



# HPE HSR6600 TAA-Compliant Router Series



## Product overview

The HPE HSR6600 TAA-Compliant 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 L2 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 due to network or system failures.

### A summary of the highlights of the HSR6600 TAA-Compliant Router Series

- 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

## 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, 10/100/1000BASE-T auto-speed detection, and 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 it can be enabled on a per-port or per-VLAN basis for added flexibility

### Performance

- High-performance platform

Provides up to 15 Mp/s forwarding performance

**Resiliency and high availability**

- Separate data and control planes  
Provide greater flexibility and enable continual services
- Hot-swappable modules  
Facilitates the replacement of hardware interface modules without impacting the traffic flow through the system
- Optional redundant power supply  
Provides uninterrupted power; and allows hot-swapping of one of the two supplies when installed
- Virtual Router Redundancy Protocol (VRRP)  
Allows groups of two routers to dynamically back each other up to create highly available routed environments
- Graceful restart  
Supports graceful restart for open shortest path first (OSPF), intermediate system to intermediate system (IS-IS), Border Gateway Protocol (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; and forwarding remains uninterrupted during the switchover to achieve nonstop forwarding (NSF)
- Hitless software upgrades  
Allow patches to be installed without restarting the device, increasing network uptime and simplifying maintenance
- 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; and achieves restoration within 50 ms—with the restoration time independent of the number of routes and fast link switchovers without route convergence

**Product architecture**

- Multicore CPU  
Delivers multi-threaded processing, with eight cores and 32 hardware threads
- Distributed processing  
Two kinds of engines are hardware separated: the 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

**L3 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; and includes loop protection
- OSPF  
Delivers faster convergence; uses the link-state routing Interior Gateway Protocol (IGP), which supports Equal-Cost Multipath (ECMP), NSSA, and MD5 authentication for increased security and graceful restart for faster failure recovery
- 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; and scales to very large networks

- IS-IS
  - Uses a path vector 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)
- 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
  - Allows IPv6 packets to traverse IPv4-only networks by encapsulating the IPv6 packet into a standard IPv4 packet; supports manually configured, 6-to-4, Intra-Site Automatic Tunnel Addressing Protocol (ISATAP) tunnels; is an important element for the transition from IPv4 to IPv6
- Multiprotocol Label Switching (MPLS)
  - Uses BGP to advertise routes across Label Switched Paths (LSPs); but uses simple labels to forward packets from any L2 or L3 protocol, which reduces complexity and increases performance; and supports graceful restart for reduced failure impact; and supports LSP tunneling and multilevel stacks
- Multiprotocol Label Switching (MPLS) L3 VPN
  - Allows L3 VPNs across a provider network; uses MBGP to establish private routes for increased security; and supports RFC 2547bis multiple autonomous system VPNs for added flexibility
- Multiprotocol Label Switching (MPLS) Layer 2 VPN
  - Establishes simple L2 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; and 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; and supports access control lists (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
- Virtual Private LAN Service (VPLS)
  - Establishes point-to-multipoint L2 VPNs across a provider network
- Bidirectional Forwarding Detection (BFD)
  - Enables link connectivity monitoring; and reduces network convergence time for RIP, OSPF, BGP, IS-IS, VRRP, MPLS, and IRF

- IGMPv1, v2, and v3  
Allow individual hosts to be registered on a particular VLAN
- PIM-SSM, PIM-DM, and PIM-SM (for IPv4 and IPv6)  
Support IP Multicast address management and inhibition of DoS attacks
- ECMP  
Enables multiple equal-cost links in a routing environment to increase link redundancy and scale bandwidth
- 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

### **L3 services**

- Address Resolution Protocol (ARP)  
Determines the MAC address of another IP host in the same subnet; and supports static ARPs; gratuitous ARP allows detection of duplicate IP addresses; and proxy ARP allows normal ARP operation between subnets or when subnets are separated by an L2 network
- User Datagram Protocol (UDP) helper  
Redirects UDP broadcasts to specific IP subnets to help prevent server spoofing
- Domain Name System (DNS)  
Provides a distributed database that translates domain names and IP addresses, which simplifies network design; and supports the client and server
- Dynamic Host Configuration Protocol (DHCP)  
Simplifies the management of large IP networks

### **Security**

- 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
- Group Domain Virtual Private Network (GDVPN)  
A tunnel-less VPN technology that allows for native end-to-end security for a full meshed network; suitable for an enterprise running encryption over a private Multiprotocol Label Switching (MPLS)/IP-based core network, as well as to encrypt multicast traffic
- 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
- ACL  
Supports powerful ACLs for both IPv4 and IPv6; ACLs are used for filtering traffic to help 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 an L2 header or an L3 protocol header; and rules can be set to operate on specific dates or times

- 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; helps prevent source spoofing and distributed attacks; and supports distributed UFPF
- 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; and increases the security of Secure FTP (SFTP) transfers
- 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
- Network address translation (NAT)  
Supports repeated multiplexing of a port and automatic 5-tuple collision detection, enabling NAT to support unlimited connections; and supports blacklist in NAT/NAPT/internal server, a limit on the number of connections, session log, and multi-instance

### **Quality of Service (QoS)**

- HQoS / Nested QoS  
Allows for precise and flexible traffic classification and scheduling
- Traffic policing  
Supports committed access rate (CAR) and line rate
- Congestion management  
Supports FIFO, PQ, CQ, WFQ, CBQ, and RTPQ
- Weighted random early detection (WRED)/random early detection (RED)  
Delivers congestion avoidance capabilities through the use of queue management algorithms
- Other QoS technologies  
Support traffic shaping, FR QoS, MPLS QoS, and MP QoS/LFI

### **Management**

- Industry-standard CLI with a hierarchical structure  
Reduces training time and expenses; and increases productivity in multivendor installations
- SNMPv1, v2, and v3  
Provide complete support of SNMP and full support of industry-standard Management Information Base (MIB) plus private extensions; SNMPv3 supports increased security, using encryption
- Management interface control  
Enables or disables each of the following interfaces depending on security preferences: console port, telnet port, or reset button
- Remote monitoring (RMON)  
Uses standard SNMP to monitor essential network functions; supports events, alarm, history, and a statistics group plus a private alarm extension group
- Management security  
Restricts access to critical configuration commands; and offers multiple privilege levels with password protection; ACLs provide telnet and SNMP access; and local and remote syslog capabilities allow logging of all access

- FTP, trivial FTP (TFTP), and SFTP support

Offers different mechanisms for configuration updates; FTP allows bidirectional transfers over a TCP/IP network; TFTP is a simpler method using User Datagram Protocol (UDP); and SFTP runs over an SSH tunnel to provide additional security

- 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; provides network performance and service quality parameters such as jitter, TCP, or FTP connection delays and file transfer rates; and allows a network manager to determine the 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; maintains consistent timekeeping among all clock-dependent devices within the network—so that the devices can provide diverse applications, based on the consistent time

- 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 the order of severity; and sends out the network information to multiple channels, based on user-defined rules

#### **Multicast support**

- Internet Group Management Protocol (IGMP)

Utilizes Any-Source Multicast (ASM) or Source-Specific Multicast (SSM) to manage IPv4 multicast networks; and 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; PIM Dense Mode (DM), Sparse Mode (SM), and Source-Specific Mode (SSM) are supported

- Multicast Source Discovery Protocol (MSDP)

Allows multiple PIM-SM domains to interoperate; is used for inter-domain multicast applications

- Multicast Border Gateway Protocol (MBGP)

Allows multicast traffic to be forwarded across BGP networks separately from unicast traffic

#### **Additional information**

- Green initiative support

Provides support for RoHS and WEEE regulations

#### **Warranty and support**

- 1-year warranty

See [hpe.com/networking/warrantysummary](http://hpe.com/networking/warrantysummary) for warranty and support information included with your product purchase.

- Software releases

To find software for your product, visit [hpe.com/networking/support](http://hpe.com/networking/support); for details on the software releases available with your product purchase, visit [hpe.com/networking/warrantysummary](http://hpe.com/networking/warrantysummary)

## HPE HSR6600 TAA-compliant Router Series



SPECIFICATIONS	HPE HSR6602-G TAA-compliant Router (JG776A)	HPE HSR6602-XG TAA-compliant Router (JG777A)
<b>I/O ports and slots</b>	4 dual-personality 1000 Mbps ports (IEEE 802.3ab Type 1000BASE-T) 2 RJ-45 serial console ports 1 USB 2.0 1 RJ-45 out-of-band management port 1 Compact Flash port 1 open module slot; for either a FIP10 or FIP20 Module	4 dual-personality 1000 Mbps ports (IEEE 802.3ab Type 1000BASE-T) 2 SFP+ 10GbE ports (IEEE 802.3ae Type 10GBASE-SR) 2 RJ-45 serial console ports 1 USB 2.0 1 RJ-45 out-of-band management port 1 Compact Flash port 1 open module slot; for either a FIP10 or FIP20 Module
<b>Physical characteristics</b>	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) shipping weight Chassis and power supplies as shipped	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) shipping weight Chassis and power supplies as shipped
<b>Memory and processor</b>	Processor Multi-core PowerPC @ 1500 MHz, 8 MB flash, 2 GB SDRAM, 512 MB compact flash	Processor Multi-core PowerPC @ 1500 MHz, 8 MB flash, 4 GB SDRAM, 512 MB compact flash
<b>Mounting and enclosure</b>	EIA standard 19 in. rack	EIA standard 19 in. rack
<b>Performance</b>	IPv6 Ready Certified Latency 13.5 $\mu$ s (FIFO 64-byte packets) Throughput up to 9 million pps (64-byte packets) Switch fabric speed 80 Gb/s Routing table size 1000000 entries (IPv4), 1000000 entries (IPv6) Forwarding table size 1000000 entries (IPv4), 1000000 entries (IPv6) Backplane bandwidth 80 Gb/s	IPv6 Ready Certified Latency 13.5 $\mu$ s (FIFO 64-byte packets) Throughput up to 15 million pps (64-byte packets) Switch fabric speed 80 Gb/s Routing table size 4000000 entries (IPv4), 2000000 entries (IPv6) Forwarding table size 1000000 entries (IPv4), 1000000 entries (IPv6) Backplane bandwidth 80 Gb/s
<b>Environment</b>	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)	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)
<b>Electrical characteristics</b>	Frequency 50/60 Hz Maximum heat dissipation 505 BTU/hr (532.78 kJ/hr) AC voltage 100 - 240 VAC DC voltage -48 VDC to -60 VDC Maximum power rating 300 W	Frequency 50/60 Hz Maximum heat dissipation 512 BTU/hr (540.16 kJ/hr) AC voltage 100 - 240 VAC DC voltage -48 VDC to -60 VDC Maximum power rating 300 W
	<b>Notes</b> 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.	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.
<b>Safety</b>	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	UL 60950; CAN/CSA 22.2 No. 60950; EN 60825; AS/NZS 60950; GOST R MEK60950; IEC 60950; EN 60950; IEC 60825; ROHS Compliance

SPECIFICATIONS	HPE HSR6602-G TAA-compliant Router (JG776A)	HPE HSR6602-XG TAA-compliant Router (JG777A)
<b>Emissions</b>	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	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
<b>Immunity</b>		
Generic	ETSI EN 300 386 V1.3.3; KN24	ETSI EN 300 386 V1.3.3; KN24
EN	EN 55024, CISPR 24	EN 55024, CISPR 24
<b>Management</b>	command-line interface; out-of-band management; SNMP Manager; Telnet; RMON1; terminal interface (serial RS-232C); Ethernet Interface MIB	command-line interface; out-of-band management; SNMP Manager; Telnet; RMON1; terminal interface (serial RS-232C); Ethernet Interface MIB
<b>Services</b>	Refer to the Hewlett Packard Enterprise website at <a href="http://hpe.com/networking/services">hpe.com/networking/services</a> for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local Hewlett Packard Enterprise sales office.	Refer to the Hewlett Packard Enterprise website at <a href="http://hpe.com/networking/services">hpe.com/networking/services</a> for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local Hewlett Packard Enterprise sales office.

**STANDARDS AND PROTOCOLS**

(applies to all products in series)

<b>BGP</b>	RFC 1657 Definitions of Managed Objects for BGPv4 RFC 1772 Application of the BGP RFC 1773 Experience with the BGP-4 Protocol RFC 1774 BGP-4 Protocol Analysis RFC 1965 BGP-4 confederations RFC 1966 BGP Route Reflection An alternative to full mesh IBGP 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 2842 Capability Advertisement with BGP-4	RFC 2858 BGP-4 Multi-Protocol Extensions RFC 2918 Route Refresh Capability RFC 4271 A Border Gateway Protocol 4 (BGP-4) RFC 4272 BGP Security Vulnerabilities Analysis 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 4451 BGP MULTI_EXIT_DISC (MED) Considerations RFC 4456 BGP Route Reflection: An Alternative to Full Mesh Internal BGP (IBGP)	RFC 4486 Subcodes for BGP Cease Notification Message RFC 4724 Graceful Restart Mechanism for BGP RFC 4760 Multiprotocol Extensions for BGP-4 RFC 4893 BGP Support for Four-octet AS Number Space RFC 5065 Autonomous System Confederations for BGP RFC 5291 Outbound Route Filtering Capability for BGP-4 RFC 5292 Address-Prefix-Based Outbound Route Filter for BGP-4 RFC 5398 Autonomous System (AS) Number Reservation for Documentation Use RFC 5883 BFD for Multihop Paths
<b>Denial of service protection</b>		CPU DoS Protection	Rate Limiting by ACLs
<b>Device management</b>	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 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



**STANDARDS AND PROTOCOLS**

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**General protocols**

IEEE 802.1ad Q-in-Q	RFC 1631 NAT	RFC 2865 Remote Authentication Dial In User Service (RADIUS)
IEEE 802.1ag Service Layer OAM	RFC 1638 PPP Bridging Control Protocol (BCP)	RFC 2866 RADIUS Accounting
IEEE 802.1ah Provider Backbone Bridges	RFC 1661 The Point-to-Point Protocol (PPP)	RFC 2868 RADIUS Attributes for Tunnel Protocol Support
IEEE 802.1AX-2008 Link Aggregation	RFC 1662 PPP in HDLC-like Framing	RFC 2869 RADIUS Extensions
IEEE 802.1D MAC Bridges	RFC 1695 Definitions of Managed Objects for ATM	RFC 2878 PPP Bridging Control Protocol (BCP)
IEEE 802.1p Priority	Management Version 8.0 using SMIv2	RFC 2915 The Naming Authority Pointer (NAPTR) DNS Resource Record
IEEE 802.1Q (GVRP)	RFC 1700 Assigned Numbers	RFC 2916 E.164 number and DNS P. Faltstrom
IEEE 802.1Q VLANs	RFC 1701 Generic Routing Encapsulation	RFC 2961 RSVP Refresh Overhead Reduction Extensions
IEEE 802.1s (MSTP)	RFC 1702 Generic Routing Encapsulation over IPv4 networks	RFC 2965 HTTP State Management Mechanism
IEEE 802.1s Multiple Spanning Trees	RFC 1721 RIP-2 Analysis	RFC 2966 Domain-wide Prefix Distribution with Two-Level IS-IS
IEEE 802.1v VLAN classification by Protocol and Port	RFC 1722 RIP-2 Applicability	RFC 2973 IS-IS Mesh Groups
IEEE 802.1w Rapid Reconfiguration of Spanning Tree	RFC 1723 RIP v2	RFC 2976 The SIP INFO Method
IEEE 802.1X PAE	RFC 1795 Data Link Switching: Switch-to-Switch	RFC 3022 Traditional IP Network Address Translator (Traditional NAT)
IEEE 802.3 Type 10BASE-T	Protocol AIW DLSw RIG: DLSw Closed Pages, DLSw Standard Version 1	RFC 3027 Protocol Complications with the IP Network Address Translator
IEEE 802.3ab 1000BASE-T	RFC 1812 IPv4 Routing	RFC 3031 Multiprotocol Label Switching Architecture
IEEE 802.3ac (VLAN Tagging Extension)	RFC 1829 The ESP DES-CBC Transform	RFC 3032 MPLS Label Stack Encoding
IEEE 802.3ad Link Aggregation (LAG)	RFC 1853 IP in IP Tunneling	RFC 3036 LDP Specification
IEEE 802.3ad Link Aggregation Control Protocol (LACP)	RFC 1877 PPP Internet Protocol Control Protocol Extensions for Name Server Addresses	RFC 3046 DHCP Relay Agent Information Option
IEEE 802.3ae 10-Gigabit Ethernet	RFC 1944 Benchmarking Methodology for Network Interconnect Devices	RFC 3063 MPLS Loop Prevention Mechanism
IEEE 802.3ag Ethernet OAM	RFC 1945 Hypertext Transfer Protocol -- HTTP/1.0	RFC 3065 Support AS confederation
IEEE 802.3ah Ethernet in First Mile over Point to Point Fiber - EFMF	RFC 1973 PPP in Frame Relay	RFC 3137 OSPF Stub Router Advertisement
IEEE 802.3i 10BASE-T	RFC 1974 PPP Stac LZS Compression Protocol	RFC 3209 RSVP-TE Extensions to RSVP for LSP Tunnels
IEEE 802.3u 100BASE-X	RFC 1981 Path MTU Discovery for IP version 6	RFC 3210 Applicability Statement for Extensions to RSVP for LSP-Tunnels
IEEE 802.3x Flow Control	RFC 1990 The PPP Multilink Protocol (MP)	RFC 3212 Constraint-Based LSP setup using LDP (CR-LDP)
IEEE 802.3z 1000BASE-X	RFC 1994 PPP Challenge Handshake Authentication Protocol (CHAP)	RFC 3214 LSP Modification Using CR-LDP
RFC 768 UDP	RFC 2003 IP Encapsulation within IP	RFC 3215 LDP State Machine
RFC 783 TFTP Protocol (revision 2)	RFC 2082 RIP-2 MD5 Authentication	RFC 3246 Expedited Forwarding PHB
RFC 791 IP	RFC 2091 Trigger RIP	
RFC 792 ICMP	RFC 2104 HMAC: Keyed-Hashing for Message Authentication	
RFC 793 TCP	RFC 2131 DHCP	
RFC 826 ARP	RFC 2132 DHCP Options and BOOTP Vendor Extensions	
RFC 854 TELNET		
RFC 855 Telnet Option Specification		
RFC 856 TELNET		

**STANDARDS AND PROTOCOLS**

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RFC 857 Telnet Echo Option	RFC 2138 Remote Authentication Dial In User Service (RADIUS)	RFC 3268 Advanced Encryption Standard (AES) Ciphersuites for Transport Layer Security (TLS)
RFC 858 Telnet Suppress Go Ahead Option	RFC 2205 Resource ReSerVation Protocol (RSVP) - Version 1 Functional Specification	RFC 3272 Overview and Principles of Internet Traffic Engineering
RFC 894 IP over Ethernet	RFC 2209 Resource ReSerVation Protocol (RSVP) - Version 1 Message Processing Rules	RFC 3277 IS-IS Transient Blackhole Avoidance
RFC 896 Congestion Control in IP/TCP Internetworks	RFC 2225 Classical IP and ARP over ATM	RFC 3279 Algorithms and Identifiers for the Internet X.509 Public Key Infrastructure Certificate and Certificate Revocation List (CRL) Profile
RFC 906 TFTP Bootstrap	RFC 2236 IGMP Snooping	RFC 3280 Internet X.509 Public Key Infrastructure Certificate and Certificate Revocation List (CRL) Profile
RFC 925 Multi-LAN Address Resolution Procedure RFC 951 BOOTP	RFC 2246 The TLS Protocol Version 1.0	RFC 3359 Reserved Type, Length and Value (TLV) Codepoints in Intermediate System to Intermediate System
RFC 950 Internet Standard Subnetting	RFC 2251 Lightweight Directory Access Protocol (v3) RFC 2252 Lightweight Directory Access Protocol (v3): Attribute Syntax Definitions	RFC 3392 Support BGP capabilities advertisement
RFC 951 BOOTP	RFC 2283 MBGP	RFC 3410 Applicability Statements for SNMP
RFC 959 File Transfer Protocol (FTP)	RFC 2284 EAP over LAN RFC 2338 VRRP	RFC 3416 Protocol Operations for SNMP
RFC 1006 ISO transport services on top of the TCP Version 3	RFC 2364 PPP Over AAL5	RFC 3417 Transport Mappings for the Simple Network Management Protocol (SNMP)
RFC 1027 Proxy ARP	RFC 2374 An Aggregatable Global Unicast Address Format	RFC 3442 The Classless Static Route Option for Dynamic Host Configuration Protocol (DHCP) version 4
RFC 1034 Domain Concepts and Facilities	RFC 2390 Inverse Address Resolution Protocol	RFC 3479 Fault Tolerance for the Label Distribution Protocol (LDP)
RFC 1035 Domain Implementation and Specification	RFC 2427 Multiprotocol Interconnect over Frame Relay RFC 2451 The ESP CBC-Mode Cipher Algorithms	RFC 3509 OSPF ABR Behavior
RFC 1042 IP Datagrams	RFC 2453 RIPv2	RFC 3526 More Modular Exponential (MODP) Diffie-Hellman groups for Internet Key Exchange (IKE)
RFC 1058 RIPv1	RFC 2510 Internet X.509 Public Key Infrastructure Certificate Management Protocols	RFC 3562 Key Management Considerations for the TCP MD5 Signature Option
RFC 1071 Computing the Internet Checksum	RFC 2514 Definitions of Textual Conventions and OBJECT-IDENTITIES for ATM Management	RFC 3564 Requirements for Support of Differentiated Services-aware MPLS Traffic Engineering
RFC 1091 Telnet Terminal-Type Option	RFC 2515 Definitions of Managed Objects for ATM Management	RFC 3567 Intermediate System to Intermediate System (IS-IS) Cryptographic Authentication
RFC 1093 NSFNET routing architecture	RFC 2516 A Method for Transmitting PPP Over Ethernet (PPPoE)	RFC 3590 Source Address Selection for the Multicast Listener Discovery (MLD) Protocol
RFC 1122 Host Requirements	RFC 2519 A Framework for Inter-Domain Route Aggregation	RFC 3602 The AES-CBC Cipher Algorithm and Its Use with IPsec
RFC 1141 Incremental updating of the Internet checksum	RFC 2529 Transmission of IPv6 over IPv4 Domains without Explicit Tunnels	RFC 3623 Graceful OSPF Restart
RFC 1142 OSI IS-IS Intra-domain Routing Protocol RFC 1144 Compressing TCP/IP headers for low-speed serial links	RFC 2544 Benchmarking Methodology for Network Interconnect Devices	RFC 3706 A Traffic-Based Method of Detecting Dead Internet Key Exchange (IKE) Peers
RFC 1191 Path MTU discovery	RFC 2581 TCP Congestion Control	RFC 3768 Virtual Route Redundancy Protocol (VRRP) RFC 3784 ISIS TE support
RFC 1195 OSI ISIS for IP and Dual Environments	RFC 2615 PPP over SONET/SDH (Synchronous Optical Network/Synchronous Digital Hierarchy)	RFC 3786 Extending the Number of IS-IS LSP Fragments Beyond the 256 Limit
RFC 1213 Management Information Base for Network Management of TCP/IP-based internets	RFC 2616 HTTP Compatibility v1.1	RFC 3811 Definitions of Textual Conventions (TCs) for Multiprotocol Label Switching (MPLS) Management
RFC 1256 ICMP Router Discovery Protocol (IRDP) RFC 1305 NTPv3	RFC 2617 HTTP Authentication: Basic and Digest Access Authentication	RFC 3812 Multiprotocol Label Switching (MPLS) Traffic Engineering (TE) Management Information Base (MIB)
RFC 1315 Management Information Base for Frame Relay DTES	RFC 2622 Routing Policy Specification Language (RPSL)	RFC 3847 Restart signaling for IS-IS
RFC 1321 The MD5 Message-Digest Algorithm	RFC 2644 Directed Broadcast Control	RFC 3879 Deprecating Site Local Addresses
RFC 1332 The PPP Internet Protocol Control Protocol (IPCP)	RFC 2661 L2TP	RFC 3906 Calculating Interior Gateway Protocol (IGP) Routes Over Traffic Engineering Tunnels
RFC 1333 PPP Link Quality Monitoring	RFC 2663 NAT Terminology and Considerations	RFC 3917 Requirements for IP Flow Information Export (IPFIX)
RFC 1334 PPP Authentication Protocols (PAP) RFC 1349 Type of Service	RFC 2684 Multiprotocol Encapsulation over ATM Adaptation Layer 5	RFC 3954 Cisco Systems NetFlow Services Export Version 9
RFC 1350 TFTP Protocol (revision 2)	RFC 2694 DNS extensions to Network Address Translators (DNS_ALG)	RFC 4213 Basic IPv6 Transition Mechanisms
RFC 1377 The PPP OSI Network Layer Control Protocol (OSINLCP)	RFC 2702 Requirements for Traffic Engineering Over MPLS	RFC 4884 Extended ICMP to Support Multi-Part Messages
RFC 1381 SNMP MIB Extension for X.25 LAPB	RFC 2716 PPP EAP TLS Authentication Protocol	
RFC 1382 SNMP MIB Extension for the X.25 Packet Layer	RFC 2747 RSVP Cryptographic Authentication	
RFC 1471 The Definitions of Managed Objects for the Link Control Protocol of the Point-to-Point Protocol	RFC 2763 Dynamic Name-to-System ID mapping	
RFC 1473 The Definitions of Managed Objects for the IP Network Control Protocol of the Point-to-Point Protocol	RFC 2765 Stateless IP/ICMP Translation Algorithm (SIIT)	
RFC 1483 Multiprotocol Encapsulation over ATM Adaptation Layer 5	RFC 2766 Network Address Translation - Protocol Translation (NAT-PT)	
RFC 1490 Multiprotocol Interconnect over Frame Relay	RFC 2782 A DNS RR (DNS Resource Record) for specifying the location of services (DNS SRV) Domain Name System Server	
RFC 1519 CIDR	RFC 2784 Generic Routing Encapsulation (GRE)	
RFC 1534 DHCP/BOOTP Interoperation		
RFC 1542 BOOTP Extensions		
RFC 1542 Clarifications and Extensions for the Bootstrap Protocol		
RFC 1552 The PPP Internetworking Packet Exchange Control Protocol (IPXCP)		

**STANDARDS AND PROTOCOLS**

(applies to all products in series)

	RFC 1577 Classical IP and ARP over ATM RFC 1613 Cisco Systems X.25 over TCP (XOT) RFC 1619 PPP over SONET/SDH (Synchronous Optical Network/Synchronous Digital Hierarchy) RFC 1624 Incremental Internet Checksum	RFC 2787 Definitions of Managed Objects for VRRP RFC 2833 RTP Payload for DTMF Digits, Telephony Tones and Telephony Signals RFC 2856 Textual Conventions for Additional High Capacity Data Types	RFC 5082 The Generalized TTL Security Mechanism (GTSM) RFC 5286 Basic Specification for IP Fast Reroute: Loop-Free Alternates RFC 5880 Bidirectional Forwarding Detection RFC 5882 Generic Application of BFD
<b>IP multicast</b>	RFC 1112 IGMP RFC 2236 IGMPv2 RFC 2283 Multiprotocol Extensions for BGP-4 RFC 2362 PIM Sparse Mode RFC 2365 Administratively Scoped IP Multicast RFC 2934 Protocol Independent Multicast MIB for IPv4 RFC 3376 IGMPv3 RFC 3446 Anycast Rendezvous Point (RP) mechanism using Protocol Independent Multicast (PIM) and Multicast Source Discovery Protocol (MSDP) RFC 3569 An Overview of Source-Specific Multicast (SSM)	RFC 3618 Multicast Source Discovery Protocol (MSDP) RFC 3973 PIM Dense Mode 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 4608 Source-Specific Protocol Independent Multicast in 232/8 (PIM SSM)	RFC 4611 Multicast Source Discovery Protocol (MSDP) Deployment Scenarios RFC 4950 ICMP Extensions for Multiprotocol Label Switching RFC 5015 Bidirectional Protocol Independent Multicast (BIDIR-PIM) RFC 5059 Bootstrap Router (BSR) Mechanism for Protocol Independent Multicast (PIM) RFC 5060 Protocol Independent Multicast MIB RFC 5240 Protocol Independent Multicast (PIM) Bootstrap Router MIB
<b>IPv6</b>	RFC 1350 TFTP 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 2894 Router Renumbering for IPv6 RFC 2925 Definitions of Managed Objects for Remote Ping, Traceroute, and Lookup Operations (Ping only)	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 3646 DNS Configuration options for Dynamic Host Configuration Protocol for IPv6 RFC 3736 Stateless Dynamic Host Configuration Protocol (DHCP) Service for IPv6 RFC 3810 MLDv2 (host joins only) RFC 3810 MLDv2 for IPv6 RFC 3810 Multicast Listener Discovery Version 2 (MLDv2) for IPv6 RFC 3956 Embedding the Rendezvous Point (RP) Address in an IPv6 Multicast Address RFC 4001 Textual Conventions for Internet Network Addresses RFC 4007 IPv6 Scoped Address Architecture 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 4552 Authentication/Confidentiality for OSPFv3 RFC 4798 Connecting IPv6 Islands over IPv4 MPLS Using IPv6 Provider Edge Routers (6PE) RFC 4861 IPv6 Neighbor Discovery RFC 4862 IPv6 Stateless Address Auto-configuration RFC 4940 IANA Considerations for OSPF RFC 5072 IP Version 6 over PPP 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 RFC 5881 BFD for IPv4 and IPv6 (Single Hop)

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<b>MIBs</b>	<p>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            RFC 1643 Ethernet MIB            RFC 1650 Ethernet-Like MIB            RFC 1657 BGP-4 MIB            RFC 1724 RIPv2 MIB            RFC 1757 Remote Network Monitoring MIB            RFC 1850 OSPFv2 MIB            RFC 1907 SNMPv2 MIB            RFC 2011 SNMPv2 MIB for IP            RFC 2012 SNMPv2 MIB for TCP</p>	<p>RFC 2013 SNMPv2 MIB for UDP            RFC 2021 RMONv2 MIB            RFC 2096 IP Forwarding Table MIB            RFC 2233 Interfaces MIB            RFC 2273 SNMP-NOTIFICATION-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 2574 SNMP USM MIB            RFC 2618 RADIUS Client MIB            RFC 2620 RADIUS Accounting Client MIB            RFC 2665 Ethernet-Like-MIB            RFC 2668 802.3 MAU MIB            RFC 2674 802.1p and IEEE 802.1Q Bridge MIB            RFC 2688 MAU-MIB            RFC 2737 Entity MIB (Version 2)</p>	<p>RFC 2787 VRRP MIB            RFC 2819 RMON MIB            RFC 2863 The Interfaces Group MIB            RFC 2925 Ping MIB            RFC 2932IP (Multicast Routing MIB)            RFC 2933 IGMP MIB            RFC 3273 HC-RMON MIB            RFC 3414 SNMP-User based-SM MIB            RFC 3415 SNMP-View based-ACM MIB            RFC 3418 MIB for SNMPv3            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</p>
<b>MPLS</b>	<p>RFC 3037 LDP (Label Distribution Protocol) Applicability            RFC 3270 Multi-Protocol Label Switching (MPLS) Support of Differentiated Services            RFC 3429 Assignment of the 'OAM Alert Label' for Multiprotocol Label Switching            RFC 3443 Time To Live (TTL) Processing in Multi-Protocol Label Switching (MPLS) Networks            RFC 3478 Graceful Restart Mechanism for Label Distribution Protocol            RFC 3612 Applicability Statement for Restart Mechanisms for the Label Distribution            RFC 3916 Requirements for Pseudo-Wire Emulation            Edge-to-Edge (PWE3)            RFC 3985 Pseudo Wire Emulation            Edge-to-Edge (PWE3) Architecture            RFC 4023 Encapsulating MPLS in IP or Generic Routing Encapsulation (GRE)            RFC 4090 Fast Reroute Extensions to RSVP-TE for LSP Tunnels            RFC 4105 Requirements for Inter-Area MPLS Traffic Engineering            RFC 4124 Protocol Extensions for Support of DiffServ-aware MPLS Traffic Engineering</p>	<p>RFC 4125 Maximum Allocation Bandwidth Constraints Model for DiffServ-aware MPLS Traffic            RFC 4127 Russian Dolls Bandwidth Constraints Model for DiffServ-aware MPLS Traffic            RFC 4182 Removing a Restriction on the use of MPLS Explicit NULL            RFC 4216 MPLS Inter-Autonomous System (AS) Traffic Engineering (TE) Requirements            RFC 4364 BGP/MPLS IP Virtual Private Networks (VPNs)            RFC 4365 Applicability Statement for BGP/ MPLS IP Virtual Private Networks (VPNs)            RFC 4381 Analyses of the Security of BGP/ MPLS IP VPNs RFC 4385 Pseudowire Emulation Edge-to-Edge (PWE3)            Control Word for Use over an MPLS PSN            RFC 4446 IANA Allocations for Pseudowire Edge to Edge Emulation (PWE3)            RFC 4448 Encapsulation Methods for Transport of Ethernet over MPLS Networks            RFC 4576 Using a Link State Advertisement (LSA) Options Bit to Prevent Looping in BGP/ MPLS            RFC 4618 Encapsulation Methods for Transport of PPP/High-Level Data Link Control (HDLC) over MPLS Networks            RFC 4619 Encapsulation Methods for Transport of Frame Relay over Multiprotocol Label</p>	<p>RFC 4659 BGP-MPLS IP Virtual Private Network (VPN) Extension for IPv6 VPN            RFC 4664 Framework for Layer 2 Virtual Private Networks            RFC 4665 Service Requirements for Layer 2 Provider Provisioned Virtual Private Networks            RFC 4717 Encapsulation Methods for Transport of Asynchronous Transfer Mode (ATM) over MPLS            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 4764 Framework for Layer 2 Virtual Private Networks (L2VPNs)            RFC 4765 Service Requirements for Layer 2 Provider Provisioned Virtual Private Networks            RFC 4816 Pseudowire Emulation Edge-to-Edge (PWE3) Asynchronous Transfer Mode (ATM)            RFC 4941 Privacy Extensions for Stateless Address Autoconfiguration in IPv6            RFC 5085 Pseudowire Virtual Circuit Connectivity Verification (VCCV): A Control Channel            RFC 5443 LDP IGP Synchronization            RFC 5601 Pseudowire (PW) Management Information Base (MIB)</p>

**STANDARDS AND PROTOCOLS**

(applies to all products in series)

<b>Network management</b>	IEEE 802.1AB Link Layer Discovery Protocol (LLDP) IEEE 802.1D (STP) RFC 1098 A Simple Network Management Protocol (SNMP) RFC 1155 Structure of Management Information RFC 1157 SNMPv1 RFC 1215 SNMP Generic traps RFC 1757 RMON 4 groups: Stats, History, Alarms and Events RFC 1901 SNMPv2 Introduction RFC 1902 SNMPv2 Structure RFC 1903 SNMPv2 Textual Conventions RFC 1904 SNMPv2 Conformance RFC 1905 SNMPv2 Protocol Operations RFC 1906 SNMPv2 Transport Mappings Information Base RFC 1918 Private Internet Address Allocation RFC 2272 SNMPv3 Management Protocol RFC 2273 SNMPv3 Applications RFC 2274 USM for SNMPv3 RFC 2275 VACM for SNMPv3	RFC 2570 SNMPv3 Overview RFC 2571 SNMP Management Frameworks RFC 2572 SNMPv3 Message Processing RFC 2573 SNMPv3 Applications RFC 2574 SNMPv3 User-based Security Model (USM) RFC 2575 SNMPv3 View-based Access Control Model (VACM) RFC 2575 VACM for SNMP RFC 2576 Coexistence between SNMP versions RFC 2578 SMIPv2 RFC 2819 Four groups of RMON: 1 (statistics), 2 (history), 3 (alarm) and 9 (events) RFC 2819 Remote Network Monitoring Management RFC 3164 BSD syslog Protocol RFC 3176 sFlow RFC 3411 SNMP Management Frameworks RFC 3412 SNMPv3 Message Processing RFC 3413 Simple Network Management Protocol (SNMP) Applications	RFC 3414 SNMPv3 User-based Security Model (USM) RFC 3415 SNMPv3 View-based Access Control Model (VACM) RFC 3584 Coexistence between Version 1 and Version 2 of the Internet-standard Network RFC 3593 Textual Conventions for MIB Modules Using Performance History Based on 15 Minute RFC 3636 Definitions of Managed Objects for IEEE 802.3 Medium Attachment Units (MAUs) RFC 4292 IP Forwarding Table MIB RFC 4502 Remote Network Monitoring Management Information Base Version 2 RFC 4878 Definitions and Managed Objects for Operations, Administration, and Maintenance (OAM) Functions on ANSI/TIA-1057 LLDP Media Endpoint Discovery (LLDP-MED) SNMPv1/v2 SNMPv1/v2c SNMPv1/v2c (read only)
<b>OSPF</b>	RFC 1245 OSPF protocol analysis RFC 1246 Experience with OSPF RFC 1253 OSPFv2 MIB RFC 1583 OSPFv2 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 3630 Traffic Engineering Extensions to OSPF Version 2 RFC 4061 Benchmarking Basic OSPF Single Router Convergence RFC 4062 OSPF Benchmarking Terminology and Concepts RFC 4063 Considerations When Using Basic OSPF	RFC 4222 Prioritized Treatment of Specific OSPF Version 2 Packets and Congestion Avoidance RFC 4577 OSPF as the Provider/Customer Edge Protocol for BGP/MPLS IP Virtual Private Networks (VPNs) RFC 4811 OSPF Out-of-Band LSDB Resynchronization RFC 4812 OSPF Restart Signaling RFC 4813 OSPF Link-Local Signaling RFC 5187 OSPFv3 Graceful Restart RFC 5340 OSPF for IPv6 RFC 5340 OSPFv3 for IPv6
<b>QoS/CoS</b>	IEEE 802.1P (CoS) RFC 2474, with 4 queues per port RFC 2309 Recommendations on queue management and congestion avoidance in the Internet 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 2475 DiffServ Architecture RFC 2597 DiffServ Assured Forwarding (AF) RFC 2597 DiffServ Assured Forwarding (AF)- partial support RFC 2598 DiffServ Expedited Forwarding (EF) RFC 2697 A Single Rate Three Color Marker RFC 2698 A Two Rate Three Color Marker	RFC 2751 Signaled Preemption Priority Policy Element RFC 3247 Supplemental Information for the New Definition of the EF PHB (Expedited Forwarding Per-Hop Behavior) RFC 3260 New Terminology and Clarifications for DiffServ RFC 3662 A Lower Effort Per-Domain Behavior (PDB) for Differentiated Services

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<b>Security</b>	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 2408 Internet Security Association and Key Management Protocol (ISAKMP) RFC 2409 The Internet Key Exchange (IKE) 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 Tunnel Protocol Support RFC 2868 RADIUS Attributes for Tunnel Protocol Support RFC 2869 RADIUS Extensions RFC 2993 Architectural Implications of NAT RFC 3567 Intermediate System (IS) to IS Cryptographic Authentication RFC 3576 Dynamic Authorization Extensions to RADIUS RFC 3579 RADIUS Support For Extensible Authentication Protocol (EAP)	RFC 3580 IEEE 802.1X Remote Authentication Dial In User Service (RADIUS) Usage Guidelines RFC 4250 The Secure Shell (SSH) Protocol Assigned Numbers RFC 5214 Intra-Site Automatic Tunnel Addressing Protocol (ISATAP) Access Control Lists (ACLs) Guest VLAN for 802.1x MAC Authentication Port Security Secure Sockets Layer (SSL) SSHv1 Secure Shell SSHv1.5 Secure Shell SSHv1/SSHv2 Secure Shell
<b>VPN</b>	RFC 2403 - HMAC-MD5-96 RFC 2404 - HMAC-SHA1-96 RFC 2405 - DES-CBC Cipher algorithm RFC 2407 - Domain of interpretation RFC 2547 BGP/MPLS VPNs RFC 2764 A Framework for IP Based Virtual Private Networks	RFC 2796 BGP Route Reflection - An Alternative to Full Mesh IBGP RFC 2842 Capabilities Advertisement with BGP-4 RFC 2858 Multiprotocol Extensions for BGP-4 RFC 2917 A Core MPLS IP VPN Architecture RFC 2918 Route Refresh Capability for BGP-4	RFC 3107 Carrying Label Information in BGP-4 RFC 4302 - IP Authentication Header (AH) RFC 4303 - IP Encapsulating Security Payload (ESP) RFC 4305 - Cryptographic Algorithm Implementation Requirements for ESP and AH
<b>IPSec</b>	RFC 1828 IP Authentication using Keyed MD5 RFC 2401 IP Security Architecture RFC 2402 IP Authentication Header RFC 2406 IP Encapsulating Security Payload RFC 2407 - Domain of interpretation	RFC 2408 - Internet Security Association and Key Management Protocol (ISAKMP) RFC 2409 - The Internet Key Exchange RFC 2410 - The NULL Encryption Algorithm and its use with IPSec RFC 2411 IP Security Document Roadmap	RFC 2412 - OAKLEY RFC 2865 - Remote Authentication Dial In User Service (RADIUS) RFC 4835 Cryptographic Algorithm Implementation Requirements for Encapsulating Security
<b>IKEv1</b>		RFC 2865 - Remote Authentication Dial In User Service (RADIUS) RFC 3748 - Extensible Authentication Protocol (EAP)	RFC 4109 Algorithms for Internet Key Exchange version 1 (IKEv1)
<b>PKI</b>		RFC 5280 Internet X.509 Public Key Infrastructure Certificate and Certificate Revocation List (CRL) Profile	

## HPE HSR6600 TAA-compliant Router Series accessories

### Transceivers

HPE X110 100M SFP LC LH40 Transceiver (JD090A)  
 HPE X110 100M SFP LC LH80 Transceiver (JD091A)  
 HPE X110 100M SFP LC FX Transceiver (JD102B)  
 HPE X110 100M SFP LC LX Transceiver (JD120B)  
 HPE X120 622M SFP LC LX 15km Transceiver (JF829A)  
 HPE X120 622M SFP LC LH 40km 1310 Transceiver (JF830A)  
 HPE X120 622M SFP LC LH 80km 1550 Transceiver (JF831A)  
 HPE X125 1G SFP LC LH40 1310nm Transceiver (JD061A)  
 HPE X120 1G SFP LC LH40 1550nm Transceiver (JD062A)  
 HPE X120 1G SFP LC BX 10-U Transceiver (JD098B)  
 HPE X120 1G SFP LC BX 10-D Transceiver (JD099B)  
 HPE X120 1G SFP LC LH100 Transceiver (JD103A)  
 HPE X120 1G SFP LC SX Transceiver (JD118B)  
 HPE X120 1G SFP LC LX Transceiver (JD119B)  
 HPE X125 1G SFP LC LH70 Transceiver (JD063B)  
 HPE X120 1G SFP RJ45 T Transceiver (JD089B)  
 HPE X160 2.5G SFP LC 2km Transceiver (JD084A)  
 HPE X160 2.5G SFP LC 15km Transceiver (JD085A)  
 HPE X160 2.5G SFP LC 40km Transceiver (JD086A)  
 HPE X160 2.5G SFP LC 80km Transceiver (JD087A)  
 HPE X135 10G XFP LC ER Transceiver (JD121A)  
 HPE X130 10G XFP LC LR Transceiver (JD108B)  
 HPE X130 10G XFP LC SR Transceiver (JD117B)  
 HPE X130 10G SFP+ LC SR Transceiver (JD092B)  
 HPE X130 10G SFP+ LC LR Transceiver (JD094B)  
 HPE X130 10G SFP+ LC ER 40km Transceiver (JG234A)

### Cables

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

### Power Supply

HPE 5800 300W AC Power Supply (JC087A)  
 HPE 5800 300W DC Power Supply (JC090A)

### Fan Tray

HPE HSR6602 Router Spare Fan Assembly (JG359A)

## HPE HSR6600 TAA-compliant Router Series accessories (continued)

### Router Modules

HPE 6600 8-port 10/100Base-T HIM Module (JC575A)  
HPE 6600 4-port Gig-T HIM Module (JC163A)  
HPE 6600 8-port Gig-T HIM Module (JC164A)  
HPE 6600 4-port GbE SFP HIM Module (JC171A)  
HPE 6600 8-port GbE SFP HIM Module (JC174A)  
HPE 6600 1-port 10-GbE XFP HIM Module (JC168A)  
HPE 6600 1-port OC-3/STM-1 (E1/T1) CPOS SFP HIM Module (JC161A)  
HPE 6600 2-port OC-3/STM-1 (E1/T1) CPOS SFP HIM Module (JC162A)  
HPE 6600 2-port OC-3/STM-1 (E3/T3) CPOS SFP HIM Module (JC169A)  
HPE 6600 1-port OC-3/STM-1 (E3/T3) CPOS SFP HIM Module (JC170A)  
HPE 6600 4-port OC-3c/STM-1c or 2-port OC-12c/STM-4c POS SFP HIM Module (JC172A)  
HPE 6600 2-port OC-3c/STM-1c or 1-port OC-12c/STM-4c POS SFP HIM Module (JC173A)  
HPE 6600 1-port OC-3c/STM-1c ATM SFP HIM Module (JC175A)  
HPE 6600 1-port OC-48c/STM-16c POS/CPOS SFP HIM Module (JC494A)  
HPE 6600 2-port OC-3c/STM-1c ATM SFP HIM Module (JC495A)  
HPE 6600 2-port OC-48c/STM-16c RPR SFP HIM Module (JC576A)  
HPE MSR 2-port Enhanced Sync/Async Serial MIM Module (JD540A)  
HPE MSR 8-port T1/Fractional T1 MIM Module (JC159A)  
HPE MSR 8-port T1/CT1/PRI MIM Module (JC160A)  
HPE MSR 4-port Enhanced Sync/Async Serial MIM Module (JD541A)  
HPE MSR 8-port Enhanced Sync/Async Serial MIM Module (JD552A)  
HPE MSR 1-port T3/CT3/FT3 MIM Module (JD628A)  
HPE MSR 1-port FE3/CE3 MIM Module (JD630A)  
HPE MSR 8-port E1/Fractional E1 (75ohm) MIM Module (JF255A)  
HPE 6600 FIP-10 Flexible Interface Platform Router Module (JG357A)  
HPE 6600 FIP-20 Flexible Interface Platform Router Module (JG358A)  
**NEW** HPE MSR 1-port T3/CT3/FT3 HMIM Module (JG435A)  
**NEW** HPE MSR 1-port E3/CE3/FE3 HMIM Module (JG436A)

### Memory

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