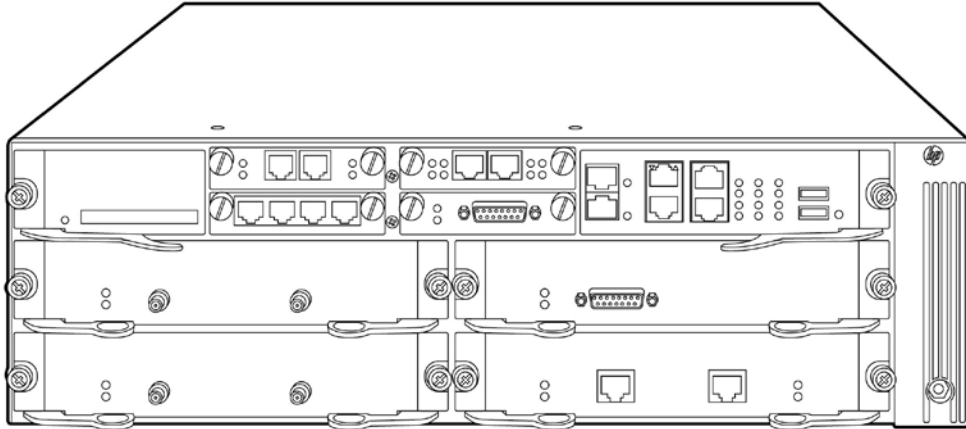
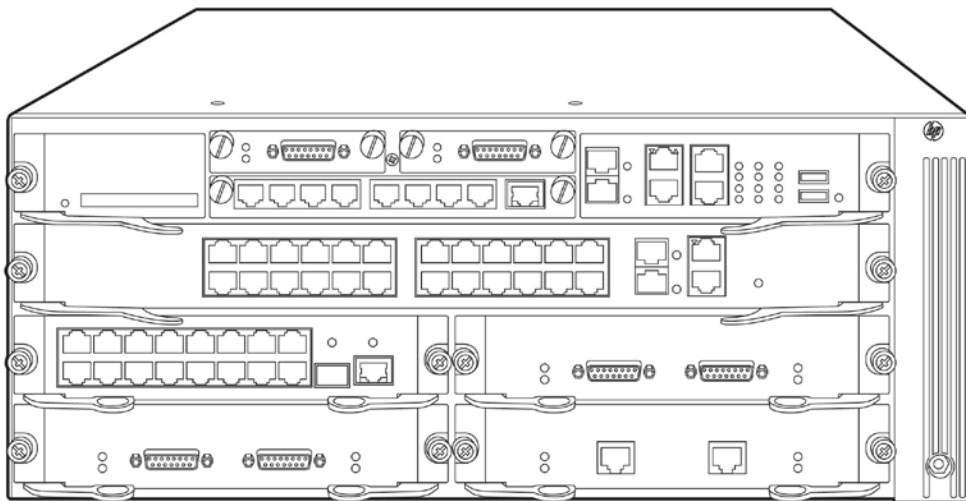


# QuickSpecs

**HPE MSR50 Series**
**Overview**
**HPE MSR50 Series**

**HP MSR50-40 Router**

**HP MSR50-60 Router**
**Models**

HP MSR50-40 Router

JD433A

HP MSR50-60 Router

JF231A

**Key features**

- High-performance, modular LAN/WAN router
- Converged routing, switching, wireless, voice, and security
- Third-party applications and virtualized services platform

## Overview

- Embedded encryption, firewall, and other security features
- High reliability, with available dual power supplies and hot-swappable modules

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## Product overview

HPE MSR50 Series routers are a component of the Hewlett Packard Enterprise FlexBranch solution, which is part of the Hewlett Packard Enterprise FlexNetwork architecture.

These routers are designed for large branch offices, regional offices, and enterprise deployments that require high-performance converged routing, switching, wireless, security, voice, and virtualized applications.

The MSR50 Series has a rich set of modular WAN, LAN, and voice interface connectivity options, as well as embedded hardware-based encryption and voice processing. With optional Open Architecture Platform (OAP) modules, it can deliver VMware vSphere, an industry-leading virtualization platform that integrates third-party applications with the router

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## Features and benefits

### Quality of Service (QoS)

- **Traffic policing:** supports Committed Access Rate (CAR) and line rate
- **Congestion management:** supports FIFO, PQ, CQ, WFQ, CBQ, and RTPQ
- **Congestion avoidance:** Weighted Random Early Detection (WRED)/Random Early Detection (RED)
- **Other QoS technologies:** supports traffic shaping, FR QoS, MPLS QoS, and MP QoS/LFI

### Management

- **Management interface control:** provides management access through modem port and terminal interface; provides access through terminal interface, telnet, or SSH
- **Industry-standard CLI with a hierarchical structure:** reduces training time and expenses, and increases productivity in multivendor installations
- **Management security:** restricts access to critical configuration commands; offers multiple privilege levels with password protection; ACLs provide Telnet and SNMP access; local and remote syslog capabilities allow logging of all access
- **SNMPv1, v2, and v3:** provide complete support of SNMP; provide full support of industry-standard Management Information Base (MIB) plus private extensions; SNMPv3 supports increased security using encryption
- **Remote monitoring (RMON):** uses standard SNMP to monitor essential network functions; supports events, alarm, history, and statistics group plus a private alarm extension group
- **FTP, TFTP, and SFTP support:** FTP allows bidirectional transfers over a TCP/IP network and is used for configuration updates; Trivial FTP is a simpler method using User Datagram Protocol (UDP)
- **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
- **Info center:** provides a central information center for system and network information; aggregates all logs, traps, and debugging information generated by the system and maintains them in order of severity; outputs the network information to multiple channels based on user-defined rules
- **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

## Overview

### Connectivity

- **High-density port connectivity:** provides up to 10 interface module slots and up to 90 Fast Ethernet ports
- **Multiple WAN and LAN interfaces:** provide a traditional link with E3, T3, E1, T1, ADSL, ADSL2, ADSL2+, G.SHDSL, OC-3, POS, ATM, and ISDN/AM backup; deliver high-density Ethernet access with WAN Fast Ethernet/Gigabit Ethernet, LAN Fast Ethernet, and PoE; offer mobility access with IEEE 802.11b/g/n Wi-Fi and 3G
- **3G access support:** provides 3G wireless access for primary or backup connectivity via a 3G SIC module certified on various cellular networks; optional carrier 3G USB modems are available
- **Ideal IP telephony solutions:** support FXO, FXS, T1, E1, and BRI in various densities; provide Web browser-based administration, Smart Dial Routing, FXS and FXO 1:1 binding for all ports, Power to Escape to PSTN when IP failures occur, and Enhanced Local MSR Survivability
- **Flexible port selection:** provides combination of fiber and copper interface modules, 100/1000BASE-X auto-speed selection, and 10/100/1000BASE-T auto-speed detection plus auto duplex and MDI/MDI-X
- **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

### Performance

- **Excellent forwarding performance:** provides forwarding performance up to 800 Kpps/1280 Kpps (for two kinds of engines); meets current and future bandwidth-intensive application demands of enterprise businesses
- **Powerful encryption capacity:** includes embedded hardware encryption accelerator to improve encryption performance
- **Flexible chassis selection:** offers a choice of four or six FIC slot routers, meeting different requirements on enterprise branches

### Resiliency and high availability

- **Hot swappable modules:** facilitate the replacement of hardware interface modules without impacting the traffic flow through the system
- **Dual internal power supply:** provides high reliability
- **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

### Layer 2 switching

- **Spanning Tree Protocol (STP)**  
fully 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:** effectively control and manage the flooding of multicast packets in a Layer 2 network
- **Port mirroring:** duplicates port traffic (ingress and egress) to a local or remote monitoring port
- **VLANs:** support up to 4,094 ports or IEEE 802.1Q-based VLANs
- **sFlow:** allows traffic sampling

### 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

## Overview

subnets or when subnets are separated by a Layer 2 network

- **User Datagram Protocol (UDP) helper:** redirects UDP broadcasts to specific IP subnets to prevent server spoofing
- **Dynamic Host Configuration Protocol (DHCP):** simplifies the management of large IP networks and supports client and server; DHCP Relay enables DHCP operation across subnets

## 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)**  
Interior Gateway Protocol (IGP) uses link-state protocol for faster convergence; supports ECMP, NSSA, and MD5 authentication for increased security and graceful restart for faster failure recovery
- **Border Gateway Protocol 4 (BGP-4)**  
Exterior Gateway Protocol (EGP) with path vector protocol uses TCP for enhanced reliability for the route discovery process, reduces bandwidth consumption by advertising only incremental updates, and supports extensive policies for increased flexibility, as well as scales to very large networks
- **Intermediate system to intermediate system (IS-IS):** Interior Gateway Protocol (IGP) using path vector protocol, which is defined by the ISO organization for IS-IS routing and extended by IETF RFC 1195 to operate in both TCP/IP and the OSI reference model (Integrated IS-IS)
- **Static IPv6 routing:** provides simple, manually configured IPv6 routing
- **Dual IP stack:** maintains separate stacks for IPv4 and IPv6 to ease the transition from an IPv4-only network to an IPv6-only network design
- **Routing Information Protocol next generation (RIPng):** extends RIPv2 to support IPv6 addressing
- **OSPFv3:** provides OSPF support for IPv6
- **BGP+:** extends BGP-4 to support Multiprotocol BGP (MBGP), including support for IPv6 addressing
- **IS-IS for IPv6:** extends IS-IS to support IPv6 addressing
- **IPv6 tunneling:** is an important element for the transition from IPv4 to IPv6; allows IPv6 packets to traverse IPv4-only networks by encapsulating the IPv6 packet into a standard IPv4 packet; supports manually configured, 6to4, and Intra-Site Automatic Tunnel Addressing Protocol (ISATAP) tunnels
- **Multiprotocol Label Switching (MPLS):** uses BGP to advertise routes across Label Switched Paths (LSPs), but uses simple labels to forward packets from any Layer 2 or Layer 3 protocol, thus reducing complexity and increasing performance; supports graceful restart for reduced failure impact; supports LSP tunneling and multilevel stacks
- **Multiprotocol Label Switching (MPLS) Layer 3 VPN:** allows Layer 3 VPNs across a provider network; uses MP-BGP to establish private routes for increased security; supports RFC 2547bis multiple autonomous system VPNs for added flexibility; 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
- **Policy routing:** allows custom filters for increased performance and security; supports ACLs, IP prefix, AS paths, community lists, and aggregate policies

## Security

- **Access control list (ACL):** supports powerful ACLs for both IPv4 and IPv6; ACLs are used for filtering traffic to prevent illegal 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

## Overview

- **Media access control (MAC) authentication:** provides simple authentication based on a user's MAC address; supports local or RADIUS-based authentication
- **Terminal Access Controller Access-Control System (TACACS+)** is an authentication tool using TCP with encryption of the full authentication request that provides additional security
- **Network login:** standard IEEE 802.1X allows authentication of multiple users per port
- **RADIUS:** eases security access administration by using a 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 login into a remote device or securely login into the router from a remote location; with authentication and encryption, it protects against IP spoofing and plain text password interception; increases the security of SFTP transfers
- **Unicast Reverse Path Forwarding (URPF):** allows normal packets to be forwarded correctly, but discards the attaching packet due to lack of reverse path route or incorrect inbound interface; prevents source spoofing and distributed attacks
- **IPSec VPN:** supports DES, 3DES, and AES 128/192/256 encryption, and MD5 and SHA-1 authentication
- **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

## Convergence

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

## Integration

- **Open Application Architecture (OAA):** provides high-performance application-specific modules fully integrated with the switching architecture; uses the chassis high-speed backplane to access network-related data; increases performance, reduces costs, and simplifies network management
- **Embedded NetStream:** local and global server load-balancing module improves traffic distribution using powerful scheduling algorithms, including Layer 4 to 7 services; monitors the health status of servers and firewalls
- **Embedded VPN 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

## Additional information

- **OPEX savings:** are delivered through the use of a common operating system that simplifies and streamlines deployment, management, and training, thereby cutting costs as well as reducing the chance for human errors associated with having to manage multiple operating systems across different platforms and network layers
- **High reliability:** provides a state-of-the-art unified code base
- **Faster time to market:** engineering efficiencies allow new and custom features to be brought rapidly to the market with

## Overview

better initial and ongoing stability

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

## Product architecture

- **Ideal multiservice platform**

provides a WAN router, Ethernet switch, wireless LAN, 3G WAN, firewall, VPN, and SIP/voice gateway all in one box

- **High-density voice interfaces**

provide flexible analog and digital voice interface options for easy integration within a wide range of deployments

- **Embedded service modules for security and voice**

embedded Voice Co-Processing Modules (VCPMs) and Voice Processing Modules (VPMs) accommodate digital signal processor (DSP) modules for voice packet processing; embedded hardware encryption modules, Standard Network Data Encryption (SNDE) cards, and Advanced Network Data Encryption (ANDE) cards do not occupy I/O slots

- **Open Application Platform (OAP) and virtualization**

are available on HP MSR Open Architecture Platform (OAP) Module with VMware vSphere; offer an industry-leading virtualization platform which integrates third-party applications with the MSR series routers; provide application and services flexibility; deliver the potential functionality of multiple devices, creating capital and operational expense savings and lasting investment protection

- **USB interface**

uses USB memory disk to download and upload configuration files; supports an external USB 3G modem for a 3G WAN uplink

- **Flexible modular design**

includes multiple types of modules that meet different requirements, such as Smart Interface Cards (SICs), which are small and cost-effective modules; Multi-functional Interface Modules (MIMs), which are more high-density and affordable modules;

Flexible Interface Cards (FICs), which provide high reliability and are hot-swappable; and double-width modules, which provide high density

- **SIP trunk**

the SIP trunk link can carry multiple concurrent calls, and the carrier authenticates only the link, rather than carrying each SIP call on this link

## Warranty and support

- **1-year warranty:** See <http://www.hpe.com/networking/warrantysummary> for warranty and support information included with your product purchase.
- **Software releases:** to find software for your product, refer to <http://www.hpe.com/networking/support>; for details on the software releases available with your product purchase, refer to <http://www.hpe.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.

### Standard Switch Enclosures

#### HP MSR50-40 Router

- 4 - FIC module slots
- Must select at least 1 Main Processing Unit
- Must select at least 1 Multi Service Module
- 1 - 350w AC Power Supply included
- 3U - Height

JD433A  
See  
Configuration  
**NOTE:9**

#### HP MSR50-40 DC Router

- 4 - FIC module slots
- Must select at least 1 Main Processing Unit
- Must select at least 1 Multi Service Module
- 1 - 350w DC Power Supply included
- 3U - Height

JF285A

#### HP MSR50-60 Router

- 6 - FIC module slots
- Must select at least 1 Main Processing Unit
- Must select at least 1 Multi Service Module
- 1 - 350w AC Power Supply included
- 4U - Height

JF231A  
See  
Configuration  
**NOTE:9**

#### HP MSR50-60 Rtr Chassis w DC PwrSupply

- 6 - FIC module slots
- Must select at least 1 Main Processing Unit
- Must select at least 1 Multi Service Module
- 1 - 350w DC Power Supply included
- 4U - Height

JF640A

#### Configuration Rules:

Note 9      Localization required. (See Localization Menu)

## CTO Models

### CTO Solution Sku

## Configuration

HP MSR CTO Router Solution

- SSP trigger sku

JG500A  
See  
Configuration  
**NOTE:**10

### CTO Base Sku

HP MSR50-40 Router

- 4 - FIC module slots
- Must select at least 1 Main Processing Unit
- Must select at least 1 Multi Service Module
- 1 - 350w AC Power Supply included
- 3U - Height

JD433A  
See  
Configuration  
**NOTE:**1, 9, 11

HP MSR50-60 Router

- 6 - FIC module slots
- Must select at least 1 Main Processing Unit
- Must select at least 1 Multi Service Module
- 1 - 350w AC Power Supply included
- 4U - Height

JF231A  
See  
Configuration  
**NOTE:**1, 9, 11

Configuration Rules:

- Note 1      If this Switch is selected integrated to the CTO Switch Solution, Then a Minimum of 1 factory integrated accessory must be ordered and integrated to CTO chassis. See Menu below, option must have a #0D1 to be integrated to the CTO Chassis.
- Note 9      Localization required. (See Localization Menu for list.)
- Note 10     This HPN CTO switch cannot be factory racked. (Future Release)
- Note 11     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)

## Internal Power Supplies

JD433A and JF285A Only System (std 1 // max 2) User Selection (min 0 // max 1) Per router

JF231A and JF640A Only System (std 1 // max 3) User Selection (min 0 // max 2) Per router

HP MSR50 AC Power Supply

JD650A  
See  
Configuration  
**NOTE:**1, 4, 9



## Configuration

HP MSR50-60 DC Power Supply JF443A  
See  
Configuration  
**NOTE:**2, 4

HP MSR50 AC PoE Power Supply JD652A  
See  
Configuration  
**NOTE:**3, 5, 9

### Configuration Rules:

Note 1 If this Power Supply is selected, Then one of the following routers is required:

HP MSR50-40 Router JD433A

HP MSR50-60 Router JF231A

Note 2 If this Power Supply is selected, Then one of the following routers is required:

HP MSR50-40 DC Router JF285A

HP MSR50-60 Rtr Chassis w DC PwrSupply JF640A

Note 3 Only 1 AC PoE Power Supply can be added ANY MSR 50.

Note 4 Only 1 JD650A - HP MSR50 AC Power Supply or JF443A - HP MSR50-60 DC Power Supply can be added ANY MSR50.

Note 5 If the JD429B - HP MSR50 G2 Processor Module is selected, Then this power supply is not supported.

Note 9 Localization required. (See Localization Menu for list.)

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

## Modules

### Main Processing Unit Slot

HP MSR50 Processor Module JD653A  
See  
Configuration  
**NOTE:**1, 2, 4, 6,  
8

- 4 - SIC modules slot
- min=0 \ max=2 SFP Transceivers
- 1 - 512MB HP MSR 512MB SDRAM Included
- 1 - 256MB HP X600 256M Compact Flash Card Included

Russian Reduced Encryption JD653A#A59

## Configuration

HP MSR50 G2 Processor Module	JD429B
<ul style="list-style-type: none"> <li>• with no SIC modules slot</li> <li>• min=0 \ max=3 SFP Transceiver</li> <li>• 1 - 512MB HP MSR 512MB SDRAM Included</li> <li>• 1 - 256MB HP X600 256M Compact Flash Card Included</li> </ul>	See Configuration <b>NOTE:</b> 1,3, 4, 5, 8
Russian Reduced Encryption	JD429B#A59
Configuration Rules:	
Note 1	The following Transceivers install into this Module: (Use #0D1 if router is CTO) - if applicable
	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 X115 100M SFP LC FX Transceiver JD102B
	HP X110 100M SFP LC LH40 Transceiver JD120B
	HP X110 100M SFP LC LH80 Transceiver JD091A
	HP X110 100M SFP LC LH40 Transceiver JD090A
	HP X120 1G SFP LC BX 10-D Transceiver JD099B
Note 2	The following DDR SDRAM install into this Module:
	HP A-Series 256MB DDR SDRAM JD647A
	HP A-Series 512MB DDR SDRAM JD648A
Note 3	The following DDR SDRAM install into this Module:
	HP A-Series 2GB DDR2 SDRAM JG205A
Note 4	The following CF Card install into this Module:
	HP A7500 1G Compact Flash Card JC684A
	HP A7500 512M Compact Flash Card JC685A
	HP A7500 256M Compact Flash Card JC686A
Note 5	If this Module is selected, Then JD434A - HP MSR50 Router Software License is required.
Note 6	The following SIC Modules install into this Module: (Use #0D1 if router is CTO) - if applicable
	HP MSR 4-port 10/100 SIC Module JD573B
	HP MSR 9-port 10/100 DSIC Module JD574B
	HP A-MSR 4-port 10/100Base-T PoE Switch SIC Module JD620A
	HP A-MSR 9-port 10/100Base-T PoE Switch DSIC Module JD621A
	HP MSR 1-port 10/100 SIC Module JD545B
	HP 1-port 100Mbt SFP SIC Router Module JF280A
	HP MSR 1-port 10/100/1000 SIC Module JD572A

## Configuration

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 1-port E1-Voice SIC Module	JD575A
HP MSR 1-port T1-Voice SIC Module	JD576A
HP 2p ISDN-S/T Voice Interface SIC Mod	JF821A
HP MSR 2FXS + 1FXO Voice Intfc SIC Mod	JD632A
HP MSR 1-port Fractional E1 SIC Module	JD634A
HP MSR 1-port Fractional SIC Module	JD538A
HP MSR 2-port Fractional E1 SIC Module	JF842A
HP MSR 1-port Enhanced Serial SIC Mod	JD557A
HP A-MSR 1-port ADSL over POTS SIC Module	JD537A
HP MSR 1-port ISDN-S/T SIC Module	JD571A
HP A-MSR 8-port Async Serial SIC Module	JF281A
HP 802.11b/g/n Wireless AP SIC Module	JF819A
HP MSR 802.11b/g/n Wless AP SIC Mod (NA)	JG211A
HP MSR 1p 8-wire G.SHDSL (RJ45) DSIC Mod	JG191A
HP MSR 1-port ADSL over ISDN SIC Module	JG056B
HP MSR 16-port Async Serial SIC Module	JG186A
HP A-MSR 4-port FXS/1-port FXO DSIC Mod	JG189A
HP A-MSR HSPA/WCDMA SIC Module	JG187A
HP MSR 4G LTE SIC Mod for Verizon	JG742A
HP MSR 4G LTE SIC Mod for ATT	JG743A
HP MSR 4G LTE SIC Mod for Global	JG744A

Note 8 If this product is ordered in Russia, Then the #A59 must be ordered with product number.

### Multi-Service Module Slot

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

HP MSR50 Module	JD651A
<ul style="list-style-type: none"> <li>• 2 - ESM Modules</li> <li>• 1 - VCPM Module</li> <li>• 4 - VPM Modules</li> </ul>	See Configuration <b>NOTE:</b> 1, 3, 4, 5

HP MSR50 G2 Module	JD430A
<ul style="list-style-type: none"> <li>• 2 - ESM Modules</li> <li>• 1 - VCPM Module</li> </ul>	See Configuration <b>NOTE:</b> 2, 3, 4

Configuration Rules:

Note 1 If this module is selected, Then the JD653A - HP MSR50 Processor Module is required.

## Configuration

Note 2	If this module is selected, Then the JD429B - HP MSR50 G2 Processor Module is required.	
Note 3	The following ESM Modules install into this Module: (Use #OD1 if router is CTO) - -	
	HP A-MSR Advanced Network Data Encryption ESM Module	JD608A
	HP A-MSR Standard Network Data Encryption ESM Module	JD609A
Note 4	The following VCPM Modules install into this Module: (Use #OD1 if router is CTO)	
	HP A-MSR Voice Co-processing Module	JD610A
Note 5	The following VPM Modules install into this Module: (Use #OD1 if router is CTO)	
	HP A-MSR 32-Channel Voice Processing Module	JD598A
	HP A-MSR 24-Channel Voice Processing Module	JD599A
	HP A-MSR 16-Channel Voice Processing Module	JD600A
	HP A-MSR 8-Channel Voice Processing Module	JD601A

### FIC Modules

JD433A and JF285A Only System (std 0 // max 4) User Selection (min 0 // max 4) Per router

JF231A and JF640A Only System (std 0 // max 6) User Selection (min 0 // max 6) Per router

HP MSR 1-port 10/100/1000 FIC Module	JD583B
HP MSR 8p Async Serial RJ45 FIC Module	JF260B
<ul style="list-style-type: none"> <li>min=0 \ max=8 AUX Cables</li> </ul>	See Configuration <b>NOTE:6</b>
HP MSR 16p Async Serial RJ45 FIC Mod	JF265B
<ul style="list-style-type: none"> <li>min=0 \ max=16 AUX Cables</li> </ul>	See Configuration <b>NOTE:6</b>
HP MSR 2-port Gig-T FIC Module	JF269B
HP MSR 2-port 1000BASE-X FIC Module	JF270B
<ul style="list-style-type: none"> <li>min=0 \ max=2 SFP Modules</li> </ul>	See Configuration <b>NOTE:3</b>
HP MSR 1-port GbE Fiber FIC Module	JD582A
<ul style="list-style-type: none"> <li>min=0 \ max=1 SFP Modules</li> </ul>	See Configuration <b>NOTE:3</b>
HP MSR 2-port 10/100 FIC MSR Module	JD577A

## Configuration

HP 4-port 10/100 FIC Module	JF824A
HP MSR 16-port 10/100 PoE FIC Module <ul style="list-style-type: none"> <li>min=0 \ max=1 SFP Modules</li> </ul>	JD616A See Configuration <b>NOTE:</b> 3, 11, 19, 20
HP MSR 24-port 10/100 POE DFIC Module <ul style="list-style-type: none"> <li>min=0 \ max=2 SFP Modules</li> </ul>	JD617A See Configuration <b>NOTE:</b> 1, 2,3, 11, 19, 20
HP MSR 4-port E and M FIC Module	JD602A
HP MSR 4-port FXO FIC Module	JD593A
HP MSR 4-port FXS FIC Module	JD594A
HP MSR 1-port T1 Voice FIC Module <ul style="list-style-type: none"> <li>min=0 \ max=1 T1 Cable</li> </ul>	JD605A
HP MSR 2-port T1 Voice FIC Module <ul style="list-style-type: none"> <li>min=0 \ max=2 T1 Cable</li> </ul>	JD606A
HP MSR 1-port E1 Voice FIC Module <ul style="list-style-type: none"> <li>min=0 \ max=1 E1 Cable</li> </ul>	JD607A See Configuration <b>NOTE:</b> 8, 13
HP MSR 2-port E1-Voice FIC Module <ul style="list-style-type: none"> <li>min=0 \ max=2 E1 Cable</li> </ul>	JD587A See Configuration <b>NOTE:</b> 8, 13
HP MSR 4-port Enhanced Serial FIC Module <ul style="list-style-type: none"> <li>min=0 \ max=4 Serial Port Cable</li> </ul>	JD584A See Configuration <b>NOTE:</b> 7
HP MSR 8-port Serial Enhanced FIC Module <ul style="list-style-type: none"> <li>min=0 \ max=8 Serial Port Cable</li> </ul>	JD580A See Configuration

## Configuration

HP MSR 2-port CE1/PRI FIC Module <ul style="list-style-type: none"> <li>• min=0 \ max=2 E1 Cable</li> </ul>	<b>NOTE:7</b>  JD578A See Configuration <b>NOTE:8, 13</b>
HP MSR 4-port CE1/PRI FIC Module <ul style="list-style-type: none"> <li>• min=0 \ max=4 E1 Cable</li> </ul>	JD588A See Configuration <b>NOTE:8, 13</b>
HP MSR 8-port CE1/PRI FIC-75 Module <ul style="list-style-type: none"> <li>• must select 1 8-port E1 Cable</li> </ul>	JD585A See Configuration <b>NOTE:9</b>
HP MSR 4-port Fractional E1 FIC Module <ul style="list-style-type: none"> <li>• min=0 \ max=4 E1 Cable</li> </ul>	JD591A See Configuration <b>NOTE:8, 13</b>
HP MSR 4-port Fractional T1 FIC Module <ul style="list-style-type: none"> <li>• min=0 \ max=4 T1 Cable</li> </ul>	JD592A See Configuration <b>NOTE:12</b>
HP MSR 1-port FT3/CT3 FIC Module <ul style="list-style-type: none"> <li>• min=0 \ max=2 E3/T3 Cable</li> </ul>	JD629A See Configuration <b>NOTE:11</b>
HP MSR 1-port FE3/CE3 FIC Module <ul style="list-style-type: none"> <li>• min=0 \ max=2 E3/T3 Cable</li> </ul>	JD625A See Configuration <b>NOTE:11</b>
HP MSR 4-port ISDN-S/T FIC Module	JD589A
HP MSR 4-port E1-IMA FIC -75 Module <ul style="list-style-type: none"> <li>• min=0 \ max=1 E1 Cable</li> </ul>	JD622A See Configuration <b>NOTE:14</b>
HP MSR 1-port T3 ATM FIC Module <ul style="list-style-type: none"> <li>• min=0 \ max=2 E3/T3 Cable</li> </ul>	JD595A See Configuration

## Configuration

HP MSR 1-port E3 ATM FIC Module <ul style="list-style-type: none"> <li>• min=0 \ max=2 E3/T3 Cable</li> </ul>	<b>NOTE:11</b>  JD596A See Configuration <b>NOTE:11</b>
HP MSR 1-port OC-3 ATM FIC Module <ul style="list-style-type: none"> <li>• min=0 \ max=1 SFP Modules</li> </ul>	JD633A See Configuration <b>NOTE:4</b>
HP MSR 1-port OC-3 POS FIC Module <ul style="list-style-type: none"> <li>• min=0 \ max=1 SFP Modules</li> </ul>	JD581C See Configuration <b>NOTE:4</b>
HP MSR 1p OC-3/STM-1 E1/T1 CPOS FIC Mod <ul style="list-style-type: none"> <li>• min=0 \ max=1 SFP Modules</li> </ul>	JG201A See Configuration <b>NOTE:4</b>
HP A-MSR 8-p E1 IMA (75ohm) FIC Module <ul style="list-style-type: none"> <li>• min=1 \ max=1 8-port E1 Cable</li> </ul>	JF278B See Configuration <b>NOTE:15</b>
HP A-MSR 24-port FXS FIC Module	JG197A
HP A-MSR 8-port T1/CT1/PRI FIC Module <ul style="list-style-type: none"> <li>• min=1 \ max=1 T1 Cable</li> </ul>	JD586B See Configuration <b>NOTE:17</b>
HP A-MSR 8-port T1 IMA FIC Module <ul style="list-style-type: none"> <li>• min=1 \ max=1 T1 Cable</li> </ul>	JG200A See Configuration <b>NOTE:17</b>
HP MSR OAP FIC Mod w/VMware vSphere	JG533A#B01
HP MSR LSB Com FIC Mod pwrby Msft Lync	JG589A#B01 See Configuration <b>NOTE:21</b>

Configuration Rules:

## Configuration

Note 1	If these Modules are add to the following routers Then Max = 2: HP MSR50-40 Router HP MSR50-40 DC Router	JD433A JF285A
Note 2	If these Modules are add to the following routers Then Max = 2: HP MSR50-60 Router HP MSR50-60 Rtr Chassis w DC PwrSupply	JF231A JF640A
Note 3	The following Transceivers install into this Module: (Use #0D1 if router is CTO) - if applicable HP X125 1G SFP LC LH70 Transceiver HP X120 1G SFP LC LH40 1550nm Transceiver HP X125 1G SFP LC LH40 1310nm 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 HP X120 1G SFP LC SX Transceiver HP X120 1G SFP LC LX Transceiver	JD063B JD062A JD061A JD098B JD099B JD103A JD118B JD119B
Note 4	The following Transceivers install into this Module: (Use #0D1 if router is CTO) - if applicable HP X110 100M SFP LC LH40 Transceiver HP X110 100M SFP LC LH80 Transceiver HP X110 100M SFP LC FX Transceiver HP X110 100M SFP LC LX Transceiver	JD090A JD091A JD102B JD120B
Note 6	The following AUX Cables and Transit Cables install into this Module: Aux Cable-3m (D25 Male) Single Cable, Transit Plug, D25F, MP8(S)-? Single Cable, Transit Cable, 0.5m (RJ45)	JD508A JD636A JD641A
Note 7	The following Cables install into this Module: V.24 Serial Port Cable, DTE, 3m V.24 Serial Port Cable, DCE, 3m V.35 Serial Port Cable, DTE, 3m V.35 Serial Port Cable, DCE, 3m X.21 Serial Port Cable, DTE, 3m X.21 Serial Port Cable, DCE, 3m RS449 Serial Port Cable, DTE, 3m RS449 Serial Port Cable, DCE, 3m RS530 Serial Port Cable, DTE, 3m RS530 Serial Port Cable, DCE, 3m	JD519A JD521A JD523A JD525A JD527A JD529A JF825A JF826A JF827A JF828A
Note 8	The following E1 Cables install into this Module: HP X260 E1 (2) BNC 75 ohm 3m Rtr Cable HP X260 E1 BNC 20m Router Cable HP X260 E1/2 BNC 75 ohm 40m Router Cable	JD175A JD514A JD516A



## Configuration

Note 9	The following Cable install into this Module: 8-port E1 Cable, 16 BNC, 3m, 75ohm	JD512A
Note 11	The following E3/T3 Cable and Connector install into this Module: E3/T3 Cable 15m-BNC75 (ohm) Straight Male/SFYZ-75-2-1/SMB75 (ohm) Straight Female E3/T3 Cable 30m-BNC75 (ohm) Straight Male/SFYZ-75-2-1/SMB75 (ohm) Straight Female	JD531A JD533A
Note 12	The following T1 Cables install into this Module: HP X260 T1 Router Cable	JD518A
Note 13	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 14	The following E1 Cables install into this Module: HP X260 E1 4-Port IMA Router Cable	JD638A
Note 15	The following 8E1 Cables install into this Module: HP CAB-75ohm 8E1-3m-BNC-IMA	JD927A
Note 16	The following Cables install into this Module: HP A-MSR 50 pin D-sub Male to 24 x RJ-11 Plug 15m Router Cable	JG318A
Note 17	The following Cables install into this Module: HP X260 8T1 RJ45 3m Router Cable	JD639A
Note 19	If selected, Then show - Warning- JD652A - HP MSR50 AC PoE Power Supply required for POE.	
Note 20	If the JD429B - HP MSR50 G2 Processor Module is selected, Then this Module is not supported.	
Note 21	Max of 2 Modules per router with 1 Power Supply, and Max of 4 Modules per router with 2 Power supplies.	

## SIC Modules

System (std 0 // max 4) User Selection (min 0 // max 4) per JD653A MPU

HP MSR 4-port 10/100 SIC Module	JD573B See Configuration <b>NOTE:1</b>
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HP MSR 9-port 10/100 DSIC Module	JD574B See Configuration <b>NOTE:1</b>
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## Configuration

HP A-MSR 4-port 10/100Base-T PoE Switch SIC Module	JD620A See Configuration <b>NOTE:1</b>
HP A-MSR 9-port 10/100Base-T PoE Switch DSIC Module	JD621A See Configuration <b>NOTE:1</b>
HP MSR 1-port 10/100 SIC Module	JD545B See Configuration <b>NOTE:1</b>
HP 1-port 100Mbt SFP SIC Router Module <ul style="list-style-type: none"> <li data-bbox="119 869 534 898">• min=0 \ max=1 SFP Transceivers</li> </ul>	JF280A See Configuration <b>NOTE:1, 2</b>
HP MSR 1-port 10/100/1000 SIC Module <ul style="list-style-type: none"> <li data-bbox="119 1056 534 1085">• min=0 \ max=1 SFP Transceivers</li> </ul>	JD572A See Configuration <b>NOTE:1, 3</b>
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 1-port E1-Voice SIC Module <ul style="list-style-type: none"> <li data-bbox="119 1713 470 1743">• min=0 \ max=1 E1 Cable</li> </ul>	JD575A See Configuration <b>NOTE:4, 13</b>
HP MSR 1-port T1-Voice SIC Module <ul style="list-style-type: none"> <li data-bbox="119 1900 470 1929">• min=0 \ max=1 T1 Cable</li> </ul>	JD576A See Configuration <b>NOTE: 10</b>

## Configuration

HP 2p ISDN-S/T Voice Interface SIC Mod	JF821A
HP MSR 2FXS + 1FXO Voice Intfc SIC Mod	JD632A
HP MSR 1-port Fractional E1 SIC Module <ul style="list-style-type: none"> <li>min=0 \ max=1 E1 Cable</li> </ul>	JD634B See Configuration <b>NOTE:4</b>
HP MSR 1-port Fractional SIC Module <ul style="list-style-type: none"> <li>min=0 \ max=1 T1 Cable</li> </ul>	JD538A See Configuration <b>NOTE: 10</b>
HP MSR 2-port Fractional E1 SIC Module <ul style="list-style-type: none"> <li>min=0 \ max=1 2E1 Cable</li> </ul>	JF842A See Configuration <b>NOTE:11</b>
HP MSR 1-port Enhanced Serial SIC Mod <ul style="list-style-type: none"> <li>min=0 \ max=1 Serial Port Cable</li> </ul>	JD557A See Configuration <b>NOTE:6</b>
HP A-MSR 1-port ADSL over POTS SIC Module	JD537A See Configuration <b>NOTE:1</b>
HP MSR 1-port ISDN-S/T SIC Module	JD571A
HP A-MSR 8-port Async Serial SIC Module <ul style="list-style-type: none"> <li>Must select 1 8AS Communication Cable (min=1 \ max=1 cable)</li> </ul>	JF281A See Configuration <b>NOTE:7</b>
HP 802.11b/g/n Wireless AP SIC Module	JF819A See Configuration <b>NOTE:1</b>
HP MSR 802.11b/g/n Wless AP SIC Mod (NA)	JG211A See

## Configuration

	Configuration <b>NOTE:1</b>
HP MSR 1p 8-wire G.SHDSL (RJ45) DSIC Mod	JG191A See Configuration <b>NOTE:1</b>
HP MSR 1-port ADSL over ISDN SIC Module	JG056B See Configuration <b>NOTE:1</b>
HP MSR 16-port Async Serial SIC Module <ul style="list-style-type: none"> <li>Must select 4 HP X260 mini D-28/4-RJ45 0.3m Rtr Cables (min=4 \ max=4 cables)</li> </ul>	JG186A See Configuration <b>NOTE:12</b>
HP A-MSR 4-port FXS/1-port FXO DSIC Mod	JG189A See Configuration <b>NOTE:1</b>
HP A-MSR HSPA/WCDMA SIC Module	JG187A See Configuration <b>NOTE:1</b>
HP MSR 1-port E1/CE1/PRI SIC Module	JF253B See Configuration <b>NOTE:1</b>
HP MSR 4G LTE SIC Mod for Verizon <ul style="list-style-type: none"> <li>None</li> </ul>	JG742A See Configuration <b>NOTE:14, 15</b>
HP MSR 4G LTE SIC Mod for ATT <ul style="list-style-type: none"> <li>None</li> </ul>	JG743A See Configuration <b>NOTE:14, 15</b>
HP MSR 4G LTE SIC Mod for Global <ul style="list-style-type: none"> <li>None</li> </ul>	JG744A See Configuration <b>NOTE:14, 15</b>

## Configuration

### Configuration Rules:

Note 1	If these Modules are added, Then the Max = 2.	
Note 2	The following Transceivers install into this Module: (Use #0D1 if router is CTO) - if applicable	
	HP X110 100M SFP LC LH40 Transceiver	JD090A
	HP X110 100M SFP LC LH80 Transceiver	JD091A
	HP X110 100M SFP LC FX Transceiver	JD102B
	HP X110 100M SFP LC LX Transceiver	JD120B
Note 3	The following Transceivers install into this Module:	
	HP X125 1G SFP LC LH70 Transceiver	JD063B
	HP X120 1G SFP LC LH40 1550nm Transceiver	JD062A
	HP X125 1G SFP LC LH40 1310nm Transceiver	JD061A
	HP X120 1G SFP LC BX 10-U Transceiver	JD098B
	HP X120 1G SFP LC BX 10-D Transceiver	JD099B
	HP X120 1G SFP LC LH100 Transceiver	JD103A
	HP X120 1G SFP LC SX Transceiver	JD118B
	HP X120 1G SFP LC LX Transceiver	JD119B
Note 4	The following E1 Cables install into this Module:	
	HP X260 E1 (2) BNC 75 ohm 3m Rtr Cable	JD175A
	HP X260 E1 BNC 20m Router Cable	JD514A
	HP X260 E1/2 BNC 75 ohm 40m Router Cable	JD516A
Note 6	The following Cables install into this Module:	
	V.24 Serial Port Cable, DTE, 3m	JD519A
	V.24 Serial Port Cable, DCE, 3m	JD521A
	V.35 Serial Port Cable, DTE, 3m	JD523A
	V.35 Serial Port Cable, DCE, 3m	JD525A
	X.21 Serial Port Cable, DTE, 3m	JD527A
	X.21 Serial Port Cable, DCE, 3m	JD529A
	RS449 Serial Port Cable, DTE, 3m	JF825A
	RS449 Serial Port Cable, DCE, 3m	JF826A
	RS530 Serial Port Cable, DTE, 3m	JF827A
	RS530 Serial Port Cable, DCE, 3m	JF828A
Note 7	If this module is selected Then 1 JD642A - HP X260 SIC-8AS RJ45 0.28m Router Cable is required.	
Note 10	The following T1 Cables install into this Module:	
	HP X260 T1 Router Cable	JD518A
Note 11	The following 2E1 Cables install into this Module:	
	HP X260 2E1 BNC 3m Router Cable	JD643A

## Configuration

Note 12	If this module is selected Then 4 - JG263A HP X260 mini D-28/4-RJ45 0.3m Rtr Cable are required to be on the same order.	
Note 13	The following E1 Cables install into this Module:	
	HP X260 E1 RJ45 3m Router Cable	JD509A
	HP X260 E1 RJ45 20m Router Cable	JD517A
Note 14	The following Antenna Cables install into this Module:	
	HP MSR 3G RF 2.8m Antenna Cable	JG522A
	HP MSR 3G RF 6m Antenna Cable	JG666A
	HP MSR 3G RF 15m Antenna Cable	JG667A
Note 15	If this module is selected, Then Max = 2 Modules of any combination or pairing of the following modules: JG742A, JG743A, JG744A.	

### ESM Modules

JD651A and JD430A Service Modules Only - System (std 0 // max 2) User Selection (min 0 // max 2)

HP MSR Encryption Accelerator Adv Mod	JD608A
HP MSR Std Encryption Accelerator Mod	JD609A

### Voice Co-Processing Modules

JD651A and JD430A Service Modules Only -System (std 0 // max 1) User Selection (min 0 // max 1)

HP MSR Voice Co-processor Module	JD610A
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### Voice Processing Modules

JD651A Service Modules Only -System (std 0 // max 1) User Selection (min 0 // max 4)

JD430A Service Modules Only -Not supported

HP MSR 32-channel Voice Processor Module	JD598A
HP MSR 24-channel Voice Processor Module	JD599A
HP MSR 16-channel Voice Processor Module	JD600A
HP MSR 8-channel Voice Processor Module	JD601A

### SDRAM

System (std 1 // max 2) User Selection (min 0 // max 2) per Main Processing Module

HP 2GB DDR2 SDRAM	JG205A
HP MSR 256MB SDRAM	JD647A
HP MSR 512MB SDRAM	JD648A

## Configuration

### Transceivers

#### SFP Transceivers

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

### Cables

HP X260 mini D-28/4-RJ45 0.3m Rtr Cable	JG263A
HP X200 V.24 DTE 3m Serial Port Cable	JD519A
HP X200 V.24 DCE 3m Serial Port Cable	JD521A
HP X200 V.35 DTE 3m Serial Port Cable	JD523A
HP X200 V.35 DCE 3m Serial Port Cable	JD525A
HP X200 X.21 DTE 3m Serial Port Cable	JD527A
HP X200 X.21 DCE 3m Serial Port Cable	JD529A
HP X260 RS449 3m DTE Serial Port Cable	JF825A
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 Rtr Cable	JD175A
HP X260 E1 BNC 20m Router Cable	JD514A
HP X260 E1/2 BNC 75 ohm 40m Router Cable	JD516A
HP X260 E1 RJ45 BNC 75-120 ohm Conversion Router Cable	JD511A
HP X260 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 E1 4-port IMA Router Cable	JD638A
HP X260 8E1 BNC 75 ohm 3m Router Cable	JD512A

## Configuration

HP X260 SIC-8AS RJ45 0.28m Router Cable	JD642A
HP X200 Transit Plug D25F MP8(S) Single Cable	JD636A
HP X200 Transit Cable RJ45 0.5m Single Cable	JD641A
HP A-MSR 50 pin D-sub Male to 24 x RJ-11 Plug 15m Router Cable	JG318A
HP X260 8T1 RJ45 3m Router Cable	JD639A
HP CAB-75ohm 8E1-3m-BNC-IMA	JD927A

### Remarks:

The following cable is used for RJ45 BNC Conversion

HP X260 E1 RJ45 BNC 75-120 ohm Conversion Router Cable

JD511A

## Router Options

### Antenna Cables

System (std 0 // max 2) User Selection (min 0 // max 2) per SIC Module (JG742A, JG743A, JG744A)

HP MSR 3G RF 2.8m Antenna Cable	JG522A
HP MSR 3G RF 6m Antenna Cable	JG666A
HP MSR 3G RF 15m Antenna Cable	JG667A

### Licenses

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

HP MSR50 Router Software License	JD434A
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### SDRAM

System (std 1 // max 2) User Selection (min 0 // max 2) per Main Processing Module

HP A-Series 2GB DDR2 SDRAM	JG205A See Configuration <b>NOTE:1</b>
HP MSR 256MB SDRAM	JD647A See Configuration <b>NOTE:1</b>
HP MSR 512MB SDRAM	JD648A See Configuration



## Configuration

### NOTE:1

Configuration Rules:

Note 1	These SDRAM's are supported on the following Modules only:	
	HP MSR50 G2 Main Processing Unit	JD429B
	HP MSR50 Main Processing Unit	JD653A

### Compact Flash cards

System (std 1 // max 2) User Selection (min 0 // max 1) per Main Processing Module

HP X600 1G Compact Flash Card	JC684A See Configuration
	<b>NOTE:1</b>

HP X600 512M Compact Flash Card	JC685A See Configuration
	<b>NOTE:1</b>

HP X600 256M Compact Flash Card	JC686A See Configuration
	<b>NOTE:1</b>

Configuration Rules:

Note 1	These CF Cards are supported on the following Modules only:	
	HP MSR50 G2 Main Processing Unit	JD429B
	HP MSR50 Main Processing Unit	JD653A

### Opacity Shield Kit

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

HP MSR50-40 Opcty Shld Kit	JG583A See Configuration
<b>NOTE:</b> Supported on JD433A, JF285A	<b>NOTE:1</b>

HP MSR50-60 Opcty Shld Kit	JG584A See Configuration
<b>NOTE:</b> Supported on JF231A, JF640A	<b>NOTE:1</b>

## Configuration

Configuration Rules:

Note 1 If selected with a CTO Router Solution, Quantity 1 of JG586A#B01 must also be ordered.

### Tamper Evidence Labels

HP 12mm x 60mm Tmpr-Evidence (100) Lbl

**NOTE:**

Supported on JD433A, JF285A, JF231A, JF640A

JG586A  
See  
Configuration  
**NOTE:1**

Configuration Rules:

Note 1 If selected with a CTO Router Solution, Quantity 1 of JG583A#B01 or JG584A#B01 must also be ordered.

**Remarks:** Each JG583A or JG584A would use 1 of JG586A.

## Technical Specifications

### HP MSR50-40 Router (JD433A)

<b>Ports</b>	4 FIC slots
<b>Physical characteristics</b>	
<b>Dimensions</b>	17.17(w) x 16.69(d) x 5.16(h) in (43.6 x 42.4 x 13.1 cm) (3U height)
<b>Weight</b>	39.68 lb (18 kg)
<b>Memory and processor</b>	
<b>Processor 1</b>	RISC @ 1700 MHz, 1 GB DDR SDRAM, 256 MB compact flash
<b>Processor 2</b>	RISC @ 833 MHz, 512 MB DDR SDRAM, 256 MB compact flash
<b>Mounting</b>	Mounts in an EIA standard 19-in. rack
<b>Performance</b>	
<b>Throughput</b>	up to 1280 Kpps (64-byte packets)
<b>Routing/Switching capacity</b>	3 Gbps
<b>Routing table size</b>	100000 entries (IPv4), 100000 entries (IPv6)
<b>Environment</b>	
<b>Operating temperature</b>	32°F to 104°F (0°C to 40°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>Electrical characteristics</b>	
<b>Maximum heat dissipation</b>	1194 BTU/hr (1259.67 kJ/hr)
<b>Voltage</b>	100-240 VAC
<b>Maximum power rating</b>	350 W
<b>PoE power</b>	500 W
<b>Frequency</b>	50/60 Hz
<b>Notes</b>	<p>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.</p> <p>PoE power is the power supplied by the internal power supply. It is dependent on the type and quantity of power supplies and may be supplemented with the use of an external power supply (EPS).</p>
<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; EN 60950-1; CAN/CSA-C22.2 No. 60950-1-03; FDA 21 CFR Subchapter J
<b>Emissions</b>	<p>EN 55022 Class A</p> <p>ICES-003 Class A</p> <p>ANSI C63.4 2003</p> <p>ETSI EN 300 386 V1.3.3</p> <p>AS/NZS CISPR 22 Class A</p> <p>EN 61000-4-2</p> <p>EN 61000-4-3</p> <p>EN 61000-4-4</p> <p>EN 61000-4-5</p>

## Technical Specifications

EN 61000-4-6  
 EN 61000-3-2:2006  
 EN 61000-3-3:1995 +A1:2001+A2:2005  
 EMC Directive 2004/108/EC  
 FCC (CFR 47, Part 15) Class A  
 EN 55024:1998+ A1:2001 + A2:2003  
 EN 61000-4-11:2004  
 EN 61000-4-8:2001

### Telecom

FCC part 68  
 CS-03

### Management

IMC - Intelligent Management Center; command-line interface; Web browser; SNMP Manager; Telnet; RMON1; FTP; IEEE 802.3 Ethernet MIB

### Notes

The HP 3G Wireless GSM/WCDMA WAN SIC Module (JF820A) is not approved for use in the same chassis as a Wi-Fi interface (IEEE 802.11b/g, 802.11b/g/n, etc.) in the European Union.

### Services

Refer to the Hewlett Packard Enterprise website at <http://www.hpe.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 Hewlett Packard Enterprise sales office.

## HP MSR50-60 Router (JF231A)

<b>Ports</b>	6 FIC slots	
<b>Physical characteristics</b>	<b>Dimensions</b>	17.17(w) x 16.69(d) x 6.89(h) in (43.6 x 42.4 x 17.5 cm) (4U height)
	<b>Weight</b>	44.09 lb (20 kg)
<b>Memory and processor</b>	<b>Processor 1</b>	RISC @ 1700 MHz, 1 GB DDR SDRAM, 256 MB compact flash
	<b>Processor 2</b>	RISC @ 833 MHz, 512 MB DDR SDRAM, 256 MB compact flash
<b>Mounting</b>	Mounts in an EIA standard 19-in. rack	
<b>Performance</b>	<b>Throughput</b>	up to 1280 Kpps (64-byte packets)
	<b>Routing/Switching capacity</b>	3 Gbps
	<b>Routing table size</b>	100000 entries (IPv4), 100000 entries (IPv6)
<b>Environment</b>	<b>Operating temperature</b>	32°F to 104°F (0°C to 40°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>Electrical characteristics</b>	<b>Nonoperating/Storage relative humidity</b>	5% to 90%, noncondensing
	<b>Maximum heat dissipation</b>	1194 BTU/hr (1259.67 kJ/hr)
	<b>Voltage</b>	100-240 VAC
	<b>Maximum power rating</b>	350 W
	<b>PoE power</b>	500 W
	<b>Frequency</b>	50/60 Hz
<b>Notes</b>	Maximum power rating and maximum heat dissipation are the worst-case theoretical maximum numbers provided for planning the infrastructure	

## Technical Specifications

with fully loaded PoE (if equipped), 100% traffic, all ports plugged in, and all modules populated.

PoE power is the power supplied by the internal power supply. It is dependent on the type and quantity of power supplies and may be supplemented with the use of an external power supply (EPS).

<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; EN 60950-1; CAN/CSA-C22.2 No. 60950-1-03; 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; Web browser; SNMP Manager; Telnet; RMON1; FTP; IEEE 802.3 Ethernet MIB
<b>Notes</b>	The HP 3G Wireless GSM/WCDMA WAN SIC Module (JF820A) is not approved for use in the same chassis as a Wi-Fi interface (IEEE 802.11b/g, 802.11b/g/n, etc.) in the European Union.
<b>Services</b>	Refer to the Hewlett Packard Enterprise website at <a href="http://www.hpe.com/networking/services">http://www.hpe.com/networking/services</a> for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local Hewlett Packard Enterprise sales office.

### Standards and protocols BGP

(applies to all products in series)	RFC 1163 Border Gateway Protocol (BGP)	RFC 3215 LDP State Machine
	RFC 1267 Border Gateway Protocol 3 (BGP-3)	RFC 3246 Expedited Forwarding PHB
	RFC 1657 Definitions of Managed Objects for BGPv4	RFC 3268 Advanced Encryption Standard (AES) Ciphersuites for Transport Layer Security (TLS)
	RFC 1771 BGPv4	RFC 3277 IS-IS Transient Blackhole Avoidance
	RFC 1772 Application of the BGP	RFC 3279 Algorithms and Identifiers for the Internet X.509 Public Key Infrastructure Certificate and Certificate Revocation List (CRL) Profile
	RFC 1773 Experience with the BGP-4 Protocol	RFC 3280 Internet X.509 Public Key Infrastructure Certificate and Certificate Revocation List (CRL) Profile
	RFC 1774 BGP-4 Protocol Analysis	RFC 3392 Support BGP capabilities advertisement
	RFC 1965 BGP4 confederations	RFC 3410 Introduction and Applicability Statements for Internet Standard Management Framework
	RFC 1997 BGP Communities Attribute	
	RFC 1998 PPP Gandalf FZA Compression Protocol	
	RFC 2385 BGP Session Protection via TCP MD5	
	RFC 2439 BGP Route Flap Damping	

## Technical Specifications

### Device management

RFC 1305 NTPv3  
 RFC 1945 Hypertext Transfer Protocol -- HTTP/1.0  
 RFC 2271 FrameWork  
 RFC 2452 MIB for TCP6  
 RFC 2454 MIB for UDP6

### General protocols

IEEE 802.1D MAC Bridges  
 IEEE 802.1p Priority  
 IEEE 802.1Q VLANs  
 IEEE 802.1s Multiple Spanning Trees  
 IEEE 802.1w Rapid Reconfiguration of Spanning Tree  
 RFC 768 UDP  
 RFC 783 TFTP Protocol (revision 2)  
 RFC 791 IP  
 RFC 792 ICMP  
 RFC 793 TCP  
 RFC 826 ARP  
 RFC 854 TELNET  
 RFC 855 Telnet Option Specification  
 RFC 856 TELNET  
 RFC 858 Telnet Suppress Go Ahead Option  
 RFC 894 IP over Ethernet  
 RFC 925 Multi-LAN Address Resolution  
 RFC 950 Internet Standard Subnetting Procedure  
 RFC 959 File Transfer Protocol (FTP)  
 RFC 1006 ISO transport services on top of the TCP: Version 3  
 RFC 1027 Proxy ARP  
 RFC 1034 Domain Concepts and Facilities  
 RFC 1035 Domain Implementation and Specification  
 RFC 1042 IP Datagrams  
 RFC 1058 RIPv1  
 RFC 1071 Computing the Internet Checksum  
 RFC 1091 Telnet Terminal-Type Option  
 RFC 1122 Host Requirements  
 RFC 1141 Incremental updating of the Internet checksum  
 RFC 1142 OSI IS-IS Intra-domain Routing Protocol  
 RFC 1144 Compressing TCP/IP headers for low-speed serial links  
 RFC 1195 OSI ISIS for IP and Dual Environments  
 RFC 1256 ICMP Router Discovery Protocol (IRDP)  
 RFC 1293 Inverse Address Resolution Protocol  
 RFC 1315 Management Information Base for Frame Relay DTEs  
 RFC 1332 The PPP Internet Protocol Control Protocol (IPCP)

RFC 3479 Fault Tolerance for the Label Distribution Protocol (LDP)  
 RFC 3564 Requirements for Support of Differentiated Services-aware MPLS Traffic Engineering  
 RFC 3602 The AES-CBC Cipher Algorithm and Its Use with IPsec  
 RFC 3706 A Traffic-Based Method of Detecting Dead Internet Key Exchange (IKE) Peers  
 RFC 3784 ISIS TE support  
 RFC 3786 Extending the Number of IS-IS LSP Fragments Beyond the 256 Limit  
 RFC 3811 Definitions of Textual Conventions (TCs) for Multiprotocol Label Switching (MPLS) Management  
 RFC 3812 Multiprotocol Label Switching (MPLS) Traffic Engineering (TE) Management Information Base (MIB)  
 RFC 3847 Restart signaling for IS-IS  
 RFC 4301 Security Architecture for the Internet Protocol  
 RFC 5101 Specification of the IP Flow Information Export (IPFIX) Protocol for the Exchange of IP Traffic Flow Information  
 FRF.1.2 PVC User-to-Network Interface (UNI) Implementation Agreement - July 2000  
 FRF.11.1 Voice over Frame Relay Implementation Agreement - May 1997 - Annex J added March 1999  
 FRF.12 Frame Relay Fragmentation Implementation Agreement - December 1997  
 FRF.16.1 Multilink Frame Relay UNI/NNI Implementation Agreement - May 2002  
 FRF.2.2 Frame Relay Network-to-Network Interface (NNI) Implementation Agreement - March 2002  
 FRF.20 Frame Relay IP Header Compression Implementation Agreement - June 2001  
 FRF.3.2 Frame Relay Multiprotocol Encapsulation Implementation Agreement - April 2000  
 FRF.7 Frame Relay PVC Multicast Service and Protocol Description - October 1994  
 FRF.9 Data Compression Over Frame Relay Implementation Agreement - January 1996

### IP multicast

RFC 1112 IGMP  
 RFC 2236 IGMPv2  
 RFC 2283 Multiprotocol Extensions for BGP-4  
 RFC 2362 PIM Sparse Mode  
 RFC 2934 Protocol Independent Multicast MIB for IPv4

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RFC 1333 PPP Link Quality Monitoring	RFC 3376 IGMPv3
RFC 1334 PPP Authentication Protocols (PAP)	
RFC 1349 Type of Service	<b>IPv6</b>
RFC 1350 TFTP Protocol (revision 2)	RFC 1981 IPv6 Path MTU Discovery
RFC 1377 The PPP OSI Network Layer Control Protocol (OSINLCP)	RFC 2080 RIPng for IPv6
RFC 1381 SNMP MIB Extension for X.25 LAPB	RFC 2292 Advanced Sockets API for IPv6
RFC 1471 The Definitions of Managed Objects for the Link Control Protocol of the Point-to-Point Protocol	RFC 2373 IPv6 Addressing Architecture
RFC 1472 The Definitions of Managed Objects for the Security Protocols of the Point-to-Point Protocol	RFC 2460 IPv6 Specification
RFC 1490 Multiprotocol Interconnect over Frame Relay	RFC 2461 IPv6 Neighbor Discovery
RFC 1519 CIDR	RFC 2462 IPv6 Stateless Address Auto-configuration
RFC 1534 DHCP/BOOTP Interoperation	RFC 2464 Transmission of IPv6 over Ethernet Networks
RFC 1542 Clarifications and Extensions for the Bootstrap Protocol	RFC 2472 IP Version 6 over PPP
RFC 1552 The PPP Internetworking Packet Exchange Control Protocol (IPXCP)	RFC 2473 Generic Packet Tunneling in IPv6
RFC 1577 Classical IP and ARP over ATM	RFC 2529 Transmission of IPv6 Packets over IPv4
RFC 1613 Cisco Systems X.25 over TCP (XOT)	RFC 2545 Use of MP-BGP-4 for IPv6
RFC 1624 Incremental Internet Checksum	RFC 2553 Basic Socket Interface Extensions for IPv6
RFC 1631 NAT	RFC 2740 OSPFv3 for IPv6
RFC 1638 PPP Bridging Control Protocol (BCP)	RFC 2893 Transition Mechanisms for IPv6 Hosts and Routers
RFC 1661 The Point-to-Point Protocol (PPP)	RFC 3056 Connection of IPv6 Domains via IPv4 Clouds
RFC 1662 PPP in HDLC-like Framing	RFC 3513 IPv6 Addressing Architecture
RFC 1695 Definitions of Managed Objects for ATM Management Version 8.0 using SMIv2	RFC 3596 DNS Extension for IPv6
RFC 1701 Generic Routing Encapsulation	<b>MIBs</b>
RFC 1702 Generic Routing Encapsulation over IPv4 networks	RFC 1213 MIB II
RFC 1721 RIP-2 Analysis	RFC 1229 Interface MIB Extensions
RFC 1722 RIP-2 Applicability	RFC 1286 Bridge MIB
RFC 1723 RIP v2	RFC 1493 Bridge MIB
RFC 1795 Data Link Switching: Switch-to-Switch Protocol AIW DLSw RIG: DLSw Closed Pages, DLSw Standard Version 1	RFC 1573 SNMP MIB II
RFC 1812 IPv4 Routing	RFC 1724 RIPv2 MIB
RFC 1829 The ESP DES-CBC Transform	RFC 1757 Remote Network Monitoring MIB
RFC 1877 PPP Internet Protocol Control Protocol Extensions for Name Server Addresses	RFC 1850 OSPFv2 MIB
RFC 1878 Variable Length Subnet Table for IPv4	RFC 2011 SNMPv2 MIB for IP
RFC 1944 Benchmarking Methodology for Network Interconnect Devices	RFC 2012 SNMPv2 MIB for TCP
RFC 1973 PPP in Frame Relay	RFC 2013 SNMPv2 MIB for UDP
RFC 1974 PPP Stac LZS Compression Protocol	RFC 2233 Interfaces MIB
RFC 1990 The PPP Multilink Protocol (MP)	RFC 2454 IPV6-UDP-MIB
RFC 1994 PPP Challenge Handshake Authentication Protocol (CHAP)	RFC 2465 IPv6 MIB
	RFC 2466 ICMPv6 MIB
	RFC 2618 RADIUS Client MIB
	RFC 2620 RADIUS Accounting MIB
	RFC 2674 802.1p and IEEE 802.1Q Bridge MIB
	RFC 2737 Entity MIB (Version 2)
	RFC 2863 The Interfaces Group MIB
	RFC 2933 IGMP MIB
	RFC 3813 MPLS LSR MIB

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RFC 2091 Trigger RIP  
 RFC 2131 DHCP  
 RFC 2132 DHCP Options and BOOTP Vendor Extensions  
 RFC 2166 APPN Implementer's Workshop Closed Pages Document DLSw v2.0 Enhancements  
 RFC 2205 Resource ReSerVation Protocol (RSVP) - Version 1 Functional Specification  
 RFC 2280 Routing Policy Specification Language (RPSL)  
 RFC 2284 EAP over LAN  
 RFC 2338 VRRP  
 RFC 2364 PPP Over AAL5  
 RFC 2374 An Aggregatable Global Unicast Address Format  
 RFC 2451 The ESP CBC-Mode Cipher Algorithms  
 RFC 2453 IPv6  
 RFC 2510 Internet X.509 Public Key Infrastructure Certificate Management Protocols  
 RFC 2511 Internet X.509 Certificate Request Message Format  
 RFC 2516 A Method for Transmitting PPP Over Ethernet (PPPoE)  
 RFC 2570 Introduction to Version 3 of the Internet-standard Network Management Framework  
 RFC 2644 Directed Broadcast Control  
 RFC 2661 L2TP  
 RFC 2663 NAT Terminology and Considerations  
 RFC 2684 Multiprotocol Encapsulation over ATM Adaptation Layer 5  
 RFC 2694 DNS extensions to Network Address Translators (DNS\_ALG)  
 RFC 2702 Requirements for Traffic Engineering Over MPLS  
 RFC 2747 RSVP Cryptographic Authentication  
 RFC 2763 Dynamic Name-to-System ID mapping support  
 RFC 2765 Stateless IP/ICMP Translation Algorithm (SIIT)  
 RFC 2766 Network Address Translation - Protocol Translation (NAT-PT)  
 RFC 2784 Generic Routing Encapsulation (GRE)  
 RFC 2787 Definitions of Managed Objects for VRRP  
 RFC 2961 RSVP Refresh Overhead Reduction Extensions  
 RFC 2966 Domain-wide Prefix Distribution with Two-Level IS-IS  
 RFC 2973 IS-IS Mesh Groups  
 RFC 2985 PKCS #9: Selected Object Classes and Attribute Types Version 2.0

### Network management

IEEE 802.1D (STP)  
 RFC 1155 Structure of Management Information  
 RFC 1157 SNMPv1  
 RFC 1905 SNMPv2 Protocol Operations  
 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

### OSPF

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

### QoS/CoS

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

### Security

IEEE 802.1X Port Based Network Access Control  
 RFC 1321 The MD5 Message-Digest Algorithm  
 RFC 2082 RIP-2 MD5 Authentication  
 RFC 2104 Keyed-Hashing for Message Authentication  
 RFC 2138 RADIUS Authentication  
 RFC 2209 RSVP-Message Processing  
 RFC 2246 Transport Layer Security (TLS)  
 RFC 2716 PPP EAP TLS Authentication Protocol  
 RFC 2865 RADIUS Authentication  
 RFC 2866 RADIUS Accounting  
 RFC 3567 Intermediate System (IS) to IS Cryptographic Authentication

### VPN

RFC 2403 - HMAC-MD5-96  
 RFC 2404 - HMAC-SHA1-96



## Technical Specifications

RFC 2993 Architectural Implications of NAT	RFC 2405 - DES-CBC Cipher algorithm
RFC 3022 Traditional IP Network Address Translator (Traditional NAT)	RFC 2547 BGP/MPLS VPNs
RFC 3027 Protocol Complications with the IP Network Address Translator	RFC 2796 BGP Route Reflection - An Alternative to Full Mesh IBGP
RFC 3031 Multiprotocol Label Switching Architecture	RFC 2842 Capabilities Advertisement with BGP-4
RFC 3032 MPLS Label Stack Encoding	RFC 2858 Multiprotocol Extensions for BGP-4
RFC 3036 LDP Specification	RFC 2918 Route Refresh Capability for BGP-4
RFC 3046 DHCP Relay Agent Information Option	RFC 3107 Carrying Label Information in BGP-4
RFC 3063 MPLS Loop Prevention Mechanism	<b>IPsec</b>
RFC 3065 Support AS confederation	RFC 1828 IP Authentication using Keyed MD5
RFC 3137 OSPF Stub Router Advertisement	RFC 2401 IP Security Architecture
RFC 3209 RSVP-TE Extensions to RSVP for LSP Tunnels	RFC 2402 IP Authentication Header
RFC 3210 Applicability Statement for Extensions to RSVP for LSP-Tunnels	RFC 2406 IP Encapsulating Security Payload
RFC 3212 Constraint-Based LSP setup using LDP (CR-LDP)	RFC 2407 - Domain of interpretation
RFC 3214 LSP Modification Using CR-LDP	RFC 2410 - The NULL Encryption Algorithm and its use with IPsec
	RFC 2411 IP Security Document Roadmap
	RFC 2412 - OAKLEY
	RFC 2865 - Remote Authentication Dial In User Service (RADIUS)

## Accessories

### HPE MSR50 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
<b>HP X120 1G SFP LC SX Transceiver</b>	JD118B
<b>HP X120 1G SFP LC LX Transceiver</b>	JD119B
<b>HP X124 1G SFP LC LH40 1310nm Transceiver</b>	JD061A
<b>HP X120 1G SFP LC LH40 1550nm Transceiver</b>	JD062A
<b>HP X125 1G SFP LC LH70 Transceiver</b>	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 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 E1 4-port IMA Router Cable	JD638A
HP X260 8E1 BNC 75 ohm 3m Router Cable	JD512A
HP X260 SIC-8AS RJ45 0.28m Router Cable	JD642A
HP X200 Transit Plug D25F MP8(S) Single Cable	JD636A
HP X200 Transit Cable RJ45 0.5m Single Cable	JD641A
HP X260 mini D-28 to 4-RJ45 0.3m Router Cable	JG263A
<b>HP MSR 50 pin D-sub Male to 24 x RJ-11 Plug 15m Router Cable</b>	JG318A

## Accessories

HP CAB-75ohm 8E1-3m-BNC-IMA	JD927A
HP X260 8T1 RJ45 3m Router Cable	JD639A
<b>Power Supply</b>	
HP MSR50 350W AC Power Supply	JD650A
HP MSR50 350W DC Power Supply	JF443A
HP MSR50 500W PoE Power Module	JD652A
<b>License</b>	
HP MSR50 Series Standard Version Router Software License	JD434A
<b>Router Modules</b>	
HP MSR50 G2 Main Processing Unit	JD429B
HP MSR50 G2 Multi-Service Module	JD430A
HP MSR50 Main Processing Unit	JD653A
HP MSR50 Multi-Service Module	JD651A
HP MSR Advanced Network Data Encryption ESM Module	JD608A
HP MSR Standard Network Data Encryption ESM Module	JD609A
HP MSR Voice Co-processing Module	JD610A
HP MSR 32-Channel Voice Processing Module	JD598A
HP MSR 24-Channel Voice Processing Module	JD599A
HP MSR 16-Channel Voice Processing Module	JD600A
HP MSR 8-Channel Voice Processing Module	JD601A
HP MSR 9-port 10/100Base-T Switch DSIC Module	JD574B
HP MSR 9-port 10/100Base-T PoE Switch DSIC Module	JD621A
HP MSR 4-port 10/100Base-T Switch SIC Module	JD573B
HP MSR 4-port 10/100Base-T PoE Switch SIC Module	JD620A
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 ISDN-S/T Voice SIC Module	JF821A
HP MSR 2-port FXS/1-port FXO SIC Module	JD632A
HP MSR 1-port E1 Voice SIC Module	JD575A
HP MSR 1-port T1 Voice SIC Module	JD576A
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 ADSL over POTS SIC Module	JD537A
HP MSR 1-port ADSL over ISDN SIC Module	JG056B
HP MSR 1-port 8-wire G.SHDSL (RJ45) DSIC Module	JG191A
HP MSR 1-port Enhanced Sync/Async Serial SIC Module	JD557A
HP MSR 1-port ISDN-S/T SIC Module	JD571A
<b>HP MSR 8-port Async Serial SIC Module</b>	JF281A
HP MSR 16-port Async Serial SIC Module	JG186A
HP MSR 802.11b/g/n Wireless Access Point SIC Module	JF819A

## Accessories

HP MSR 802.11b/g/n Wireless Access Point SIC Module (NA)	JG211A
HP 3G Wireless GSM/WCDMA WAN SIC Module	JF820A
HP MSR 4-port 10/100Base-T FIC Module	JF824A
HP MSR 2-port 10/100Base-T FIC Module	JD577A
HP MSR 1-port Gig-T FIC Module	JD583B
HP MSR 1-port 1000Base-X FIC Module	JD582A
HP MSR 2-port Gig-T FIC Module	JF269B
HP MSR 2-port 1000BASE-X FIC Module	JF270B
HP 24-port 10/100 DFIC A-MSR Module	JD603A
HP MSR 16-port 10/100Base-T / 1-port GbE Combo Switch FIC Module	JD604A
HP 24-port 10/100 PoE DFIC Module	JD617A
HP MSR 16-port 10/100Base-T PoE / 1-port GbE Combo Switch FIC Module	JD616A
HP MSR 8-port Enhanced Sync/Async Serial FIC Module	JD580A
HP MSR 4-port Enhanced Sync/Async Serial FIC Module	JD584A
HP MSR 8-port Enhanced Async Serial FIC Module	JF260B
HP MSR 16-port Enhanced Async Serial FIC Module	JF265B
HP MSR 4-port FXO FIC Module	JD593A
HP MSR 4-port FXS FIC Module	JD594A
HP MSR 4-port E/M FIC Module	JD602A
HP MSR 2-port E1 Voice FIC Module	JD587A
HP MSR 1-port E1 Voice FIC Module	JD607A
HP MSR 2-port T1 Voice FIC Module	JD606A
HP MSR 1-port T1 Voice FIC Module	JD605A
HP MSR 8-port E1/CE1/PRI (75ohm) FIC Module	JD585A
HP MSR 4-port E1/CE1/PRI FIC Module	JD588A
HP MSR 2-port E1/CE1/PRI FIC Module	JD578A
HP MSR 4-port E1/Fractional E1 FIC Module	JD591A
HP MSR 4-port T1/Fractional T1 FIC Module	JD592A
HP MSR 1-port E3/CE3/FE3 FIC Module	JD625A
HP MSR 1-port T3/CT3/FT3 FIC Module	JD629A
HP MSR 1-port E3 ATM FIC Module	JD596A
HP MSR 1-port T3 ATM FIC Module	JD595A
HP MSR 4-port E1 IMA (75ohm) FIC Module	JD622A
HP MSR 4-port Enhanced ISDN-S/T FIC Module	JD589A
HP MSR 1-port OC-3c/STM-1c ATM SFP FIC Module	JD633A
HP MSR 1-port OC-3c/STM-1c POS FIC Module	JD581C
HP MSR 1-port OC-3/STM-1 (E1/T1) CPOS FIC Module	JG201A
<b>HP MSR 24-port FXS FIC Module</b>	JG197A
<b>HP MSR 8-port T1/CT1/PRI FIC Module</b>	JD586B
<b>HP MSR 8-port T1 IMA FIC Module</b>	JG200A
<b>HP MSR 8-port E1 IMA (75ohm) FIC Module</b>	JF278B
<b>HP MSR 1-port E1/CE1/PRI SIC Module</b>	JF253B
<b>HP MSR 4-port FXS / 1-port FXO DSIC Module</b>	JG189A
<b>HP MSR HSPA/WCDMA SIC Module</b>	JG187A
NEW HP MSR Open Application Platform (OAP) with VMware vSphere FIC Module	JG533A

## Memory

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**Accessories**

HP Series 256MB DDR SDRAM	JD647A
HP Series 512MB DDR SDRAM	JD648A
<b>HP 2GB DDR2 SDRAM Memory</b>	JG205A
<b>HP X600 1G Compact Flash Card</b>	JC684A
<b>HP X600 512M Compact Flash Card</b>	JC685A
<b>HP X600 256M Compact Flash Card</b>	JC686A

## Accessory Product Details

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

<b>HP X120 1G SFP LC SX Transceiver</b> (JD118B)  A small form-factor pluggable (SFP) Gigabit SX transceiver that provides a full-duplex Gigabit solution up to 550m on a Multimode fiber.	<b>Ports</b>	1 LC 1000BASE-SX port		
	<b>Connectivity</b>	<b>Connector type</b>	LC	
		<b>Wavelength</b>	850 nm	
	<b>Physical characteristics</b>	<b>Dimensions</b>	2.17(d) x 0.6(w) x 0.46(h) in. (5.51 x 1.52 x 1.17 cm)	
		<b>Full configuration weight</b>	0.04 lb. (0.02 kg)	
		<b>Electrical characteristics</b>	<b>Power consumption typical</b>	0.8 W
	<b>Power consumption maximum</b>		1.0 W	
	<b>Cabling</b>	Maximum distance:		
		<ul style="list-style-type: none"> <li>• FDDI Grade distance = 220m</li> <li>• OM1 = 275m</li> <li>• OM2 = 500m</li> <li>• OM3 = Not Specified by standard</li> </ul>		
		Cable length	up to 550m	
<b>Services</b>	Fiber type	Multi Mode		
	Refer to the Hewlett Packard Enterprise website at <a href="http://www.hpe.com/networking/services">http://www.hpe.com/networking/services</a> for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local Hewlett Packard Enterprise sales office.			

<b>HP X120 1G SFP LC LX Transceiver</b> (JD119B)  A small form-factor pluggable (SFP) Gigabit LX transceiver that provides a full duplex Gigabit solution up to 550m on MMF or 10Km on SMF	<b>Ports</b>	1 SFP 1000BASE-LX port (IEEE 802.3z Type 1000BASE-LX)		
	<b>Connectivity</b>	<b>Connector type</b>	LC	
		<b>Wavelength</b>	1300 nm	
	<b>Physical characteristics</b>	<b>Dimensions</b>	2.17(d) x 0.6(w) x 0.46(h) in. (5.51 x 1.52 x 1.17 cm)	
		<b>Full configuration weight</b>	0.04 lb. (0.02 kg)	
		<b>Electrical characteristics</b>	<b>Power consumption typical</b>	0.8 W
	<b>Power consumption maximum</b>		1.0 W	
	<b>Cabling</b>	Cable type:		
		Either single mode or multimode;		
		Maximum distance:		
<ul style="list-style-type: none"> <li>• 550m for Multimode</li> <li>• 10km for Singlemode</li> </ul>				

## Accessory Product Details

	Fiber type	Both
<b>Services</b>	Refer to the Hewlett Packard Enterprise website at <a href="http://www.hpe.com/networking/services">http://www.hpe.com/networking/services</a> for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local Hewlett Packard Enterprise sales office.	

<b>HP X125 1G SFP LC LH40 Ports 1310nm Transceiver (JD061A)</b>	1 LC 1000Base-LH port (no IEEE standard exists for 1550 nm optics)	
A small form-factor pluggable SFP Gigabit LH40 transceiver that provides a full duplex Gigabit solution up to 40km on a single-mode fiber.	<b>Connectivity</b>	Connector type LC Wavelength 1310 nm
	<b>Physical characteristics</b>	Dimensions 2.17(d) x 0.6(w) x 0.46(h) in. (5.51 x 1.52 x 1.17 cm) Full configuration weight 0.04 lb. (0.02 kg)
	<b>Electrical characteristics</b>	Power consumption typical 0.8 W Power consumption maximum 1.0 W
	<b>Cabling</b>	Cable type: Single-mode fiber optic, complying with ITU-T G.652;  Maximum distance: <ul style="list-style-type: none"> <li>40km distance</li> </ul>

	Fiber type	Single Mode
<b>Services</b>	Refer to the Hewlett Packard Enterprise website at <a href="http://www.hpe.com/networking/services">http://www.hpe.com/networking/services</a> for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local Hewlett Packard Enterprise sales office.	

<b>HP X120 1G SFP LC LH40 Ports 1550nm Transceiver (JD062A)</b>	1 LC 1000BASE-LH port (no IEEE standard exists for 1550 nm optics)	
A small form-factor pluggable (SFP) Gigabit LH40 transceiver that provides a full-duplex Gigabit solution up to 40 km on a single mode fiber.	<b>Connectivity</b>	Connector type LC Wavelength 1550 nm
	<b>Physical characteristics</b>	Dimensions 2.17(d) x 0.6(w) x 0.46(h) in. (5.51 x 1.52 x 1.17 cm) Full configuration weight 0.04 lb. (0.02 kg)
	<b>Electrical characteristics</b>	Power consumption typical 0.8 W Power consumption maximum 1.0 W
	<b>Cabling</b>	Cable type: Single-mode fiber optic, complying with ITU-T G.652;  Maximum distance: <ul style="list-style-type: none"> <li>40km distance</li> </ul>

	Fiber type	Single Mode
<b>Services</b>	Refer to the Hewlett Packard Enterprise website at	

## Accessory Product Details

<http://www.hpe.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 Hewlett Packard Enterprise sales office.

<b>HP X125 1G SFP LC LH70 Ports Transceiver (JD063B)</b>		1 LC 1000BASE-LH port (no IEEE standard exists for 1550 nm optics)	
A small form-factor pluggable (SFP) Gigabit LH70 transceiver that provides a full-duplex Gigabit solution up to 70km on a single-mode fiber.	<b>Connectivity</b>	<b>Connector type</b>	LC
	<b>Physical characteristics</b>	<b>Wavelength</b>	1550 nm
		<b>Dimensions</b>	2.17(d) x 0.6(w) x 0.46(h) in. (5.51 x 1.52 x 1.17 cm)
	<b>Electrical characteristics</b>	<b>Full configuration weight</b>	0.04 lb. (0.02 kg)
		<b>Power consumption typical</b>	0.8 W
<b>Cabling</b>	<b>Power consumption maximum</b>	1.0 W	
		Cable type: Single-mode fiber optic, complying with ITU-T G.652;	
<b>Services</b>		Maximum distance: • 70km	
		Fiber type Single Mode	
		Refer to the Hewlett Packard Enterprise website at <a href="http://www.hpe.com/networking/services">http://www.hpe.com/networking/services</a> for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local Hewlett Packard Enterprise sales office.	

<b>HP MSR 50 pin D-sub Male to 24 x RJ-11 Plug 15m Router Cable (JG318A)</b>		<b>Physical characteristics</b>	<b>Dimensions</b>	14.6(d) x 13.3(w) x 4.5(h) in. (37.08 x 33.78 x 11.43 cm)
			<b>Weight</b>	4.61 lb. (2.09 kg)
	<b>Services</b>	Refer to the Hewlett Packard Enterprise website at <a href="http://www.hpe.com/networking/services">http://www.hpe.com/networking/services</a> for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local Hewlett Packard Enterprise sales office.		

<b>HP MSR 8-port Async Serial SIC Module (JF281A)</b>		<b>Connectivity</b>	<b>Bit rate</b>	115.2Kbps
			<b>Interface</b>	RS232
	<b>Services</b>	Refer to the Hewlett Packard Enterprise website at <a href="http://www.hpe.com/networking/services">http://www.hpe.com/networking/services</a> for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local Hewlett Packard Enterprise sales office.		

<b>HP MSR 24-port FXS FIC</b>		<b>Connectivity</b>	<b>Interface</b>	D50
	<b>Physical characteristics</b>	<b>Dimensions</b>	12(d) x 14.6(w) x 4.2(h) in. (30.48 x 37.08 x 10.67)	



## Accessory Product Details

<b>Module</b> (JG197A)			cm)
	<b>Weight</b>		3.7 lb. (1.68 kg)
	<b>Services</b>		Refer to the Hewlett Packard Enterprise website at <a href="http://www.hpe.com/networking/services">http://www.hpe.com/networking/services</a> for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local Hewlett Packard Enterprise sales office.
<b>HP MSR 8-port T1/CT1/PRI FIC Module</b> (JD586B)	<b>Physical characteristics</b>	<b>Dimensions</b>	12(d) x 14.6(w) x 4.2(h) in. (30.48 x 37.08 x 10.67 cm)
		<b>Weight</b>	3 lb. (1.36 kg)
	<b>Services</b>		Refer to the Hewlett Packard Enterprise website at <a href="http://www.hpe.com/networking/services">http://www.hpe.com/networking/services</a> for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local Hewlett Packard Enterprise sales office.
<b>HP MSR 8-port T1 IMA FIC Module</b> (JG200A)	<b>Connectivity</b>	<b>Interface</b>	D68, ITU-G.703, ITU-G.704
	<b>Physical characteristics</b>	<b>Dimensions</b>	12(d) x 14.6(w) x 4.2(h) in. (30.48 x 37.08 x 10.67 cm)
		<b>Weight</b>	3.11 lb. (1.41 kg)
	<b>Services</b>		Refer to the Hewlett Packard Enterprise website at <a href="http://www.hpe.com/networking/services">http://www.hpe.com/networking/services</a> for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local Hewlett Packard Enterprise sales office.
<b>HP MSR 8-port E1 IMA (75ohm) FIC Module</b> (JF278B)	<b>Connectivity</b>	T1: 2.048 Mbps	
		<b>Interface</b>	D68, ITU-G.703, ITU-G.704
	<b>Physical characteristics</b>	<b>Dimensions</b>	12(d) x 14.6(w) x 4.2(h) in. (30.48 x 37.08 x 10.67 cm)
		<b>Weight</b>	3.11 lb. (1.41 kg)
	<b>Services</b>		Refer to the Hewlett Packard Enterprise website at <a href="http://www.hpe.com/networking/services">http://www.hpe.com/networking/services</a> for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local Hewlett Packard Enterprise sales office.
<b>HP MSR 1-port E1/CE1/PRI SIC Module</b> (JF253B)	<b>Connectivity</b>	E1: 2.048 Mbps	
		<b>Interface</b>	D15
	<b>Physical characteristics</b>	<b>Dimensions</b>	12.8(d) x 8.3(w) x 4.2(h) in. (32.51 x 21.08 x 10.67 cm)
		<b>Weight</b>	1.1 lb. (0.5 kg)
	<b>Notes</b>		support 75ohm cable direct connection, can support 120Ohm connection but need to JD511A (75-120 ohm convertor)
	<b>Services</b>		Refer to the Hewlett Packard Enterprise website at

## Accessory Product Details

<http://www.hpe.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 Hewlett Packard Enterprise sales office.

<b>HP MSR 4-port FXS / 1-port FXO DSIC Module</b> (JG189A)	<b>Connectivity</b>	<b>Interface</b>	5*RJ11
	<b>Physical characteristics</b>	<b>Dimensions</b>	12.8(d) x 8.3(w) x 4.2(h) in. (32.51 x 21.08 x 10.67 cm)
		<b>Weight</b>	1.19 lb. (0.54 kg)
	<b>Services</b>	Refer to the Hewlett Packard Enterprise website at <a href="http://www.hpe.com/networking/services">http://www.hpe.com/networking/services</a> for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local Hewlett Packard Enterprise sales office..	

<b>HP MSR HSPA/WCDMA SIC Module</b> (JG187A)	<b>Connectivity</b>	<b>Interface</b>	2*TNC RF, 1*RJ45
	<b>Physical characteristics</b>	<b>Dimensions</b>	12.8(d) x 8.3(w) x 4.2(h) in. (32.51 x 21.08 x 10.67 cm)
		<b>Weight</b>	1.41 lb. (0.64 kg)
	<b>Services</b>	Refer to the Hewlett Packard Enterprise website at <a href="http://www.hpe.com/networking/services">http://www.hpe.com/networking/services</a> for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local Hewlett Packard Enterprise sales office.	

<b>HP 2GB DDR2 SDRAM Memory</b> (JG205A)	<b>Physical characteristics</b>	<b>Dimensions</b>	8.8(d) x 5(w) x 2.6(h) in. (22.35 x 12.7 x 6.6 cm)
		<b>Weight</b>	0.99 lb. (0.45 kg)
	<b>Services</b>	Refer to the Hewlett Packard Enterprise website at <a href="http://www.hpe.com/networking/services">http://www.hpe.com/networking/services</a> for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local Hewlett Packard Enterprise sales office.	

<b>HP X600 1G Compact Flash Card</b> (JC684A)	<b>Physical characteristics</b>	<b>Dimensions</b>	4.96(d) x 8.82(w) x 2.56(h) in. (12.6 x 22.4 x 6.5 cm)
		<b>Weight</b>	0.33 lb. (0.15 kg)
	<b>Services</b>	Refer to the Hewlett Packard Enterprise website at <a href="http://www.hpe.com/networking/services">http://www.hpe.com/networking/services</a> for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local Hewlett Packard Enterprise sales office.	

<b>HP X600 512M Compact Flash Card</b> (JC685A)	<b>Physical characteristics</b>	<b>Dimensions</b>	4.96(d) x 8.82(w) x 2.56(h) in. (12.6 x 22.4 x 6.5 cm)
		<b>Weight</b>	0.33 lb. (0.15 kg)
	<b>Services</b>	Refer to the Hewlett Packard Enterprise website at <a href="http://www.hpe.com/networking/services">http://www.hpe.com/networking/services</a> for details on the service-	

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## Accessory Product Details

level descriptions and product numbers. For details about services and response times in your area, please contact your local Hewlett Packard Enterprise sales office.

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<b>HP X600 256M Compact Flash Card</b> (JC686A)	<b>Physical characteristics</b>	<b>Dimensions</b>	4.96(d) x 8.82(w) x 2.56(h) in. (12.6 x 22.4 x 6.5 cm)
	<b>Services</b>	<b>Weight</b>	0.33 lb. (0.15 kg)
			Refer to the Hewlett Packard Enterprise website at <a href="http://www.hpe.com/networking/services">http://www.hpe.com/networking/services</a> for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local Hewlett Packard Enterprise sales office.

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## Summary of Changes

<b>Date</b>	<b>Version History</b>	<b>Action</b>	<b>Description of Change:</b>
December 1, 2015	From Version 22 to 23	Changed	Overview and Technical Specifications updated
February 11, 2015	From Version 21 to 22	Changed	Configuration menu updated
July 3, 2014	From Version 20 to 21	Changed	Configuration menu updated.
June 17, 2014	From Version 18 to 20	Changed	Updated General Protocols, as well as the AC Voltage specifications.
June 10, 2014	From Version 17 to 18	Changed	Updated Router Options.
January 31, 2014	From Version 16 to 17	Changed	Minor edit was made in Configuration
December 13, 2013	From Version 15 to 16	Changed	Multi-Service Module Slot, FIC Modules, and SIC Modules were revised in Configuration.
November 22, 2013	From Version 14 to 15	Changed	FIC Modules, SIC Modules, and Cables were revised in Configuration.
October 18, 2013	From Version 13 to 14	Changed	Configuration was revised.
September 30, 2013	From Version 12 to 13	Removed	HP 1-port Analog Modem SIC MSR Module was removed from Accessories
September 27, 2013	From Version 11 to 12	Changed	Configuration was revised.
August 9, 2013	From Version 10 to 11	Changed	Notes were revised in CTO Models.
July 12, 2013	From Version 9 to 10	Changed	Updated the Configuration section.
June 10, 2013	From Version 8 to 9	Added	Configuration was added.
March 5, 2013	From Version 7 to 8	Added	Added two images to the Overview section.
February 19, 2013	From Version 6 to 7	Changed	Product overview, Features and benefits, Model specifications, and Accessories were revised.
March 26, 2012	From Version 5 to 6	Changed	Changes were made throughout.
November 14, 2011	From Version 4 to 5	Changed	The product name and accessories sections were updated.
October 13, 2011	From Version 3 to 4	Added	Accessory Product Descriptions was added.
March 16, 2011	From Version 2 to 3	Changed	Changes were made throughout.

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## Summary of Changes



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