supply
- 18U - Height

See Configuration Note:1, 2

Configuration Rules:

Note 1	If the Switch Chassis is to be Factory Integrated (CTO), Then the #0D1 is required on the Switch Chassis and integrated to the JG504A - HP 105xx CTO Enablement. (Min 1/Max 1 Switch per SSP)
Note 2	If this Switch is selected, Then a Minimum of 1 factory integrated accessory must be ordered and integrated to CTO chassis. See Menu below, option must have a #0D1 to be integrated to the CTO Chassis.

Internal Power Supplies

(Switch 10504) System (std 0 // max 4) User Selection (min 3 1 // max 4) per switch enclosure

10504 provides 3+1 Redundancy. Select an appropriate number of power supplies based on the maximum output power of your system and redundancy requirements. For component power consumption consult the install guide.
(Switch 10508 and ,10508-V and 10512) System (std 0 // max 6) User Selection (min 5 1 // max 6) per switch enclosure

10512 ,10508-V and 10512 provides 5+1 Redundancy. Select an appropriate number of power supplies based on the maximum output power of your system and redundancy requirements. For component power consumption consult the install guide.

HP 10500 2500W AC Power Supply — JC610A

- includes 1 x c19, 2500w

See Configuration Note: 1,2,3

PDU Cable NA/MEX/TW/JP — JC610A#B2B

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

Configuration

PDU Cable ROW • C19 PDU Jumper Cord (ROW)	JC610A#B2C
High Volt Switch to Wall Power Cord • NEMA L6-20P Cord (NA/MEX/JP/TW)	JC610A#B2E
HP 10500 2400W DC Power Supply	JC747A See Configuration Note:1, 6

Configuration Rules:

Note 1	If more than 1 power supply is selected they, must all be the same Sku number.
Note 2	Localization required on orders without #B2B, #B2C or #B2E options.
Note 3	#B2E is Offered only in NA, Mexico, Taiwan and Japan.
Note 6	One of these cables is required when ordering this power supply: (Use #B01 if switch is CTO) - if applicable HP 10500 -48V 3m DC Power Supply Cable JG390A HP 10500 -48V 15m DC Power Supply Cable JG391A
Remarks:	"Drop down under power supply should offer the following options and results: Switch/Router/Power Supply to PDU Power Cord - #B2B in North America, Mexico, Taiwan, and Japan or #B2C ROW. (Watson Default B2B or B2C for Rack Level CTO) Switch/Router/Power Supply to Wall Power Cord - Localized Option (Watson Default for BTO and Box Level CTO) High Volt Switch/Router/Power Supply to Wall Power Cord - #B2E Option. (Offered only in North America, Mexico, Taiwan, and Japan)"

Modules

Interface Modules

(10504 Switch Only) System (std 0 // max 4) User Selection (min 1 // max 4) per enclosure

(10508 and 10508-V Switch Only) System (std 0 // max 8) User Selection (min 1 // max 8) per enclosure

(10512 Switch Only) System (std 0 // max 12) User Selection (min 1 // max 12) per enclosure

HP 10500 4-port 10GbE XFP SE Module • min=0 \ max=4 XFP Transceivers	JC620A See Configuration Note:4

Configuration

HP 10500 4-port 10GbE XFP EA Module • min=0 \ max=4 XFP Transceivers	JC624A See Configuration Note:4
HP 10500 4-port 10GbE XFP EB Module • min=0 \ max=4 XFP Transceivers	JC627A See Configuration Note:4
HP 10500 8-port 10GbE SFP+ EB Module • min=0 \ max=8 SFP+ Transceivers	JC629A See Configuration Note:1, 3
HP 10500 8-port 10GbE SFP+ EA Module • min=0 \ max=8 SFP+ Transceivers	JC630A See Configuration Note:1, 3
HP 10500 8-port 10GbE SFP+ SE Module • min=0 \ max=8 SFP+ Transceivers	JC631A See Configuration Note:1, 3
HP 10500 16-port 10GbE SFP+ SC Module • min=0 \ max=16 SFP+ Transceivers	JC628A See Configuration Note:1, 3
HP 10500 48-port GbE SFP SE Module • min=0 \ max=48 SFP Transceivers	JC619A See Configuration Note:1, 2
HP 10500 48-port GbE SFP EA Module • min=0 \ max=48 SFP Transceivers	JC622A See Configuration Note:1, 2
HP 10500 48-port GbE SFP EB Module • min=0 \ max=48 SFP Transceivers	JC625A See Configuration Note:1, 2
HP 10500 24p GbE / 2p 10GbE XFP SE Mod • min=0 \ max=2 XFP min=0 \ max=24 SFP Transceivers	JC617A See Configuration Note:1, 2, 4
HP 10500 24p GbE / 2p 10GbE XFP EA Mod • min=0 \ max=2 XFP min=0 \ max=24 SFP Transceivers	JC621A See Configuration Note:1, 2, 4
HP 10500 24p GbE / 2p 10GbE XFP EB Mod • min=0 \ max=2 XFP min=0 \ max=24 SFP Transceivers	JC626A See Configuration Note:1, 2, 4

Configuration

HP 10500 24p 1/10GBASE-T SF Mod • No Transceivers	JG394A
HP 10500 48-port Gig-T EA Module • No Transceivers	JC623A
HP 10500 48-port Gig-T SE Module • No Transceivers	JC618A
HP 7500 Advanced VPN Firewall Module • min=0 \ max=2 SFP Transceivers	JD249A See Configuration Note:6,8,9
HP 10500/11900/7500 20Gbps VPN FW Module • min=0 \ max=2 SFP Transceivers	JG372A See Configuration Note:6,8
HP 7500 Load Balancing Module • No supported Transceivers	JD252A See Configuration Note:6,9
HP 7500 SSL VPN Module w/500-user Lic • No supported Transceivers	JD253A See Configuration Note:6,9
HP 7500 NetStream Monitoring Module • No supported Transceivers	JD254A See Configuration Note:6,9
HP 10500 32-port 10GbE SFP+ SF Module • min=0 \ max=32 SFP or SFP+ Transceivers	JC755A See Configuration Note:1, 3
HP 10500 48-port 10GbE SFP+ SF Module • min=0 \ max=48 SFP or SFP+ Transceivers	JC756A See Configuration Note:1, 3
HP 10500 4-port 40GbE QSFP+ SF Module • min=0 \ max=4 QSFP+ Transceivers	JC757A See Configuration Note:5
HP 10500 16p GbE SFP/8p GbE Cmbo SE Mod • min=0 \ max=24 SFP Transceivers	JC763A See Configuration Note:1

Configuration

HP 10500 8p 40GbE QSFP+ SF Module	JG392A
• min=0 \ max=8 QSFP+ Transceivers	See Configuration Note:5
HP 10500 4p 40GbE CFP SF Module	JG396A
• min=0 \ max=4 CFP Transceivers	See Configuration Note:7
HP 10500/7500 20G Unified Wired-WLAN Mod	JG639A
• No supported Transceivers	See Configuration Note:6,11

Configuration Rules:

Note 1	The following Transceivers install into this Module: (Use #0D1 if switch is CTO) - if applicable	
	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 LH100 Transceiver	JD103A
	HP X125 1G SFP LC LH40 1310nm Transceiver	JD061A
	HP X120 1G SFP LC LH40 1550nm Transceiver	JD062A
	HP X120 1G SFP RJ45 T Transceiver	JD089B
	HP X120 1G SFP LC SX Transceiver	JD118B
	HP X120 1G SFP LC LX Transceiver	JD119B
	HP X125 1G SFP LC LH70 Transceiver	JD063B
	HP X120 1G SFP LC BX 10-U Transceiver	JD098B
	HP X120 1G SFP LC BX 10-D Transceiver	JD099B
Note 2	The following Transceivers install into this Module (Use #0D1 if switch is CTO) - if applicable:	
	HP X110 100M SFP LC LH40 Transceiver	JD090A
	HP X110 100M SFP LC LH80 Transceiver	JD091A
	HP X115 100M SFP LC FX Transceiver	JD102B
	HP X110 100M SFP LC LX Transceiver	JD120B
	HP X115 100M SFP LC BX 10-U Transceiver	JD100A
	HP X115 100M SFP LC BX 10-D Transceiver	JD101A
Note 3	The following Transceivers install into this Module (Use #0D1 or #B01 if switch is CTO) - if applicable:	
	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

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	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 X240 10G SFP+ to SFP+ 5m Direct Attach Copper Cable	JG081C
	HP X240 10G SFP+ SFP+ 7m Direct Attach Copper Cable	JC784C
	HP X130 10G SFP+ LC ER 40km Transceiver	JG234A
Note 4	The following Transceivers install into this Module (Use #0D1 if switch is CTO) - if applicable:	
	HP X135 10G XFP LC ER Transceiver	JD121A
	HP X130 10G XFP LC LR Single Mode 10km 1310nm Transceiver	JD108B
	HP X130 10G XFP LC SR Transceiver	JD117B
	HP X130 10G XFP LC ZR Single Mode 80km 1550nm Transceiver	JD107A
Note 5	The following 40G Transceivers install into this Module (Use #0D1 or #B01 if switch is CTO) - if applicable:	
	HP X140 40G QSFP+ MPO SR4 Transceiver	JG325A
	HP X240 40G QSFP+ QSFP+ 1m Direct Attach Copper Cable	JG326A
	HP X240 40G QSFP+ QSFP+ 3m Direct Attach Copper Cable	JG327A
	HP X240 40G QSFP+ 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
Note 6	These modules do not count towards the Minimum 1 module requirement.	
Note 7	The following CFP Transceivers install into this Module:	
	HP X140 40G CFP LC LR4 10km SM Transceiver	JC857A
Note 8	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 LC SX Transceiver	JD118B
	HP X120 1G SFP LC LX Transceiver	JD119B
Note 9	These modules are Not Supported with Management Module JG496A - HP 10500 Type A MPU w/Comware v7 OS. They are Only Supported with Management Modules JC614A - HP 10500 Main Processing Unit and JG375A - HP 10500 TAA Main Processing Unit.	
Note 11	Maximum of this Module per Chassis: JC612A, JG821A, JC611A, JG822A min=0\max=7 per Chassis JC613A, JG820A min=0\max=3 per Chassis JC748A, JG823A min=0\max=11 per Chassis There are no restrictions on which slots these modules may go in.	
Remark:	JD253A - Additional User licenses available below in the 'Switch Enclosure Options' category. JG639A and JG645A - Additional AP licenses available below in the 'Switch Enclosure Options' category.	

Configuration

Fabric Modules

System (std 0 // max 4) User Selection (min 4 // max 4) per enclosure

HP 10504 400Gbps Type A Fabric Module — JC615A
See Configuration Note:1, 4

HP 10508/10508-V 720Gbps Type A Fabric Module — JC616A
See Configuration Note:2, 4

HP 10504 880Gbps Type B Fabric Module — JC751A
- No supported Transceivers

See Configuration Note:1, 4

HP 10508/10508-V 1.04Tbps Type B Fabric Module — JC753A
- No supported Transceivers

See Configuration Note:2, 4

HP 10512 1.52Tbps Type B Fabric Module — JC749A
- No supported Transceivers

See Configuration Note:3, 4

HP 10512 3.44Tbps Type D Fabric Module — JC750A
- No supported Transceivers

See Configuration Note:3, 4

HP 10504 1.2Tbps Type D Fabric Module — JC752A
- No supported Transceivers

See Configuration Note:1, 4

HP 10508/10508-V 2.32Tbps Type D Fabric Module — JC754A
- No supported Transceivers

See Configuration Note:2, 4

Configuration Rules:

Note 1	These Modules install to the following switches: (Use #0D1 if switch is CTO) - if applicable	
	HP 10504 Switch Chassis	JC613A
Note 2	These Modules install to the following switches: (Use #0D1 if switch is CTO) - if applicable	
	HP 10508-V Switch Chassis	JC611A
	HP 10508 Switch Chassis	JC612A
Note 3	These Modules install to the following switches: (Use #0D1 if switch is CTO) - if applicable	

Configuration

	HP 10512 Switch Chassis	JC748A
Note 4	If more than 1 Fabric Module is selected, they must be of the same Type.	

Management Modules

System (standard 0 // maximum 2) User Selection (minimum 1 // maximum 2) per enclosure

HP 10500 Main Processing Unit	JC614A See Configuration Note:1
HP 10500 Type A MPU w/Comware v7 OS	JG496A See Configuration Note:1,2
HP 10500 Type A MPU w/Comware v7 OS	JG496A See Configuration Note:1,2,3

Configuration Rules:

Note 1	If 2 Management Module are selected, they must be the same Sku number.	
Note 2	Note in Watson: This MPU supports CWv7 only and may not have some features from CWv5.	
Note 3	The following Interface Modules are Not Supported with this Management Module:	
	HP 10500/7500 Advanced VPN Firewall Module	JD249A
	HP 7500 Load Balancing Module	JD252A
	HP 10500/7500 SSL VPN Module with 500-user License	JD253A
	HP 10500/7500 NetStream Monitoring Module	JD254A
Remarks:	For Switch 10504, these modules can only be inserted into Slots 0 and 1. For Switches 10508 and 10508-V, these modules can only be inserted into Slots 4 and 5. For Switch 10512, these modules can only be inserted into Slots 6 and 7.	

Transceivers

SFP Transceivers

HP X110 100M SFP LC LH40 Transceiver	JD090A
HP X110 100M SFP LC LH80 Transceiver	JD091A
HP X115 100M SFP LC FX Transceiver	JD102B

Configuration

HP X110 100M SFP LC LX Transceiver	JD120B
HP X110 100M SFP LC BX 10-U Transceiver	JD100A
HP X110 100M SFP LC BX 10-D Transceiver	JD101A
HP X120 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 X120 1G SFP LC LH40 1550nm XCVR	JD062A
HP X120 1G SFP LC SX Transceiver	JD118B
HP X120 1G SFP LC LX Transceiver	JD119B
HP X125 1G SFP LC LH40 1310nm XCVR	JD061A
HP X125 1G SFP LC LH70 Transceiver	JD063B
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

SFP+ Transceivers

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 X130 10G SFP+ LC ER 40km Transceiver	JG234A
HP X240 10G SFP+ SFP+ 0.65m DAC Cable	JD095C#B01
HP X240 10G SFP+ SFP+ 1.2m DAC Cable	JD096C#B01
HP X240 10G SFP+ SFP+ 3m DAC Cable	JD097C#B01
HP X240 10G SFP+ SFP+ 5m DAC Cable	JG081C#B01
HP X240 10G SFP+ 7m DAC Cable	JC784C#B01

XFP Transceivers

HP X130 10G XFP LC ZR 1550nm Transceiver	JD107A
HP X130 10G XFP LC SR Transceiver	JD117B
HP X130 10G XFP LC LR 1310nm Transceiver	JD108B
HP X135 10G XFP LC ER Transceiver	JD121A
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

Configuration

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

QSFP+ Transceivers

HP X140 40G QSFP+ MPO SR4 Transceiver	JG325A
HP X240 40G QSFP+ QSFP+ 1m DAC Cable	JG326A#B01
HP X240 40G QSFP+ QSFP+ 3m DAC Cable	JG327A#B01
HP X240 40G QSFP+ QSFP+ 5m DAC Cable	JG328A#B01
HP X240 QSFP+ 4x10G SFP+ 1m DAC Cable	JG329A#B01
HP X240 QSFP+ 4x10G SFP+ 3m DAC Cable	JG330A#B01
HP X240 QSFP+ 4x10G SFP+ 5m DAC Cable	JG331A#B01

CFP Transceivers

HP X140 40G CFP LC LR4 10km SM Transceiver	JC857A

Switch Enclosure Options

Mounting Kit

HP X421 Chassis Universal Rck Mntg Kit	JC665A See Configuration Note:1

Configuration Rules:

Note 1	If any 10500 switch is installed into a rack, then this Rack Mounting kit is required.
Remarks:	Default a quantity of 1 when Switch is selected

Software Licenses

(10504 Switch Only) System (std 0 // max 3) User Selection (min 0 // max 3) per enclosure

(10508 and 10508-V Switch Only) System (std 0 // max 7) User Selection (min 0 // max 7) per enclosure

(10512 Switch Only) System (std 0 // max 11) User Selection (min 0 // max 11) per enclosure

HP 10500/7500 Wrd-WLAN Mod 128 AP E-LTU	JG649AAE See Configuration Note:1
HP Unified Wired-WLAN 128 AP Redundant E-LTU	JG902AAE

Configuration

See Configuration Note:1

Configuration Rules:

Note 1 Only applies to JG639A and JG645A.

Fans

HP 10504 Spare Fan Assembly	JC632A
HP 10508 Spare Fan Assembly	JC633A
HP 10508-V Spare Fan Assembly	JC634A
HP 10512 Spare Top Fan Tray Assembly	JC758A
HP 10512 Spare Bottom Fan Tray Assembly	JC773A

Options for the SSL VPN Service Board Modules (JD253x)

HP 7500 SSL VPN 1000-user License JD257A
- min=0\ max=10 per SSL — See Configuration Note:1, 2

HP 7500 SSL VPN 1000-user E-LTU JD257AAE
- min=0\ max=10 per SSL — See Configuration Note:1, 2

HP 7500 SSL VPN 5000-user License JD258A
- min=0\ max=2 per SSL — See Configuration Note:1, 2

HP 7500 SSL VPN 5000-user E-LTU JD258AAE
- min=0\ max=10 per SSL — See Configuration Note:1, 2

Configuration Rules:

Note 1 Any mixture of (JD257A, JD258A, JD257AAE, JD258AAE) that equals 10,000 LTU's is the max per any JD253A module the maximum would be based on the module and not the entire switch.

Note 2 SSL VPN User Licenses are only supported on the following modules:
JD253A - HP 7500 SSL VPN Module with 500-User License

Power Supply Cables

(JC747A) System (std 0 // max 1) User Selection (min 1 // max 1) per DC Power Supply

HP 10500 -48V 3m DC Power Supply Cable	JG390A#B01
HP 10500 -48V 15m DC Power Supply Cable	JG391A#B01

Technical Specifications

HP 10504 Switch Chassis (JC613A)

I/O ports and slots	2 MPU (for management modules) slots 4 switch fabric slots 4 I/O module slots Supports a maximum of 192 10GbE ports or 192 Gigabit Ethernet ports or 192 SFP ports or 32 40-GbE ports, or a combination	
Power supplies	4 power supply slots 1 minimum power supply required (ordered separately)	
Fan tray	includes: 1 x JC632A 1 fan tray slot	
Physical characteristics	**Dimensions**	17.32(w) x 25.98(d) x 13.9(h) in (43.99 x 65.99 x 35.31 cm) (8U height)
	Weight	85.32 lb (38.7 kg) chassis
	Full configuration weight	183.14 lb (83.07 kg)
Memory and processor	**Management module**	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	
Performance	**Throughput**	2857 million pps (64-byte packets)
	Switching capacity	3.8 Tbps
	Routing table size	512000 entries (IPv4), 128000 entries (IPv6)
	MAC address table size	512000 entries
Reliability	**Availability**	99.999%
Environment	**Operating temperature**	32°F to 113°F (0°C to 45°C)
	Operating relative humidity	10% to 95%, noncondensing
	Nonoperating/Storage temperature	-40°F to 158°F (-40°C to 70°C)
	Nonoperating/Storage relative humidity	5% to 95%, noncondensing
	Altitude	up to 13,123 ft (4 km)
	Acoustic	Low-speed fan: 62.3 dB, High-speed fan: 75.5 dB
Electrical characteristics	**Frequency**	50/60 Hz
	AC voltage	100 - 120 / 200 - 240 VAC
	DC voltage	-48 to -60 / -48 to -60 VDC Powered by PoE
	Current	16/60 A
	Power output	2500 W
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	
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	
Immunity	**Generic**	Directive 2004/108/EC

Technical Specifications

	EN	EN 55024:1998+ A1:2001 + A2:2003; ETSI EN 300 386 V1.3.3
	ESD	EN 61000-4-2
	Radiated	EN 61000-4-3
	EFT/Burst	EN 61000-4-4
	Surge	EN 61000-4-5
	Conducted	EN 61000-4-6
	Power frequency magnetic field	IEC 61000-4-8
	Voltage dips and interruptions	EN 61000-4-11
	Harmonics	EN 61000-3-2, IEC 61000-3-2
	Flicker	EN 61000-3-3, IEC 61000-3-3
Management	IMC - Intelligent Management Center; command-line interface; 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	These modules - JC614A, JD249A, JG252A, and JG254A - are only available using Comware v5 for the 10500. Please seen an HP representative or technical notes for details.	
Services	3-year, parts only, global next-day advance exchange (HT059E) 3-year, 4-hour onsite, 13x5 coverage for hardware (HT060E) 3-year, 4-hour onsite, 24x7 coverage for hardware (HT062E) 3-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 SW phone support and SW updates (HT067E) 3-year, 24x7 SW phone support, software updates (HT066E) Installation with minimum configuration, system-based pricing (UX033E) 4-year, 4-hour onsite, 13x5 coverage for hardware (HT068E) 4-year, 4-hour onsite, 24x7 coverage for hardware (HT070E) 4-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone (HT075E) 4-year, 24x7 SW phone support, software updates (HT074E) 5-year, 4-hour onsite, 13x5 coverage for hardware (HT076E) 5-year, 4-hour onsite, 24x7 coverage for hardware (HT078E) 5-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone (HT083E) 5-year, 24x7 SW phone support, software updates (HT082E) 3 Yr 6 hr Call-to-Repair Onsite (HT064E) 4 Yr 6 hr Call-to-Repair Onsite (HT072E) 5 Yr 6 hr Call-to-Repair Onsite (HT080E) 1-year, 4-hour onsite, 13x5 coverage for hardware (HT051E) 1-year, 4-hour onsite, 24x7 coverage for hardware (HT053E) 1-year, 6 hour Call-To-Repair Onsite for hardware (HT055E) 1-year, 24x7 software phone support, software updates (HT057E) 1-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone support and software updates (HT058E) 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.	

HP 10508 Switch Chassis (JC612A)

Technical Specifications

I/O ports and slots	2 MPU (for management modules) slots 4 switch fabric slots 8 I/O module slots Supports a maximum of 384 10GbE ports or 384 Gigabit Ethernet ports or 384 SFP ports or 64 40-GbE ports, or a combination	
Power supplies	6 power supply slots 1 minimum power supply required (ordered separately)	
Fan tray	includes: 1 x JC633A 1 fan tray slot	
Physical characteristics	**Dimensions**	17.32(w) x 25.98(d) x 24.41(h) in (43.99 x 65.99 x 62 cm) (14U height)
	Weight	125 lb (56.7 kg) chassis
	Full configuration weight	285.34 lb (129.43 kg)
Memory and processor	**Management module**	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	
Performance	**Throughput**	5714 million pps (64-byte packets)
	Switching capacity	7.7 Tbps
	Routing table size	512000 entries (IPv4), 128000 entries (IPv6)
	MAC address table size	512000 entries
Reliability	**Availability**	99.999%
Environment	**Operating temperature**	32°F to 113°F (0°C to 45°C)
	Operating relative humidity	10% to 95%, noncondensing
	Nonoperating/Storage temperature	-40°F to 158°F (-40°C to 70°C)
	Nonoperating/Storage relative humidity	5% to 95%, noncondensing
	Altitude	up to 13,123 ft (4 km)
	Acoustic	Low-speed fan: 63 dB, High-speed fan: 75.8 dB
Electrical characteristics	**Frequency**	50/60 Hz
	AC Voltage	100-120/200-240 VAC
	Current	16/60 A
	Power output	2500 W
	Frequency	50/60 Hz
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	
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	
Immunity	**Generic**	Directive 2004/108/EC
	EN	EN 55024:1998+ A1:2001 + A2:2003; ETSI EN 300 386 V1.3.3

Technical Specifications

	ESD	EN 61000-4-2
	Radiated	EN 61000-4-3
	EFT/Burst	EN 61000-4-4
	Surge	EN 61000-4-5
	Conducted	EN 61000-4-6
	Power frequency magnetic field	IEC 61000-4-8
	Voltage dips and interruptions	EN 61000-4-11
	Harmonics	EN 61000-3-2, IEC 61000-3-2
	Flicker	EN 61000-3-3, IEC 61000-3-3
Management		IMC - Intelligent Management Center; command-line interface; 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		These modules - JC614A, JD249A, JG252A, and JG254A - are only available using Comware v5 for the 10500. Please seen an HP representative or technical notes for details.
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) 5 Yr 6 hr Call-to-Repair Onsite (HT113E) 1-year, 4-hour onsite, 13x5 coverage for hardware (HT084E) 1-year, 4-hour onsite, 24x7 coverage for hardware (HT086E) 1-year, 6 hour Call-To-Repair Onsite for hardware (HT088E) 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 (HT091E) 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.

HP 10508-V Switch Chassis (JC611A)

Technical Specifications

I/O ports and slots	2 MPU (for management modules) slots 4 switch fabric slots 8 I/O module slots Supports a maximum of 384 10GbE ports or 384 Gigabit Ethernet ports or 384 SFP ports or 64 40-GbE ports, or a combination	
Power supplies	6 power supply slots 1 minimum power supply required (ordered separately)	
Fan tray	includes: 1 x JC634A 1 fan tray slot	
Physical characteristics	**Dimensions**	17.32(w) x 25.98(d) x 34.88(h) in (43.99 x 65.99 x 88.6 cm) (20U height)
	Weight	169.53 lb (76.9 kg) chassis
	Full configuration weight	331.31 lb (150.28 kg)
Memory and processor	**Management module**	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	
Performance	**Throughput**	5714 million pps (64-byte packets)
	Switching capacity	7.7 Tbps
	Routing table size	512000 entries (IPv4), 128000 entries (IPv6)
	MAC address table size	512000 entries
Reliability	**Availability**	99.999%
Environment	**Operating temperature**	32°F to 113°F (0°C to 45°C)
	Operating relative humidity	10% to 95%, noncondensing
	Nonoperating/Storage temperature	-40°F to 158°F (-40°C to 70°C)
	Nonoperating/Storage relative humidity	5% to 95%, noncondensing
	Altitude	up to 13,123 ft (4 km)
	Acoustic	Low-speed fan: 61.6 dB, High-speed fan: 72.6 dB
Electrical characteristics	**Frequency**	50/60 Hz
	AC Voltage	100-120/200-240 VAC
	Current	16/60 A
	Power output	2500 W
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	
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	
Immunity	**Generic**	Directive 2004/108/EC
	EN	EN 55024:1998+ A1:2001 + A2:2003; ETSI EN 300 386 V1.3.3
	ESD	EN 61000-4-2

	Radiated	EN 61000-4-3
	EFT/Burst	EN 61000-4-4
	Surge	EN 61000-4-5
	Conducted	EN 61000-4-6
	Power frequency magnetic field	IEC 61000-4-8
	Voltage dips and interruptions	EN 61000-4-11
	Harmonics	EN 61000-3-2, IEC 61000-3-2
	Flicker	EN 61000-3-3, IEC 61000-3-3

Management IMC - Intelligent Management Center; command-line interface; 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 These modules - JC614A, JD249A, JG252A, and JG254A - are only available using Comware v5 for the 10500. Please seen an HP representative or technical notes for details.

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)
5 Yr 6 hr Call-to-Repair Onsite (HT113E)
1-year, 4-hour onsite, 13x5 coverage for hardware (HT084E)
1-year, 4-hour onsite, 24x7 coverage for hardware (HT086E)
1-year, 6 hour Call-To-Repair Onsite for hardware (HT088E)
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 (HT091E)

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.

HP 10512 Switch Chassis (JC748A)

Technical Specifications

I/O ports and slots	2 MPU (for management modules) slots 4 switch fabric slots 12 I/O module slots Supports a maximum of 576 10GbE ports or 576 Gigabit Ethernet ports or 576 SFP ports or 96 40-GbE ports, or a combination	
Power supplies	6 power supply slots 1 minimum power supply required (ordered separately)	
Fan tray	includes: 1 x JC758A, JC773A 2 fan tray slots	
Physical characteristics	**Dimensions**	17.32(w) x 25.98(d) x 31.38(h) in (44.0 x 66.0 x 79.7 cm) (18U height)
	Weight	166.23 lb (75.4 kg) chassis
	Full configuration weight	380.95 lb (172.8 kg)
Memory and processor	**Management module**	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	
Performance	**Throughput**	8571 million pps (64-byte packets)
	Switching capacity	11.5 Tbps
	Routing table size	512000 entries (IPv4), 128000 entries (IPv6)
	MAC address table size	512000 entries
Reliability	**Availability**	99.999%
Environment	**Operating temperature**	32°F to 113°F (0°C to 45°C)
	Operating relative humidity	10% to 95%, noncondensing
	Nonoperating/Storage temperature	-40°F to 158°F (-40°C to 70°C)
	Nonoperating/Storage relative humidity	5% to 95%, noncondensing
	Altitude	up to 13,123 ft (4 km)
	Acoustic	Low-speed fan: 66 dB, High-speed fan: 79 dB
Electrical characteristics	**Frequency**	50/60 Hz
	AC voltage	100-120/200-240 VAC
	Current	16/60 A
	Power output	2500 W
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	
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	
Immunity	**Generic**	Directive 2004/108/EC
	EN	EN 55024:1998+ A1:2001 + A2:2003; ETSI EN 300 386 V1.3.3
	ESD	EN 61000-4-2

Technical Specifications

	Radiated	EN 61000-4-3
	EFT/Burst	EN 61000-4-4
	Surge	EN 61000-4-5
	Conducted	EN 61000-4-6
	Power frequency magnetic field	IEC 61000-4-8
	Voltage dips and interruptions	EN 61000-4-11
	Harmonics	EN 61000-3-2, IEC 61000-3-2
	Flicker	EN 61000-3-3, IEC 61000-3-3
Management	IMC - Intelligent Management Center; command-line interface; 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	These modules - JC614A, JD249A, JG252A, and JG254A - are only available using Comware v5 for the 10500. Please seen an HP representative or technical notes for details.	
Services	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.	

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

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 1643 Ethernet MIB
RFC 1657 BGP-4 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

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 802.3ah Ethernet in First Mile over Point to Point Fiber - EFMF
IEEE 802.3ba 40 and 100 Gigabit Ethernet Architecture
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 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

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
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

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
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 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

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

Accessories

HP 10500 Switch Series accessories	**Modules**	
	NEW HP 10500 Type A Main Processing Unit with Comware v7 Operating System	JG496A
	HP 10500 Main Processing Unit	JC614A
	HP 10500 48-port 10GbE SFP+ SF Module	JC756A
	HP 10500 32-port 10GbE SFP+ SF Module	JC755A
	NEW HP 10500 24-port 1/10GBASE-T SF Module	JG394A
	HP 10500 8-port 40GbE QSFP+ SF Module	JG392A
	HP 10500 4-port 40GbE QSFP+ SF Module	JC757A
	HP 10500 4-port 40GbE CFP SF Module	JG396A
	HP 10500 8-port 10GbE SFP+ SE Module	JC631A
	HP 10500 4-port 10GbE XFP SE Module	JC620A
	HP 10500 16-port GbE SFP/8-port GbE Combo/2-port 10GbE XFP SE Module	JC617A
	HP 10500 16-port GbE SFP / 8-port GbE Combo SE Module	JC763A
	HP 10500 48-port Gig-T SE Module	JC618A
	HP 10500 48-port GbE SFP SE Module	JC619A
	HP 10500 16-port 10GbE SFP+ SC Module	JC628A
	HP 10500 8-port 10GbE SFP+ EA Module	JC630A
	HP 10500 4-port 10GbE XFP EA Module	JC624A
	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 8-port 10GbE SFP+ EB Module	JC629A
	HP 10500 4-port 10GbE XFP EB Module	JC627A
	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
	Transceivers	
	HP X110 100M SFP LC FX Transceiver	JD102B
	HP X110 100M SFP LC LX Transceiver	JD120B
	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 X120 1G SFP RJ45 T Transceiver	JD089B
	HP X120 1G SFP LC SX Transceiver	JD118B
	HP X120 1G SFP LC LX Transceiver	JD119B
	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 LC LH100 Transceiver	JD103A
	HP X120 1G SFP LC BX 10-D Transceiver	JD099B
	HP X120 1G SFP LC BX 10-U Transceiver	JD098B
	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

Accessories

HP X170 1G SFP LC LH70 1530 Transceiver	JD116A
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 X130 10G SFP+ LC SR Transceiver	JD092B
HP X130 10G SFP+ LC LRM Transceiver	JD093B
HP X130 10G SFP+ LC LR Transceiver	JD094B
HP X130 10G SFP+ LC ER 40km Transceiver	JG234A
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 X240 10G SFP+ to SFP+ 5m Direct Attach Copper Cable	JG081C
HP X240 10G SFP+ SFP+ 7m Direct Attach Copper Cable	JC784C
HP X130 10G XFP LC SR Transceiver	JD117B
HP X130 10G XFP LC LR Transceiver	JD108B
HP X135 10G XFP LC ER Transceiver	JD121A
HP X130 10G XFP LC ZR Transceiver	JD107A
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 X140 40G QSFP+ LC LR4 SM 10km 1310nm Transceiver	JG661A
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
HP X140 40G CFP LC LR4 10km SM Transceiver	JC857A
Security Modules	
HP 7500 Load Balancing Module	JD252A
Power Supply	
HP 10500 2500W AC Power Supply	JC610A
HP 10500 2400W DC Power Supply	JC747A
Mounting Kit	
HP X421 Chassis Universal 4-post Rack Mounting Kit	JC665A
License	
HP 10500/7500 SSL VPN 1000-user License	JD257A
HP 10500/7500 SSL VPN 5000-user License	JD258A

Accessories

HP Unified Wired-WLAN 128 AP E-LTU	JG649AAE
WLAN	
HP 10500/7500 20G Unified Wired-WLAN Module	JG639A
Power cords	
HP 10500 -48V 3m DC Power Supply Cable	JG390A
HP 10500 -48V 15m DC Power Supply Cable	JG391A
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 10500/11900/7500 20Gbps VPN Firewall Module	JG372A
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 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 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 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

Accessory Product Details

NOTE: Details are not available for all accessories. The following specifications were available at the time of publication.

Transceivers

HP X125 1G SFP LC LH40 1310nm Transceiver (JD061A) A small form-factor pluggable SFP Gigabit LH40 transceiver that provides a full duplex Gigabit solution up to 40km on a single-mode fiber.	**Ports**	1 LC 1000Base-LH port (no IEEE standard exists for 1550 nm optics)	
	Connectivity	Connector type	LC
		Wavelength	1310 nm
	Physical characteristics	Dimensions	2.17(d) x 0.6(w) x 0.46(h) in. (5.51 x 1.52 x 1.17 cm)
		Full configuration weight	0.04 lb. (0.02 kg)
	Electrical characteristics	Power consumption typical	0.8 W
		Power consumption maximum	1.0 W
	Cabling	Cable type: Single-mode fiber optic, complying with ITU-T G.652; Maximum distance: • 40km distance	
		Fiber type	Single Mode
	Services	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.	
HP X120 1G SFP LC LH40 1550nm Transceiver (JD062A) A small form-factor pluggable (SFP) Gigabit LH40 transceiver that provides a full-duplex Gigabit solution up to 40 km on a single mode fiber.	**Ports**	1 LC 1000BASE-LH port (no IEEE standard exists for 1550 nm optics)	
	Connectivity	Connector type	LC
		Wavelength	1550 nm
	Physical characteristics	Dimensions	2.17(d) x 0.6(w) x 0.46(h) in. (5.51 x 1.52 x 1.17 cm)
		Full configuration weight	0.04 lb. (0.02 kg)
	Electrical characteristics	Power consumption typical	0.8 W
		Power consumption maximum	1.0 W
	Cabling	Cable type: Single-mode fiber optic, complying with ITU-T G.652; Maximum distance: • 40km distance	
		Fiber type	Single Mode
	Services	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.	

Accessory Product Details

HP X125 1G SFP LC LH70 Transceiver (JD063B) A small form-factor pluggable (SFP) Gigabit LH70 transceiver that provides a full-duplex Gigabit solution up to 70km on a single-mode fiber.	**Ports**	1 LC 1000BASE-LH port (no IEEE standard exists for 1550 nm optics)	
	Connectivity	**Connector type**	LC
		Wavelength	1550 nm
	Physical characteristics	**Dimensions**	2.17(d) x 0.6(w) x 0.46(h) in. (5.51 x 1.52 x 1.17 cm)
		Full configuration weight	0.04 lb. (0.02 kg)
	Electrical characteristics	**Power consumption typical**	0.8 W
		Power consumption maximum	1.0 W
	Cabling	Cable type: Single-mode fiber optic, complying with ITU-T G.652; Maximum distance: • 70km	
		Fiber type	Single Mode
	Services	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.	

HP X125 1G SFP RJ45 T Transceiver (JD089B) A small form factor pluggable (SFP) Gigabit 1000Base-T transceiver that provides a full duplex Gigabit solution up to 100m on a Cat-5+ cable.	**Ports**	1 RJ-45 1000BASE-T port (IEEE 802.3ab Type 1000BASE-T)	
	Connectivity	**Connector type**	RJ-45
	Physical characteristics	**Dimensions**	2.71(d) x 0.54(w) x 0.55(h) in. (6.88 x 1.37 x 1.4 cm)
		Full configuration weight	0.07 lb. (0.03 kg)
	Electrical characteristics	**Power consumption typical**	0.8 W
		Power consumption maximum	1.0 W
	Cabling	Cable type: 1000BASE-T: Category 5 (5E or better recommended), 100 Ù differential 4-pair unshielded twisted pair (UTP) or shielded twisted pair (STP) balanced, complying with IEEE 802.3ab 1000BASE-T; Maximum distance: • 100m	
	Services	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.	

Accessory Product Details

HP X120 1G SFP LC BX 10-U Transceiver (JD098B) A small form-factor pluggable (SFP) Gigabit LX-BX10-U transceiver that provides a full duplex Gigabit solution up to 10km on a single mode cable.	**Ports**	1 LC 1000BASE-BX10 port (IEEE 802.3ah Type 1000BASE-BX10-U); Duplex: full only	
	Connectivity	**Connector type**	LC
	Physical characteristics	**Dimensions**	2.17(d) x 0.6(w) x 0.46(h) in. (5.51 x 1.52 x 1.17 cm)
		Full configuration weight	0.04 lb. (0.02 kg)
	Electrical characteristics	**Power consumption typical**	0.8 W
		Power consumption maximum	1.0 W
	Cabling	Maximum distance: • 10km	
		Fiber type	Single Mode
	Notes	TX 1310nm RX 1490nm	
	Services	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.	

HP X120 1G SFP LC BX 10-D Transceiver (JD099B) A small form-factor pluggable (SFP) Gigabit LX-BX10-D transceiver that provides a full duplex Gigabit solution up to 10km on a single mode cable.	**Ports**	1 LC 1000BASE-BX10 port (IEEE 802.3ah Type 1000BASE-BX10-D); Duplex: full only	
	Connectivity	**Connector type**	LC
	Physical characteristics	**Dimensions**	2.17(d) x 0.6(w) x 0.46(h) in. (5.51 x 1.52 x 1.17 cm)
		Full configuration weight	0.04 lb. (0.02 kg)
	Electrical characteristics	**Power consumption typical**	0.8 W
		Power consumption maximum	1.0 W
	Cabling	Maximum distance: • Up to 10km	
		Fiber type	Single Mode
	Notes	TX 1490nm RX 1310nm	
	Services	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.	

Accessory Product Details

HP X120 1G SFP LC LH100 Transceiver (JD103A) A small form factor pluggable (SFP) Gigabit LH100 transceiver that provides a full-duplex Gigabit solution up to 100km on a single mode fiber.	**Ports**	1 LC 1000BASE-LH port (no IEEE standard exists for 1550 nm optics)	
	Connectivity	**Connector type**	LC
		Wavelength	1550 nm
	Electrical characteristics	**Power consumption typical**	0.8 W
		Power consumption maximum	1.0 W
	Cabling	Cable type: Single-mode fiber optic, complying with ITU-T G.652; Maximum distance: • Up to 100km	
		Fiber type	Single Mode
	Services	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.	
HP X120 1G SFP LC SX Transceiver (JD118B) A small form-factor pluggable (SFP) Gigabit SX transceiver that provides a full-duplex Gigabit solution up to 550m on a Multimode fiber.	**Ports**	1 LC 1000BASE-SX port	
	Connectivity	**Connector type**	LC
		Wavelength	850 nm
	Physical characteristics	**Dimensions**	2.17(d) x 0.6(w) x 0.46(h) in. (5.51 x 1.52 x 1.17 cm)
		Full configuration weight	0.04 lb. (0.02 kg)
	Electrical characteristics	**Power consumption typical**	0.8 W
		Power consumption maximum	1.0 W
	Cabling	Maximum distance: • FDDI Grade distance = 220m • OM1 = 275m • OM2 = 500m • OM3 = Not Specified by standard	
		Cable length	up to 550m
		Fiber type	Multi Mode
	Services	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.	

Accessory Product Details

HP X120 1G SFP LC LX Transceiver (JD119B) A small form-factor pluggable (SFP) Gigabig LX transceiver that provides a full duplex Gigabit solution up to 550m on MMF or 10Km on SMF	**Ports**	1 SFP 1000BASE-LX port (IEEE 802.3z Type 1000BASE-LX)	
	Connectivity	**Connector type**	LC
		Wavelength	1300 nm
	Physical characteristics	**Dimensions**	2.17(d) x 0.6(w) x 0.46(h) in. (5.51 x 1.52 x 1.17 cm)
		Full configuration weight	0.04 lb. (0.02 kg)
	Electrical characteristics	**Power consumption typical**	0.8 W
		Power consumption maximum	1.0 W
	Cabling	Cable type: Either single mode or multimode; Maximum distance: • 550m for Multimode • 10km for Singlemode	
		Fiber type	Both
	Services	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.	

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