

Overview

Models

HP HSR6602-G Router

JG353A

HP HSR6602-XG Router

JG354A

Key features

- High-performance WAN routing
- Compact, multi-core centralized processing architecture
- Comprehensive routing, switching, and security
- Modular WAN and LAN connectivity options
- Robust high availability and resiliency

Product overview

The HP HSR6600 Router Series is made up of high-performance services WAN routers that are ideal for small- to medium-sized campus WAN edge and aggregation, as well as high-end branch deployments.

These routers are built with a compact multi-core centralized processing architecture that delivers, in a 2 RU form factor, robust routing, security, full Layer 2 switching, and modular WAN and LAN interface options, all integrated in a single fast and powerful routing platform.

In addition, these routers feature robust carrier-class reliability capabilities to reduce disruption from network or system failures.

Features and benefits

Connectivity

- **Multiple WAN interfaces**
support Fast Ethernet/Gigabit Ethernet/10GbE ports, OC3~OC48 POS/CPOS, and ATM ports
- **Flexible port selection**
provides a combination of fiber/copper interface modules, 100/1000BASE-X auto-speed selection, and 10/100/1000BASE-T auto-speed detection plus auto duplex and MDI/MDI-X; is speed adaptable between 155 M POS/622 M POS/Gigabit Ethernet
- **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

Performance

- **High-performance platform**
provides up to 15 Mpps forwarding performance

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

Overview

protection

- **Open Shortest Path First (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

- **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

- **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)

- **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

- **BGP+**

extends BGP-4 to support Multiprotocol BGP (MBGP), including support for IPv6 addressing

- **IS-IS for IPv6**

extends IS-IS to support IPv6 addressing

- **IPv6 tunneling**

is an important element for the transition from IPv4 to IPv6; allows IPv6 packets to traverse IPv4-only networks by encapsulating the IPv6 packet into a standard IPv4 packet; supports manually configured, 6to4, and Intra-Site Automatic Tunnel Addressing Protocol (ISATAP) tunnels

- **Multiprotocol Label Switching (MPLS)**

uses BGP to advertise routes across Label Switched Paths (LSPs), but uses simple labels to forward packets from any Layer 2 or Layer 3 protocol, thus reducing complexity and increasing performance; supports graceful restart for reduced failure impact; supports LSP tunneling and multilevel stacks

- **Multiprotocol Label Switching (MPLS) Layer 3 VPN**

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

- **Multiprotocol Label Switching (MPLS) Layer 2 VPN**

establishes simple Layer 2 point-to-point VPNs across a provider network using only MPLS Label Distribution Protocol (LDP); requires no routing and therefore decreases complexity, increases performance, and allows VPNs of non-routable protocols; uses no routing information for increased security; supports Circuit Cross Connect (CCC), Static Virtual Circuits (SVCs), Martini draft, and Kompella-draft technologies

- **Policy routing**

allows custom filters for increased performance and security; supports ACLs, IP prefix, AS paths, community lists, and aggregate policies

- **Multicast VPN**

supports Multicast Domain (MD) multicast VPN, which can be distributed on separate service cards, providing high performance and flexible configuration

- **OSPFv3 MCE**

Multi-VPN-Instance CE (MCE) binds different VPNs to different interfaces on one single CE; the OSPFv3 MCE feature creates and maintains separate OSPFv3 routing tables for each IPv6 VPN to isolate VPN services in the device

Layer 3 services

Overview

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

Quality of Service (QoS)

- **Traffic policing**
supports Committed Access Rate (CAR) and line rate
- **Congestion management**
supports FIFO, PQ, CQ, WFQ, CBQ, and RTPQ
- **Congestion avoidance**
Weighted Random Early Detection (WRED)/Random Early Detection (RED)
- **Other QoS technologies**
support traffic shaping, FR QoS, MPLS QoS, and MP QoS/LFI Security
- **Stateful VPN Firewall**
provides enhanced stateful packet inspection and filtering; supports flexible security zones and virtual firewall containment; provides advanced VPN services with Triple DES (3DES) and Advanced Encryption Standard (AES) encryption at high performance and low latency, Web content filtering, and application prioritization and enhancement
- **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+)**
is an authentication tool using TCP with encryption of the full authentication request that provides additional security
- **Network address translation (NAT)**
supports repeated multiplexing of a port and automatic 5-tuple collision detection, enabling NAT to support unlimited connections; supports blacklist in NAT/NAPT/internal server, a limit on the number of connections, session log, and multi-instance
- **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
- **Unicast Reverse Path Forwarding (URPF)**
allows normal packets to be forwarded correctly, but discards the attaching packet due to lack of reverse path route or incorrect inbound interface; prevents source spoofing and distributed attacks; supports distributed URP
- **Dynamic Virtual Private Network (DVPN)**
collects, maintains, and distributes dynamic public addresses through the VPN Address Management (VAM) protocol, making VPN establishment available between enterprise branches that use dynamic addresses to access the public network; compared to traditional VPN technologies, DVPN technology is more flexible and has richer features, such as NAT traversal of DVPN packets, AAA identity authentication, IPsec protection of data packets, and multiple VPN domains

Overview

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
- **Remote monitoring (RMON)**
uses standard SNMP to monitor essential network functions; supports events, alarm, history, and statistics group plus a private alarm extension group
- **Debug and sampler utility**
supports ping and traceroute for both IPv4 and IPv6
- **Network Quality Analyzer (NQA)**
analyzes network performance and service quality by sending test packets, and provides network performance and service quality parameters such as jitter, TCP, or FTP connection delays and file transfer rates; allows a network manager to determine overall network performance and to diagnose and locate network congestion points or failures
- **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
- **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
- **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)
- **Internet Group Management Protocol (IGMP)**
is used by IP hosts to establish and maintain multicast groups; supports v1, v2, and v3; utilizes Any-Source Multicast (ASM) or Source-Specific Multicast (SSM) to manage IPv4 multicast networks

Resiliency and high availability

- **Virtual Router Redundancy Protocol (VRRP)**
allows groups of two routers to dynamically back each other up to create highly available routed environments
- **Hot-swappable modules**
facilitate the replacement of hardware interface modules without impacting the traffic flow through the system
- **Graceful restart**
features are fully supported, including 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)
- **Separate data and control planes**
provide greater flexibility and enable continual services
- **Hitless software upgrades**
allow patches to be installed without restarting the device, increasing network uptime and simplifying maintenance

Overview

- **Optional redundant power supply**
provides uninterrupted power; allows hot-swapping of one of the two supplies when installed
- **IP Fast Reroute Framework (FRR)**
nodes are configured with backup ports and routes; local implementation requires no cooperation of adjacent devices, simplifying the deployment; solves the traditional convergence faults in IP forwarding; realizes restoration within 50 ms, with the restoration time independent of the number of routes and fast link switchovers without route convergence

Multicast support

- **Internet Group Management Protocol (IGMP)**
is used by IP hosts to establish and maintain multicast groups; supports v1, v2, and v3; utilizes Any-Source Multicast (ASM) or Source-Specific Multicast (SSM) to manage IPv4 multicast networks
- **Protocol Independent Multicast (PIM)**
is used for IPv4 and IPv6 multicast applications; supports PIM Dense Mode (PIM-DM), Sparse Mode (PIM-SM), and Source-Specific Mode (PIM-SSM)
- **Multicast Source Discovery Protocol (MSDP)**
is used for interdomain multicast applications, allowing multiple PIM-SM domains to interoperate
- **Multicast Border Gateway Protocol (MBGP)**
allows multicast traffic to be forwarded across BGP networks, separate from unicast traffic

Product architecture

- **Multi-core CPU**
delivers multi-thread processing, with eight cores and 32 hardware threads
- **Distributed processing**
two kinds of engines are hardware separated: main controller engine (routing engine) and service engines (Flexible Interface Platform [FIP]); the main controller engine is used for route computing and system management, and service engines are used for processing services

Additional information

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

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 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

Technical Specifications

HP HSR6602-G Router (JG353A)

Ports	4 dual-personality 1000 Mbps ports (IEEE 802.3ab Type 1000BASE-T) 1 open module slot; for either a FIP10 or FIP20 Module 2 RJ-45 serial console ports 1 USB 2.0 1 RJ-45 out-of-band management port 1 Compact Flash port
Physical characteristics	Dimensions 17.32(w) x 18.9(d) x 3.46(h) in (44 x 48 x 8.8 cm) (2U height) Weight 26.68 lb (12.1 kg), Fully loaded Chassis and power supplies as shipped
Memory and processor	Processor Multi-core PowerPC @ 1500 MHz, 8 MB flash, 2 GB SDRAM, 512 MB compact flash
Mounting	EIA standard 19 in. rack
Performance	IPv6 Ready Certified Latency 13.5 μ s (FIFO 64-byte packets) Throughput up to 9 million pps (64-byte packets) Switch fabric speed 80 Gbps Routing table size 1000000 entries (IPv4), 1000000 entries (IPv6) Forwarding table size 1000000 entries (IPv4), 1000000 entries (IPv6) Backplane bandwidth 80 Gbps
Environment	Operating temperature 32°F to 113°F (0°C to 45°C) Operating relative humidity 5% to 95%, noncondensing Altitude up to 13,123 ft (4 km)
Electrical characteristics	Frequency 50/60 Hz Voltage 100-240 VAC DC voltage -48 VDC to -60 VDC Maximum power rating 300 W Notes Maximum power rating and maximum heat dissipation are the worst-case theoretical maximum numbers provided for planning the infrastructure with fully loaded PoE (if equipped), 100% traffic, all ports plugged in, and all modules populated.
Safety	UL 1950; UL 60950; CAN/CSA 22.2 No. 60950; EN 60825; AS/NZS 60950; KN 60950; GOST R MEK60950; IEC 60950; EN 60950; IEC 60825; ROHS Compliance
Emissions	VCCI Class A; EN 55022 Class A; CISPR 22 Class A; ICES-003 Class A; AS/NZS CISPR 22 Class A; CSA 2.22 60950; EN 61000-3-2; EN 61000-3-3; UL 60950; EN 60950-1; IEC 60950-1; FCC (CFR 47, Part 15) Subpart B Class A; ETSI EN 300 386 Class A; KN22 Class A; GB 9254 Class A; AS/NZS 60950-1
Immunity	Generic ETSI EN 300 386 V1.3.3; KN24 EN EN 55024, CISPR 24
Management	command-line interface; out-of-band management; SNMP Manager; Telnet; RMON1; terminal interface (serial RS-232C); Ethernet Interface MIB

Technical Specifications

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 HSR6602-XG Router (JG354A)

Ports	4 dual-personality 1000 Mbps ports (IEEE 802.3ab Type 1000BASE-T) 2 SFP+ 10GbE ports (IEEE 802.3ae Type 10GBASE-SR) 1 open module slot; for either a FIP10 or FIP20 Module 2 RJ-45 serial console ports 1 USB 2.0 1 RJ-45 out-of-band management port 1 Compact Flash port	
Physical characteristics	Dimensions	17.32(w) x 18.9(d) x 3.46(h) in (44 x 48 x 8.8 cm) (2U height)
	Weight	26.68 lb (12.1 kg), Fully loaded Chassis and power supplies as shipped
Memory and processor	Processor	Multi-core PowerPC @ 1500 MHz, 8 MB flash, 4 GB SDRAM, 512 MB compact flash
Mounting	EIA standard 19 in. rack	
Performance	IPv6 Ready Certified	
	Latency	13.5 μ s (FIFO 64-byte packets)
	Throughput	up to 15 million pps (64-byte packets)
	Switch fabric speed	80 Gbps
	Routing table size	4000000 entries (IPv4), 2000000 entries (IPv6)
	Forwarding table size	1000000 entries (IPv4), 1000000 entries (IPv6)
	Backplane bandwidth	80 Gbps
Environment	Operating temperature	32°F to 113°F (0°C to 45°C)
	Operating relative humidity	5% to 95%, noncondensing
	Altitude	up to 13,123 ft (4 km)
Electrical characteristics	Frequency	50/60 Hz
	Voltage	100-240 VAC
	DC voltage	-48 VDC to -60 VDC
	Maximum power rating	300 W
	Notes	Maximum power rating and maximum heat dissipation are the worst-case theoretical maximum numbers provided for planning the infrastructure with fully loaded PoE (if equipped), 100% traffic, all ports plugged in, and all modules populated.
Safety	UL 1950; UL 60950; CAN/CSA 22.2 No. 60950; EN 60825; AS/NZS 60950; KN 60950; GOST R MEK60950; IEC 60950; EN 60950; IEC 60825; ROHS Compliance	
Emissions	VCCI Class A; EN 55022 Class A; CISPR 22 Class A; ICES-003 Class A; AS/NZS CISPR 22 Class A; CSA 2.22 60950; EN 61000-3-2; EN 61000-3-3; UL 60950; EN 60950-1; IEC 60950-1; FCC (CFR 47, Part 15) Subpart B Class A; ETSI EN 300 386 Class A; KN22 Class A; GB 9254 Class A; AS/NZS 60950-1	
Immunity	Generic	ETSI EN 300 386 V1.3.3; KN24

Technical Specifications

EN EN 55024, CISPR 24

Management command-line interface; out-of-band management; SNMP Manager; Telnet; RMON1; terminal interface (serial RS-232C); Ethernet Interface MIB

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 1267 Border Gateway Protocol 3 (BGP-3)
RFC 1657 Definitions of Managed Objects for BGPv4
RFC 1771 BGPv4
RFC 1772 Application of the BGP
RFC 1773 Experience with the BGP-4 Protocol
RFC 1774 BGP-4 Protocol Analysis
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 2842 Capability Advertisement with BGP-4
RFC 2858 BGP-4 Multi-Protocol Extensions
RFC 2918 Route Refresh Capability

Denial of service protection

CPU DoS Protection
Rate Limiting by ACLs

Device management

RFC 1155 Structure and Mgmt Information (SMIv1)
RFC 1157 SNMPv1/v2c
RFC 1305 NTPv3
RFC 1901 (Community based SNMPv2)
RFC 1901-1907 SNMPv2c, SMIv2 and Revised MIB-II
RFC 1902 (SNMPv2)
RFC 1908 (SNMP v1/2 Coexistence)
RFC 1945 Hypertext Transfer Protocol -- HTTP/1.0
RFC 2068 Hypertext Transfer Protocol -- HTTP/1.1
RFC 2271 FrameWork
RFC 2452 MIB for TCP6
RFC 2454 MIB for UDP6
RFC 2573 (SNMPv3 Applications)
RFC 2576 (Coexistence between SNMP V1, V2, V3)
RFC 2578-2580 SMIv2
RFC 2579 (SMIv2 Text Conventions)
RFC 2580 (SMIv2 Conformance)
RFC 2819 (RMON groups Alarm, Event, History and Statistics only)
RFC 2819 RMON

IP multicast

RFC 1112 IGMP
RFC 2236 IGMPv2
RFC 2283 Multiprotocol Extensions for BGP-4
RFC 2362 PIM Sparse Mode
RFC 2934 Protocol Independent Multicast MIB for IPv4
RFC 3973 PIM Dense Mode
RFC 4601 PIM Sparse Mode
RFC 4605 IGMP/MLD Proxying

IPv6

RFC 1350 TFTP
RFC 1881 IPv6 Address Allocation Management
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 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 2472 IP Version 6 over PPP
RFC 2473 Generic Packet Tunneling in IPv6
RFC 2475 IPv6 DiffServ Architecture
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 2711 IPv6 Router Alert Option
RFC 2740 OSPFv3 for IPv6
RFC 2893 Transition Mechanisms for IPv6 Hosts and Routers
RFC 2925 Definitions of Managed Objects for Remote

Technical Specifications

RFC 3410 (Management Framework)
RFC 3416 (SNMP Protocol Operations v2)
RFC 3417 (SNMP Transport Mappings)
Multiple Configuration Files
Multiple Software Images
SNMP v3 and RMON RFC support
SSHv1/SSHv2 Secure Shell
TACACS/TACACS+

General protocols

IEEE 802.1ad Q-in-Q
IEEE 802.1ag Service Layer OAM
IEEE 802.1ah Provider Backbone Bridges
IEEE 802.1AX-2008 Link Aggregation
IEEE 802.1D MAC Bridges
IEEE 802.1p Priority
IEEE 802.1Q (GVRP)
IEEE 802.1Q VLANs
IEEE 802.1s (MSTP)
IEEE 802.1s Multiple Spanning Trees
IEEE 802.1v VLAN classification by Protocol and Port
IEEE 802.1w Rapid Reconfiguration of Spanning Tree
IEEE 802.1X PAE
IEEE 802.3 Type 10BASE-T
IEEE 802.3ab 100BASE-T
IEEE 802.3ac (VLAN Tagging Extension)
IEEE 802.3ad Link Aggregation (LAG)
IEEE 802.3ad Link Aggregation Control Protocol (LACP)
IEEE 802.3ae 10-Gigabit Ethernet
IEEE 802.3ag Ethernet OAM
IEEE 802.3ah Ethernet in First Mile over Point to Point
Fiber - EFMF
IEEE 802.3i 10BASE-T
IEEE 802.3u 100BASE-X
IEEE 802.3x Flow Control
IEEE 802.3z 100BASE-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 855 Telnet Option Specification
RFC 856 TELNET
RFC 857 Telnet Echo Option
RFC 858 Telnet Suppress Go Ahead Option
RFC 894 IP over Ethernet
RFC 896 Congestion Control in IP/TCP Internetworks

RFC 3056 Connection of IPv6 Domains via IPv4 Clouds
RFC 3162 RADIUS and IPv6
RFC 3306 Unicast-Prefix-based IPv6 Multicast Addresses
(v2 models only)
RFC 3307 IPv6 Multicast Address Allocation
RFC 3315 DHCPv6 (client and relay)
RFC 3363 DNS support
RFC 3484 Default Address Selection for IPv6
RFC 3493 Basic Socket Interface Extensions for IPv6 (v2 models only)
RFC 3513 IPv6 Addressing Architecture
RFC 3542 Advanced Sockets API for IPv6
RFC 3587 IPv6 Global Unicast Address Format
RFC 3596 DNS Extension for IPv6
RFC 3810 MLDv2 (host joins only)
RFC 3810 MLDv2 for IPv6
RFC 3810 Multicast Listener Discovery Version 2 (MLDv2) for IPv6
RFC 4022 MIB for TCP
RFC 4113 MIB for UDP
RFC 4251 SSHv6 Architecture
RFC 4252 SSHv6 Authentication
RFC 4252 SSHv6 Transport Layer
RFC 4253 SSHv6 Transport Layer
RFC 4254 SSHv6 Connection
RFC 4291 IP Version 6 Addressing Architecture
RFC 4293 MIB for IP
RFC 4419 Key Exchange for SSH
RFC 4443 ICMPv6
RFC 4541 IGMP & MLD Snooping Switch
RFC 4862 IPv6 Stateless Address Auto-configuration
RFC 5095 Deprecation of Type 0 Routing Headers in IPv6
RFC 5340 OSPF for IPv6
RFC 5340 OSPFv3 for IPv6
RFC 5722 Handling of Overlapping IPv6 Fragments

MIBs

IEEE 8021-PAE-MIB
IEEE 8023-LAG-MIB
RFC 1156 (TCP/IP MIB)
RFC 1212 Concise MIB Definitions
RFC 1213 MIB II
RFC 1229 Interface MIB Extensions
RFC 1286 Bridge MIB
RFC 1493 Bridge MIB
RFC 1573 SNMP MIB II

Technical Specifications

RFC 906 TFTP Bootstrap	RFC 1650 Ethernet-Like MIB
RFC 925 Multi-LAN Address Resolution	RFC 1657 BGP-4 MIB
RFC 950 Internet Standard Subnetting Procedure	RFC 1724 RIPv2 MIB
RFC 951 BOOTP	RFC 1757 Remote Network Monitoring MIB
RFC 959 File Transfer Protocol (FTP)	RFC 1850 OSPFv2 MIB
RFC 1006 ISO transport services on top of the TCP: Version 3	RFC 1907 SNMPv2 MIB
RFC 1027 Proxy ARP	RFC 2011 SNMPv2 MIB for IP
RFC 1034 Domain Concepts and Facilities	RFC 2012 SNMPv2 MIB for TCP
RFC 1035 Domain Implementation and Specification	RFC 2013 SNMPv2 MIB for UDP
RFC 1042 IP Datagrams	RFC 2021 RMONv2 MIB
RFC 1058 RIPv1	RFC 2096 IP Forwarding Table MIB
RFC 1071 Computing the Internet Checksum	RFC 2233 Interfaces MIB
RFC 1091 Telnet Terminal-Type Option	RFC 2273 SNMP-NOTIFICATION-MIB
RFC 1093 NSFNET routing architecture	RFC 2452 IPV6-TCP-MIB
RFC 1122 Host Requirements	RFC 2454 IPV6-UDP-MIB
RFC 1141 Incremental updating of the Internet checksum	RFC 2465 IPv6 MIB
RFC 1142 OSI IS-IS Intra-domain Routing Protocol	RFC 2466 ICMPv6 MIB
RFC 1144 Compressing TCP/IP headers for low-speed serial links	RFC 2571 SNMP Framework MIB
RFC 1171 Point-to-Point Protocol for the transmission of multi-protocol datagrams over Point-to-Point links	RFC 2572 SNMP-MPD MIB
RFC 1195 OSI ISIS for IP and Dual Environments	RFC 2574 SNMP USM MIB
RFC 1213 Management Information Base for Network Management of TCP/IP-based internets	RFC 2618 RADIUS Client MIB
RFC 1253 (OSPF v2)	RFC 2620 RADIUS Accounting Client MIB
RFC 1256 ICMP Router Discovery Protocol (IRDP)	RFC 2665 Ethernet-Like-MIB
RFC 1293 Inverse Address Resolution Protocol	RFC 2668 802.3 MAU MIB
RFC 1305 NTPv3	RFC 2674 802.1p and IEEE 802.1Q Bridge MIB
RFC 1315 Management Information Base for Frame Relay DTEs	RFC 2688 MAU-MIB
RFC 1321 The MD5 Message-Digest Algorithm	RFC 2737 Entity MIB (Version 2)
RFC 1332 The PPP Internet Protocol Control Protocol (IPCP)	RFC 2787 VRRP MIB
RFC 1333 PPP Link Quality Monitoring	RFC 2819 RMON MIB
RFC 1334 PPP Authentication Protocols (PAP)	RFC 2863 The Interfaces Group MIB
RFC 1334 PPP Authentication Protocols (PAP)	RFC 2925 Ping MIB
RFC 1349 Type of Service	RFC 2932IP (Multicast Routing MIB)
RFC 1350 TFTP Protocol (revision 2)	RFC 2933 IGMP MIB
RFC 1377 The PPP OSI Network Layer Control Protocol (OSINLCP)	RFC 3273 HC-RMON MIB
RFC 1381 SNMP MIB Extension for X.25 LAPB	RFC 3414 SNMP-User based-SM MIB
RFC 1389 RIPv2 MIB Extension	RFC 3415 SNMP-View based-ACM MIB
RFC 1471 The Definitions of Managed Objects for the Link Control Protocol of the Point-to-Point Protocol	RFC 3418 MIB for SNMPv3
RFC 1472 The Definitions of Managed Objects for the	RFC 3813 MPLS LSR MIB
	RFC 3814 MPLS FTN MIB
	RFC 3815 MPLS LDP MIB
	RFC 3826 AES for SNMP's USM MIB
	RFC 4113 UDP MIB
	RFC 4133 Entity MIB (Version 3)
	RFC 4221 MPLS FTN MIB
	LLDP-EXT-DOT1-MIB
	LLDP-EXT-DOT3-MIB
	LLDP-MIB
	Network management
	IEEE 802.1AB Link Layer Discovery Protocol (LLDP)
	IEEE 802.1D (STP)

Technical Specifications

Security Protocols of the Point-to-Point Protocol	RFC 1098 A Simple Network Management Protocol (SNMP)
RFC 1490 Multiprotocol Interconnect over Frame Relay	RFC 1155 Structure of Management Information
RFC 1519 CIDR	RFC 1157 SNMPv1
RFC 1531 Dynamic Host Configuration Protocol	RFC 1215 SNMP Generic traps
RFC 1533 DHCP Options and BOOTP Vendor Extensions	RFC 1757 RMON 4 groups: Stats, History, Alarms and Events
RFC 1534 DHCP/BOOTP Interoperation	RFC 1901 SNMPv2 Introduction
RFC 1541 DHCP	RFC 1902 SNMPv2 Structure
RFC 1542 BOOTP Extensions	RFC 1903 SNMPv2 Textual Conventions
RFC 1542 Clarifications and Extensions for the Bootstrap Protocol	RFC 1904 SNMPv2 Conformance
RFC 1552 The PPP Internetworking Packet Exchange Control Protocol (IPXCP)	RFC 1905 SNMPv2 Protocol Operations
RFC 1577 Classical IP and ARP over ATM	RFC 1906 SNMPv2 Transport Mappings
RFC 1631 NAT	RFC 1918 Private Internet Address Allocation
RFC 1638 PPP Bridging Control Protocol (BCP)	RFC 2272 SNMPv3 Management Protocol
RFC 1661 The Point-to-Point Protocol (PPP)	RFC 2273 SNMPv3 Applications
RFC 1662 PPP in HDLC-like Framing	RFC 2274 USM for SNMPv3
RFC 1695 Definitions of Managed Objects for ATM Management Version 8.0 using SMIv2	RFC 2275 VACM for SNMPv3
RFC 1700 Assigned Numbers	RFC 2570 SNMPv3 Overview
RFC 1701 Generic Routing Encapsulation	RFC 2571 SNMP Management Frameworks
RFC 1702 Generic Routing Encapsulation over IPv4 networks	RFC 2572 SNMPv3 Message Processing
RFC 1721 RIP-2 Analysis	RFC 2573 SNMPv3 Applications
RFC 1722 RIP-2 Applicability	RFC 2574 SNMPv3 User-based Security Model (USM)
RFC 1723 RIP v2	RFC 2575 SNMPv3 View-based Access Control Model (VACM)
RFC 1812 IPv4 Routing	RFC 2575 VACM for SNMP
RFC 1829 The ESP DES-CBC Transform	RFC 2576 Coexistence between SNMP versions
RFC 1877 PPP Internet Protocol Control Protocol Extensions for Name Server Addresses	RFC 2578 SMIv2
RFC 1944 Benchmarking Methodology for Network Interconnect Devices	RFC 2819 Four groups of RMON: 1 (statistics), 2 (history), 3 (alarm) and 9 (events)
RFC 1945 Hypertext Transfer Protocol -- HTTP/1.0	RFC 2819 Remote Network Monitoring Management Information Base
RFC 1973 PPP in Frame Relay	RFC 3164 BSD syslog Protocol
RFC 1974 PPP Stac LZS Compression Protocol	RFC 3176 sFlow
RFC 1981 Path MTU Discovery for IP version 6	RFC 3411 SNMP Management Frameworks
RFC 1990 The PPP Multilink Protocol (MP)	RFC 3412 SNMPv3 Message Processing
RFC 1994 PPP Challenge Handshake Authentication Protocol (CHAP)	RFC 3414 SNMPv3 User-based Security Model (USM)
RFC 2082 RIP-2 MD5 Authentication	RFC 3415 SNMPv3 View-based Access Control Model (VACM)
RFC 2091 Trigger RIP	ANSI/TIA-1057 LLDP Media Endpoint Discovery (LLDP-MED)
RFC 2104 HMAC: Keyed-Hashing for Message Authentication	SNMPv1/v2
RFC 2131 DHCP	SNMPv1/v2c
RFC 2132 DHCP Options and BOOTP Vendor Extensions	SNMPv1/v2c (read only)
RFC 2138 Remote Authentication Dial In User Service (RADIUS)	SNMPv1/v2c/v3
	OSPF
	RFC 1245 OSPF protocol analysis
	RFC 1246 Experience with OSPF
	RFC 1253 OSPFv2 MIB
	RFC 1583 OSPFv2

Technical Specifications

- RFC 2205 Resource ReSerVation Protocol (RSVP) - Version 1 Functional Specification
 - RFC 2209 Resource ReSerVation Protocol (RSVP) -- Version 1 Message Processing Rules
 - RFC 2236 IGMP Snooping
 - RFC 2246 The TLS Protocol Version 1.0
 - RFC 2252 Lightweight Directory Access Protocol (v3):
 - Attribute Syntax Definitions
 - RFC 2280 Routing Policy Specification Language (RPSL)
 - RFC 2283 MBGP
 - RFC 2284 EAP over LAN
 - RFC 2338 VRRP
 - RFC 2364 PPP Over AAL5
 - RFC 2374 An Aggregatable Global Unicast Address Format
 - RFC 2451 The ESP CBC-Mode Cipher Algorithms
 - RFC 2453 RIPv2
 - RFC 2510 Internet X.509 Public Key Infrastructure Certificate Management Protocols
 - RFC 2511 Internet X.509 Certificate Request Message Format
 - RFC 2516 A Method for Transmitting PPP Over Ethernet (PPPoE)
 - RFC 2529 Transmission of IPv6 over IPv4 Domains without Explicit Tunnels
 - RFC 2616 HTTP Compatibility v1.1
 - RFC 2622 Routing Policy Specification Language (RPSL)
 - RFC 2663 NAT Terminology and Considerations
 - RFC 2684 Multiprotocol Encapsulation over ATM Adaptation Layer 5
 - RFC 2694 DNS extensions to Network Address Translators (DNS_ALG)
 - RFC 2702 Requirements for Traffic Engineering Over MPLS
 - RFC 2716 PPP EAP TLS Authentication Protocol
 - RFC 2747 RSVP Cryptographic Authentication
 - RFC 2763 Dynamic Name-to-System ID mapping
 - RFC 2763 Dynamic Name-to-System ID mapping support
 - RFC 2765 Stateless IP/ICMP Translation Algorithm (SIIT)
 - RFC 2766 Network Address Translation - Protocol Translation (NAT-PT)
 - RFC 2767 Dual Stacks IPv4 & IPv6
 - RFC 2784 Generic Routing Encapsulation (GRE)
 - RFC 2787 Definitions of Managed Objects for VRRP
 - RFC 2865 Remote Authentication Dial In User Service (RADIUS)
 - RFC 1587 OSPF NSSA
 - RFC 1745 OSPF Interactions
 - RFC 1765 OSPF Database Overflow
 - RFC 1850 OSPFv2 Management Information Base (MIB), traps
 - RFC 2154 OSPF w/ Digital Signatures (Password, MD-5)
 - RFC 2178 OSPFv2
 - RFC 2328 OSPFv2
 - RFC 2370 OSPF Opaque LSA Option
 - RFC 3101 OSPF NSSA
 - RFC 3623 Graceful OSPF Restart
 - RFC 5340 OSPF for IPv6
 - RFC 5340 OSPFv3 for IPv6
- QoS/CoS**
- IEEE 802.1P (CoS)
 - RFC 2474 DiffServ Precedence, including 8 queues/port
 - RFC 2474 DiffServ precedence, with 4 queues per port
 - RFC 2474 DS Field in the IPv4 and IPv6 Headers
 - RFC 2474 DSCP DiffServ
 - RFC 2474, with 4 queues per port
 - RFC 2475 DiffServ Architecture
 - RFC 2597 DiffServ Assured Forwarding (AF)
 - RFC 2597 DiffServ Assured Forwarding (AF)- partial support
 - RFC 2598 DiffServ Expedited Forwarding (EF)
- Security**
- IEEE 802.1X Port Based Network Access Control
 - RFC 1321 The MD5 Message-Digest Algorithm
 - RFC 1492 TACACS+
 - RFC 2082 RIP-2 MD5 Authentication
 - RFC 2104 Keyed-Hashing for Message Authentication
 - RFC 2138 RADIUS Authentication
 - RFC 2139 RADIUS Accounting
 - RFC 2209 RSVP-Message Processing
 - RFC 2246 Transport Layer Security (TLS)
 - RFC 2459 Internet X.509 Public Key Infrastructure Certificate and CRL Profile
 - RFC 2548 Microsoft Vendor-specific RADIUS Attributes
 - RFC 2716 PPP EAP TLS Authentication Protocol
 - RFC 2818 HTTP Over TLS
 - RFC 2865 RADIUS (client only)
 - RFC 2865 RADIUS Authentication
 - RFC 2866 RADIUS Accounting
 - RFC 2867 RADIUS Accounting Modifications for

Technical Specifications

RFC 2866 RADIUS Accounting	Tunnel
RFC 2868 RADIUS Attributes for Tunnel Protocol Support	Protocol Support
RFC 2869 RADIUS Extensions	RFC 2868 RADIUS Attributes for Tunnel Protocol Support
RFC 2961 RSVP Refresh Overhead Reduction Extensions	RFC 2869 RADIUS Extensions
RFC 2966 Domain-wide Prefix Distribution with Two-Level IS-IS	RFC 3567 Intermediate System (IS) to IS Cryptographic Authentication
RFC 2973 IS-IS Mesh Groups	RFC 3576 Dynamic Authorization Extensions to RADIUS
RFC 2976 The SIP INFO Method	RFC 3579 RADIUS Support For Extensible Authentication Protocol (EAP)
RFC 3022 Traditional IP Network Address Translator (Traditional NAT)	RFC 3580 IEEE 802.1X Remote Authentication Dial In User Service (RADIUS) Usage Guidelines
RFC 3027 Protocol Complications with the IP Network Address Translator	Access Control Lists (ACLs)
RFC 3031 Multiprotocol Label Switching Architecture	Guest VLAN for 802.1x
RFC 3032 MPLS Label Stack Encoding	MAC Authentication
RFC 3036 LDP Specification	Port Security
RFC 3046 DHCP Relay Agent Information Option	Secure Sockets Layer (SSL)
RFC 3063 MPLS Loop Prevention Mechanism	SSHv1 Secure Shell
RFC 3065 Support AS confederation	SSHv1.5 Secure Shell
RFC 3137 OSPF Stub Router Advertisement	SSHv1/SSHv2 Secure Shell
RFC 3209 RSVP-TE Extensions to RSVP for LSP Tunnels	SSHv2 Secure Shell
RFC 3210 Applicability Statement for Extensions to RSVP for LSP-Tunnels	
RFC 3212 Constraint-Based LSP setup using LDP (CR-LDP)	VPN
RFC 3214 LSP Modification Using CR-LDP	RFC 2403 - HMAC-MD5-96
RFC 3215 LDP State Machine	RFC 2404 - HMAC-SHA1-96
RFC 3246 Expedited Forwarding PHB	RFC 2405 - DES-CBC Cipher algorithm
RFC 3268 Advanced Encryption Standard (AES) Ciphersuites for Transport Layer Security (TLS)	RFC 2407 - Domain of interpretation
RFC 3277 IS-IS Transient Blackhole Avoidance	RFC 2547 BGP/MPLS VPNs
RFC 3279 Algorithms and Identifiers for the Internet X.509 Public Key Infrastructure Certificate and Certificate Revocation List (CRL) Profile	RFC 2764 A Framework for IP Based Virtual Private Networks
RFC 3280 Internet X.509 Public Key Infrastructure Certificate and Certificate Revocation List (CRL) Profile	RFC 2796 BGP Route Reflection - An Alternative to Full Mesh IBGP
RFC 3392 Support BGP capabilities advertisement	RFC 2842 Capabilities Advertisement with BGP-4
RFC 3410 Applicability Statements for SNMP	RFC 2858 Multiprotocol Extensions for BGP-4
RFC 3416 Protocol Operations for SNMP	RFC 2917 A Core MPLS IP VPN Architecture
RFC 3417 Transport Mappings for the Simple Network Management Protocol (SNMP)	RFC 2918 Route Refresh Capability for BGP-4
RFC 3479 Fault Tolerance for the Label Distribution Protocol (LDP)	RFC 3107 Carrying Label Information in BGP-4
RFC 3487 Graceful Restart Mechanism for LDP	RFC 4302 - IP Authentication Header (AH)
RFC 3509 OSPF ABR Behavior	RFC 4303 - IP Encapsulating Security Payload (ESP)
RFC 3526 More Modular Exponential (MODP) Diffie-Hellman groups for Internet Key Exchange	RFC 4305 - Cryptographic Algorithm Implementation Requirements for ESP and AH

Technical Specifications

(IKE)	RFC 2407 - Domain of interpretation
RFC 3564 Requirements for Support of Differentiated Services-aware MPLS Traffic Engineering	RFC 2408 - Internet Security Association and Key Management Protocol (ISAKMP)
RFC 3567 Intermediate System to Intermediate System	RFC 2409 - The Internet Key Exchange
(IS-IS) Cryptographic Authentication	RFC 2410 - The NULL Encryption Algorithm and its use with IPsec
RFC 3602 The AES-CBC Cipher Algorithm and Its Use with IPsec	RFC 2411 IP Security Document Roadmap
RFC 3619 Ethernet Automatic Protection Switching (EAPS)	RFC 2412 – OAKLEY
RFC 3623 Graceful OSPF Restart	RFC 2865 - Remote Authentication Dial In User Service (RADIUS)
RFC 3704 Unicast Reverse Path Forwarding (URPF)	IKEv1
RFC 3706 A Traffic-Based Method of Detecting Dead Internet Key Exchange (IKE) Peers	RFC 2865 - Remote Authentication Dial In User Service (RADIUS)
RFC 3768 Virtual Router Redundancy Protocol (VRRP)	RFC 3748 - Extensible Authentication Protocol (EAP)
RFC 3784 ISIS TE support	
RFC 3786 Extending the Number of IS-IS LSP Fragments Beyond the 256 Limit	
RFC 3811 Definitions of Textual Conventions (TCs) for Multiprotocol Label Switching (MPLS) Management	
RFC 3812 Multiprotocol Label Switching (MPLS) Traffic Engineering (TE) Management Information Base (MIB)	
RFC 3847 Restart signaling for IS-IS	
RFC 4213 Basic IPv6 Transition Mechanisms	

Accessories

HP HSR6600 Router Series accessories

Transceivers

HP X110 100M SFP LC LH40 Transceiver	JD090A
HP X110 100M SFP LC LH80 Transceiver	JD091A
HP X110 100M SFP LC FX Transceiver	JD102B
HP X110 100M SFP LC LX Transceiver	JD120B
HP X120 622M SFP LC LX 15km Transceiver	JF829A
HP X120 622M SFP LC LH 40km 1310 Transceiver	JF830A
HP X120 622M SFP LC LH 80km 1550 Transceiver	JF831A
HP X125 1G SFP LC LH40 1310nm Transceiver	JD061A
HP X120 1G SFP LC LH40 1550nm Transceiver	JD062A
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 SX Transceiver	JD118B
HP X120 1G SFP LC LX Transceiver	JD119B
HP X125 1G SFP LC LH70 Transceiver	JD063B
HP X120 1G SFP RJ45 T Transceiver	JD089B
HP X160 2.5G SFP LC 2km Transceiver	JD084A
HP X160 2.5G SFP LC 15km Transceiver	JD085A
HP X160 2.5G SFP LC 40km Transceiver	JD086A
HP X160 2.5G SFP LC 80km Transceiver	JD087A
HP X135 10G XFP LC ER Transceiver	JD121A
HP X130 10G XFP LC LR Transceiver	JD108B
HP X130 10G XFP LC SR Transceiver	JD117B
HP X130 10G SFP+ LC SR Transceiver	JD092B
HP X130 10G SFP+ LC LR Transceiver	JD094B
HP X130 10G SFP+ LC ER 40km Transceiver	JG234A

Cables

HP X200 V.24 DTE 3m Serial Port Cable	JD519A
HP X200 V.24 DCE 3m Serial Port Cable	JD521A
HP X200 V.35 DTE 3m Serial Port Cable	JD523A
HP X200 V.35 DCE 3m Serial Port Cable	JD525A
HP X200 X.21 DTE 3m Serial Port Cable	JD527A
HP X200 X.21 DCE 3m Serial Port Cable	JD529A
HP X260 RS449 3m DTE Serial Port Cable	JF825A
HP X260 RS449 3m DCE Serial Port Cable	JF826A
HP X260 RS530 3m DTE Serial Port Cable	JF827A
HP X260 RS530 3m DCE Serial Port Cable	JF828A
HP X260 8E1 BNC 75 ohm 3m Router Cable	JD512A
HP X260 E1 RJ45 BNC 75-120 ohm Conversion Router Cable	JD511A

Power Supply

HP 5800 300W AC Power Supply	JC087A
HP 5800 300W DC Power Supply	JC090A

Accessories

Fan Tray

HP HSR6602 Router Spare Fan Assembly JG359A

Router Modules

HP 6600 8-port 10/100Base-T HIM Module JC575A

HP 6600 4-port Gig-T HIM Module JC163A

HP 6600 8-port Gig-T HIM Module JC164A

HP 6600 4-port GbE SFP HIM Module JC171A

HP 6600 8-port GbE SFP HIM Module JC174A

HP 6600 1-port 10-GbE XFP HIM Module JC168A

HP 6600 1-port OC-3/STM-1 (E1/T1) CPOS SFP HIM Module JC161A

HP 6600 2-port OC-3/STM-1 (E1/T1) CPOS SFP HIM Module JC162A

HP 6600 2-port OC-3/STM-1 (E3/T3) CPOS SFP HIM Module JC169A

HP 6600 1-port OC-3/STM-1 (E3/T3) CPOS SFP HIM Module JC170A

HP 6600 4-port OC-3c/STM-1c or 2-port OC-12c/STM-4c POS SFP HIM Module JC172A

HP 6600 2-port OC-3c/STM-1c or 1-port OC-12c/STM-4c POS SFP HIM Module JC173A

HP 6600 1-port OC-3c/STM-1c ATM SFP HIM Module JC175A

HP 6600 1-port OC-48c/STM-16c POS/CPOS SFP HIM Module JC494A

HP 6600 2-port OC-3c/STM-1c ATM SFP HIM Module JC495A

HP 6600 2-port OC-48c/STM-16c RPR SFP HIM Module JC576A

HP MSR 2-port Enhanced Sync/Async Serial MIM Module JD540A

HP MSR 8-port T1/Fractional T1 MIM Module JC159A

HP MSR 8-port T1/CT1/PRI MIM Module JC160A

HP MSR 4-port Enhanced Sync/Async Serial MIM Module JD541A

HP MSR 8-port Enhanced Sync/Async Serial MIM Module JD552A

HP MSR 1-port T3/CT3/FT3 MIM Module JD628A

HP MSR 1-port FE3/CE3 MIM Module JD630A

HP MSR 8-port E1/Fractional E1 (75ohm) MIM Module JF255A

HP 6600 FIP-10 Flexible Interface Platform Router Module JG357A

HP 6600 FIP-20 Flexible Interface Platform Router Module JG358A

Memory

HP X610 2G VLP DDR3 SDRAM Memory JG482A

Accessory Product Details

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

HP X125 1G SFP LC LH40 1310nm Transceiver (JD061A)	Ports Connectivity	1 LC 1000Base-LH port (no IEEE standard exists for 1550 nm optics) Connector type LC
A small form-factor pluggable SFP Gigabit LH40 transceiver that provides a full duplex Gigabit solution up to 40km on a single-mode fiber.	Physical characteristics	Wavelength 1310 nm Dimensions 2.17(d) x 0.6(w) x 0.46(h) in. (5.51 x 1.52 x 1.17 cm)
	Electrical characteristics	Full configuration weight 0.04 lb. (0.02 kg) 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: <ul style="list-style-type: none"> ● 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)	Ports Connectivity	1 LC 1000BASE-LH port (no IEEE standard exists for 1550 nm optics) Connector type LC
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.	Physical characteristics	Wavelength 1550 nm Dimensions 2.17(d) x 0.6(w) x 0.46(h) in. (5.51 x 1.52 x 1.17 cm)
	Electrical characteristics	Full configuration weight 0.04 lb. (0.02 kg) 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: <ul style="list-style-type: none"> ● 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

<p>HP X120 1G SFP LC BX 10-U Transceiver (JD098B)</p> <p>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.</p>	<p>Ports</p> <p>1 LC 1000BASE-BX10 port (IEEE 802.3ah Type 1000BASE-BX10-U); Duplex: full only</p> <p>Connectivity</p> <p>Connector type LC</p> <p>Physical characteristics</p> <p>Dimensions 2.17(d) x 0.6(w) x 0.46(h) in. (5.51 x 1.52 x 1.17 cm)</p> <p>Full configuration weight 0.04 lb. (0.02 kg)</p> <p>Electrical characteristics</p> <p>Power consumption typical 0.8 W</p> <p>Power consumption maximum 1.0 W</p> <p>Cabling</p> <p>Maximum distance:</p> <ul style="list-style-type: none"> • 10km <p>Fiber type Single Mode</p> <p>Notes</p> <p>TX 1310nm RX 1490nm</p> <p>Services</p> <p>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.</p>
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<p>HP X120 1G SFP LC BX 10-D Transceiver (JD099B)</p> <p>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.</p>	<p>Ports</p> <p>1 LC 1000BASE-BX10 port (IEEE 802.3ah Type 1000BASE-BX10-D); Duplex: full only</p> <p>Connectivity</p> <p>Connector type LC</p> <p>Physical characteristics</p> <p>Dimensions 2.17(d) x 0.6(w) x 0.46(h) in. (5.51 x 1.52 x 1.17 cm)</p> <p>Full configuration weight 0.04 lb. (0.02 kg)</p> <p>Electrical characteristics</p> <p>Power consumption typical 0.8 W</p> <p>Power consumption maximum 1.0 W</p> <p>Cabling</p> <p>Maximum distance:</p> <ul style="list-style-type: none"> • Up to 10km <p>Fiber type Single Mode</p> <p>Notes</p> <p>TX 1490nm RX 1310nm</p> <p>Services</p> <p>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.</p>
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Accessory Product Details

HP X120 1G SFP LC LH100 Transceiver (JD103A)	Ports	1 LC 1000BASE-LH port (no IEEE standard exists for 1550 nm optics)	
	Connectivity	Connector type	LC
<p>A small form factor pluggable (SFP) Gigabit LH100 transceiver that provides a full-duplex Gigabit solution up to 100km on a single mode fiber.</p>	Electrical characteristics	Wavelength	1550 nm
		Power consumption typical	0.8 W
	Cabling	Power consumption maximum	1.0 W
		Cable type: Single-mode fiber optic, complying with ITU-T G.652;	
	Services	Maximum distance: • Up to 100km	
		Fiber type	Single Mode
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)	Ports	1 LC 1000BASE-SX port	
	Connectivity	Connector type	LC
<p>A small form-factor pluggable (SFP) Gigabit SX transceiver that provides a full-duplex Gigabit solution up to 550m on a Multimode fiber.</p>	Physical characteristics	Wavelength	850 nm
		Dimensions	2.17(d) x 0.6(w) x 0.46(h) in. (5.51 x 1.52 x 1.17 cm)
	Electrical characteristics	Full configuration weight	0.04 lb. (0.02 kg)
		Power consumption typical	0.8 W
	Cabling	Power consumption maximum	1.0 W
		Maximum distance: • FDDI Grade distance = 220m • OM1 = 275m • OM2 = 500m • OM3 = Not Specified by standard	
	Services	Cable length	up to 550m
		Fiber type	Multi Mode
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) Gigabit LX transceiver that provides a full duplex Gigabit solution up to 550m on MMF or 10Km on SMF	Ports Connectivity	1 SFP 1000BASE-LX port (IEEE 802.3z Type 1000BASE-LX) Connector type LC Wavelength 1300 nm
	Physical characteristics Electrical 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) 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.	

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 Connectivity	1 LC 1000BASE-LH port (no IEEE standard exists for 1550 nm optics) Connector type LC Wavelength 1550 nm
	Physical characteristics Electrical 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) 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.	

Accessory Product Details

HP X120 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 Ω 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.

To learn more, visit: www.hp.com/networking

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