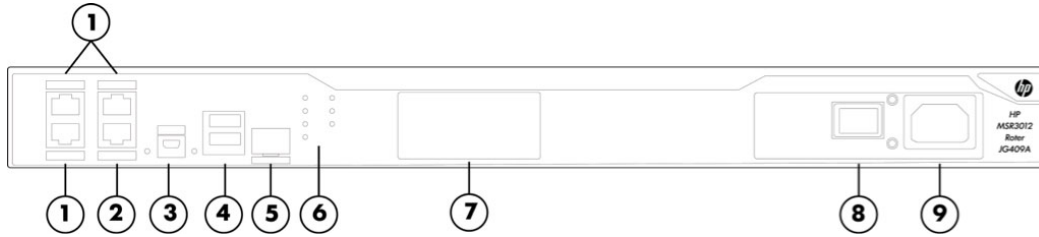
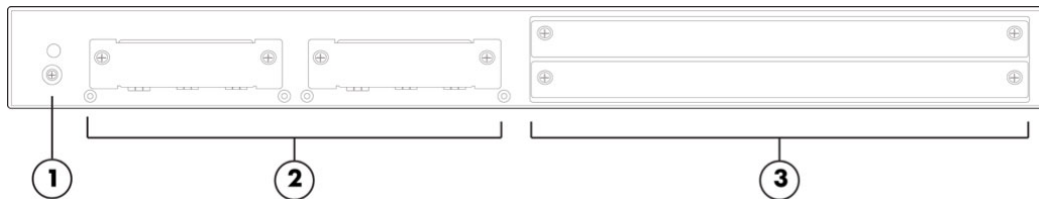


### Overview



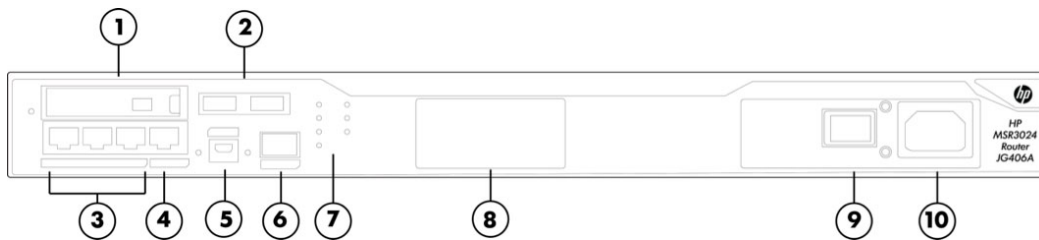
**HP MSR3012 AC Router- Front (JG409A)**

- |  |                              |
|--|------------------------------|
| 1. RJ-45 1000BASE-T ports (IEEE 802.3ab Type 1000BASE-T) | 6. System Activity LEDs      |
| 2. Console port/AUX port (CON/AUX)                       | 7. RPS receptacle cover      |
| 3. USB console port(CON)                                 | 8. Power Switch              |
| 4. USB 2.0 Port for 3G modem and USB disk                | 9. AC-input power receptacle |
| 5. SFP fixed Gigabit Ethernet SFP port                   |                              |



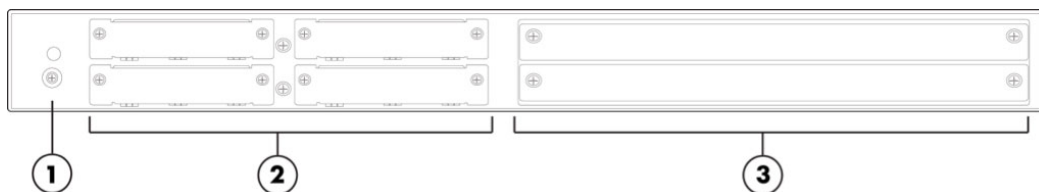
**HP MSR3012 AC Router- Rear (JG409A)**

- |                       |                      |
|-----------------------|----------------------|
| 1. Grounding Terminal | 3. HMIM module slots |
| 2. SIC slots          |                      |



**HP MSR3024 AC Router - Front**

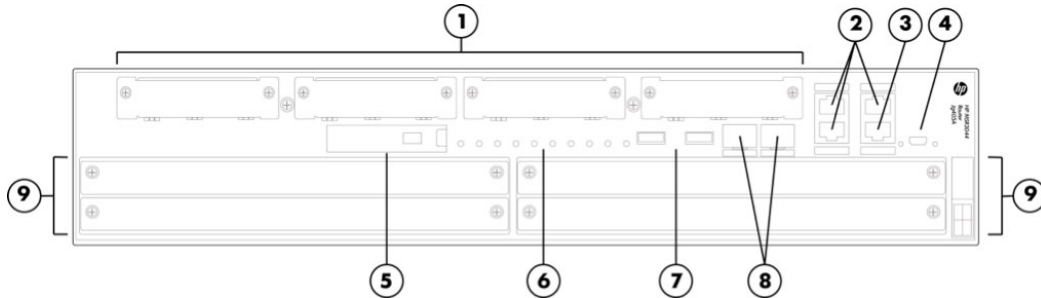
- |  |                               |
|--|-------------------------------|
| 1. CF Card Slot  | 6. Fixed COMBO 1000M RJ45/SFP |
| 2. USB 2.0 Port for 3G modem and USB disk                | 7. System Activity LEDs       |
| 3. RJ-45 1000BASE-T ports (IEEE 802.3ab Type 1000BASE-T) | 8. RPS receptacle cover       |
| 4. Console port/AUX port (CON/AUX)                       | 9. Power Switch               |
| 5. USB console port (CON)                                | 10. AC-input power receptacle |



### Overview

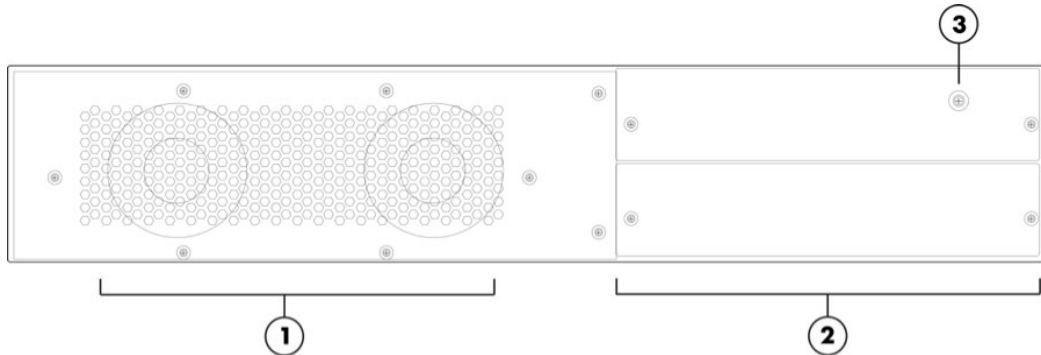
#### HP MSR3024 AC Router - Rear

1. Grounding terminal
2. SIC module slots / 2 - DSIC module slots
3. HMIM module slots



#### HP MSR3044 Router - Front

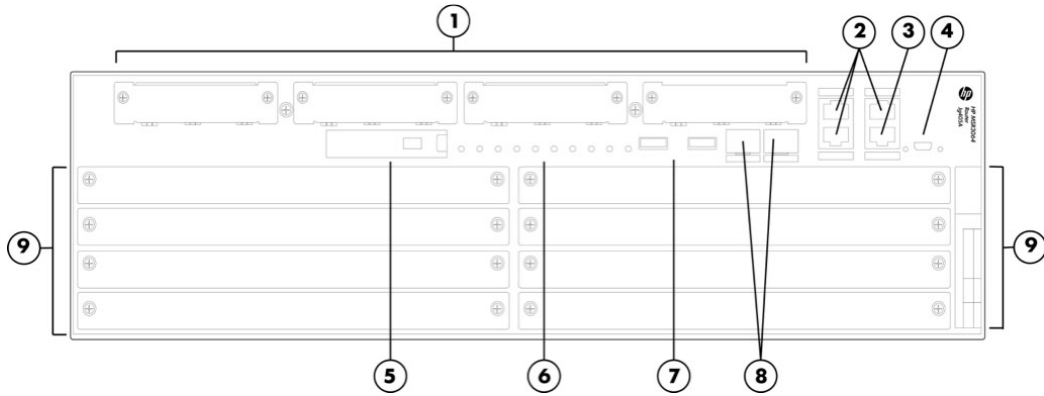
1. 4 - SIC module slots / 2 - DSIC module slots
2. 3 Fixed 10M/100M/1000M RJ45 ports
3. Console port/AUX port (CON/AUX)
4. USB console port (CON)
5. CF Card Slot
6. System Activity LEDs
7. 2 USB 2.0 Port for 3G modem and USB disk
8. 2 Fixed COMBO 1000M RJ45/SFP ports min=0 \ max=2 SFP Transceivers
9. HMIM module slots (4 - Half Height Slots) / 0 - DHMIM module slot (Double Width Full Height Slot)



#### HP MSR3044 Router - Rear

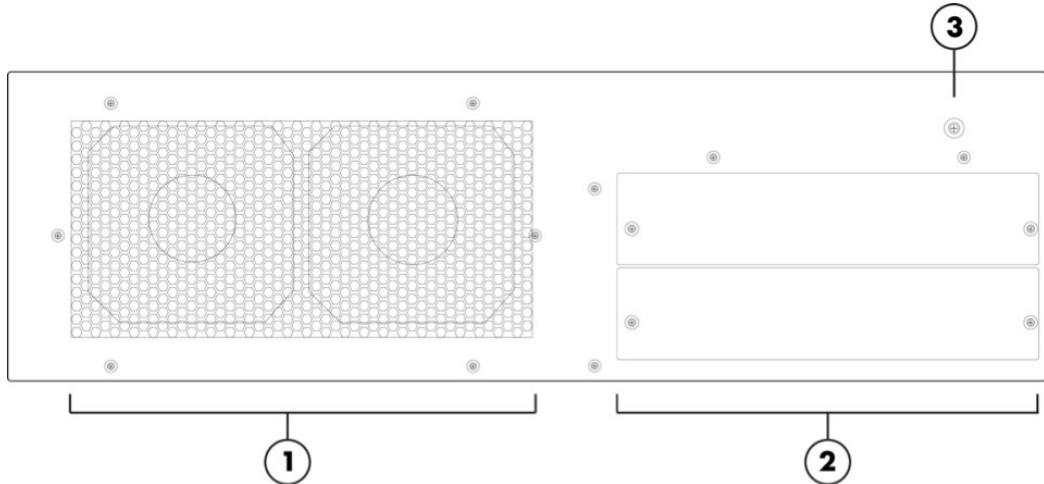
1. Fans
2. Power Supplies
3. Ground

### Overview



**HP MSR3064 Router**

- 1. SIC module slots / 2 - DSIC module slots
- 2. Fixed 10M/100M/1000M RJ45 ports
- 3. Console port/AUX port (CON/AUX)
- 4. USB console port (CON)
- 5. CF Card Slot
- 6. System Activity LEDs
- 7. 2 USB 2.0 Port for 3G modem and USB disk
- 8. 2 Fixed COMBO 1000M RJ45/SFP ports min=0 \ max=2 SFP Transceivers
- 9. 6 - HMIM module slots (4 Half Height + 2 Full Height Slots) / 1 - DHMIM module slot (Double Width Full Height Slot)



**HP MSR3064 Router**

- 1. Fans
- 2. Power supply slots
- 3. Grounding Terminal

### Models

HP MSR3012 AC Router  
HP MSR3024 AC Router  
HP MSR3044 Router  
HP MSR3064 Router

JG409A  
JG406A  
JG405A  
JG404A

### Overview

#### Key features

- Up to 5 Mpps forwarding performance; support for multiple concurrent services
- Open Application Platform for HP AllianceOne applications like WAN acceleration and Microsoft® Lync
- Embedded security features with hardware-based encryption, firewall, NAT, and VPNs
- No additional licensing complexity; no cost for advanced features
- Zero-touch solution, with single pane-of-glass management

#### Product overview

The HP MSR3000 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 medium- to large-sized branch offices. This gives your IT personnel the benefit of reduced complexity, and simplified configuration, deployment, and management.

The MSR3000 routers use the latest multicore CPUs, offer Gigabit switching, provide an enhanced PCI bus, and ship with the latest version of HP Comware software to help ensure high performance with concurrent services. The MSR3000 series provides a full-featured, resilient routing platform, including IPv6 and MPLS, with up to 5 Mpps forwarding capacity and 3.3 Gb/s of IPSec VPN encrypted throughput. These routers also support HP Open Application Platform (OAP) modules to deliver integrated industry-leading HP AllianceOne partner applications such as virtualization, unified communications and collaboration (UC&C), and application optimization capabilities.

The MSR3000 series provides an agile, flexible network infrastructure that enables you to quickly adapt to 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 5 Mpps (3.3 Gb/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 3.3 Gb/s with a maximum of 4,000 IPSec VPN tunnels

##### Product architecture

- **Ideal multiservice platform**  
provides WAN router, Ethernet switch, wireless LAN, 3G/4G WAN, firewall, VPN, and SIP/voice gateway all in one device
- **Advanced hardware architecture**  
provides multicore processors, gigabit switching, and PCIE bus; external RPS or dual internal power supplies, and internal and external CF cards are offered; new high-performance MIM modules (HMIM) supported
- **New operation system version**  
ships with new Comware v7 operating system delivering the latest in virtualization and routing
- **Open Application Platform architecture**  
provides unmatched application and services flexibility, with the potential to deliver the functionality of multiple devices, creating capital and operational expense savings and lasting investment protection
- **Field-programmable gate array (FPGA)**  
improves the bandwidth of SIC module slots from 100 Mb/s to 1000 Mb/s, and improves uplink performance from 1 Gb/s to 10

### Overview

Gb/s

- **Multi Gigabit Fabric (MGF)**

eases utilization of the main processor by transmitting Layer 2 packets directly via the MGF

### Connectivity

- **High-density port connectivity**

provides up to 10 interface module slots and up to three on-board Gigabit Ethernet ports

- **Multiple WAN interfaces**

provides traditional links with E1, T1, Serial, and ISDN; high-density Ethernet access with WAN Gigabit Ethernet and LAN 4- and 9-port Fast Ethernet; mobility access with 3G SIC module and 3G/4G USB modems, and high-speed E3/T3 and 155 Mb/s OC3 access options

- **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 are available

- **USB interface**

uses USB memory disk to download and upload configuration/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

### 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 remotemonitoring port

- **VLANs**

supports up to 4,094 VLANs or 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 of 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)**

### Overview

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

- **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)**

### Overview

simplifies the management of large IP networks and supports client and server; DHCP Relay enables DHCP operation across subnets

### Quality of Service (QoS)

- **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
- **Hierarchical quality of service (HQoS)/Nested QoS**  
manages traffic uniformly, and hierarchically schedules traffic by user, network service, and application; provides more granular traffic control and quality assurance services than traditional QoS
- **Other QoS technologies**  
supports traffic shaping, MPLS QoS, and MP QoS/LF

### 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
- **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 using 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

### Overview

- **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, Web content 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)**  
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



### Overview

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

### Investment protection

- **Re-use of existing SIC and MIM modules**  
supports existing SIC and MIM 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

### Overview

#### Warranty and support

- **1-year Warranty 2.0**  
advance hardware replacement with 10-calendar-day delivery (available in most countries)
- **Electronic and telephone support (for Warranty 2.0)**  
limited electronic and 24x7 telephone support is available from HP for the entire warranty period; to reach our support centers, refer to [www.hp.com/networking/contact-support](http://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](http://www.hp.com/networking/warrantysummary)
- **Software releases**  
to find software for your product, refer to [www.hp.com/networking/support](http://www.hp.com/networking/support); for details on the software releases available with your product purchase, refer to [www.hp.com/networking/warrantysummary](http://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 MSR3064 Router

- 3 Fixed 10M/100M/1000M RJ45 ports
- 2 Fixed COMBO 1000M RJ45/SFP ports min=0 \ max=2 SFP Transceivers
- 4 - SIC module slots / 2 - DSIC module slots
- 6 - HMIM module slots (4 Half Height + 2 Full Height Slots) / 1 - DHMIM module slot (Double Width Full Height Slot)
- 2 - VPM slots
- 2 USB 2.0 Port for 3G modem and USB disk
- 1 CON/AUX port and 1 USB console port
- 2GB DDR3 SDRAM Included (4GB Max, by replacing existing single 2GB SDRAM)
- 1 - CF Card Slot
- Must select min 1 Power Supply (min=1 \ max=2)
- 3U - Height

JG404A

See Configuration  
Note:3, 4, 5, 6

##### HP MSR3044 Router

- 3 Fixed 10M/100M/1000M RJ45 ports
- 2 Fixed COMBO 1000M RJ45/SFP ports min=0 \ max=2 SFP Transceivers
- 4 - SIC module slots / 2 - DSIC module slots
- 4 - HMIM module slots (4 - Half Height Slots) / 0 - DHMIM module slot (Double Width Full Height Slot)
- 2 - VPM slots
- 2 USB 2.0 Port for 3G modem and USB disk
- 1 CON/AUX port and 1 USB console port
- 2GB DDR3 SDRAM Included (4GB Max, by replacing existing single 2GB SDRAM)
- 1 - CF Card Slot
- Must select min 1 Power Supply (min=1 \ max=2)
- 2U - Height

JG405A

See Configuration  
Note:3, 4, 5, 6

##### HP MSR3024 AC Router

- 3 Fixed 10M/100M/1000M RJ45 ports
- 1 Fixed COMBO 1000M RJ45/SFP port min=0 \ max=1 SFP Transceiver
- 4 - SIC module slots / 2 - DSIC module slots
- 2 - HMIM module slots (2 - Half Height Slots) / 0 - DHMIM module slot (Double Width Full Height Slot)
- 2 - VPM slots
- 2 USB 2.0 Port for 3G modem and USB disk
- 1 CON/AUX port and 1 USB console port
- 2GB DDR3 SDRAM Included (4GB Max, by replacing existing single 2GB SDRAM)
- 1 - CF Card Slot
- AC Power Supply included (+RPS Optional)
- 1U - Height

JG406A

See Configuration  
Note:1, 2, 3, 4, 5,  
6

##### C15 PDU NA

- C15 to C14 Jumper Cord (NA)

JG406A#B2B

### Configuration

<p>C15 PDU ROW</p> <ul style="list-style-type: none"> <li>• C15 to C14 Jumper Cord (ROW)</li> </ul>	<p>JG406A#B2C</p>																						
<p>220 NA</p> <ul style="list-style-type: none"> <li>• NEMA L6-20P Cord</li> </ul>	<p>JG406A#B2E</p>																						
<p>HP MSR3012 AC Router</p> <ul style="list-style-type: none"> <li>• 3 Fixed 10M/100M/1000M RJ45 ports</li> <li>• 1 Fixed COMBO 1000M RJ45/SFP port min=0 \ max=1 SFP Transceiver</li> <li>• 2 - SIC module slots / 0 - DSIC module slots</li> <li>• 1 - HMIM module slot (1 - Full Height Slot) / 0 - DHMIM module slot (Double Width Full Height Slot)</li> <li>• 1 - VPM slot</li> <li>• 2 USB 2.0 Port for 3G modem and USB disk</li> <li>• 1 CON/AUX port and 1 USB console port</li> <li>• 1GB DDR3 SDRAM Included (default=1GB \ max=1GB DDR SDRAM)</li> <li>• AC Power Supply included</li> <li>• 1U - Height</li> </ul>	<p>JG409A See Configuration Note:1, 2, 3, 6</p>																						
<p>C15 PDU NA</p> <ul style="list-style-type: none"> <li>• C15 to C14 Jumper Cord (NA)</li> </ul>	<p>JG409A#B2B</p>																						
<p>C15 PDU ROW</p> <ul style="list-style-type: none"> <li>• C15 to C14 Jumper Cord (ROW)</li> </ul>	<p>JG409A#B2C</p>																						
<p>220 NA</p> <ul style="list-style-type: none"> <li>• NEMA L6-20P Cord</li> </ul>	<p>JG409A#B2E</p>																						
<p>Configuration Rules:</p>																							
<p>Note 1</p>	<p>1 - AC Power Supply included</p>																						
<p>Note 2</p>	<p>Localization required on orders without #B2B, #B2C or #B2E. (See Localization Menu)</p>																						
<p>Note 3</p>	<p>The following Transceivers install into this Switch:</p> <table border="0" style="width: 100%;"> <tr> <td style="padding-left: 20px;">HP X120 1G SFP LC SX Transceiver</td> <td style="text-align: right;">JD118B</td> </tr> <tr> <td style="padding-left: 20px;">HP X120 1G SFP LC LX Transceiver</td> <td style="text-align: right;">JD119B</td> </tr> <tr> <td style="padding-left: 20px;">HP X125 1G SFP LC LH40 1310nm Transceiver</td> <td style="text-align: right;">JD061A</td> </tr> <tr> <td style="padding-left: 20px;">HP X120 1G SFP LC LH40 1550nm Transceiver</td> <td style="text-align: right;">JD062A</td> </tr> <tr> <td style="padding-left: 20px;">HP X125 1G SFP LC LH70 Transceiver</td> <td style="text-align: right;">JD063B</td> </tr> <tr> <td style="padding-left: 20px;">HP X120 1G SFP LC LH100 Transceiver</td> <td style="text-align: right;">JD103A</td> </tr> <tr> <td style="padding-left: 20px;">HP X115 100M SFP LC FX Transceiver</td> <td style="text-align: right;">JD102B</td> </tr> <tr> <td style="padding-left: 20px;">HP X110 100M SFP LC LX Transceiver</td> <td style="text-align: right;">JD120B</td> </tr> <tr> <td style="padding-left: 20px;">HP X110 100M SFP LC LH40 Transceiver</td> <td style="text-align: right;">JD090A</td> </tr> <tr> <td style="padding-left: 20px;">HP X110 100M SFP LC LH80 Transceiver</td> <td style="text-align: right;">JD091A</td> </tr> <tr> <td style="padding-left: 20px;">HP X120 1G SFP LC BX 10-U Transceiver</td> <td style="text-align: right;">JD098B</td> </tr> </table>	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 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	HP X120 1G SFP LC BX 10-U Transceiver	JD098B
HP X120 1G SFP LC SX Transceiver	JD118B																						
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HP X125 1G SFP LC LH40 1310nm Transceiver	JD061A																						
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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																						
HP X120 1G SFP LC BX 10-U Transceiver	JD098B																						

### Configuration

	HP X120 1G SFP LC BX 10-D Transceiver	JD099B
Note 4	The following DDR SDRAM install into this Switch: HP X610 4GB DDR3 SDRAM UDIMM Memory (Must remove existing 2GB UDIMM to install the 4GB UDIMM)	JG530A
Note 5	The following CF Card install into this Switch: HP X600 256M Compact Flash Card HP X600 512M Compact Flash Card HP X600 1G Compact Flash Card	JC686A JC685A JC684A
Note 6	The following VPM Modules install into this Router: HP MSR G2 128-channel Voice Processing Module	JG417A

### Box Level Integration CTO Models

#### CTO Router Chassis

HP MSR CTO Router Solution		JG500A
<ul style="list-style-type: none"><li>SSP trigger sku</li></ul>		
HP MSR3064 Router		JG404A
<ul style="list-style-type: none"><li>3 Fixed 10M/100M/1000M RJ45 ports</li><li>2 Fixed COMBO 1000M RJ45/SFP ports min=0 \ max=2 SFP Transceivers</li><li>4 - SIC module slots / 2 - DSIC module slots</li><li>6 - HMIM module slots (4 Half Height + 2 Full Height Slots) / 1 - DHMIM module slot (Double Width Full Height Slot)</li><li>2 - VPM slots</li><li>2 USB 2.0 Port for 3G modem and USB disk</li><li>1 CON/AUX port and 1 USB console port</li><li>2GB DDR3 SDRAM Included (4GB Max, by replacing existing single 2GB SDRAM)</li><li>1 - CF Card Slot</li><li>Must select min 1 Power Supply (min=1 \ max=2)</li><li>3U - Height</li></ul>	See Configuration Note:3, 4, 5, 6, 8	
HP MSR3044 Router		JG405A
<ul style="list-style-type: none"><li>3 Fixed 10M/100M/1000M RJ45 ports</li><li>2 Fixed COMBO 1000M RJ45/SFP ports min=0 \ max=2 SFP Transceivers</li><li>4 - SIC module slots / 2 - DSIC module slots</li><li>4 - HMIM module slots (4 - Half Height Slots) / 0 - DHMIM module slot (Double Width Full Height Slot)</li><li>2 - VPM slots</li><li>2 USB 2.0 Port for 3G modem and USB disk</li><li>1 CON/AUX port and 1 USB console port</li><li>2GB DDR3 SDRAM Included (4GB Max, by replacing existing single 2GB SDRAM)</li><li>1 - CF Card Slot</li><li>Must select min 1 Power Supply (min=1 \ max=2)</li><li>2U - Height</li></ul>	See Configuration Note:3, 4, 5, 6, 8	

### Configuration

#### HP MSR3024 AC Router

- 3 Fixed 10M/100M/1000M RJ45 ports
- 1 Fixed COMBO 1000M RJ45/SFP port min=0 \ max=1 SFP Transceiver
- 4 - SIC module slots / 2 - DSIC module slots
- 2 - HMIM module slots (2 - Half Height Slots) / 0 - DHMIM module slot (Double Width Full Height Slot)
- 2 - VPM slots
- 2 USB 2.0 Port for 3G modem and USB disk
- 1 CON/AUX port and 1 USB console port
- 2GB DDR3 SDRAM Included (4GB Max, by replacing existing single 2GB SDRAM)
- 1 - CF Card Slot
- AC Power Supply included (+RPS Optional)
- 1U - Height

JG406A

See Configuration  
Note:1, 2, 3, 4, 5,  
6, 7, 8

#### C15 PDU NA

- C15 to C14 Jumper Cord (NA)

JG406A#B2B

#### C15 PDU ROW

- C15 to C14 Jumper Cord (ROW)

JG406A#B2C

#### 220 NA

- NEMA L6-20P Cord

JG406A#B2E

#### HP MSR3012 AC Router

- 3 Fixed 10M/100M/1000M RJ45 ports
- 1 Fixed COMBO 1000M RJ45/SFP port min=0 \ max=1 SFP Transceiver
- 2 - SIC module slots / 0 - DSIC module slots
- 1 - HMIM module slot (1 - Full Height Slot) / 0 - DHMIM module slot (Double Width Full Height Slot)
- 1 - VPM slot
- 2 USB 2.0 Port for 3G modem and USB disk
- 1 CON/AUX port and 1 USB console port
- 1GB DDR3 SDRAM Included (default=1GB \ max=1GB DDR SDRAM)
- AC Power Supply included
- 1U - Height

JG409A

See Configuration  
Note:1, 2, 3, 6, 7,  
8

#### C15 PDU NA

- C15 to C14 Jumper Cord (NA)

JG409A#B2B

#### C15 PDU ROW

- C15 to C14 Jumper Cord (ROW)

JG409A#B2C

#### 220 NA

- NEMA L6-20P Cord

JG409A#B2E

#### Configuration Rules:

Note 1            1 - AC Power Supply included

### Configuration

- Note 2            Localization required on orders without #B2B, #B2C or #B2E. (See Localization Menu)
- Note 3            The following Transceivers install into this Switch:
- |   |        |
|---|--------|
| 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 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 |
| HP X120 1G SFP LC BX 10-U Transceiver     | JD098B |
| HP X120 1G SFP LC BX 10-D Transceiver     | JD099B |
- Note 4            The following DDR SDRAM install into this Switch:
- |   |        |
|---|--------|
| HP X610 4GB DDR3 SDRAM UDIMM Memory (Must remove existing 2GB UDIMM to install the 4GB UDIMM) | JG530A |
|---|--------|
- Note 5            The following CF Card install into this Switch:
- |                                 |        |
|---------------------------------|--------|
| HP X600 256M Compact Flash Card | JC686A |
| HP X600 512M Compact Flash Card | JC685A |
| HP X600 1G Compact Flash Card   | JC684A |
- Note 6            The following VPM Modules install into this Switch:
- |   |        |
|---|--------|
| HP MSR G2 128-channel Voice Processing Module | JG417A |
|---|--------|
- Note 7            #B2E is Offered only in AMS, Taiwan, and Japan.
- Note 8            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 to PDU Power Cord - replace localized option with #B2B in AMS or #B2C in APJ or EMEA.  
Switch to Wall Power Cord - Should leave existing Localized Option (no #B2x options)  
High Volt Power Cord - Should replace Localized option with #B2E for power supply and with #B2E for switch .  
(Offered only in AMS, Taiwan, and Japan)

## Rack Level Integration CTO Models

### Router Chassis

HP MSR3064 Router

JG404A



### Configuration

- 3 Fixed 10M/100M/1000M RJ45 ports
- 2 Fixed COMBO 1000M RJ45/SFP ports min=0 \ max=2 SFP Transceivers
- 4 - SIC module slots / 2 - DSIC module slots
- 6 - HMIM module slots (4 Half Height + 2 Full Height Slots) / 1 - DHMIM module slot (Double Width Full Height Slot)
- 2 - VPM slots
- 2 USB 2.0 Port for 3G modem and USB disk
- 1 CON/AUX port and 1 USB console port
- 2GB DDR3 SDRAM Included (4GB Max, by replacing existing single 2GB SDRAM)
- 1 - CF Card Slot
- Must select min 1 Power Supply (min=1 \ max=2)
- 3U - Height

See Configuration  
Note:3, 4, 5, 6

#### HP MSR3044 Router

- 3 Fixed 10M/100M/1000M RJ45 ports
- 2 Fixed COMBO 1000M RJ45/SFP ports min=0 \ max=2 SFP Transceivers
- 4 - SIC module slots / 2 - DSIC module slots
- 4 - HMIM module slots (4 - Half Height Slots) / 0 - DHMIM module slot (Double Width Full Height Slot)
- 2 - VPM slots
- 2 USB 2.0 Port for 3G modem and USB disk
- 1 CON/AUX port and 1 USB console port
- 2GB DDR3 SDRAM Included (4GB Max, by replacing existing single 2GB SDRAM)
- 1 - CF Card Slot
- Must select min 1 Power Supply (min=1 \ max=2)
- 2U - Height

JG405A  
See Configuration  
Note:3, 4, 5, 6

#### HP MSR3024 AC Router

- 3 Fixed 10M/100M/1000M RJ45 ports
- 1 Fixed COMBO 1000M RJ45/SFP port min=0 \ max=1 SFP Transceiver
- 4 - SIC module slots / 2 - DSIC module slots
- 2 - HMIM module slots (2 - Half Height Slots) / 0 - DHMIM module slot (Double Width Full Height Slot)
- 2 - VPM slots
- 2 USB 2.0 Port for 3G modem and USB disk
- 1 CON/AUX port and 1 USB console port
- 2GB DDR3 SDRAM Included (4GB Max, by replacing existing single 2GB SDRAM)
- 1 - CF Card Slot
- AC Power Supply included (+RPS Optional)
- 1U - Height

JG406A  
See Configuration  
Note:1, 2, 3, 4, 5,  
6, 7

#### C15 PDU NA

- C15 to C14 Jumper Cord (NA)

JG406A#B2B

#### C15 PDU ROW

- C15 to C14 Jumper Cord (ROW)

JG406A#B2C

#### HP MSR3012 AC Router

- 3 Fixed 10M/100M/1000M RJ45 ports
- 1 Fixed COMBO 1000M RJ45/SFP port min=0 \ max=1 SFP Transceiver
- 2 - SIC module slots / 0 - DSIC module slots

JG409A  
See Configuration  
Note:1, 2, 3, 6, 7





### Configuration

Note 7 If the CTO Base Model is ordered #0D1, Then #B2B, or #B2C is Required on the Router. (Optional when Router is not Factory Racked. See Drop down remark in "Remarks" section.)

#### Remarks:

Drop down under power supply should offer the following options and results:  
Router to PDU Power Cord - replace localized option with #B2B in AMS or #B2C in APJ or EMEA.  
Router to Wall Power Cord - Should leave existing Localized Option (no #B2x options)  
High Volt Power Cord - Should replace Localized option with #B2E for power supply and with #B2E for Router .  
(Offered only in AMS, Taiwan, and Japan)

### Power Supplies

(JG404A and JG405A only) System (std 0 // max 2) User Selection (min 1 // max 2) MSR3064/3044 Router

HP X351 300W 100-240VAC to 12VDC Power Supply	JG527A See Configuration Note:1, 2
C15 PDU NA <ul style="list-style-type: none"><li>C15 to C14 Jumper Cord (NA)</li></ul>	JG527A#B2B
C15 PDU ROW <ul style="list-style-type: none"><li>C15 to C14 Jumper Cord (ROW)</li></ul>	JG527A#B2C
220 NA <ul style="list-style-type: none"><li>NEMA L6-20P Cord</li></ul>	JG527A#B2E

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

### SIC Modules

System (std 0 // max 2 or 4) User Selection (min 0 // max 2 or 4) per Host (See Modules for Port information)

HP A-MSR 4-port 10/100Base-T Switch SIC Module	JD573B See Configuration Note:1, 4
HP A-MSR 9-port 10/100Base-T Switch DSIC Module	JD574B See Configuration Note:1, 3
HP A-MSR 1-port 10/100Base-T SIC Module	JD545B See Configuration Note:1, 4
HP A-MSR 1-port 100Base-X SIC Module	JF280A

### Configuration

<ul style="list-style-type: none"><li>min=0 \ max=1 SFP Transceiver</li></ul>	See Configuration Note:1, 4, 5
HP A-MSR 1-port GbE Combo SIC Module <ul style="list-style-type: none"><li>min=0 \ max=1 SFP Transceiver</li></ul>	JD572A See Configuration Note:1, 4, 6
HP A-MSR 2-port FXO SIC Module	JD558A See Configuration Note:2, 4
HP A-MSR 1-port FXO SIC Module	JD559A See Configuration Note:2, 4
HP A-MSR 2-port FXS SIC Module	JD560A See Configuration Note:2, 4
HP A-MSR 1-port FXS SIC Module	JD561A See Configuration Note:2, 4
HP A-MSR 4-port FXS/1-port FXO DSIC Mod	JG189A See Configuration Note:1, 3
HP A-MSR 1-port E1 Voice SIC Module <ul style="list-style-type: none"><li>Must select 1 Voice Processing Module min=0 \ max=1 E1 Cable</li></ul>	JD575A See Configuration Note:2, 4, 7, 8, 13
HP A-MSR 1-port T1 Voice SIC Module <ul style="list-style-type: none"><li>Must select 1 Voice Processing Module min=0 \ max=1 T1 Cable</li></ul>	JD576A See Configuration Note:2, 4, 9, 13
HP A-MSR 2-port ISDN-S/T Voice SIC Module	JF821A See Configuration Note:2, 4
HP A-MSR 2-port FXS/1-port FXO SIC Module	JD632A See Configuration Note:2, 4
HP A-MSR 1-port E1/Fractional E1 (75ohm) SIC Module <ul style="list-style-type: none"><li>min=0 \ max=1 E1 or 2E1 Cable</li></ul>	JD634B See Configuration Note:2, 4, 7, 10

### Configuration

HP A-MSR 1-port T1/Fractional T1 SIC Module	JD538A <a href="#">See Configuration Note:2, 4, 9</a>
HP A-MSR 2-port E1/Fractional E1 (75ohm) SIC Module <ul style="list-style-type: none"><li>min=0 \ max=1 2E1 Cable</li></ul>	JF842A <a href="#">See Configuration Note:2, 4, 10</a>
HP A-MSR 1-port Enhanced Sync/Async Serial SIC Module <ul style="list-style-type: none"><li>min=0 \ max=1 Serial Port Cable</li></ul>	JD557A <a href="#">See Configuration Note:2, 4, 11</a>
HP A-MSR 1-port ISDN-S/T SIC Module	JD571A <a href="#">See Configuration Note:2, 4</a>
HP A-MSR 8-port Async Serial SIC Module <ul style="list-style-type: none"><li>Must select 1 8AS Communication Cable</li></ul>	JF281A <a href="#">See Configuration Note:2, 4, 12</a>
HP A-MSR 16-port Async Serial SIC Module	JG186A <a href="#">See Configuration Note:2, 4, 14</a>
HP A-MSR HSPA/WCDMA SIC Module	JG187A <a href="#">See Configuration Note:1, 4</a>

### Configuration Rules:

Note 1	These Modules can install directly to the Routers (JG404A, JG405A and JG406A) min=0\ max=2 per enclosure
Note 2	These Modules can install directly to the Routers (JG404A, JG405A and JG406A) min=0\ max=4 per enclosure
Note 3	These Modules can not install directly to the Routers (JG409A)
Note 4	These Modules can install directly to the Routers (JG409A) min=0\ max=2 per enclosure
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

### Configuration

Note 6	The following Transceivers install into this Module: HP X120 1G SFP LC SX Transceiver HP X120 1G SFP LC LX Transceiver HP X125 1G SFP LC LH40 1310nm Transceiver HP X120 1G SFP LC LH40 1550nm Transceiver HP X125 1G SFP LC LH70 Transceiver HP X120 1G SFP LC LH100 Transceiver HP X120 1G SFP LC BX 10-U Transceiver HP X120 1G SFP LC BX 10-D Transceiver HP X120 1G SFP LC LH100 Transceiver	JD118B JD119B JD061A JD062A JD063B JD103A JD098B JD099B JD103A
Note 7	The following E1 Cables install into this Module: HP X260 E1 2*BNC 75 ohm 3m Router Cable HP X260 E1 BNC 20m Router Cable HP X260 E1/2 BNC 75 ohm 40m Router Cable	JD175A JD514A JD516A
Note 8	The following E1 Cables install into this Module: HP X260 E1 RJ45 3m Router Cable HP X260 E1 RJ45 20m Router Cable	JD509A JD517A
Note 9	The following T1 Cables install into this Module: JD518A-HP X260 T1 Router Cable HP X260 T1 Router Cable	JD518A
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 HP X260 RS449 3m DTE Serial Port Cable HP X200 X.21 DCE 3m Serial Port Cable HP X200 V.24 DTE 3m Serial Port Cable HP X200 V.35 DTE 3m Serial Port Cable HP X260 RS530 3m DTE Serial Port Cable HP X200 V.35 DCE 3m Serial Port Cable HP X260 RS530 3m DCE Serial Port Cable HP X200 V.24 DCE 3m Serial Port Cable HP X200 X.21 DTE 3m Serial Port Cable	JF826A JF825A JD529A JD519A JD523A JF827A JD525A JF828A JD521A JD527A
Note 12	The following Cables install into this Module: HP X260 SIC-8AS RJ45 0.28m Router Cable	JD642A
Note 13	The following Modules install into Routers and work with this Module: HP MSR G2 128-channel Voice Processing Module	JG417A

### Configuration

Note 14 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.

### HMIM Modules

System (std 0 // max 6 or 4 or 2 or 1) User Selection (min 0 // max 6 or 4 or 2 or 1) per Router Chassis (See Modules for Port information)

#### HP MSR 1-port E1 Voice HMIM Module

- (Full Height Module; Takes up 1 - Full Height slot or 2 - Half Height slots, vertically)  
min=0 \ max=1 E1 Cable

JG429A  
See Configuration  
Note:1, 3, 5, 11,  
13, 14

#### HP MSR 1-port T1 Voice HMIM Module

- (Full Height Module; Takes up 1 - Full Height slot or 2 - Half Height slots, vertically)  
min=0 \ max=1 E1 Cable

JG430A  
See Configuration  
Note:1, 3, 10, 11,  
13, 14

#### HP MSR 2-port E1 Voice HMIM Module

- (Full Height Module; Takes up 1 - Full Height slot or 2 - Half Height slots, vertically)  
min=0 \ max=1 E1 Cable

JG431A  
See Configuration  
Note:1, 3, 5, 11,  
13, 14

#### HP MSR 1-port T3 / CT3 / FT3 HMIM Module

- (Half Height Module; Takes up 1 Half Height or 1 Full Height slot)  
min=0 \ max=2 E3/T3 Cable

JG435A  
See Configuration  
Note:2, 4, 6, 12,  
13

#### HP MSR 1-port E3 / CE3 / FE3 HMIM Module

- (Half Height Module; Takes up 1 Half Height or 1 Full Height slot)  
min=0 \ max=2 E3/T3 Cable

JG436A  
See Configuration  
Note:2, 4, 6, 12,  
13

#### HP MSR 1-port OC-3c / STM-1c POS HMIM Module

- (Half Height Module; Takes up 1 Half Height or 1 Full Height slot)  
min=0 \ max=1 SFP Transceiver

JG438A  
See Configuration  
Note:2, 4, 7, 12,  
13

#### HP MSR 4-port Enhanced Sync / Async Serial HMIM Module

- (Half Height Module; Takes up 1 Half Height or 1 Full Height slot)  
min=0 \ max=4 Serial Port Cable

JG442A  
See Configuration  
Note:2, 4, 8, 12,  
13

#### HP MSR 8-port Enhanced Sync / Async Serial HMIM Module

JG443A

### Configuration

<ul style="list-style-type: none"><li>(Half Height Module; Takes up 1 Half Height or 1 Full Height slot) min=0 \ max=8 Serial Port Cable</li></ul>	See Configuration Note:2, 4, 8, 12, 13
HP MSR 4-port FXS HMIM Module <ul style="list-style-type: none"><li>(Half Height Module; Takes up 1 Half Height or 1 Full Height slot)</li></ul>	JG446A See Configuration Note:2, 4, 12, 13
HP MSR 4-port FXO HMIM Module <ul style="list-style-type: none"><li>(Half Height Module; Takes up 1 Half Height or 1 Full Height slot)</li></ul>	JG447A See Configuration Note:2, 4, 12, 13
HP MSR 4-port E&M HMIM Module <ul style="list-style-type: none"><li>(Half Height Module; Takes up 1 Half Height or 1 Full Height slot)</li></ul>	JG448A See Configuration Note:2, 4, 12, 13
HP MSR 2-port E1 / CE1 / PRI HMIM Module <ul style="list-style-type: none"><li>(Half Height Module; Takes up 1 Half Height or 1 Full Height slot) min=0 \ max=2 E1 Cable</li></ul>	JG450A See Configuration Note:2, 4, 5, 12, 13
HP MSR 4-port E1 / CE1 / PRI HMIM Module <ul style="list-style-type: none"><li>(Half Height Module; Takes up 1 Half Height or 1 Full Height slot) min=0 \ max=4 E1 Cable</li></ul>	JG451A See Configuration Note:2, 4, 5, 12, 13
HP MSR 8-port E1 / CE1 / PRI (75ohm) HMIM Module <ul style="list-style-type: none"><li>(Half Height Module; Takes up 1 Half Height or 1 Full Height slot) min=0 \ max=1 8E1 Cable</li></ul>	JG452A See Configuration Note:2, 4, 9, 12, 13
HP MSR 4-port E1 / Fractional E1 HMIM Module <ul style="list-style-type: none"><li>(Half Height Module; Takes up 1 Half Height or 1 Full Height slot) min=0 \ max=4 E1 Cable</li></ul>	JG453A See Configuration Note:2, 4, 5, 12, 13
HP MSR 2-port T1 / CT1 / PRI HMIM Module <ul style="list-style-type: none"><li>(Half Height Module; Takes up 1 Half Height or 1 Full Height slot)</li></ul>	JG456A See Configuration Note:2, 4, 12, 13
HP MSR 4-port T1 / Fractional T1 HMIM Module <ul style="list-style-type: none"><li>(Half Height Module; Takes up 1 Half Height or 1 Full Height slot)</li></ul>	JG457A See Configuration Note:2, 4, 12, 13
HP MSR 1U HMIM Adapter Module	JG416A#B01

### Configuration

- (Half Height Module; Takes up 1 Half Height or 1 Full Height slot)

See Configuration Note:2, 4, 12, 13, 15

#### HP MSR 0.5U HMIM Adapter Module

- (Half Height Module; Takes up 1 Half Height or 1 Full Height slot)

JG415A#B01  
See Configuration Note:2, 4, 12, 13, 16

### Configuration Rules:

- Note 1      These Modules can install directly to the Router Chassis (JG404A)  
min=0\ max=4 per enclosure (Full Height Module; Takes up 1 - Full Height slot or 2 - Half Height slots, vertically)
- Note 2      These Modules can install directly to the Router Chassis (JG404A)  
min=0\ max=6 per enclosure
- Note 3      These Modules can install directly to the Router Chassis (JG405A)  
min=0\ max=2 per enclosure (Full Height Module; Takes up 1 - Full Height slot or 2 - Half Height slots, vertically)
- Note 4      These Modules can install directly to the Router Chassis (JG405A)  
min=0\ max=4 per enclosure
- Note 5      The following Cables install into this Module:
- |  |        |
|--|--------|
| 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 3m Router Cable          | JD509A |
| HP X260 E1 RJ45 20m Router Cable         | JD517A |
- Note 6      The following E3/T3 Cable and Connector install into this Module:
- |                                  |        |
|----------------------------------|--------|
| HP X260 T3/E3 Router Cable       | JD531A |
| HP X260 E3-30 E3/T3 Router Cable | JD533A |
- Note 7      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 8      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 |



### Configuration

	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 9	The following Cable install into this Module: HP X260 8E1 BNC 75 ohm 3m Router Cable	JD512A
Note 10	The following T1 Cables install into this Module: HP X260 T1 Router Cable	JD518A
Note 11	These Modules can install directly to the Router Chassis (JG406A) min=0\ max=1 per enclosure (Full Height Module; Takes up 1 - Full Height slot or 2 - Half Height slots, vertically)	
Note 12	These Modules can install directly to the Router Chassis (JG406A) min=0\ max=2 per enclosure	
Note 13	These Modules can install directly to the Router Chassis (JG409A) min=0\ max=1 per enclosure	
Note 14	Full Height Module; Takes up 1 - Full Height slot or 2 - Half Height slots, vertically	
Note 15	1U HMIM Adapter Modules can adapt the following MIM Modules:	
	HP A-MSR 1-port E1 Voice MIM Module	JD565B
	HP A-MSR 2-port E1 Voice MIM Module	JD567B
	HP A-MSR 1-port T1 Voice MIM Module	JD566B
	HP A-MSR 2-port T1 Voice MIM Module	JD568B
	HP A-MSR 16-port FXS MIM Module	JF822A
	HP A-MSR 16-port Enhanced Async Serial MIM Module	JF841A
Note 16	0.5U HMIM Adapter Modules can adapt following MIM Modules:	
	HP A-MSR 8-port Enhanced Async Serial MIM Module	JF840A
	HP A-MSR 1-port T3/CT3/FT3 MIM Module	JD628A
	HP A-MSR 1-port E3/CE3/FE3 MIM Module	JD630A
	HP A-MSR 1-port OC-3c/STM-1c POS MIM Module	JG193A
	HP A-MSR 2-port Enhanced Sync/Async Serial MIM Module	JD540A
	HP A-MSR 4-port Enhanced Sync/Async Serial MIM Module	JD541A
	HP A-MSR 8-port Enhanced Sync/Async Serial MIM Module	JD552A
	HP A-MSR 4-port FXS MIM Module	JD553A
	HP A-MSR 4-port FXO MIM Module	JD542A
	HP A-MSR 4-port E&M MIM Module	JD539A
	HP A-MSR 2-port E1/CE1/PRI MIM Module	JD544B
	HP A-MSR 4-port E1/CE1/PRI MIM Module	JD550B
	HP A-MSR 8-port E1/CE1/PRI (75ohm) MIM Module	JD563A
	HP A-MSR 4-port E1/Fractional E1 MIM Module	JF257B

### Configuration

HP A-MSR 8-port E1/Fractional E1 (75ohm) MIM Module	JF255A
HP A-MSR 2-port T1/CT1/PRI MIM Module	JD549A
HP A-MSR 4-port T1/Fractional T1 MIM Module	JF254B
HP A-MSR 8-port T1/CT1/PRI MIM Module	JC160A
HP A-MSR 8-port T1/Fractional T1 MIM Module	JC159A
HP A-MSR 2-port 10/100Base-T MIM Module	JD613A
HP A-MSR 4-port 10/100Base-T MIM Module	JD551A
HP A-MSR 2-port Gig-T MIM Module	JD548A
HP A-MSR 2-port FXO MIM Module	JD543A
HP A-MSR 4-port ISDN-S/T Voice MIM Module	JF837A

### VPM Modules

HP MSR G2 128-channel Voice Processing Module	JG417A See Configuration Note:1, 2
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#### Configuration Rules:

Note 1      These Modules can install directly to the Router  
JG404A, JG405A, JG406A min=0\ max=2 per enclosure  
JG409A min=0\ max=1 per enclosure

Note 2      VPM JG417A required if SIC-1VE1/SIC-1VT1 (JD575A/JD576A) are ordered

### Transceivers

System (std 0 // max 2 or 1) User Selection (min 0 // max 2 or 1) per MSR3000 Router

HP X120 1G SFP LC SX Transceiver	JD118B See Configuration Note:1, 2
HP X120 1G SFP LC LX Transceiver	JD119B See Configuration Note:1, 2
HP X125 1G SFP LC LH40 1310nm Transceiver	JD061A See Configuration Note:1, 2
HP X120 1G SFP LC LH40 1550nm Transceiver	JD062A See Configuration Note:1, 2

### Configuration

HP X125 1G SFP LC LH70 Transceiver	JD063B <a href="#">See Configuration Note:1, 2</a>
HP X110 100M SFP LC LH40 Transceiver	JD090A <a href="#">See Configuration Note:1, 2</a>
HP X110 100M SFP LC LH80 Transceiver	JD091A <a href="#">See Configuration Note:1, 2</a>
HP X115 100M SFP LC FX Transceiver	JD102B <a href="#">See Configuration Note:1, 2</a>
HP X110 100M SFP LC LX Transceiver	JD120B <a href="#">See Configuration Note:1, 2</a>
HP X120 1G SFP LC LH100 Transceiver	JD103A <a href="#">See Configuration Note:1, 2</a>
HP X120 1G SFP LC BX 10-U Transceiver	JD098B <a href="#">See Configuration Note:1, 2</a>
HP X120 1G SFP LC BX 10-D Transceiver	JD099B <a href="#">See Configuration Note:1, 2</a>

#### Configuration Rules:

**Note 1**            These Transceivers can install directly to JG404A and JG405A  
min=0\ max=2 per enclosure

**Note 2**            These Transceivers can install directly to JG406A and JG409A  
min=0\ max=1 per enclosure

### Cables

HP X260 mini D-28/4-RJ45 0.3m Rtr Cable	JG263A
HP X200 V.24 DTE 3m Serial Port Cable	JD519A

### Configuration

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 RJ45 3m Router Cable	JD509A
HP X260 E1 RJ45 20m Router Cable	JD517A
HP X260 E1 BNC 75 ohm 3m Router Cable	JD175A
HP X260 E1 BNC 20m Router Cable	JD514A
HP X260 E1 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 T3/E3 Router Cable	JD531A
HP X260 E3-30 E3/T3 Router Cable	JD533A
HP X260 8E1 BNC 75 ohm 3m Router Cable	JD512A
HP X260 SIC-8AS RJ45 0.28m Router Cable	JD642A

### Configuration

HP X200 Transit Plug D25F MP8(S) Single Cable JD636A

HP X200 Transit Cable RJ45 0.5m Single Cable JD641A

#### Configuration Rules:

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

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

### Router Enclosure Options

#### SDRAM

User Selection (min 0 // max 1) (default=2GB \ max=4GB) per JG404A, JG405A and JG406A (4GB Max, by replacing existing single 2GB SDRAM)

HP X610 2GB DDR3 SDRAM UDIMM Memory JD529A  
• Spare Only (Parts List Only)

HP X610 4GB DDR3 SDRAM UDIMM Memory JD530A  
• (Must remove existing 2GB UDIMM to install the 4GB UDIMM)

#### Compact Flash Card

System (std 0 // max 1 External CF Card) per JG404A, JG405A and JG406A

HP X600 1G Compact Flash Card JC684A

HP X600 512M Compact Flash Card JC685A

HP X600 256M Compact Flash Card JC686A

#### External Redundant Power Supplies

JG406A and JG409A only - System (std 0 // max 1) User Selection (min 0 // max 1)

HP RPS 800 Redundant Power Supply JD183A  
• Height = 1U  
See Configuration Note:1, 2, 3

#### Configuration Rules:



### Configuration

Note 1            These power supplies are supported on the following routers only:  
JG406A - HP MSR3024 AC Router  
JG409A - HP MSR3012 AC Router

Note 2            Localization required. (See Localization Menu for list.)

Note 3            JD637A - HP X290 MSR30 1m RPS Cable is required if power supply is selected.

### Power Cables

System (std 0 // max 1) User Selection (min 0 // max 1) per JD183A

HP X290 MSR30 1m RPS Cable

JD637A

### Technical Specifications

#### HP MSR3012 AC Router (JG409A)

<b>Ports</b>	1 HMIM slot 2 SIC slots 1 VPM slot 3 RJ-45 1000BASE-T ports (IEEE 802.3ab Type 1000BASE-T) 1 SFP fixed Gigabit Ethernet SFP port	
<b>Physical characteristics</b>	<b>Dimensions</b>	17.32(w) x 18.9(d) x 1.74(h) in (44 x 48 x 4.42 cm) (1U height)
	<b>Weight</b>	15.76 lb (7.15 kg)
<b>Memory and processor</b>	RISC, 4 cores @ 1 GHz, 256 MB flash capacity, 1 GB DDR3 SDRAM	
<b>Mounting</b>	Desktop or can be mounted in a EIA standard 19-inch telco rack when used with the rack-mount kit in the package.	
<b>Performance</b>	<b>Throughput</b>	up to 2.6 Mpps (64-byte packets)
	<b>Routing table size</b>	200000 entries (IPv4), 200000 entries (IPv6)
	<b>Forwarding table size</b>	200000 entries (IPv4), 200000 entries (IPv6)
<b>Environment</b>	<b>Operating temperature</b>	32°F to 113°F (0°C to 45°C)
	<b>Operating relative humidity</b>	5% to 90%, noncondensing
	<b>Nonoperating/Storage temperature</b>	-40°F to 158°F (-40°C to 70°C)
	<b>Nonoperating/Storage relative humidity</b>	5% to 90%, noncondensing
	<b>Altitude</b>	up to 16,404 ft (5 km)
<b>Electrical characteristics</b>	<b>Frequency</b>	50/60 Hz
	<b>Maximum heat dissipation</b>	127 BTU/hr (133.98 kJ/hr)
	<b>Voltage</b>	100-120/200-240 VAC
	<b>Maximum power rating</b>	100 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.
<b>Reliability</b>	<b>MTBF (years)</b>	52.56
<b>Safety</b>	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	
<b>Emissions</b>	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	
<b>Telecom</b>	FCC part 68; CS-03	
<b>Management</b>	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	

### Technical Specifications

#### 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  
 1-year, 24x7 software phone support, software updates (HR557E)

Refer to the HP website at: [www.hp.com/networking/services](http://www.hp.com/networking/services) for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local HP sales office.

#### HP MSR3024 AC Router (JG406A)

<b>Ports</b>	2 HMIM slots 4 SIC slots or 2 DSIC slots 1 VPM slot 3 RJ-45 1000BASE-T ports (IEEE 802.3ab Type 1000BASE-T) 1 SFP fixed Gigabit Ethernet SFP port	
<b>Physical characteristics</b>	<b>Dimensions</b>	17.32(w) x 18.9(d) x 1.74(h) in (44 x 48 x 4.42 cm) (1U height)
	<b>Weight</b>	17.42 lb (7.9 kg)
<b>Memory and processor</b>	RISC, 4 cores @ 1 GHz, 256 MB flash capacity, 2 GB DDR3 SDRAM	
<b>Mounting</b>	Desktop or can be mounted in a EIA standard 19-inch telco rack when used with the rack-mount kit in the package.	
<b>Performance</b>	<b>Throughput</b>	up to 2.6 Mpps (64-byte packets)
	<b>Routing table size</b>	500000 entries (IPv4), 500000 entries (IPv6)
	<b>Forwarding table size</b>	500000 entries (IPv4), 500000 entries (IPv6)
<b>Environment</b>	<b>Operating temperature</b>	32°F to 113°F (0°C to 45°C)
	<b>Operating relative humidity</b>	5% to 90%, noncondensing



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	<b>Nonoperating/Storage temperature</b>	-40°F to 158°F (-40°C to 70°C)
	<b>Nonoperating/Storage relative humidity</b>	5% to 90%, noncondensing
	<b>Altitude</b>	up to 16,404 ft (5 km)
<b>Electrical characteristics</b>	<b>Frequency</b>	50/60 Hz
	<b>Maximum heat dissipation</b>	168 BTU/hr (177.24 kJ/hr)
	<b>Voltage</b>	100-120/200-240 VAC
	<b>Maximum power rating</b>	100 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.
<b>Reliability</b>	<b>MTBF (years)</b>	49.61
<b>Safety</b>	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	
<b>Emissions</b>	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	
<b>Telecom</b>	FCC part 68; CS-03	
<b>Management</b>	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	
<b>Services</b>	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)	

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1-year, 6 hour Call-To-Repair Onsite for hardware (HR558E) 1  
 1-year, 24x7 software phone support, software updates (HR557E)

Refer to the HP website at: [www.hp.com/networking/services](http://www.hp.com/networking/services) for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local HP sales office.

#### HP MSR3044 Router (JG405A)

<b>Ports</b>	4 HMIM slots 4 SIC slots or 2 DSIC slots 2 VPM slots 2 Power Supply slots 3 RJ-45 1000BASE-T ports (IEEE 802.3ab Type 1000BASE-T) 2 SFP fixed Gigabit Ethernet SFP ports	
<b>Physical characteristics</b>	<b>Dimensions</b>	17.32(w) x 18.9(d) x 3.47(h) in (44 x 48 x 8.81 cm) (2U height)
	<b>Weight</b>	27.45 lb (12.45 kg)
<b>Memory and processor</b>	RISC, 4 cores @ 1 GHz, 256 MB flash capacity, 2 GB DDR3 SDRAM	
<b>Mounting</b>	Desktop or can be mounted in a EIA standard 19-inch telco rack when used with the rack-mount kit in the package.	
<b>Performance</b>	<b>Throughput</b>	up to 3.5 Mpps (64-byte packets)
	<b>Routing table size</b>	500000 entries (IPv4), 500000 entries (IPv6)
	<b>Forwarding table size</b>	500000 entries (IPv4), 500000 entries (IPv6)
<b>Environment</b>	<b>Operating temperature</b>	32°F to 113°F (0°C to 45°C)
	<b>Operating relative humidity</b>	5% to 90%, noncondensing
	<b>Nonoperating/Storage temperature</b>	-40°F to 158°F (-40°C to 70°C)
	<b>Nonoperating/Storage relative humidity</b>	5% to 90%, noncondensing
	<b>Altitude</b>	up to 16,404 ft (5 km)
<b>Electrical characteristics</b>	<b>Frequency</b>	50/60 Hz
	<b>Maximum heat dissipation</b>	172 BTU/hr (181.46 kJ/hr)
	<b>Voltage</b>	100-120/200-240 VAC
	<b>Maximum power rating</b>	100 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. No default Power Supply included in the chassis, Min.1/Max.4 power supplies should be ordered
<b>Reliability</b>	<b>MTBF (years)</b>	82.57
<b>Safety</b>	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	

### Technical Specifications

<b>Emissions</b>	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
<b>Telecom</b>	FCC part 68; CS-03
<b>Management</b>	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
<b>Services</b>	<p>3-year, parts only, global next-day advance exchange (UW075E)</p> <p>3-year, 4-hour onsite, 13x5 coverage for hardware (UW076E)</p> <p>3-year, 4-hour onsite, 24x7 coverage for hardware (UW006E)</p> <p>3-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 SW phone support and SW updates (UW009E)</p> <p>3-year, 24x7 SW phone support, software updates (UW012E)</p> <p>1-year, post-warranty, 4-hour onsite, 13x5 coverage for hardware (HR554E)</p> <p>1-year, post-warranty, 4-hour onsite, 24x7 coverage for hardware (HR555E)</p> <p>1-year, post-warranty, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone support (HR556E)</p> <p>4-year, 4-hour onsite, 13x5 coverage for hardware (UW077E)</p> <p>4-year, 4-hour onsite, 24x7 coverage for hardware (UW007E)</p> <p>4-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone (UW010E)</p> <p>4-year, 24x7 SW phone support, software updates (UW013E)</p> <p>5-year, 4-hour onsite, 13x5 coverage for hardware (UW078E)</p> <p>5-year, 4-hour onsite, 24x7 coverage for hardware (UW008E)</p> <p>5-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone (UW011E)</p> <p>5-year, 24x7 SW phone support, software updates (UW014E)</p> <p>3 Yr 6 hr Call-to-Repair Onsite (UW079E)</p> <p>4 Yr 6 hr Call-to-Repair Onsite (UW080E)</p> <p>5 Yr 6 hr Call-to-Repair Onsite (UW081E)</p> <p>1-year, 6 hour Call-To-Repair Onsite for hardware (HR558E) 1</p> <p>1-year, 24x7 software phone support, software updates (HR557E)</p>

Refer to the HP website at: [www.hp.com/networking/services](http://www.hp.com/networking/services) for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local HP sales office.

### HP MSR3064 Router (JG404A)

<b>Ports</b>	6 HMIM slots 4 SIC slots or 2 DSIC slots 2 VPM slots 2 Power Supply slots 3 RJ-45 1000BASE-T ports (IEEE 802.3ab Type 1000BASE-T) 2 SFP fixed Gigabit Ethernet SFP ports
<b>Physical characteristics</b>	<p><b>Dimensions</b> 17.32(w) x 18.9(d) x 5.31(h) in (44 x 48 x 13.5 cm) (3U height)</p> <p><b>Weight</b> 36.49 lb (16.55 kg)</p>
<b>Memory and processor</b>	RISC, 6 cores @ 1.3 GHz, 256 MB flash capacity, 2 GB DDR3 SDRAM

### Technical Specifications

<b>Mounting</b>	Desktop or can be mounted in a EIA standard 19-inch telco rack when used with the rack-mount kit in the package.	
<b>Performance</b>	<b>Throughput</b>	up to 5 Mpps (64-byte packets)
	<b>Routing table size</b>	500000 entries (IPv4), 500000 entries (IPv6)
	<b>Forwarding table size</b>	500000 entries (IPv4), 500000 entries (IPv6)
<b>Environment</b>	<b>Operating temperature</b>	32°F to 113°F (0°C to 45°C)
	<b>Operating relative humidity</b>	5% to 90%, noncondensing
	<b>Nonoperating/Storage temperature</b>	-40°F to 158°F (-40°C to 70°C)
	<b>Nonoperating/Storage relative humidity</b>	5% to 90%, noncondensing
	<b>Altitude</b>	up to 16,404 ft (5 km)
<b>Electrical characteristics</b>	<b>Frequency</b>	50/60 Hz
	<b>Maximum heat dissipation</b>	218 BTU/hr (229.99 kJ/hr)
	<b>Voltage</b>	100-120/200-240 VAC
	<b>Maximum power rating</b>	100 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. No default Power Supply included in the chassis, Min.1/Max.4 power supplies should be ordered
<b>Reliability</b>	<b>MTBF (years)</b>	80.58
<b>Safety</b>	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	
<b>Emissions</b>	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	
<b>Telecom</b>	FCC part 68; CS-03	
<b>Management</b>	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	
<b>Services</b>	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)	

### Technical Specifications

- 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
- 1-year, 24x7 software phone support, software updates (HR557E)

Refer to the HP website at: [www.hp.com/networking/services](http://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 1305 NTPv3
- RFC 1591 DNS (client)
- RFC 1902 (SNMPv2)
- RFC 1908 (SNMP v1/2 Coexistence)
- RFC 1945 Hypertext Transfer Protocol -- HTTP/1.0
- RFC 2271 Framework
- 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 3416 (SNMP Protocol Operations v2)
- RFC 3417 (SNMP Transport Mappings)

##### General protocols

- RFC 768 UDP
- RFC 3036 LDP Specification
- RFC 3037 LDP (Label Distribution for Transport of Ethernet over
- RFC 4448 Encapsulation Methods for Transport of Ethernet over

### Technical Specifications

- 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 2)
- RFC 1449 Transport Mappings for version 2 of the Simple Network Management Protocol (SNMPv2)
- RFC 1519 CIDR 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 3526 More Modular Exponential (MODP) Diffie-Hellman groups for Internet Key Exchange (IKE)
- RFC 3564 Requirements for Support of Differentiated Services- MPLS Networks
- 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 for Layer 2 Provider-Provisioned Virtual Private Networks

### Technical Specifications

- 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 2246 The TLS Protocol Version 1.0
- RFC 2251 Lightweight Directory Access Protocol (v3)
- RFC 2251 Lightweight Directory Access Protocol (v3) 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)
- RFC 3810 Multicast Listener Discovery Version 2 (MLDv2) for IPv6
- RFC 3812 Multiprotocol Label Switching (MPLS) Traffic Engineering (TE) Management
- 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 Autoconfiguration in IPv6
- RFC 5007 DHCPv6 Leasequery

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- 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 Filtering: Defeating Denial of Service Attacks Which Employ IP Source Address Spoofing
- 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) Connection Protocol
- RFC 4291 IP Version 6 Addressing Architecture
- RFC 4305 Cryptographic Algorithm Implementation Requirements for Encapsulating
- 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)
- RFC 5398 Autonomous System



### Technical Specifications

- 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
- IP multicast**
- RFC 1112 IGMP
  - RFC 2362 PIM Sparse Mode
- IPv6**
- RFC 2080 RIPng for IPv6
  - RFC 2460 IPv6 Specification
  - RFC 2473 Generic Packet Tunneling in IPv6
  - RFC 2475 IPv6 DiffServ Architecture
- MIBs**
- RFC 1213 MIB II
  - RFC 1493 Bridge MIB
  - RFC 1724 RIPv2 MIB
  - RFC 1850 OSPFv2 MIB
  - RFC 1907 SNMPv2 MIB
  - RFC 2011 SNMPv2 MIB for IP 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 2710 Multicast Listener Discovery (MLD) for IPv6
  - RFC 2934 Protocol Independent Multicast MIB for IPv4
  - RFC 3376 IGMPv3
  - 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 2012 SNMPv2 MIB for TCP
  - RFC 2013 SNMPv2 MIB for UDP
  - RFC 2096 IP Forwarding Table MIB
  - RFC 2233 Interfaces MIB
  - RFC 2273 SNMP-NOTIFICATION-MIB
  - (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
  - RFC 3376 IGMPv3 (host joins only)
  - RFC 5059 Bootstrap Router (BSR) Mechanism for Protocol Independent Multicast (PIM)
  - 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
  - RFC 2573 SNMP-Notification MIB
  - RFC 2574 SNMP USM MIB
  - RFC 2674 802.1p and IEEE 802.1Q Bridge MIB
  - RFC 2737 Entity MIB (Version 2)
  - RFC 2863 The Interfaces Group MIB

### Technical Specifications

#### 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

#### OSPF

- RFC 1245 OSPF protocol analysis
- RFC 1246 Experience with OSPF
- RFC 1583 OSPFv2

#### 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)

#### Security

- IEEE 802.1X Port Based Network Access Control
- RFC 2082 RIP-2 MD5 Authentication
- RFC 2104 Keyed-Hashing for Message Authentication

- RFC 2571 SNMP Framework MIB
- RFC 2572 SNMP-MPD MIB
- 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 1587 OSPF NSSA
- RFC 1765 OSPF Database Overflow
- RFC 1850 OSPFv2 Management Information Base (MIB), traps
- 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 2408 Internet Security Association and Key Management Protocol (ISAKMP)
- RFC 2409 The Internet Key Exchange (IKE)
- RFC 2412 The OAKLEY Key Determination Protocol

- RFC 3813 MPLS LSR MIB
- 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)
- RFC 2328 OSPFv2
- RFC 2370 OSPF Opaque LSA Option
- RFC 3101 OSPF NSSA
- 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 2865 RADIUS Authentication
- RFC 2866 RADIUS Accounting
- RFC 3579 RADIUS Support For Extensible Authentication Protocol (EAP)
- RFC 3580 IEEE 802.1X Remote Authentication Dial In User Service

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- RFC 2138 RADIUS Authentication
  - RFC 2139 RADIUS Accounting
- 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 2459 Internet X.509 Public Key Infrastructure Certificate and CRL Profile
  - RFC 2818 HTTP Over TLS
  - 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
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### Accessories

#### HP MSR3000 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 RJ45 3m Router Cable	JD509A
HP X260 E1 RJ45 20m Router Cable	JD517A
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 8E1 BNC 75 ohm 3m Router Cable	JD512A
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
HP X260 T3/E3 Router Cable	JD531A
HP X260 E3-30 E3/T3 Router Cable	JD533A
HP X200 Transit Plug D25F MP8(S) Single Cable	JD636A
HP X200 Transit RJ45 0.5m Single Cable	JD641A

##### Power Supply

HP RPS 800 Redundant Power Supply	JD183A
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### Accessories

<b>NEW</b> HP X351 300W 100-240VAC to 12VDC Power Supply	JG527A
<b>Router Modules</b>	
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
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
<b>NEW</b> HP MSR 1-port E1 Voice HMIM Module	JG429A
<b>NEW</b> HP MSR 1-port T1 Voice HMIM Module	JG430A
<b>NEW</b> HP MSR 2-port E1 Voice HMIM Module	JG431A
<b>NEW</b> HP MSR 4-port FXS HMIM Module	JG446A
<b>NEW</b> HP MSR 4-port FXO HMIM Module	JG447A
<b>NEW</b> HP MSR 4-port E and M HMIM Module	JG448A
<b>NEW</b> HP MSR 4-port Enhanced Sync/Async Serial HMIM Module	JG442A
<b>NEW</b> HP MSR 8-port Enhanced Sync/Async Serial HMIM Module	JG443A
<b>NEW</b> HP MSR 2-port E1/CE1/PRI HMIM Module	JG450A
<b>NEW</b> HP MSR 4-port E1/CE1/PRI HMIM Module	JG451A
<b>NEW</b> HP MSR 4-port E1/Fractional E1 HMIM Module	JG453A
<b>NEW</b> HP MSR 8-port E1/CE1/PRI (75ohm) HMIM Module	JG452A
<b>NEW</b> HP MSR 2-port T1/CT1/PRI HMIM Module	JG456A
<b>NEW</b> HP MSR 4-port T1/Fractional T1 HMIM Module	JG457A
<b>NEW</b> HP MSR 1-port E3/CE3/FE3 HMIM Module	JG436A
<b>NEW</b> HP MSR 1-port T3/CT3/FT3 HMIM Module	JG435A
<b>NEW</b> HP MSR 1-port OC-3c/STM-1c POS HMIM Module	JG438A
<b>NEW</b> HP MSR G2 128-channel Voice Processing Module	JG417A
<b>NEW</b> HP MSR 1U HMIM Adapter Module	JG416A
<b>NEW</b> HP MSR 0.5U HMIM Adapter Module	JG415A
<b>Power cords</b>	
HP X290 MSR30 1m RPS Cable	JD637A

### Accessories

#### Memory

HP X600 1G Compact Flash Card	JC684A
HP X600 512M Compact Flash Card	JC685A
HP X600 256M Compact Flash Card	JC686A
<b>NEW</b> HP X610 2GB DDR3 SDRAM UDIMM Memory	JG529A
<b>NEW</b> HP X610 4GB DDR3 SDRAM UDIMM Memory	JG530A

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