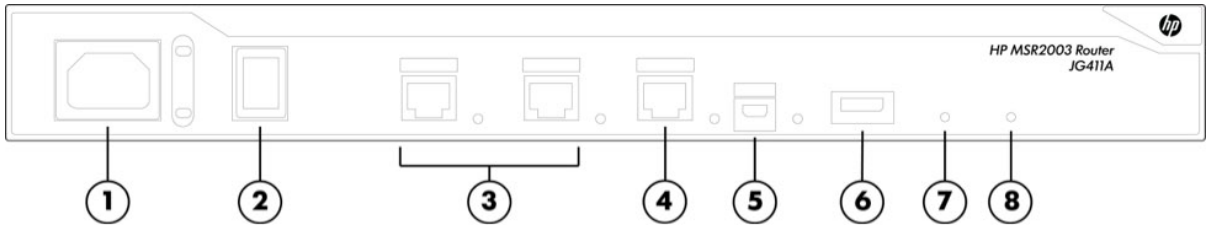
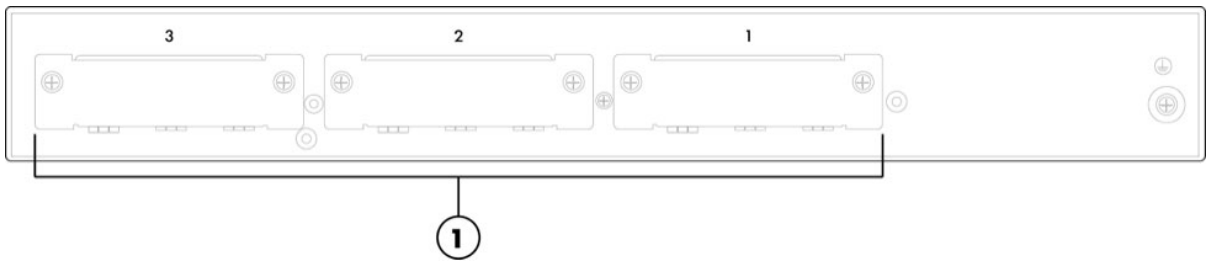
Overview



HP MSR2003 AC Router Front View

1. AC Power input
2. Power Switch
3. Fixed 10M/100M/1000M RJ45 Ports
4. CON/AUX port
5. USB console port
6. 1 USB 2.0 Port for 3G modem and USB disk
7. System Activity LED
8. Power LED



HP MSR2003 AC Router Rear View

1. SIC module slots / 1 DSIC (Slots 1 + 2)

Models

HP MSR2003 AC Router	JG411A

Key features

- Up to 1 Mpps forwarding; converged high-performance routing, switching, security, voice, mobility
- Embedded security features with hardware-based encryption, firewall, NAT, and VPNs
- Industry-leading breadth of LAN and WAN connectivity options
- No additional licensing complexity; no cost for advanced features
- Zero-touch solution, with single pane-of-glass management

Overview

Product overview

The HP MSR2000 Router Series, the next generation of router from HP, is a component of the HP FlexBranch solution, which is a part of the comprehensive HP FlexNetwork architecture. These routers feature a modular design that delivers unmatched application services for small- to medium-sized branch offices. This gives your IT personnel the benefit of reduced complexity, and simplified configuration, deployment, and management.

The MSR2000 series provides an agile, flexible network infrastructure that enables you to quickly adapt to your changing business requirements while delivering integrated concurrent services on a single, easy-to-manage platform.

Features and benefits

Performance

- **Excellent forwarding performance**
  provides forwarding performance up to 1 Mpps (672 Mb/s); meets the bandwidth-intensive application demands of enterprise businesses
- **Powerful security capacity**
  includes an embedded hardware encryption accelerator to improve encryption performance; IPSec encryption throughput can be up to 400 Mb/s with a maximum of 1,000 IPSec VPN tunnels

Product architecture

- **Ideal multi-service platform**
  provides WAN router, Ethernet switch, wireless LAN, 3G/4G WAN, firewall, VPN, and SIP/voice gateway all in one device
- **Advanced hardware architecture**
  supports multicore processors, gigabit switching, and PCIE bus
- **New operation system version**
  ships with new Comware v7 operating system delivering the latest in virtualization and routing

Connectivity

- **High-density port connectivity**
  provides up to three interface module slots and up to 15 Fast Ethernet ports
- **Multiple WAN interfaces**
  provides a traditional link with E1, T1, Serial, and ISDN links; high-density Ethernet access with WAN Gigabit Ethernet and LAN 4- and 9-port Fast Ethernet; and mobility access with 3G SIC module and 3G/4G USB modems
- **Packet storm protection**
  protects against broadcast, multicast, or unicast storms with user-defined thresholds
- **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
- **3G/4G LTE access support**
  provides 3G wireless access for primary or backup connectivity via a 3G SIC module certified on various cellular networks; optional carrier 3G/4G LTE USB modems available
- **USB interface**
  uses USB memory disk to download and upload configuration and OS image files; supports an external USB 3G/4G modem for a 3G/4G WAN uplink
- **Flexible port selection**
  provides a combination of fiber and copper interface modules, 100/1000BASE-X support, and 10/100/1000BASE-T auto-speed detection plus auto duplex and MDI/MDI-X

Overview

Layer 2 switching

- **Spanning Tree Protocol (STP)**
  supports standard IEEE 802.1D STP, IEEE 802.1w Rapid Spanning Tree Protocol (RSTP) for faster convergence, and IEEE 802.1s Multiple Spanning Tree Protocol (MSTP)
- **Internet Group Management Protocol (IGMP) and Multicast Listener Discovery (MLD) protocol snooping**
  controls and manages the flooding of multicast packets in a Layer 2
  network
- **Port mirroring**
  duplicates port traffic (ingress and egress) to a local or remote monitoring port
- **VLANs**
  supports IEEE 802.1Q-based VLANs
- **sFlow**
  allows traffic sampling
- **Define port as switched or routed**
  supports command switch to easily change switched ports to routed (maximum four Fast Ethernet ports)

Layer 3 routing

- **Static IPv4 routing**
  provides simple manually configured IPv4 routing
- **Routing Information Protocol (RIP)**
  uses a distance vector algorithm with UDP packets for route determination; supports RIPv1 and RIPv2 routing; includes loop protection
- **Open shortest path first (OSPF)**
  delivers faster convergence; uses this link-state routing Interior Gateway Protocol (IGP), which supports ECMP, NSSA, and MD5 authentication for increased security and graceful restart for faster failure recovery
- **Border Gateway Protocol 4 (BGP-4)**
  delivers an implementation of the Exterior Gateway Protocol (EGP) utilizing path vectors; uses TCP for enhanced reliability for the route discovery process; reduces bandwidth consumption by advertising only incremental updates; supports extensive policies for increased flexibility; scales to very large networks
- **Intermediate system to intermediate system (IS-IS)**
  uses a path vector Interior Gateway Protocol (IGP), which is defined by the ISO organization for IS-IS routing and extended by IETF RFC 1195 to operate in both TCP/IP and the OSI reference model (Integrated IS-IS)
- **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, 6to4, and Intra-Site Automatic Tunnel Addressing Protocol (ISATAP) tunnels; is an important element for the transition from IPv4 to IPv6

Overview

- **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, which reduces complexity and increases 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 Multiprotocol BGP (MP-BGP) to establish private routes for increased security; supports RFC 2547bis multiple autonomous system VPNs for added flexibility; supports IPv6 MPLS VPN
- **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
- **Routing policy**
  allows custom filters for increased performance and security; supports ACLs, IP prefix, AS paths, community lists, and aggregate policies

Layer 3 services

- **Address Resolution Protocol (ARP)**
  determines the MAC address of another IP host in the same subnet; supports static ARPs; gratuitous ARP allows detection of duplicate IP addresses; proxy ARP allows normal ARP operation between subnets or when subnets are separated by a Layer 2 network
- **User Datagram Protocol (UDP) helper**
  redirects UDP broadcasts to specific IP subnets to prevent server spoofing
- **Dynamic Host Configuration Protocol (DHCP)**
  simplifies the management of large IP networks and supports client and server; DHCP Relay enables DHCP operation across subnets

Quality of Service (QoS)

- **Nested QoS**
  provides a built-in QoS engine that supports nested QoS (Same to hierarchical QoS) and can implement a hierarchical scheduling mechanism based on ports, user groups, users, and user services.
- **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**
  supports traffic shaping, MPLS QoS, and MP QoS/LFI

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
- **IPSec VPN**
  supports DES, 3DES, and AES 128/192/256 encryption, and MD5 and SHA-1 authentication

Overview

- **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
- **Terminal Access Controller Access-Control System (TACACS+)**
  delivers an authentication tool using TCP with encryption of the full authentication request, providing additional security
- **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
- **Network login**
  allows authentication of multiple users per port
- **RADIUS**
  eases security access administration by utilizing a user/password authentication server
- **Network address translation (NAT)**
  supports one-to-one NAT, many-to-many NAT, and NAT control, enabling NAT-PT to support multiple connections; supports blacklist in NAT/NAT-PT, a limit on the number of connections, session logs, and multi-instances
- **Secure Shell (SSHv2)**
  uses external servers to securely log in into a remote device; with authentication and encryption, it protects against IP spoofing and plain text password interception; increases the security of SFTP transfers

Convergence

- **Internet Group Management Protocol (IGMP)**
  utilizes Any-Source Multicast (ASM) or Source-Specific Multicast (SSM) to manage IPv4 multicast networks; supports IGMPv1, v2, and v3
- **Protocol Independent Multicast (PIM)**
  defines modes of Internet IPv4 and IPv6 multicasting to allow one-to-many and many-to-many transmission of information; supports PIM Dense Mode (DM), Sparse Mode (SM), and Source-Specific Mode (SSM)
- **Multicast 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 and kept separate from unicast traffic

Integration

- **Embedded NetStream**
  improves traffic distribution using powerful scheduling algorithms, including Layer 4 to 7 services; monitors the health status of servers and firewalls
- **Embedded VPN and firewall**
  provides enhanced stateful packet inspection and filtering; delivers advanced VPN services with Triple DES (3DES) and Advanced Encryption Standard (AES) encryption at high performance and low latency, URL filtering, and application prioritization and enhancement
- **SIP trunking**
  delivers multiple concurrent calls on one link; the carrier authenticates only the link, rather than carrying each SIP call on the link

Resiliency and high availability

- **Backup Center**
  acts as a part of the management and backup function to provide backup for device interfaces; delivers reliability by switching traffic over to a backup interface when the primary one fails
- **Virtual Router Redundancy Protocol (VRRP)**

Overview

allows groups of two routers to dynamically back each other up to create highly available routed environments; supports VRRP load balancing

- **Embedded Automation Architecture (EAA)**
  monitors the internal event and status of system hardware and software, identifying potential problems as early as possible; collects field information and attempts to automatically repair the issues; based on the user configuration, onsite information will be sent to technical support
- **Bidirectional Forwarding Detection (BFD)**
  detects quickly the failures of the bidirectional forwarding paths between two devices for upper-layer protocols such as routing protocols and MPLS

Management

- **HP Intelligent Management Center (IMC)**
  integrates fault management, element configuration, and network monitoring from a central vantage point; built-in support for third-party devices enables network administrators to centrally manage all network elements with a variety of automated tasks, including discovery, categorization, baseline configurations, and software images; the software also provides configuration comparison tools, version tracking, change alerts, and more
- **Industry-standard CLI with a hierarchical structure**
  reduces training time and expenses, and increases productivity in multivendor installations
- **Management security**
  restricts access to critical configuration commands; offers multiple privilege levels with password protection; 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
- **FTP, TFTP, and SFTP support**
  offers different mechanisms for configuration updates; FTP allows bidirectional transfers over a TCP/IP network; trivial FTP (TFTP) is a simpler method using User Datagram Protocol (UDP); Secure File Transfer Protocol (SFTP) runs over an SSH tunnel to provide additional security
- **Debug and sampler utility**
  supports ping and traceroute for both IPv4 and IPv6
- **Network Time Protocol (NTP)**
  synchronizes timekeeping among distributed time servers and clients; keeps timekeeping consistent among all clock-dependent devices within the network so that the devices can provide diverse applications based on the consistent time
- **Information center**
  provides a central repository for system and network information; aggregates all logs, traps, and debugging information generated by the system and maintains them in order of severity; outputs the network information to multiple channels based on user-defined rules
- **Management interface control**
  provides management access through modem port and terminal interface; provides access through terminal interface, telnet, or SSH
- **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; allows network manager to determine overall network performance and diagnose and locate network congestion points or failures
- **Role-based security**
  delivers role-based access control (RBAC); supports 16 user levels (0~15)

Overview

- **Standards-based authentication support for LDAP**
  integrates seamlessly into existing authentication services

Investment protection

- **Re-use of existing SIC modules**
  supports existing SIC modules, transceivers, and cables for investment protection

Ease of deployment

- **Zero-touch deployment**
  supports both USB disk auto deployment and 3G SMS auto deployment

Additional information

- **OPEX savings**
  simplifies and streamlines deployment, management, and training through the use of a common operating system, thereby cutting costs as well as reducing the risk of human errors associated with having to manage multiple operating systems across different platforms and network layers
- **Faster time to market**
  allows new and custom features to be brought rapidly to market through engineering efficiencies, delivering better initial and ongoing stability
- **Green initiative support**
  provides support for RoHS and WEEE regulations

Warranty and support

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

Configuration

Build To Order:

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

Router Chassis

HP MSR2003 AC Router — JG411A

- 2 Fixed 10M/100M/1000M RJ45 Ports — See Configuration
- 3 - SIC module slots / 1 DSIC — Note:1, 2, 3
- 1 USB 2.0 Port for 3G modem and USB disk
- 1 CON/AUX port and 1 USB console port
- 0 - VCPM slots
- 0 - VPM slot
- 1GB DDR3 SDRAM included (default=1GB \ max=1GB DDR SDRAM)
- AC Power Supply included
- 1U - Height

PDU CABLE NA/MEX/TW/JP — JG411A#B2B

- C15 PDU Jumper Cord (NA/MEX/TW/JP)

PDU CABLE ROW — JG411A#B2C

- C15 PDU Jumper Cord (ROW)

High Volt Switch to Wall Power Cord — JG411A#B2E

- NEMA L6-20P Cord (NA/MEX/JP/TW)

Configuration Rules:

Note 1 AC Power Supply included

Note 2 Localization required on orders without #B2B, #B2C or #B2E options.

Note 3 #B2E is Offered only in NA, Mexico,, Taiwan, and Japan.

Box Level Integration CTO Models

CTO Solution Sku

HP MSR CTO Router Solution — JG500A

- SSP trigger sku

Router Chassis

HP MSR2003 AC Router — JG411A

- 2 Fixed 10M/100M/1000M RJ45 Ports — See Configuration

Configuration

- 3 - SIC module slots / 1 DSIC Note:1, 2, 3, 4
- 1 USB 2.0 Port for 3G modem and USB disk
- 1 CON/AUX port and 1 USB console port
- 0 - VCPM slots
- 0 - VPM slot
- 1GB DDR3 SDRAM included (default=1GB \ max=1GB DDR SDRAM)
- AC Power Supply included
- 1U - Height

PDU CABLE NA/MEX/TW/JP JG411A#B2B

- C15 PDU Jumper Cord (NA/MEX/TW/JP)

PDU CABLE ROW JG411A#B2C

- C15 PDU Jumper Cord (ROW)

High Volt Switch to Wall Power Cord JG411A#B2E

- NEMA L6-20P Cord (NA/MEX/JP/TW)

Configuration Rules:

Note 1 If this Switch is selected integrated to the CTO Switch Solution, Then a Minimum of 1 factory integrated accessory must be ordered and integrated to CTO chassis. See Menu below, option must have a #0D1 to be integrated to the CTO Chassis.

Note 2 Localization required on orders without #B2B, #B2C or #B2E options.

Note 3 #B2E is Offered only in NA, Mexico,, Taiwan, and Japan.

Note 4 If the Router Chassis is to be Box Level Factory Integrated (CTO), Then the #0D1 is required on the Router Chassis and integrated to the JG500A - HP MSR CTO Enablement. (Min 1/Max 1 Router per SSP)

Remarks:

Drop down under power supply should offer the following options and results:
Switch/Router/Power Supply to PDU Power Cord - #B2B in North America, Mexico, Taiwan, and Japan or #B2C ROW. (Watson Default B2B or B2C for Rack Level CTO)
Switch/Router/Power Supply to Wall Power Cord - Localized Option (Watson Default for BTO and Box Level CTO)
High Volt Switch/Router/Power Supply to Wall Power Cord - #B2E Option. (Offered only in North America, Mexico, Taiwan, and Japan)

Internal Power Supplies

Internal Power Supplies included

Enter the following menu selections as integrated to the CTO Model X server above if order is factory built.

SIC Modules

Configuration

System (std 0 // max 3 or 2 or 1) User Selection (min 0 // max 3 or 2 or 1) per Host (See Modules for Port information)

HP A-MSR 4-port 10/100Base-T Switch SIC Module	JD573B See Configuration Note:1
HP A-MSR 9-port 10/100Base-T Switch DSIC Module	JD574B See Configuration Note:3
HP A-MSR 1-port 10/100Base-T SIC Module	JD545B See Configuration Note:1
HP A-MSR 1-port 100Base-X SIC Module • min=0 \ max=1 SFP Transceivers	JF280A See Configuration Note:1, 5
HP A-MSR 1-port GbE Combo SIC Module • min=0 \ max=1 SFP Transceivers	JD572A See Configuration Note:1, 6
HP A-MSR 2-port FXO SIC Module	JD558A See Configuration Note:2
HP A-MSR 1-port FXO SIC Module	JD559A See Configuration Note:2
HP A-MSR 2-port FXS SIC Module	JD560A See Configuration Note:2
HP A-MSR 1-port FXS SIC Module	JD561A See Configuration Note:2
HP A-MSR 4-port FXS/1-port FXO DSIC Mod	JG189A See Configuration Note:3
HP A-MSR 2-port ISDN-S/T Voice SIC Module	JF821A See Configuration Note:2

Configuration

HP A-MSR 2-port FXS/1-port FXO SIC Module	JD632A See Configuration Note:2
HP A-MSR 1-port E1/Fractional E1 (75ohm) SIC Module • min=0 \ max=1 E1or 2E1 Cable	JD634B See Configuration Note:2, 7, 10
HP A-MSR 1-port T1/Fractional T1 SIC Module	JD538A See Configuration Note:2, 14
HP A-MSR 2-port E1/Fractional E1 (75ohm) SIC Module • min=0 \ max=1 2E1 Cable	JF842A See Configuration Note:2, 10
HP A-MSR 1-port Enhanced Sync/Async Serial SIC Module • min=0 \ max=1 Serial Port Cable	JD557A See Configuration Note:1, 11
HP A-MSR 1-port ISDN-S/T SIC Module	JD571A See Configuration Note:2
HP A-MSR 8-port Async Serial SIC Module • Must select 1 8AS Communication Cable	JF281A See Configuration Note:2, 12
HP A-MSR 16-port Async Serial SIC Module	JG186A See Configuration Note:2, 13
HP A-MSR HSPA/WCDMA SIC Module	JG187A See Configuration Note:1

Configuration Rules:

Note 1	These Modules can install directly to the Routers (JG411A) min=0\ max=2 per enclosure
Note 2	These Modules can install directly to the Routers (JG411A) min=0\ max=3 per enclosure
Note 3	These Modules can install directly to the Routers (JG411A) min=0\ max=1 per enclosure (This Module takes up two slots, and is installed in Slots 1 + 2)

Configuration

Note 5	The following Transceivers install into this Module:	
	HP X115 100M SFP LC FX Transceiver	JD102B
	HP X110 100M SFP LC LX Transceiver	JD120B
	HP X110 100M SFP LC LH40 Transceiver	JD090A
	HP X110 100M SFP LC LH80 Transceiver	JD091A
Note 6	The following Transceivers install into this Module:	
	HP X120 1G SFP LC SX Transceiver	JD118B
	HP X120 1G SFP LC LX Transceiver	JD119B
	HP X125 1G SFP LC LH40 1310nm Transceiver	JD061A
	HP X120 1G SFP LC LH40 1550nm Transceiver	JD062A
	HP X125 1G SFP LC LH70 Transceiver	JD063B
	HP X120 1G SFP LC BX 10-U Transceiver	JD098B
	HP X120 1G SFP LC BX 10-D Transceiver	JD099B
	HP X120 1G SFP LC LH100 Transceiver	JD103A
Note 7	The following E1 Cables install into this Module:	
	HP X260 E1 (2) BNC 75 ohm 3m Rtr Cable	JD175A
	HP X260 E1 BNC 20m Router Cable	JD514A
	HP X260 E1/2 BNC 75 ohm 40m Router Cable	JD516A
Note 10	The following 2E1 Cables install into this Module:	
	HP X260 2E1 BNC 3m Router Cable	JD643A
Note 11	The following Cables install into this Module:	
	HP X260 RS449 3m DCE Serial Port Cable	JF826A
	HP X260 RS449 3m DTE Serial Port Cable	JF825A
	HP X200 X.21 DCE 3m Serial Port Cable	JD529A
	HP X200 V.24 DTE 3m Serial Port Cable	JD519A
	HP X200 V.35 DTE 3m Serial Port Cable	JD523A
	HP X260 RS530 3m DTE Serial Port Cable	JF827A
	HP X200 V.35 DCE 3m Serial Port Cable	JD525A
	HP X260 RS530 3m DCE Serial Port Cable	JF828A
	HP X200 V.24 DCE 3m Serial Port Cable	JD521A
	HP X200 X.21 DTE 3m Serial Port Cable	JD527A
Note 12	The following Cables install into this Module:	
	HP X260 SIC-8AS RJ45 0.28m Router Cable	JD642A
Note 13	If this module is selected Then 4 - JG263A HP X260 mini D-28/4-RJ45 0.3m Rtr Cable are required to be on the same order.	
Note 14	The following T1 Cables install into this Module:	
	HP X260 T1 Router Cable	JD518A

Configuration

Transceivers

SFP Transceivers

HP X115 100M SFP LC FX Transceiver	JD102B
HP X110 100M SFP LC LH40 Transceiver	JD120B
HP X110 100M SFP LC LH80 Transceiver	JD091A
HP X120 1G SFP LC SX Transceiver	JD118B
HP X120 1G SFP LC LX Transceiver	JD119B
HP X120 1G SFP LC LH40 1550nm XCVR	JD062A
HP X110 100M SFP LC LH40 Transceiver	JD090A
HP X125 1G SFP LC LH40 1310nm XCVR	JD061A
HP X125 1G SFP LC LH70 Transceiver	JD063B
HP X120 1G SFP LC BX 10-D Transceiver	JD099B
HP X120 1G SFP LC BX 10-U Transceiver	JD098B
HP X120 1G SFP LC LH100 Transceiver	JD103A

Cables

HP X260 mini D-28/4-RJ45 0.3m Rtr Cable	JG263A
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

Configuration

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 Auxiliary Router Cable	JD508A
HP X260 E1 (2) BNC 75 ohm 3m Rtr Cable	JD175A
HP X260 E1 BNC 20m Router Cable	JD514A
HP X260 E1/2 BNC 75 ohm 40m Router Cable	JD516A
HP X260 E1 RJ45 BNC 75-120 ohm Conversion Router Cable	JD511A
HP X260 T1 Router Cable	JD518A
HP X260 T1 Voice Router Cable	JD535A
HP X260 2E1 BNC 3m Router Cable	JD643A
HP X260 SIC-8AS RJ45 0.28m Router Cable	JD642A

Configuration Rules:

Remarks:

The following cable is used for RJ45 BNC Conversion -
HP X260 E1 RJ45 BNC 75-120 ohm Conversion Router Cable JD511A

The following Connector is used to extend E1/T1 Cables:
HP X500 T1/E1 Voice RJ45 Interface Connector JD535A

Technical Specifications

HP MSR2003 AC Router (JG411A)		
Ports	3 SIC slots or 1 DSIC slot and 1 SIC slot	
	2 RJ-45 1000BASE-T ports (IEEE 802.3ab Type 1000BASE-T)	
Physical characteristics	**Dimensions**	14.17(w) x 11.81(d) x 1.74(h) in (36 x 30 x 4.42 cm) (1U height)
	Weight	7.61 lb (3.45 kg)
Memory and processor	RISC @ 800 MHz, 256 MB flash capacity, 1 GB DDR3 SDRAM	
Mounting	Desktop or can be mounted in a EIA standard 19-inch telco rack when used with the rack-mount kit in the package.	
Performance	**Throughput**	up to 1 Mpps (64-byte packets)
	Routing table size	200000 entries (IPv4), 200000 entries (IPv6)
	Forwarding table size	200000 entries (IPv4), 200000 entries (IPv6)
	GRE tunnels	1000, max
Environment	**Operating temperature**	32ºF to 113ºF (0ºC to 45ºC)
	Operating relative humidity	5% to 90%, noncondensing
	Nonoperating/Storage temperature	-40ºF to 158ºF (-40ºC to 70ºC)
	Nonoperating/Storage relative humidity	5% to 90%, noncondensing
	Altitude	up to 16,404 ft (5 km)
Electrical characteristics	**Maximum heat dissipation**	78 BTU/hr (82.29 kJ/hr)
	Voltage	100-120/200-240 VAC
	Maximum power rating	54 W
	Frequency	50/60 Hz
	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.
Reliability	**MTBF (years)**	92.73
Safety	UL 60950-1; AS/NZS 60950; EN 60825-1 Safety of Laser Products-Part 1; EN 60825-2 Safety of Laser Products-Part 2; IEC 60950-1; CAN/CSA-C22.2 No. 60950-1-03; EN 60950-1/A11; FDA 21 CFR Subchapter J	
Emissions	EN 55022 Class A; ICES-003 Class A; ANSI C63.4 2003; ETSI EN 300 386 V1.3.3; AS/NZS CISPR 22 Class A; EN 61000-4-2; EN 61000-4-3; EN 61000-4-4; EN 61000-4-5; EN 61000-4-6; EN 61000-3-2:2006; EN 61000-3-3:1995 +A1:2001+A2:2005; EMC Directive 2004/108/EC; FCC (CFR 47, Part 15) Class A; EN 55024:1998+ A1:2001 + A2:2003; EN 61000-4-11:2004; EN 61000-4-8:2001	
Telecom	FCC part 68; CS-03	
Management	IMC - Intelligent Management Center; command-line interface; limited command-line interface; configuration menu; out-of-band management (RJ-45 Ethernet); SNMP Manager; Telnet; RMON1; FTP; in-line and out-of-band; modem interface; out-of-band management (serial RS-232C or Micro USB); IEEE 802.3 Ethernet MIB	
Services	3-year, parts only, global next-day advance exchange (UW075E)	

3-year, 4-hour onsite, 13x5 coverage for hardware (UW076E)
3-year, 4-hour onsite, 24x7 coverage for hardware (UW006E)
3-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 SW phone support and SW updates (UW009E)
3-year, 24x7 SW phone support, software updates (UW012E)
1-year, post-warranty, 4-hour onsite, 13x5 coverage for hardware (HR554E)
1-year, post-warranty, 4-hour onsite, 24x7 coverage for hardware (HR555E)
1-year, post-warranty, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone support (HR556E)
4-year, 4-hour onsite, 13x5 coverage for hardware (UW077E)
4-year, 4-hour onsite, 24x7 coverage for hardware (UW007E)
4-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone (UW010E)
4-year, 24x7 SW phone support, software updates (UW013E)
5-year, 4-hour onsite, 13x5 coverage for hardware (UW078E)
5-year, 4-hour onsite, 24x7 coverage for hardware (UW008E)
5-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone (UW011E)
5-year, 24x7 SW phone support, software updates (UW014E)
3 Yr 6 hr Call-to-Repair Onsite (UW079E)
4 Yr 6 hr Call-to-Repair Onsite (UW080E)
5 Yr 6 hr Call-to-Repair Onsite (UW081E)
1-year, 6 hour Call-To-Repair Onsite for hardware (HR558E)
1-year, 24x7 software phone support, software updates (HR557E)

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 1163 Border Gateway Protocol (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 BGP-4 confederations
RFC 1997 BGP Communities Attribute
RFC 1998 PPP Gandalf FZA Compression Protocol
RFC 2439 BGP Route Flap Damping
RFC 2547 BGP/MPLS VPNs
RFC 2796 BGP Route Reflection
RFC 2842 Capability Advertisement with BGP-4
RFC 2858 BGP-4 Multi-Protocol Extensions
RFC 2918 Route Refresh Capability
RFC 3065 Autonomous System Confederations for BGP
RFC 3107 Support BGP carry Label for MPLS
RFC 3392 Capabilities Advertisement with BGP-4
RFC 4271 A Border Gateway Protocol 4 (BGP-4)
RFC 4273 Definitions of Managed Objects for BGP-4
RFC 4274 BGP-4 Protocol Analysis
RFC 4275 BGP-4 MIB Implementation Survey
RFC 4276 BGP-4 Implementation Report
RFC 4277 Experience with the BGP-4 Protocol
RFC 4360 BGP Extended Communities Attribute
RFC 4456 BGP Route Reflection: An Alternative to Full Mesh Internal BGP (IBGP)
RFC 4724 Graceful Restart Mechanism for BGP
RFC 4760 Multiprotocol Extensions for BGP-4

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 1908 (SNMP v1/2 Coexistence)
RFC 1945 Hypertext Transfer Protocol -- HTTP/1.0
RFC 2271 Framework
RFC 2578-2580 SMIv2
RFC 2579 (SMIv2 Text Conventions)
RFC 2580 (SMIv2 Conformance)

RFC 1305 NTPv3
RFC 1591 DNS (client)
RFC 1902 (SNMPv2)
RFC 2573 (SNMPv3 Applications)
RFC 2576 (Coexistence between SNMP V1, V2, V3)
RFC 3416 (SNMP Protocol Operations v2)
RFC 3417 (SNMP Transport Mappings)

General protocols

RFC 768 UDP
RFC 783 TFTP Protocol (revision 2)
RFC 791 IP
RFC 792 ICMP
RFC 793 TCP
RFC 826 ARP
RFC 896 Congestion Control in IP/TCP Internetworks
RFC 917 Internet Subnets
RFC 925 Multi-LAN Address Resolution
RFC 950 Internet Standard Subnetting Procedure
RFC 951 BOOTP
RFC 959 File Transfer Protocol (FTP)
RFC 1027 Proxy ARP
RFC 1048 BOOTP (Bootstrap Protocol) vendor information extensions
RFC 1058 RIPv1
RFC 1091 Telnet Terminal-Type Option
RFC 1093 NSFNET routing architecture
RFC 1141 Incremental updating of the Internet checksum
RFC 1142 OSI IS-IS Intra-domain Routing Protocol
RFC 1166 Internet address used by Internet Protocol (IP)
RFC 1191 Path MTU discovery
RFC 1195 OSI ISIS for IP and Dual Environments
RFC 1213 Management Information Base for Network Management of TCP/IP-based internets
RFC 1253 (OSPF v2)
RFC 1305 NTPv3 (IPv4 only)
RFC 1321 The MD5 Message-Digest Algorithm
RFC 1323 TCP Extensions for High Performance
RFC 1349 Type of Service
RFC 1350 TFTP Protocol (revision
RFC 3036 LDP Specification
RFC 3037 LDP (Label Distribution Protocol) Applicability
RFC 3046 DHCP Relay Agent Information Option
RFC 3063 MPLS Loop Prevention Mechanism
RFC 3137 OSPF Stub Router Advertisement
RFC 3168 The Addition of Explicit Congestion Notification (ECN) to IP
RFC 3215 LDP State Machine
RFC 3246 Expedited Forwarding PHB
RFC 3268 Advanced Encryption Standard (AES) Ciphersuites for Transport Layer Security (TLS)
RFC 3277 IS-IS Transient Blackhole Avoidance
RFC 3279 Algorithms and Identifiers for the Internet X.509 Public Key Infrastructure Certificate and Certificate Revocation List (CRL) Profile
RFC 3280 Internet X.509 Public Key Infrastructure Certificate and Certificate Revocation List (CRL) Profile
RFC 3319 Dynamic Host Configuration Protocol (DHCPv6) Options for Session Initiation Protocol (SIP) Servers
RFC 3359 Reserved Type, Length and Value (TLV) Codepoints in Intermediate System to Intermediate System
RFC 3392 Support BGP capabilities advertisement
RFC 3443 Time To Live (TTL) Processing in Multi-Protocol Label Switching (MPLS) Networks
RFC 3478 Graceful Restart Mechanism for Label Distribution Protocol
RFC 3479 Fault Tolerance for the Label Distribution Protocol (LDP)
RFC 3509 OSPF ABR Behavior
RFC 4451 BGP MULTI_EXIT_DISC (MED) Considerations
RFC 4486 Subcodes for BGP Cease Notification Message
RFC 4541 Considerations for Internet Group Management Protocol (IGMP) and Multicast Listener Discovery (MLD) Snooping Switches
RFC 4553 Structure-Agnostic Time Division Multiplexing (TDM) over Packet (SAToP)
RFC 4562 MAC-Forced Forwarding: A Method for Subscriber Separation on an Ethernet Access Network
RFC 4576 Using a Link State Advertisement (LSA) Options Bit to Prevent Looping in BGP/MPLS IP Virtual Private Networks (VPNs)
RFC 4577 OSPF as the Provider/Customer Edge Protocol for BGP/MPLS IP Virtual Private Networks (VPNs)
RFC 4594 Configuration Guidelines for DiffServ Service Classes
RFC 4601 Protocol Independent Multicast - Sparse Mode (PIM-SM): Protocol Specification (Revised)
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 Switching (MPLS) Networks
RFC 4632 Classless Inter-domain Routing (CIDR): The Internet Address Assignment and Aggregation Plan
RFC 4659 BGP-MPLS IP Virtual Private Network (VPN) Extension for IPv6 VPN
RFC 4664 Framework for Layer 2 Virtual Private Networks (L2VPNs)
RFC 4665 Service Requirements

2)
RFC 1449 Transport Mappings for version 2 of the Simple Network Management Protocol (SNMPv2)
RFC 1519 CIDR
RFC 1542 BOOTP Extensions
RFC 1542 Clarifications and Extensions for the Bootstrap Protocol
RFC 1624 Incremental Internet Checksum
RFC 1631 NAT
RFC 1701 Generic Routing Encapsulation
RFC 1702 Generic Routing Encapsulation over IPv4 networks
RFC 1721 RIP-2 Analysis
RFC 1722 RIP-2 Applicability
RFC 1723 RIP v2
RFC 1724 RIP Version 2 MIB Extension
RFC 1777 Lightweight Directory Access Protocol
RFC 1812 IPv4 Routing
RFC 1825 Security Architecture for the Internet Protocol
RFC 1826 IP Authentication Header
RFC 1827 IP Encapsulating Security Payload (ESP)
RFC 1829 The ESP DES-CBC Transform
RFC 1945 Hypertext Transfer Protocol -- HTTP/1.0
RFC 1966 BGP Route Reflection An alternative to full mesh IBGP
RFC 1981 Path MTU Discovery for IP version 6
RFC 2003 IP Encapsulation within IP
RFC 2018 TCP Selective Acknowledgement Options
RFC 2082 RIP-2 MD5 Authentication
RFC 2104 HMAC: Keyed-Hashing for Message Authentication
RFC 2131 DHCP
RFC 2132 DHCP Options and BOOTP Vendor Extensions
RFC 2138 Remote Authentication Dial In User Service (RADIUS)
RFC 2236 IGMP Snooping
RFC 3526 More Modular Exponential (MODP) Diffie-Hellman groups for Internet Key Exchange (IKE)
RFC 3564 Requirements for Support of Differentiated Services-aware MPLS Traffic Engineering
RFC 3567 Intermediate System to Intermediate System (IS-IS) Cryptographic Authentication
RFC 3584 Coexistence between Version 1 and Version 2 of the Internet-standard Network Management Framework
RFC 3602 The AES-CBC Cipher Algorithm and Its Use with IPSec
RFC 3612 Applicability Statement for Restart Mechanisms for the Label Distribution Protocol (LDP)
RFC 3623 Graceful OSPF Restart
RFC 3646 DNS Configuration options for Dynamic Host Configuration Protocol for IPv6 (DHCPv6)
RFC 3662 A Lower Effort Per-Domain Behavior (PDB) for Differentiated Services
RFC 3704 Unicast Reverse Path Forwarding (URPF)
RFC 3706 A Traffic-Based Method of Detecting Dead Internet Key Exchange (IKE) Peers
RFC 3719 Recommendations for Interoperable Networks using Intermediate System to Intermediate System (IS-IS)
RFC 3736 Stateless Dynamic Host Configuration Protocol (DHCP) Service for IPv6
RFC 3768 Virtual Router Redundancy Protocol (VRRP)
RFC 3782 The NewReno Modification to TCP's Fast Recovery Algorithm
RFC 3786 Extending the Number of IS-IS LSP Fragments Beyond the 256 Limit
RFC 3787 Recommendations for Interoperable IP Networks using Intermediate System to Intermediate System (IS-IS)
for Layer 2 Provider-Provisioned Virtual Private Networks
RFC 4741 NETCONF Configuration Protocol
RFC 4742 Using the NETCONF Configuration Protocol over Secure SHell (SSH)
RFC 4743 Using NETCONF over the Simple Object Access Protocol (SOAP)
RFC 4765 Service Requirements for Layer 2 Provider Provisioned Virtual Private Networks
RFC 4781 Graceful Restart Mechanism for BGP with MPLS
RFC 4787 Network Address Translation (NAT) Behavioral Requirements for Unicast UDP
RFC 4798 Connecting IPv6 Islands over IPv4 MPLS Using IPv6 Provider Edge Routers (6PE)
RFC 4811 OSPF Out-of-Band Link State Database (LSDB) Resynchronization
RFC 4812 OSPF Restart Signaling
RFC 4813 OSPF Link-Local Signaling
RFC 4816 Pseudowire Emulation Edge-to-Edge (PWE3) Asynchronous Transfer Mode (ATM) Transparent Cell Transport Service
RFC 4835 Cryptographic Algorithm Implementation Requirements for Encapsulating Security Payload (ESP) and Authentication Header (AH)
RFC 4861 Neighbor Discovery for IP version 6 (IPv6)
RFC 4862 IPv6 Stateless Address Autoconfiguration
RFC 4878 "Definitions and Managed Objects for Operations, Administration, and Maintenance (OAM) Functions on
RFC 4893 BGP Support for Four-octet AS Number Space
RFC 4940 IANA Considerations for OSPF
RFC 4941 Privacy Extensions for Stateless Address

Technical Specifications

RFC 2246 The TLS Protocol Version 1.0
RFC 2251 Lightweight Directory Access Protocol (v3)
RFC 2252 Lightweight Directory Access Protocol (v3): Attribute Syntax Definitions
RFC 2283 MBGP
RFC 2309 Recommendations on queue management and congestion avoidance in the Internet
RFC 2338 VRRP
RFC 2451 The ESP CBC-Mode Cipher Algorithms
RFC 2453 RIPv2
RFC 2474 Definition of the Differentiated Services Field (DS Field) in the IPv4 and IPv6 Headers
RFC 2510 Internet X.509 Public Key Infrastructure Certificate Management Protocols
RFC 2519 A Framework for Inter-Domain Route Aggregation
RFC 2529 Transmission of IPv6 over IPv4 Domains without Explicit Tunnels
RFC 2548 (MS-RAS-Vendor only)
RFC 2581 TCP Congestion Control
RFC 2597 Assured Forwarding PHB Group
RFC 2598 An Expedited Forwarding PHB
RFC 2616 HTTP Compatibility v1.1
RFC 2661 L2TP
RFC 2663 NAT Terminology and Considerations
RFC 2694 DNS extensions to Network Address Translators (DNS_ALG)
RFC 2698 A Two Rate Three Color Marker
RFC 2716 PPP EAP TLS Authentication Protocol
RFC 2747 RSVP Cryptographic Authentication
RFC 2763 Dynamic Name-to-System ID mapping
RFC 2784 Generic Routing Encapsulation (GRE)
RFC 2827 Network Ingress
RFC 3810 Multicast Listener Discovery Version 2 (MLDv2) for IPv6
RFC 3812 Multiprotocol Label Switching (MPLS) Traffic Engineering (TE) Management Information Base (MIB)
RFC 3815 Definitions of Managed Objects for the Multiprotocol Label Switching (MPLS), Label Distribution Protocol (LDP)
RFC 3847 Restart signaling for IS-IS
RFC 3916 Requirements for Pseudo-Wire Emulation Edge-to-Edge (PWE3)
RFC 3948 UDP Encapsulation of IPsec ESP Packets
RFC 3973 Protocol Independent Multicast - Dense Mode (PIM-DM): Protocol Specification (Revised)
RFC 3985 Pseudo Wire Emulation Edge-to-Edge (PWE3) Architecture
RFC 4061 Benchmarking Basic OSPF Single Router Control Plane Convergence
RFC 4062 OSPF Benchmarking Terminology and Concepts
RFC 4063 Considerations When Using Basic OSPF Convergence Benchmarks
RFC 4109 Algorithms for Internet Key Exchange version 1 (IKEv1)
RFC 4133 Entity MIB (Version 3)
RFC 4182 Removing a Restriction on the use of MPLS Explicit NULL
RFC 4214 Intra-Site Automatic Tunnel Addressing Protocol (ISATAP)
RFC 4222 Prioritized Treatment of Specific OSPF Version 2 Packets and Congestion Avoidance
RFC 4250 The Secure Shell (SSH) Protocol Assigned Numbers
RFC 4251 The Secure Shell (SSH) Protocol Architecture
RFC 4252 The Secure Shell (SSH) Authentication Protocol
RFC 4253 The Secure Shell (SSH) Transport Layer Protocol
RFC 4254 The Secure Shell (SSH) Autoconfiguration in IPv6
RFC 5007 DHCPv6 Leasequery
RFC 5036 LDP Specification
RFC 5065 Autonomous System Confederations for BGP
RFC 5086 Structure-Aware Time Division Multiplexed (TDM) Circuit Emulation Service over Packet Switched Network (CESoPSN)
RFC 5095 Deprecation of Type 0 Routing Headers in IPv6
RFC 5130 A Policy Control Mechanism in IS-IS Using Administrative Tags
RFC 5187 OSPFv3 Graceful Restart
RFC 5214 Intra-Site Automatic Tunnel Addressing Protocol (ISATAP)
RFC 5254 Requirements for Multi-Segment Pseudowire Emulation Edge-to-Edge (PWE3)
RFC 5277 NETCONF Event Notifications
RFC 5280 Internet X.509 Public Key Infrastructure Certificate and Certificate Revocation List (CRL) Profile
RFC 5286 Basic Specification for IP Fast Reroute: Loop-Free Alternates
RFC 5287 Control Protocol Extensions for the Setup of Time-Division Multiplexing (TDM) Pseudowires in MPLS Networks
RFC 5301 Dynamic Hostname Exchange Mechanism for IS-IS
RFC 5302 Domain-Wide Prefix Distribution with Two-Level IS-IS
RFC 5304 Intermediate System to Intermediate System (IS-IS) Cryptographic Authentication
RFC 5306 Restart Signaling for IS-IS
RFC 5308 Routing IPv6 with IS-IS
RFC 5309 Point-to-Point Operation over LAN in Link State Routing Protocols
RFC 5381 Experience of Implementing NETCONF over SOAP
RFC 5382 The IP Network Address Translator (NAT)

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Filtering: Defeating Denial of Service Attacks Which Employ IP Source Address Spoofing
RFC 2865 Remote Authentication Dial In User Service (RADIUS)
RFC 2866 RADIUS Accounting
RFC 2868 RADIUS Attributes for Tunnel Protocol Support
RFC 2869 RADIUS Extensions
RFC 2884 Performance Evaluation of Explicit Congestion Notification (ECN) in IP Networks.
RFC 2963 A Rate Adaptive Shaper for Differentiated Services
RFC 2966 Domain-wide Prefix Distribution with Two-Level IS-IS
RFC 2973 IS-IS Mesh Groups
RFC 2993 Architectural Implications of NAT
RFC 3011 The IPv4 Subnet Selection Option for DHCP
RFC 3022 Traditional IP Network Address Translator (Traditional NAT)
RFC 3027 Protocol Complications with the IP Network Address Translator
RFC 3031 Multiprotocol Label Switching Architecture
RFC 3032 MPLS Label Stack Encoding
Connection Protocol
RFC 4291 IP Version 6 Addressing Architecture
RFC 4305 Cryptographic Algorithm Implementation Requirements for Encapsulating Security Payload (ESP) and Authentication Header (AH)
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 4382 MPLS/BGP Layer 3 Virtual Private Network (VPN) Management Information Base
RFC 4385 Pseudowire Emulation Edge-to-Edge (PWE3) Control Word for Use over an MPLS PSN
RFC 4419 Diffie-Hellman Group Exchange for the Secure Shell (SSH) Transport Layer Protocol
RFC 4446 IANA Allocations for Pseudowire Edge to Edge Emulation (PWE3)
RFC 4447 Pseudowire Setup and Maintenance Using the Label Distribution Protocol (LDP)
RFC 4448 Encapsulation Methods for Transport of Ethernet over MPLS Networks
RFC 5398 Autonomous System (AS) Number Reservation for Documentation Use
RFC 5492 Capabilities Advertisement with BGP-4
RFC 5508 NAT Behavioral Requirements for ICMP
RFC 5539 NETCONF over Transport Layer Security (TLS)
RFC 5613 OSPF Link-Local Signaling
RFC 5659 An Architecture for Multi-Segment Pseudowire Emulation Edge-to-Edge
RFC 5798 Virtual Router Redundancy Protocol (VRRP) Version 3 for IPv4 and IPv6
RFC 5880 Bidirectional Forwarding Detection
RFC 5881 BFD for IPv4 and IPv6 (Single Hop)
RFC 5882 Generic Application of BFD
RFC 5883 BFD for Multihop Paths
RFC 5905 Network Time Protocol Version 4: Protocol and Algorithms Specification
RFC 854 Telnet Protocol Specification
RFC 856 Telnet Binary Transmission

IP multicast
RFC 1112 IGMP
RFC 2362 PIM Sparse Mode
RFC 2710 Multicast Listener Discovery (MLD) for IPv6
RFC 2934 Protocol Independent Multicast MIB for IPv4
RFC 3376 IGMPv3
RFC 3376 IGMPv3 (host joins only)
RFC 5059 Bootstrap Router (BSR) Mechanism for Protocol Independent Multicast (PIM)

IPv6
RFC 2080 RIPng for IPv6
RFC 2460 IPv6 Specification
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 2740 OSPFv3 for IPv6
RFC 2893 Transition Mechanisms for IPv6 Hosts and Routers
RFC 3056 Connection of IPv6 Domains via IPv4 Clouds
RFC 3162 RADIUS and IPv6
RFC 3315 DHCPv6 (client and relay)
RFC 5340 OSPF for IPv6

MIBs
RFC 1213 MIB II
RFC 1493 Bridge MIB
RFC 1724 RIPv2 MIB
RFC 2012 SNMPv2 MIB for TCP
RFC 2013 SNMPv2 MIB for UDP
RFC 2096 IP Forwarding Table MIB
RFC 2233 Interfaces MIB
RFC 2573 SNMP-Notification MIB
RFC 2574 SNMP USM MIB
RFC 2674 802.1p and IEEE 802.1Q Bridge MIB

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RFC 1850 OSPFv2 MIB
RFC 1907 SNMPv2 MIB
RFC 2011 SNMPv2 MIB for IP
RFC 2273 SNMP-NOTIFICATION-MIB
RFC 2571 SNMP Framework MIB
RFC 2572 SNMP-MPD MIB
RFC 2737 Entity MIB (Version 2)
RFC 2863 The Interfaces Group MIB
RFC 3813 MPLS LSR MIB

Network management
IEEE 802.1D (STP)
RFC 1098 Simple Network Management Protocol (SNMP)
RFC 1158 Management Information Base for network management of TCP/IP-based internets: MIB-II
RFC 1212 Concise MIB definitions
RFC 1215 Convention for defining traps for use with the SNMP
RFC 1389 RIPv2 MIB Extension
RFC 1448 Protocol Operations for version 2 of the Simple Network Management Protocol (SNMPv2)
RFC 1450 Management Information Base (MIB) for version 2 of the Simple Network Management Protocol (SNMPv2)
RFC 1902 Structure of Management Information for Version 2 of the Simple Network Management Protocol (SNMPv2)
RFC 1903 SNMPv2 Textual Conventions
RFC 1904 SNMPv2 Conformance
RFC 1905 SNMPv2 Protocol Operations
RFC 1906 SNMPv2 Transport Mappings
RFC 1908 Coexistence between Version 1 and Version 2 of the Internet-standard Network Management Framework
RFC 1918 Private Internet Address Allocation
RFC 2037 Entity MIB using SMIv2
RFC 2261 An Architecture for Describing SNMP Management Frameworks
RFC 2262 Message Processing and Dispatching for the Simple Network Management Protocol (SNMP)
RFC 2263 SNMPv3 Applications
RFC 2264 User-based Security Model (USM) for version 3 of the Simple Network Management Protocol (SNMPv3)
RFC 2265 View-based Access Control Model (VACM) for the Simple Network Management Protocol (SNMP)
RFC 2272 SNMPv3 Management Protocol
RFC 2273 SNMPv3 Applications
RFC 2274 USM for SNMPv3
RFC 2275 VACM for SNMPv3
RFC 2575 SNMPv3 View-based Access Control Model (VACM)
RFC 3164 BSD syslog Protocol
RFC 3411 An Architecture for Describing Simple Network Management Protocol (SNMP) Management Frameworks
RFC 3412 Message Processing and Dispatching for the Simple Network Management Protocol (SNMP)
RFC 3413 Simple Network Management Protocol (SNMP) Applications
RFC 3414 SNMPv3 User-based Security Model (USM)
RFC 3415 View-based Access Control Model (VACM) for the Simple Network Management Protocol (SNMP)
RFC 3418 Management Information Base (MIB) for the Simple Network Management Protocol (SNMP)

OSPF
RFC 1245 OSPF protocol analysis
RFC 1246 Experience with OSPF
RFC 1583 OSPFv2
RFC 1587 OSPF NSSA
RFC 1765 OSPF Database Overflow
RFC 1850 OSPFv2 Management Information Base (MIB), traps
RFC 2328 OSPFv2
RFC 2370 OSPF Opaque LSA Option
RFC 3101 OSPF NSSA

QoS/CoS
IEEE 802.1P (CoS)
RFC 2474 DS Field in the IPv4 and IPv6 Headers
RFC 2475 DiffServ Architecture
RFC 2597 DiffServ Assured Forwarding (AF)
RFC 2598 DiffServ Expedited Forwarding (EF)
RFC 2697 A Single Rate Three Color Marker
RFC 3168 The Addition of Explicit Congestion Notification (ECN) to IP
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

Security
IEEE 802.1X Port Based Network Access Control
RFC 2082 RIP-2 MD5 Authentication
RFC 2104 Keyed-Hashing for Message Authentication
RFC 2408 Internet Security Association and Key Management Protocol (ISAKMP)
RFC 2409 The Internet Key Exchange (IKE)
RFC 2412 The OAKLEY Key Determination Protocol
RFC 2818 HTTP Over TLSR
FC 2865 RADIUS Authentication
RFC 2866 RADIUS Accounting
RFC 3579 RADIUS Support For Extensible Authentication Protocol (EAP)
RFC 3580 IEEE 802.1X Remote

RFC 2138 RADIUS Authentication
RFC 2139 RADIUS Accounting
RFC 2459 Internet X.509 Public Key Infrastructure Certificate and CRL Profile
Authentication Dial In User Service (RADIUS) Usage Guidelines

VPN

RFC 1828 IP Authentication using Keyed MD5
RFC 1853 IP in IP Tunneling
RFC 2401 Security Architecture for the Internet Protocol
RFC 2402 IP Authentication Header
RFC 2403 The Use of HMAC-MD5-96 within ESP and AH
RFC 2404 The Use of HMAC-SHA-1-96 within ESP and AH
RFC 2405 The ESP DES-CBC Cipher Algorithm With Explicit IV
RFC 2406 IP Encapsulating Security Payload (ESP)
RFC 2407 The Internet IP Security Domain of Interpretation for ISAKMP
RFC 2410 The NULL Encryption Algorithm and Its Use With IPSec
RFC 2411 IP Security Document Roadmap
RFC 3948 - UDP Encapsulation of IPSec ESP Packets
RFC 4301 - Security Architecture for the Internet Protocol
RFC 4302 - IP Authentication Header (AH)
RFC 4303 - IP Encapsulating Security Payload (ESP)
RFC 4305 - Cryptographic Algorithm Implementation Requirements for ESP and AH

HP MSR2000 Router Series accessories

Transceivers	
HP X110 100M SFP LC FX Transceiver	JD102B
HP X110 100M SFP LC LX Transceiver	JD120B
HP X110 100M SFP LC LH40 Transceiver	JD090A
HP X110 100M SFP LC LH80 Transceiver	JD091A
HP X120 1G SFP LC SX Transceiver	JD118B
HP X120 1G SFP LC LX Transceiver	JD119B
HP X125 1G SFP LC LH40 1310nm Transceiver	JD061A
HP X120 1G SFP LC LH40 1550nm Transceiver	JD062A
HP X125 1G SFP LC LH70 Transceiver	JD063B
HP X120 1G SFP LC LH100 Transceiver	JD103A
HP X120 1G SFP LC BX 10-U Transceiver	JD098B
HP X120 1G SFP LC BX 10-D Transceiver	JD099B
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 Auxiliary Router Cable	JD508A
HP X260 E1 (2) BNC 75 ohm 3m Router Cable	JD175A
HP X260 E1 BNC 20m Router Cable	JD514A
HP X260 E1 2 BNC 75 ohm 40m Router Cable	JD516A
HP X260 E1 RJ45 BNC 75-120 ohm Conversion Router Cable	JD511A
HP X260 2E1 BNC 3m Router Cable	JD643A
HP X260 T1 Router Cable	JD518A
HP X260 T1 Voice Router Cable	JD535A
HP X260 SIC-8AS RJ45 0.28m Router Cable	JD642A
HP X260 mini D-28 to 4-RJ45 0.3m Router Cable	JG263A
Router Modules	
HP MSR 9-port 10/100Base-T Switch DSIC Module	JD574B
HP MSR 4-port 10/100Base-T Switch SIC Module	JD573B
HP MSR 1-port 10/100Base-T SIC Module	JD545B
HP MSR 1-port 100Base-X SIC Module	JF280A
HP MSR 1-port GbE Combo SIC Module	JD572A
HP MSR 2-port FXO SIC Module	JD558A
HP MSR 1-port FXO SIC Module	JD559A
HP MSR 2-port FXS SIC Module	JD560A

Accessories

HP MSR 1-port FXS SIC Module	JD561A
HP MSR 2-port FXS/1-port FXO SIC Module	JD632A
HP MSR 4-port FXS / 1-port FXO DSIC Module	JG189A
HP MSR 2-port ISDN-S/T Voice SIC Module	JF821A
HP MSR 1-port E1/Fractional E1 (75ohm) SIC Module	JD634B
HP MSR 2-port E1/Fractional E1 (75ohm) SIC Module	JF842A
HP MSR 1-port T1/Fractional T1 SIC Module	JD538A
HP MSR 1-port Enhanced Sync/Async Serial SIC Module	JD557A
HP MSR 1-port ISDN-S/T SIC Module	JD571A
HP MSR 8-port Async Serial SIC Module	JF281A
HP MSR 16-port Async Serial SIC Module	JG186A
HP MSR HSPA/WCDMA SIC Module	JG187A

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