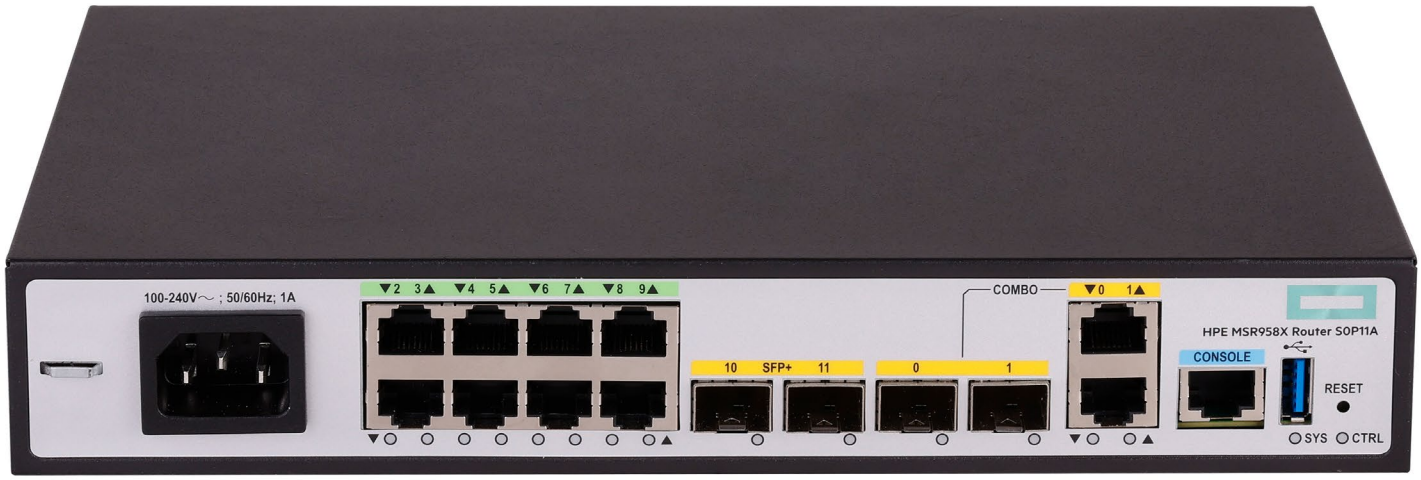
Shape the Future of QuickSpecs - Your Input Matters

# HPE Networking Comware Router Series MSR95x QuickSpecs

**The HPE Networking Comware Router Series MSR95x is a high-performance Comware v7 based small-branch router that delivers integrated routing, 4-port or 8-port switch options, security, SIP, embedded 802.11b/g/n WLAN connectivity, dual 3G/4G LTE, and fiber (SFP) in a single box.**

The MSR95x Router Series solutions deliver up to 300 Kpps forwarding with comprehensive IPv4 and IPv6 routing, MPLS, QoS, stateful firewall, network address translation (NAT), VPN, switching, voice, and wireless capabilities in a compact, fixed form factor. Moreover, this router series is based on open standards for seamless integration with existing small-branch deployments.

## Overview




**HPE Networking Comware MSR958X 10GbE and Combo Router (S0P11A)**

## Key features

- Converged high-performance fiber routing, switching, security, and 3 Mpps performance
- Integrated 1/10GbE WAN and LAN, fiber (SFP)
- Embedded encryption, stateful firewall, NAT, ADVPN security features
- Unified Comware v7 OS, Comware v7 OS zero-touch solution, and single-pane-of-glass management
- The new 958X router supports 10GbE ports with Comware v9 OS

Standard Features

# 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
- **Weighted random early detection (WRED)/random early detection (RED)**
  delivers congestion avoidance capabilities through the use of queue management algorithms
- **Other QoS technologies**
  support traffic shaping, FR QoS, and MP QoS/LFI

## Management

- **Industry-standard CLI with a hierarchical structure**
  reduces training time and expenses, and increases productivity in multivendor installations
- **Management security**
  restricts access to critical configuration commands; offers multiple privilege levels with password protection; ACLs provide Telnet and SNMP access; local and remote syslog capabilities allow logging of all access
- **SNMPv1, v2, and v3**
  provide complete support of SNMP; provide full support of industry-standard Management Information Base (MIB) plus private extensions; SNMPv3 supports increased security using encryption
- **Remote monitoring (RMON)**
  uses standard SNMP to monitor essential network functions; supports events, alarm, history, and statistics group plus a private alarm extension group
- **FTP, TFTP, and SFTP support**
  offers different mechanisms for configuration updates; FTP allows bidirectional transfers over a TCP/IP network; trivial FTP (TFTP) is a simpler method using User Datagram Protocol (UDP); Secure File Transfer Protocol (SFTP) runs over an SSH tunnel to provide additional security
- **Debug and sampler utility**
  supports ping and traceroute for both IPv4 and IPv6
- **Network Time Protocol (NTP)**
  synchronizes timekeeping among distributed time servers and clients; keeps timekeeping consistent among all clock-dependent devices within the network so that the devices can provide diverse applications based on the consistent time
- **Information center**
  provides a central repository for system and network information; aggregates all logs, traps, and debugging information generated by the system and maintains them in order of severity; outputs the network information to multiple channels based on user-defined rules

## Connectivity

- **Multiple Gigabit Ethernet connection options**
  provides 2 GbE WAN and 4 GbE LAN ports onboard
- **Multiple advanced WAN interfaces**
  provide traditional connection options including GbE copper (cat5e/Ethernet) connection but an additional Fiber (SFP) port for a total of 2 WAN Gigabit Ethernet ports; and offer wireless access with 4G LTE, 3G and 802.11n WLAN connectivity

## Standard Features

- **4G LTE Verizon/At&t/Sprint and global carrier support**
  delivers embedded 4G LTE wireless WAN backhaul connectivity with three different carrier firmware options and simultaneous 802.11n WLAN connectivity
- **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 basis for added flexibility
- **3G and 4G LTE access**
  supports popular 3G and 4G LTE USB modems; for a list of supported products, contact your local HPE representative

### Performance

- **Forwarding performance**
  provides up to 3Mpps and meets current and future bandwidth-intensive application demands for enterprise businesses
- **Embedded encryption**
  supports up to 100 VPN tunnels and up to 160 Mb/s encryption throughput
- **Gigabit Ethernet interface**
  provides a connection to the network that eliminates the network as a bottleneck

### 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; and supports VRRP load balancing

### Layer 2 switching

- **Spanning Tree Protocol (STP)**
  supports standard IEEE 802.1D STP, IEEE 802.1w Rapid Spanning Tree Protocol (RSTP) for faster convergence, and IEEE 802.1s Multiple Spanning Tree Protocol (MSTP)
- **Internet Group Management Protocol (IGMP) and Multicast Listener Discovery (MLD) protocol snooping**
  controls and manages the flooding of multicast packets in a Layer 2 network
- **Port mirroring**
  duplicates port traffic (ingress and egress) to a local or remote monitoring port
- **Port isolation**
  increases security by isolating ports within a VLAN while still allowing them to communicate with other VLANs
- **VLANs**
  supports IEEE 802.1Q-based VLANs
- **sFlow**
  allows traffic sampling

## Standard Features

### 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
- **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)**
  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
- **Policy routing**
  allows custom filters for increased performance and security; supports ACLs, IP prefix, AS paths, community lists, and aggregate policies

Standard Features

- **BGP4+ support**
  utilizes the BGP-4 (RFC 4271) exterior routing protocol for routing integrity and reliability between different autonomous systems

## Security

- **Intrusion prevention system (IPS) and high encryption (HE)**
  With Comware v7, deploy router-based IPS to help prevent attacks at the perimeter, and high encryption for enhanced traffic security
- **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
- **Remote Authentication Dial-in user Service (RADIUS) login**
  eases security access administration by using a password authentication server
- **NAT enablement**
  facilitates one-to-one NAT, many-to-many NAT, and NAT control—enabling NAT-PT to support multiple connections; supports blacklisting in the NAT/NAT-PT; and enables a limit on the number of connections, session logs, and multiple instances
- **SSHv2**
  uses external servers to securely log in to a remote device or MSRs from a remote location; protects against IP spoofing and plain-text password interception, with authentication and encryption; and increases the security of SFTP transfers
- **Unicast Reverse Path Forwarding (URPF)**
  allows normal packets to be forwarded correctly, but discards the attaching packets due to lack of a reverse path route or an incorrect inbound interface; and helps prevents source spoofing and distributed attacks
- **IPSec VPN**
  supports DES, 3DES, and AES 128/192/256 encryption as well as MD5 and SHA-1 authentication

- **DVPN**
  collects, maintains, and distributes dynamic public addresses through the VPN Address Management (VAM) protocol, making the VPN establishment available between enterprise branches that use dynamic addresses to access the public network; compared to traditional VPN technologies, the 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)**
  utilizes Any-Source Multicast (ASM) or Source-Specific Multicast (SSM) to manage IPv4 multicast networks; supports IGMPv1, v2, and v3
- **Protocol Independent Multicast (PIM)**
  defines modes of Internet IPv4 and IPv6 multicasting to allow one-to-many and many-to-many transmission of information; supports PIM Dense Mode (DM), Sparse Mode (SM), and Source-Specific Multicast(SSM)

Standard Features

- **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
- **Internet Group Management Protocol (IGMP) snooping and proxy**
  - Monitors and observes IGMP network traffic, allowing the network device to listen in on the IGMP conversation between hosts and routers—enabling better IP multicast stream control
  - Allows a multicast router to learn multicast group membership information; and enables it to forward multicast packets
- **Multicast VPN and bidirectional protocol-independent multicasting (PIM)**
  - Allows rich multicast services such as video conferencing and data sharing amongst enterprise VPN-based deployments
  - Improves scalability of various applications through the use of bidirectional PIM

## Integration

- **Embedded NetStream**
  improves traffic distribution using powerful scheduling algorithms, including Layer 4 to 7 services; monitors the health status of servers and firewalls

## Additional information

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

## Warranty and support

For details on Limited Lifetime warranty and software releases available with your product purchase, please refer to hpe.com/networking/support

Configuration Information

## MSR 954 Router Series

### BTO Models

| Rule # | Description | SKU |
|---|---|---|
| 1, 2 | HPE MSR954 1GbE SFP 2GbE-WAN 4GbE-LAN CWv7 Router | JH296A |
| | HPE MSR954 1GbE SFP 2GbE-WAN 4GbE-LAN CWv7 Router PDU NA, JP or TW | JH296A#B2B |
| | HPE MSR954 1GbE SFP 2GbE-WAN 4GbE-LAN CWv7 Router PDU ROW | JH296A#B2C |
| | HPE MSR954 1GbE SFP 2GbE-WAN 4GbE-LAN CWv7 Router United States 220 volt | JH296A#B2E |
| | HPE MSR954 1GbE SFP Router | JH296A#AC3 |
| 1, 2, 3 | HPE Networking MSR954-W 1GbE SFP (WW) 2GbE-WAN 4GbE-LAN Wireless 802.11n CWv7 Router | JH297A |
| | HPE Networking MSR954-W 1GbE SFP (WW) 2GbE-WAN 4GbE-LAN Wireless 802.11n CWv7 Router PDU | JH297A#B2B |
| | HPE Networking MSR954-W 1GbE SFP (WW) 2GbE-WAN 4GbE-LAN Wireless 802.11n CWv7 Router PDU | JH297A#B2C |
| | HPE Networking MSR954-W 1GbE SFP (WW) 2GbE-WAN 4GbE-LAN Wireless 802.11n CWv7 Router | JH297A#AC3 |

### Configuration Rules

| Rule # | Description | SKU |
|---|---|---|
| 1 | Localization required on orders without #B2B, #B2C or #B2E. (See Localization Menu) | |
| 2 | The following Transceivers install into this Router: | |
| | HPE Networking X120 1G SFP LC SX Transceiver | JD118B |
| | HPE Networking X120 1G SFP LC LX Transceiver | JD119B |
| | HPE Networking X120 1G SFP LC BX 10-D Transceiver | JD099B |
| | HPE Networking X120 1G SFP LC BX 10-U Transceiver | JD098B |
| | HPE Networking X120 1G SFP LC LH100 Transceiver | JD103A |
| | HPE Networking X120 1G SFP RJ45 T Transceiver | JD089B |
| 3 | For AMS Region, this switch is available in Brasil only. | |
| **Notes:** | OCA Only Model Selection Form - HPE Offering > HPE Aruba Networking > Routers - Branch: MSR954 Router Series | |

## Router Options

### Mounting Kit

| Rule # | Description | SKU |
|---|---|---|
| 1 | HPE Networking MSR954 Chassis Rack Mount Kit | JH316A |

### Configuration Rules

| Rule # | Description | SKU |
|---|---|---|
| 1 | This Rackmount Kit is supported on the following Routers: | |
| | HPE MSR954 1GbE SFP 2GbE-WAN 4GbE-LAN CWv7 Router | JH296A |
| | HPE Networking MSR954-W 1GbE SFP (WW) 2GbE-WAN 4GbE-LAN Wireless 802.11n CWv7 Router | JH297A |

Configuration Information

## Transceivers

### SFP Transceivers

| Rule # | Description | SKU |
|---|---|---|
| | HPE Networking X120 1G SFP LC SX Transceiver | JD118B |
| | HPE Networking X120 1G SFP LC LX Transceiver | JD119B |
| | HPE Networking X120 1G SFP LC BX 10-D Transceiver | JD099B |
| | HPE Networking X120 1G SFP LC BX 10-U Transceiver | JD098B |
| | HPE Networking X120 1G SFP LC LH100 Transceiver | JD103A |
| | HPE Networking X120 1G SFP RJ45 T Transceiver | JD089B |

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## MSR 958 Router Series

### BTO Models

| Rule # | Description | SKU |
|---|---|---|
| 1, 3, 4, 5 | HPE Networking Comware Router 10GbE and Combo MSR958X | SOP11A |
| | HPE Networking Comware Router 10GbE and Combo MSR958X | SOP11A |
| | HPE Networking Comware Router 10GbE and Combo MSR958X | SOP11A |
| | HPE Networking Comware Router 10GbE and Combo MSR958X | SOP11A |
| 1, 2 | HPE Networking Comware Router 1GbE and Combo 2GbE WAN 8GbE LAN MSR958 | JH300A |
| | HPE Networking Comware Router 1GbE and Combo 2GbE WAN 8GbE LAN MSR958 | JH300A |
| | HPE Networking Comware Router 1GbE and Combo 2GbE WAN 8GbE LAN MSR958 | JH300A |
| | HPE Networking Comware Router 1GbE and Combo 2GbE WAN 8GbE LAN MSR958 | JH300A |
| 1, 2 | HPE Networking Comware Router 1GbE and Combo 2GbE WAN 8GbE LAN PoE MSR958 | JH301A |
| | HPE Networking Comware Router 1GbE and Combo 2GbE WAN 8GbE LAN PoE MSR958 | JH301A |
| | HPE Networking Comware Router 1GbE and Combo 2GbE WAN 8GbE LAN PoE MSR958 | JH301A |
| | HPE Networking Comware Router 1GbE and Combo 2GbE WAN 8GbE LAN PoE MSR958 | JH301A |

### Configuration Rules

| Rule # | Description | |
|---|---|---|
| 1 | Localization required on orders without #B2B, #B2C or #B2E. (See Localization Menu) | |
| 2 | The following Transceivers install into this Router: | |
| | HPE Networking X115 100M SFP LC BX 10-D Transceiver | JD101A |
| | HPE Networking X115 100M SFP LC FX Transceiver | JD102B |
| | HPE Networking X110 100M SFP LC LX Transceiver | JD120B |
| | HPE Networking X115 100M SFP LC BX 10-U Transceiver | JD100A |
| | HPE Networking X120 1G SFP LC SX Transceiver | JD118B |
| | HPE Networking X120 1G SFP LC LX Transceiver | JD119B |
| | HPE Networking X120 1G SFP LC BX 10-D Transceiver | JD099B |
| | HPE Networking X120 1G SFP LC BX 10-U Transceiver | JD098B |
| | HPE Networking X120 1G SFP LC LH100 Transceiver | JD103A |
| | HPE Networking X120 1G SFP RJ45 T Transceiver | JD089B |
| 3 | The following Transceivers install into this Router: | |
| | HPE Networking X130 10G SFP+ LC ER 40km Transceiver | JG234A |
| | HPE Networking X130 10G SFP+ LC LH 80km Transceiver | JG915A |
| | HPE Networking X130 10G SFP+ LC LR Transceiver | JD094B |

Configuration Information

| | | |
|---|---|---|
| | HPE Networking X130 10G SFP+ LC SR Transceiver | JD092B |
| | HPE Networking X130 10G SFP+ LC BiDi 10km-Uplink Transceiver | JL737A |
| | HPE Networking X130 10G SFP+ LC BiDi 10km-Downlink Transceiver | JL738A |
| | HPE Networking X130 10G SFP+ LC BiDi 40km-Uplink Transceiver | JL739A |
| | HPE Networking X130 10G SFP+ LC BiDi 40km-Downlink Transceiver | JL740A |
| 4 | The following Transceivers install into this Router: | |
| | HPE Networking X115 100M SFP LC FX Transceiver | JD102B |
| | HPE Networking X110 100M SFP LC LX Transceiver | JD120B |
| | HPE Networking X115 100M SFP LC BX 10-U Transceiver | JD100A |
| | HPE Networking X120 1G SFP LC BX 10-D Transceiver | JD099B |
| | HPE Networking X120 1G SFP LC BX 10-U Transceiver | JD098B |
| | HPE Networking X120 1G SFP LC LH100 Transceiver | JD103A |
| | HPE Networking X120 1G SFP RJ45 T Transceiver | JD089B |
| 5 | The following Transceivers install into this Router: | |
| | HPE Networking Comware 10GBASE-T SFP+ RJ45 30m Cat6A Transceiver | S2N61A |
| **Notes:** | OCA Only Model Selection Form - HPE Offering > HPE Aruba Networking > Routers - Branch: MSR958 Router Series | |

## Router Options

### Mounting Kit

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

| Rule # | Description | SKU |
|---|---|---|
| | HPE Networking MSR958 Chassis Rack Mount Kit | JH317A |

## Transceivers

### SFP Transceivers

| Rule # | Description | SKU |
|---|---|---|
| | HPE Networking X115 100M SFP LC BX 10-D Transceiver | JD101A |
| | HPE Networking X115 100M SFP LC FX Transceiver | JD102B |
| | HPE Networking X110 100M SFP LC LX Transceiver | JD120B |
| | HPE Networking X115 100M SFP LC BX 10-U Transceiver | JD100A |
| | HPE Networking X120 1G SFP LC SX Transceiver | JD118B |
| | HPE Networking X120 1G SFP LC LX Transceiver | JD119B |
| | HPE Networking X120 1G SFP LC BX 10-D Transceiver | JD099B |
| | HPE Networking X120 1G SFP LC BX 10-U Transceiver | JD098B |
| | HPE Networking X120 1G SFP LC LH100 Transceiver | JD103A |
| | HPE Networking X120 1G SFP RJ45 T Transceiver | JD089B |

### SFP+Transceivers

| Rule # | Description | SKU |
|---|---|---|
| | HPE Networking X130 10G SFP+ LC ER 40km Transceiver | JG234A |
| | HPE Networking X130 10G SFP+ LC LH 80km Transceiver | JG915A |
| | HPE Networking X130 10G SFP+ LC LR Transceiver | JD094B |
| | HPE Networking X130 10G SFP+ LC SR Transceiver | JD092B |

## Configuration Information

| | |
|---|---|
| HPE Networking X130 10G SFP+ LC BiDi 10km-Uplink Transceiver | JL737A |
| HPE Networking X130 10G SFP+ LC BiDi 10km-Downlink Transceiver | JL738A |
| HPE Networking X130 10G SFP+ LC BiDi 40km-Uplink Transceiver | JL739A |
| HPE Networking X130 10G SFP+ LC BiDi 40km-Downlink Transceiver | JL740A |
| HPE Networking Comware 10GBASE-T SFP+ RJ45 30m Cat6A Transceiver | S2N61A |

Technical Specifications

| HPE FlexNetwork MSR954 Serial 1GbE Dual 4G LTE (WW) Router (JH373A) | | |
|---|---|---|
| **I/O ports and slots** | 1 RJ-45 autosensing 10/100/1000 WAN port | |
| | 4 RJ-45 autosensing 10/100/1000 LAN ports | |
| | 1 Serial port | |
| **Additional ports and slots** | 1 USB 2.0<br>1 RJ-45 console port<br>2 SIM slots | |
| **AP characteristics** | **Radios (built-in)** | 802.11b/g/n; 3G, 4G LTE |
| | **AP operation modes** | Autonomous |
| | **Wi-Fi Alliance Certification** | b/g/n Wi-Fi Certified |
| **Physical characteristics** | **Dimensions** | 10.47(w) x 6.34(d) x 1.72(h) in (26.59 x 16.1 x 4.37 cm) (1U height) |
| | **Weight** | 2.2 lb (1 kg) |
| **Memory and processor** | Marvell A370 @ 800 MHz, 1 GB DDR3 SDRAM; storage: 64GB SD Card, 256MB NAND flash | |
| **Performance** | **Throughput** | up to 300 Kpps (64-byte packets) |
| | **Routing table size** | 10000 entries (IPv4), 5000 entries (IPv6) |
| | **Forwarding table size** | 10000 entries (IPv4), 5000 entries (IPv6) |
| **Environment** | **Operating temperature** | 32°F to 113°F (0°C to 45°C) |
| | **Operating relative humidity** | 5% to 92%, noncondensing |
| | **Altitude** | up to 5,000 ft (1.5 km) |
| **Electrical characteristics** | **Voltage** | 100 - 264 VAC, rated |
| | **Maximum power rating** | 22 W |
| | **Notes;** | Maximum power rating and maximum heat dissipation are the worst-case theoretical maximum numbers provided for planning the infrastructure with fully loaded PoE (if equipped), 100% traffic, all ports plugged in, and all modules populated. |
| **Safety** | UL 60950-1, CAN/CSA 22.2 No. 60950-1, AS/NZS 60950, EN 60825-1 Safety of Laser Products-Part 1, EN 60825-2 Safety of Laser Products-Part 2, IEC 60950-1, CAN/CSA-C22.2 No. 60950-1-03, EN 60950-1/A11, FDA 21 CFR Subchapter J | |
| **Emissions** | ANSI C63.4; EN 55022 Class B; ICES-003 Class B; ETSI EN 300 386 V1.3.3; 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; EN 55024:1998+ A1:2001 + A2:2003; EN 61000-4-11:2004; EN 61000-4-8:2001; AS/NZS CISPR 22 Class B; FCC (CFR 47, Part 15) Class B | |
| **Telecom** | FCC part 68; TIA-968-B; CS03 Part 8; AS/ACIF S043; G.992.1/2/3/5 | |
| **Management** | IMC - Intelligent Management Center; Command-line interface; Web browser; SNMP manager; Telnet; RMON1; FTP; IEEE 802.3 Ethernet MIB | |
| **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. | |

Technical Specifications

| HPE MSR954 1GbE SFP 2GbE-WAN 4GbE-LAN CWv7 Router (JH296A) | | |
|---|---|---|
| **I/O ports and slots** | 1 fixed Gigabit Ethernet SFP port | |
| | 1 RJ-45 autosensing 10/100/1000 WAN port | |
| | 4 RJ-45 autosensing 10/100/1000 LAN ports | |
| **Additional ports and slots** | 2 USB 2.0<br>1 RJ-45 console port | |
| **Physical characteristics** | **Dimensions** | 10.47(w) x 6.34(d) x 1.72(h) in (26.6 x 16.1 x 4.36 cm) (1U height) |
| | **Weight** | 2.2 lb (1 kg) |
| **Memory and processor** | Marvell A370 @ 800 MHz, 1 GB DDR3 SDRAM, 256 MB NAND flash, 64 GB SD Card | |
| **Performance** | **Throughput** | up to 300 Kpps (64-byte packets) |
| | **Routing table size** | 10000 entries (IPv4), 5000 entries (IPv6) |
| | **Forwarding table size** | 10000 entries (IPv4), 5000 entries (IPv6) |
| **Environment** | **Operating temperature** | 32°F to 113°F (0°C to 45°C) |
| | **Operating relative humidity** | 5% to 92%, noncondensing |
| | **Altitude** | up to 5,000 ft (1.5 km) |
| **Electrical characteristics** | **Voltage** | 100 - 264 VAC, rated |
| | **Maximum power rating** | 22 W |
| | **Notes:** | Maximum power rating and maximum heat dissipation are the worst-case theoretical maximum numbers provided for planning the infrastructure with fully loaded PoE (if equipped), 100% traffic, all ports plugged in, and all modules populated. |
| **Safety** | UL 60950-1; CAN/CSA 22.2 No. 60950-1; AS/NZS 60950; EN 60825-1 Safety of Laser Products-Part 1; EN 60825-2 Safety of Laser Products-Part 2; IEC 60950-1; CAN/CSA-C22.2 No. 60950-1-03; EN 60950-1/A11; FDA 21 CFR Subchapter J | |
| **Emissions** | ANSI C63.4; EN 55022 Class B; ICES-003 Class B; ETSI EN 300 386 V1.3.3; 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; EN 55024:1998+ A1:2001 + A2:2003; EN 61000-4-11:2004; EN 61000-4-8:2001; AS/NZS CISPR 22 Class B; FCC (CFR 47, Part 15) Class B | |
| **Telecom** | FCC part 68; TIA-968-B; CS03 Part 8; AS/ACIF S043; G.992.1/2/3/5 | |
| **Management** | IMC - Intelligent Management Center; Command-line interface; Web browser; SNMP manager; Telnet; RMON1; FTP; IEEE 802.3 Ethernet MIB | |
| **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. | |

Technical Specifications

| HPE MSR954-W 1GbE SFP (WW) 2GbE-WAN 4GbE-LAN Wireless 802.11n CWv7 Router (JH297A) | | |
|---|---|---|
| **I/O ports and slots** | 1 fixed Gigabit Ethernet SFP port | |
| | 1 RJ-45 autosensing 10/100/1000 WAN port | |
| | 4 RJ-45 autosensing 10/100/1000 LAN ports | |
| **Additional ports and slots** | 1 RJ-45 console port | |
| **AP characteristics** | **Radios (built-in)** | 802.11b/g/n |
| **Physical characteristics** | **Dimensions** | 10.47(w) x 6.34(d) x 1.72(h) in (26.6 x 16.1 x 4.36 cm) (1U height) |
| | **Weight** | 2.2 lb (1 kg) |
| **Memory and processor** | Marvell A370 @ 800 MHz, 1 GB DDR3 SDRAM, 256 MB NAND flash, 64 GB SD Card | |
| **Performance** | **Throughput** | up to 300 Kpps (64-byte packets) |
| | **Routing table size** | 10000 entries (IPv4), 5000 entries (IPv6) |
| | **Forwarding table size** | 10000 entries (IPv4), 5000 entries (IPv6) |
| **Environment** | **Operating temperature** | 32°F to 113°F (0°C to 45°C) |
| | **Operating relative humidity** | 5% to 92%, noncondensing |
| | **Altitude** | up to 5,000 ft (1.5 km) |
| **Electrical characteristics** | **Voltage** | 100 - 264 VAC, rated |
| | **Maximum power rating** | 22 W |
| | **Notes:** | Maximum power rating and maximum heat dissipation are the worst-case theoretical maximum numbers provided for planning the infrastructure with fully loaded PoE (if equipped), 100% traffic, all ports plugged in, and all modules populated. |
| **Safety** | UL 60950-1; CAN/CSA 22.2 No. 60950-1; AS/NZS 60950; EN 60825-1 Safety of Laser Products-Part 1; EN 60825-2 Safety of Laser Products-Part 2; IEC 60950-1; CAN/CSA-C22.2 No. 60950-1-03; EN 60950-1/A11; FDA 21 CFR Subchapter J | |
| **Emissions** | ANSI C63.4; EN 55022 Class B; ICES-003 Class B; ETSI EN 300 386 V1.3.3; 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; EN 55024:1998+ A1:2001 + A2:2003; EN 61000-4-11:2004; EN 61000-4-8:2001; AS/NZS CISPR 22 Class B; FCC (CFR 47, Part 15) Class B | |
| **Telecom** | FCC part 68; TIA-968-B; CS03 Part 8; AS/ACIF S043; G.992.1/2/3/5 | |
| **Management** | IMC - Intelligent Management Center; Command-line interface; Web browser; SNMP manager; Telnet; RMON1; FTP; IEEE 802.3 Ethernet MIB | |
| **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. | |

Technical Specifications

| HPE MSR954-W 1GbE SFP LTE (AM) 2GbE-WAN 4GbE-LAN Wireless 802.11n CWv7 Router (JH298A) | | |
|---|---|---|
| **I/O ports and slots** | 1 fixed Gigabit Ethernet SFP port | |
| | 1 RJ-45 autosensing 10/100/1000 WAN port | |
| | 4 RJ-45 autosensing 10/100/1000 LAN ports | |
| **Additional ports and slots** | 2 USB 2.0<br>1 RJ-45 console port<br>1 SIM slot | |
| **AP characteristics** | **Radios (built-in)** | 802.11b/g/n; 3G, 4G LTE |
| | **AP operation modes** | Autonomous |
| **Physical characteristics** | **Dimensions** | 10.47(w) x 6.34(d) x 1.72(h) in (26.6 x 16.1 x 4.36 cm) (1U height) |
| | **Weight** | 2.2 lb (1 kg) |
| **Memory and processor** | Marvell A370 @ 800 MHz, 1 GB DDR3 SDRAM, 256 MB NAND flash, 64 GB SD Card | |
| **Performance** | **Throughput** | up to 300 Kpps (64-byte packets) |
| | **Routing table size** | 10000 entries (IPv4), 5000 entries (IPv6) |
| | **Forwarding table size** | 10000 entries (IPv4), 5000 entries (IPv6) |
| **Environment** | **Operating temperature** | 32°F to 113°F (0°C to 45°C) |
| | **Operating relative humidity** | 5% to 92%, noncondensing |
| | **Altitude** | up to 5,000 ft (1.5 km) |
| **Electrical characteristics** | **Voltage** | 100 - 264 VAC, rated |
| | **Maximum power rating** | 22 W |
| | **Notes:** | Maximum power rating and maximum heat dissipation are the worst-case theoretical maximum numbers provided for planning the infrastructure with fully loaded PoE (if equipped), 100% traffic, all ports plugged in, and all modules populated. |
| **Safety** | UL 60950-1; CAN/CSA 22.2 No. 60950-1; AS/NZS 60950; EN 60825-1 Safety of Laser Products-Part 1; EN 60825-2 Safety of Laser Products-Part 2; IEC 60950-1; CAN/CSA-C22.2 No. 60950-1-03; EN 60950-1/A11; FDA 21 CFR Subchapter J | |
| **Emissions** | ANSI C63.4; EN 55022 Class B; ICES-003 Class B; ETSI EN 300 386 V1.3.3; 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; EN 55024:1998+ A1:2001 + A2:2003; EN 61000-4-11:2004; EN 61000-4-8:2001; AS/NZS CISPR 22 Class B; FCC (CFR 47, Part 15) Class B | |
| **Telecom** | FCC part 68; TIA-968-B; CS03 Part 8; AS/ACIF S043; G.992.1/2/3/5 | |
| **Management** | IMC - Intelligent Management Center; Command-line interface; Web browser; SNMP manager; Telnet; RMON1; FTP; IEEE 802.3 Ethernet MIB | |
| **Notes:** | – This router has the Sierra Wireless MC7354 AirPrime Series Module embedded:<br>– Air interface: LTE, HSPA+, GSM/GPRS/EDGE, EV-DO Rev A, 1xRTT<br>– Peak download rate (data speed): 100Mbps<br>– Peak upload rate (data speed): 50Mbps<br>– LTE frequencies: B2, B4, B5, B13, B17, B25<br>– CDMA 1xRTT/EV-DO Rev A: MC7354/50: BC0, BC1, BC10 | |

| | |
|---|---|
| | – Regulatory: FCC, PTCRB, NCC<br>– Carriers: AT&T, Verizon, Sprint<br>– This model (JH298A) is certified with Verizon, AT&T and Sprint Wireless 4G LTE networks, firmware must be changed at CLI level for each carrier. Carrier SIM card not included.<br>– Default antennas: 2; maximum antennas: 2<br>– For local 4G LTE/3G carrier certification, please contact your regional sales team. |
| **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. |

## HPE MSR954-W 1GbE SFP LTE (WW) 2GbE-WAN 4GbE-LAN Wireless 802.11n CWv7 Router (JH299A)

| | | |
|---|---|---|
| **I/O ports and slots** | 1 fixed Gigabit Ethernet SFP port | |
| | 1 RJ-45 autosensing 10/100/1000 WAN port | |
| | 4 RJ-45 autosensing 10/100/1000 LAN ports | |
| **Additional ports and slots** | 2 USB 2.0<br>1 RJ-45 console port<br>1 SIM slot | |
| **AP characteristics** | **Radios (built-in)** | 802.11b/g/n; 3G, 4G LTE |
| | **AP operation modes** | Autonomous |
| **Physical characteristics** | **Dimensions** | 10.47(w) x 6.34(d) x 1.72(h) in (26.6 x 16.1 x 4.36 cm) (1U height) |
| | **Weight** | 2.2 lb (1 kg) |
| **Memory and processor** | Marvell A370 @ 800 MHz, 1 GB DDR3 SDRAM, 256 MB NAND flash, 64 GB SD Card | |
| **Performance** | **Throughput** | up to 300 Kpps (64-byte packets) |
| | **Routing table size** | 10000 entries (IPv4), 5000 entries (IPv6) |
| | **Forwarding table size** | 10000 entries (IPv4), 5000 entries (IPv6) |
| **Environment** | **Operating temperature** | 32°F to 113°F (0°C to 45°C) |
| | **Operating relative humidity** | 5% to 92%, noncondensing |
| | **Altitude** | up to 5,000 ft (1.5 km) |
| **Electrical characteristics** | **Voltage** | 100 - 264 VAC, rated |
| | **Maximum power rating** | 22 W |
| | **Notes:** | Maximum power rating and maximum heat dissipation are the worst-case theoretical maximum numbers provided for planning the infrastructure with fully loaded PoE (if equipped), 100% traffic, all ports plugged in, and all modules populated. |
| **Safety** | UL 60950-1; CAN/CSA 22.2 No. 60950-1; AS/NZS 60950; EN 60825-1 Safety of Laser Products-Part 1; EN 60825-2 Safety of Laser Products-Part 2; IEC 60950-1; CAN/CSA-C22.2 No. 60950-1-03; EN 60950-1/A11; FDA 21 CFR Subchapter J | |
| **Emissions** | ANSI C63.4; EN 55022 Class B; ICES-003 Class B; ETSI EN 300 386 V1.3.3; 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 | |

Technical Specifications

| | |
|---|---|
| | +A1:2001+A2:2005; EMC Directive 2004/108/EC; EN 55024:1998+ A1:2001 + A2:2003; EN 61000-4-11:2004; EN 61000-4-8:2001; AS/NZS CISPR 22 Class B; FCC (CFR 47, Part 15) Class B |
| **Telecom** | FCC part 68; TIA-968-B; CS03 Part 8; AS/ACIF S043; G.992.1/2/3/5 |
| **Management** | IMC - Intelligent Management Center; Command-line interface; Web browser; SNMP manager; Telnet; RMON1; FTP; IEEE 802.3 Ethernet MIB |
| **Notes:** | – This router has the Sierra Wireless MC7304 AirPrime Series Module embedded:<br>– Air interface: LTE,HSPA+,GSM/GPRS/EDGE, EV-DO Rev A, 1xRTT<br>– Peak download rate (data speed): 100Mbps<br>– Peak upload rate (data speed): 50Mbps<br>– LTE frequency bands: B1, B3, B7, B8,B20<br>– UMTS (WCDMA)/HSDPA/HSUPA/HSPA+ bands: B1,B2,B5,B8<br>– CDMA 1xRTT/EV-DO Rev A: MC7354/50: BC0, BC1, BC10<br>– Regulatory: CE, GCF, NCC, FCC<br>– Carriers: Telstra, Vodafone<br>– This model (JH299A) is pre-certified with various international 4G LTE networks, firmware must be changed at CLI level for each carrier. Carrier SIM card not included.<br>– Default antennas: 2; maximum antennas: 2<br>– For local 4G LTE/3G carrier certification, please contact your regional sales team. |
| **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. |

## HPE FlexNetwork MSR958 1GbE and Combo 2GbE WAN 8GbE LAN Router (JH300A)

| | | |
|---|---|---|
| **I/O ports and slots** | 1 fixed Gigabit Ethernet SFP port | |
| | 1 RJ-45 autosensing 10/100/1000 WAN port | |
| | 8 RJ-45 autosensing 10/100/1000 LAN ports | |
| **Additional ports and slots** | 2 USB 2.0<br>1 RJ-45 console port | |
| **Physical characteristics** | **Dimensions** | 10.47(w) x 6.34(d) x 1.72(h) in (26.6 x 16.1 x 4.36 cm) (1U height) |
| | **Weight** | 2.2 lb (1 kg) |
| **Memory and processor** | Marvell A370 @ 800 MHz, 1 GB DDR3 SDRAM, 256 MB NAND flash, 64 GB SD Card | |
| **Performance** | **Throughput** | up to 300 Kpps (64-byte packets) |
| | **Routing table size** | 10000 entries (IPv4), 5000 entries (IPv6) |
| | **Forwarding table size** | 10000 entries (IPv4), 5000 entries (IPv6) |
| **Environment** | **Operating temperature** | 32°F to 113°F (0°C to 45°C) |
| | **Operating relative humidity** | 5% to 92%, noncondensing |
| | **Altitude** | up to 5,000 ft (1.5 km) |
| **Electrical characteristics** | **Voltage** | 100 - 264 VAC, rated |
| | **Maximum power rating** | 22 W |

Technical Specifications

| | | |
|---|---|---|
| | **Notes:** | Maximum power rating and maximum heat dissipation are the worst-case theoretical maximum numbers provided for planning the infrastructure with fully loaded PoE (if equipped), 100% traffic, all ports plugged in, and all modules populated. |
| **Safety** | UL 60950-1; CAN/CSA 22.2 No. 60950-1; AS/NZS 60950; EN 60825-1 Safety of Laser Products-Part 1; EN 60825-2 Safety of Laser Products-Part 2; IEC 60950-1; CAN/CSA-C22.2 No. 60950-1-03; EN 60950-1/A11; FDA 21 CFR Subchapter J | |
| **Emissions** | ANSI C63.4; EN 55022 Class B; ICES-003 Class B; ETSI EN 300 386 V1.3.3; 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; EN 55024:1998+ A1:2001 + A2:2003; EN 61000-4-11:2004; EN 61000-4-8:2001; AS/NZS CISPR 22 Class B; FCC (CFR 47, Part 15) Class B | |
| **Telecom** | FCC part 68; TIA-968-B; CS03 Part 8; AS/ACIF S043; G.992.1/2/3/5 | |
| **Management** | IMC - Intelligent Management Center; Command-line interface; Web browser; SNMP manager; Telnet; RMON1; FTP; IEEE 802.3 Ethernet MIB | |
| **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. | |

## HPE FlexNetwork MSR958 1GbE and Combo 2GbE WAN 8GbE LAN PoE Router (JH301A)

| | | |
|---|---|---|
| **I/O ports and slots** | 1 fixed Gigabit Ethernet SFP port | |
| | 1 RJ-45 autosensing 10/100/1000 WAN port | |
| | 8 RJ-45 autosensing 10/100/1000 LAN ports | |
| **Additional ports and slots** | 2 USB 2.0<br>1 RJ-45 console port | |
| **Physical characteristics** | **Dimensions** | 10.47(w) x 6.34(d) x 1.72(h) in (26.6 x 16.1 x 4.36 cm) (1U height) |
| | **Weight** | 2.2 lb (1 kg) |
| **Memory and processor** | Marvell A370 @ 800 MHz, 1 GB DDR3 SDRAM, 256 MB NAND flash, 64 GB SD Card | |
| **Performance** | **Throughput** | up to 300 Kpps (64-byte packets) |
| | **Routing table size** | 10000 entries (IPv4), 5000 entries (IPv6) |
| | **Forwarding table size** | 10000 entries (IPv4), 5000 entries (IPv6) |
| **Environment** | **Operating temperature** | 32°F to 113°F (0°C to 45°C) |
| | **Operating relative humidity** | 5% to 92%, noncondensing |
| | **Altitude** | up to 5,000 ft (1.5 km) |
| **Electrical characteristics** | **Voltage** | 100 - 264 VAC, rated |
| | **Maximum power rating** | 22 W |
| | **Notes:** | Maximum power rating and maximum heat dissipation are the worst-case theoretical maximum numbers provided for planning the infrastructure with fully loaded PoE (if equipped), 100% traffic, all ports plugged in, and all modules populated. |

## Technical Specifications

| | |
|---|---|
| **Safety** | UL 60950-1; CAN/CSA 22.2 No. 60950-1; AS/NZS 60950; EN 60825-1 Safety of Laser Products-Part 1; EN 60825-2 Safety of Laser Products-Part 2; IEC 60950-1; CAN/CSA-C22.2 No. 60950-1-03; EN 60950-1/A11; FDA 21 CFR Subchapter J |
| **Emissions** | ANSI C63.4; EN 55022 Class B; ICES-003 Class B; ETSI EN 300 386 V1.3.3; 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; EN 55024:1998+ A1:2001 + A2:2003; EN 61000-4-11:2004; EN 61000-4-8:2001; AS/NZS CISPR 22 Class B; FCC (CFR 47, Part 15) Class B |
| **Telecom** | FCC part 68; TIA-968-B; CS03 Part 8; AS/ACIF S043; G.992.1/2/3/5 |
| **Management** | IMC - Intelligent Management Center; Command-line interface; Web browser; SNMP manager; Telnet; RMON1; FTP; IEEE 802.3 Ethernet MIB |
| **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. |

## HPE FlexNetwork MSR958X 10GbE and Combo Router (SOP11A)

| | | |
|---|---|---|
| **I/O ports and slots** | 2 fixed Gigabit Ethernet SFP port, 2 combo ports (SFP or RJ45) | |
| | 8 RJ-45 autosensing 10/100/1000 LAN ports (Four of them can be switched to routing mode.) | |
| **Additional ports and slots** | 1 RJ-45 console port | |
| **Radios (built-in)** | 802.11b/g/n; 3G, 4G LTE Autonomous | |
| **Physical characteristics** | **Dimensions** | 266 x 161 x 43.6 mm |
| | **Weight** | 1.2 kg |
| **Memory and processor** | Marvell ARM64 @ 1.6 GHz, 2 GB DRAM, 4 GB eMMC Flash | |
| **Mounting and enclosure** | Mounts in an EIA standard 19-inch telco rack or equipment cabinet | |
| **Performance** | **Throughput** | 3 Mpps |
| | **Routing table size** | 200000 entries (IPv4), 200000 entries (IPv6) |
| | **Forwarding table size** | 200000 entries (IPv4), 200000 entries (IPv6) |
| **Environment** | **Operating temperature** | 0~45°C |
| | **Operating relative humidity** | 5~95% no dew |
| | **Non-operating/storage temp** | -40°C~70°C |
| | **Non-operating/storage relative humidity** | 5~95% no dew |
| | **Acoustic** | Silent, without fan trays |
| | **Altitude** | Up to 5,000 ft (1.5 km) |
| **Electrical characteristics** | **Frequency** | 1.6 GHz |
| | **Voltage** | 100 - 240 VAC; 50/60 Hz |
| | **Maximum power rating** | 36W |
| | **Reliability—MTBF (years)** | 187 years |
| | **Safety** | IKE/IP<br>SecVPN, ADVPN, GDVPN, L2TP VPN, GRE VPN |

Technical Specifications

| | | |
|---|---|---|
| | | NAT/NAPT, PKI, RSA, URPF<br>DDoS attack prevention, ARP attack prevention<br>EAD<br>FIPS, N<br>ETCONF, OpenFlow, telemetry, VXLAN, EVPN |
| **EMC** | CISPR 24, EN 55024, EN 61000–3–2, EN 61000–3–3, EN 61000–6–1, ETSI EN 300 386, EN 301 489–1, EN 301 489–17, UL 60950–1, CAN/CSA C22.2 No 60950-1, IEC 60950-1, EN 60950-1/A11 | |
| **Telecom** | EN 301 511; EN 301 908-1; EN 300 328; EN 62311; FCC Part 22 | |
| **Management** | IMC—Intelligent Management Center; Command-line interface; SNMP manager; Telnet; RMON1; FTP; IEEE 802.3 Ethernet MIB | |
| **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. | |

## 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 1997 BGP Communities Attribute
- RFC 1998 An Application of the BGP Community Attribute in Multi-home Routing
- RFC 2385 BGP Session Protection via TCP MD5
- RFC 2439 BGP Route Flap Damping

### Denial of service protection

- CPU DoS Protection
- Rate Limiting by ACLs

### Device Management

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

### General Protocols

- IEEE 802.1: LAN/MAN Bridge and Management
- IEEE 802.1D MAC Bridges
- IEEE 802.1p Priority
- IEEE 802.1Q VLANs
- IEEE 802.1s Multiple Spanning Trees

## Technical Specifications

- IEEE 802.1w Rapid Reconfiguration of Spanning Tree
- IEEE 802.1X: Authenticated VLAN (multiple MAC, multiple VLANs per port)
- IEEE 802.2: Logical Link Control
- IEEE 802.3: Carrier Sense Multiple Access with Collision Detection (CSMA/CD) access method and physical layer specifications
- IEEE 802.3ad Link Aggregation (LAG)
- 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 1333 PPP Link Quality Monitoring
- RFC 1334 PPP Authentication Protocols (PAP)
- RFC 1349 Type of Service
- RFC 1350 TFTP Protocol (revision 2)
- RFC 1377 The PPP OSI Network Layer Control Protocol (OSINLCP)
- RFC 1381 SNMP MIB Extension for X.25 LAPB
- RFC 1471 The Definitions of Managed Objects for the Link Control Protocol of the Point-to-Point Protocol
- RFC 1472 The Definitions of Managed Objects for the Security Protocols of the Point-to-Point Protocol

## Technical Specifications

- RFC 1490 Multiprotocol Interconnect over Frame Relay
- RFC 1519 CIDR
- RFC 1534 DHCP/BOOTP Interoperation
- RFC 1542 Clarifications and Extensions for the Bootstrap Protocol
- RFC 1552 The PPP Internetworking Packet Exchange Control Protocol (IPXCP)
- RFC 1577 Classical IP and ARP over ATM
- RFC 1613 Cisco Systems X.25 over TCP (XOT)
- RFC 1624 Incremental Internet Checksum
- RFC 1631 NAT
- RFC 1638 PPP Bridging Control Protocol (BCP)
- RFC 1661 The Point-to-Point Protocol (PPP)
- RFC 1662 PPP in HDLC-like Framing
- RFC 1695 Definitions of Managed Objects for ATM Management Version 8.0 using SMIv2
- 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 1795 Data Link Switching: Switch-to-Switch Protocol AIW DLSw RIG: DLSw Closed Pages, DLSw Standard Version 1
- RFC 1812 IPv4 Routing
- RFC 1829 The ESP DES-CBC Transform
- RFC 1877 PPP Internet Protocol Control Protocol Extensions for Name Server Addresses
- RFC 1944 Benchmarking Methodology for Network Interconnect Devices
- RFC 1973 PPP in Frame Relay
- RFC 1974 PPP Stac LZS Compression Protocol
- RFC 1990 The PPP Multilink Protocol (MP)
- RFC 1994 PPP Challenge Handshake Authentication Protocol (CHAP)
- 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 RIPv2
- RFC 2510 Internet X.509 Public Key Infrastructure Certificate Management Protocols
- RFC 2511 Internet X.509 Certificate Request Message Format
- RFC 2516 A Method for Transmitting PPP Over Ethernet (PPPoE)
- RFC 2644 Directed Broadcast Control
- RFC 2661 L2TP

## Technical Specifications

- 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 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 2993 Architectural Implications of NAT
- 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 3036 LDP Specification
- RFC 3046 DHCP Relay Agent Information Option
- RFC 3065 Support AS confederation
- RFC 3137 OSPF Stub Router Advertisement
- RFC 3209 RSVP-TE Extensions to RSVP for LSP Tunnels
- RFC 3210 Applicability Statement for Extensions to RSVP for LSP-Tunnels
- RFC 3212 Constraint-Based LSP setup using LDP (CR-LDP)
- RFC 3214 LSP Modification Using CR-LDP
- RFC 3215 LDP State Machine
- 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 3392 Support BGP capabilities advertisement
- RFC 3526 More Modular Exponential (MODP) Diffie-Hellman groups for Internet Key Exchange (IKE)
- 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 3847 Restart signaling for IS-IS
- FRF.1.2 PVC User-to-Network Interface (UNI) Implementation Agreement - July 2000
- FRF.10.1: Network-to-Network Frame Relay/ATM SVC Service Interworking Implementation Agreement
- FRF.11.1 Voice over Frame Relay Implementation Agreement - May 1997 - Annex J added March 1999
- FRF.15: End-to-End Multilink Frame Relay Implementation Agreement
- FRF.16: Multilink Frame Relay UNI/NNI Implementation Agreement
- FRF.17: Frame Relay Privacy Implementation Agreement
- FRF.18: Network-to-Network Frame Relay/ATM SVC Service Interworking Implementation Agreement
- FRF.19: Frame Relay Operations, Administration and Maintenance Implementation

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- FRF.2.1: Frame Relay Network-to-Network (NNI) Implementation Agreement Version 2.1
- FRF.20 Frame Relay IP Header Compression Implementation Agreement - June 2001
- FRF.3.2 Frame Relay Multiprotocol Encapsulation Implementation Agreement - April 2000
- FRF.4.1: SVC User-to-Network Interface (UNI) Implementation Agreement
- FRF.5: Frame Relay/ATM Network Internetworking Implementation Agreement
- FRF.6: Frame Relay Service Customer Network Management Implementation
- FRF.7 Frame Relay PVC Multicast Service and Protocol Description - October 1994
- FRF.8.1: Frame Relay/ATM PVC Service Internetworking Implementation Agreement
- FRF.9 Data Compression Over Frame Relay Implementation Agreement - January 1996
- ITU-T Recommendation X.29: Public Data Networks: Procedures for the Exchange of Control Information and User Data
- Q.921: ISDN user network interface-Data Link Layer specification
- Q.922 Annex A: Core aspects of Q.922 for use with frame relaying bearer service
- Q.931: ISDN user network interface-Layer 3 specification for basic call control
- Q.933 Annex A: Additional procedures for Permanent Virtual Connection (PVC) status management (using Unnumbered Information frames)
- X.25 : Interface between Data Terminal Equipment (DTE) and Data Circuit-terminating Equipment (DCE)

### IP Multicast

- RFC 1112 IGMP
- RFC 2236 IGMPv2
- RFC 2283 Multiprotocol Extensions for BGP-4
- RFC 2362 PIM Sparse Mode
- RFC 2934 Protocol Independent Multicast MIB for IPv4
- RFC 3376 IGMPv3

### IPv6

- RFC 1981 IPv6 Path MTU Discovery
- RFC 2080 RIPng for IPv6
- RFC 2292 Advanced Sockets API for IPv6
- RFC 2373 IPv6 Addressing Architecture
- RFC 2460 IPv6 Specification
- RFC 2461 IPv6 Neighbor Discovery
- RFC 2462 IPv6 Stateless Address Auto-configuration
- RFC 2463 ICMPv6
- RFC 2464 Transmission of IPv6 over Ethernet Networks
- RFC 2472 IP Version 6 over PPP
- RFC 2473 Generic Packet Tunneling in IPv6
- RFC 2529 Transmission of IPv6 Packets over IPv4
- RFC 2545 Use of MP-BGP-4 for IPv6
- RFC 2553 Basic Socket Interface Extensions for IPv6
- RFC 2740 OSPFv3 for IPv6
- RFC 2893 Transition Mechanisms for IPv6 Hosts and Routers
- RFC 3056 Connection of IPv6 Domains via IPv4 Clouds
- RFC 3513 IPv6 Addressing Architecture

- RFC 3596 DNS Extension for IPv6

**MIBs**

- RFC 1213 MIB II
- RFC 1229 Interface MIB Extensions
- RFC 1286 Bridge MIB
- RFC 1493 Bridge MIB
- RFC 1573 SNMP MIB II
- RFC 1724 RIPv2 MIB
- RFC 1757 Remote Network Monitoring MIB
- RFC 1850 OSPFv2 MIB
- RFC 2011 SNMPv2 MIB for IP
- RFC 2012 SNMPv2 MIB for TCP
- RFC 2013 SNMPv2 MIB for UDP
- RFC 2233 Interfaces MIB
- RFC 2454 IPV6-UDP-MIB
- 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

**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

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- 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
- RFC 2405 - DES-CBC Cipher algorithm
- RFC 2796 BGP Route Reflection - An Alternative to Full Mesh IBGP
- RFC 2842 Capabilities Advertisement with BGP-4
- RFC 2858 Multiprotocol Extensions for BGP-4
- RFC 2918 Route Refresh Capability for BGP-4
- RFC 3107 Carrying Label Information in BGP-4

### IPSec

- RFC 1828 IP Authentication using Keyed MD5
- RFC 2401 IP Security Architecture
- RFC 2402 IP Authentication Header
- RFC 2406 IP Encapsulating Security Payload
- RFC 2407 - Domain of interpretation
- RFC 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)

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**IKEv1**

- RFC 2865 - Remote Authentication Dial In User Service (RADIUS)
- RFC 3748 - Extensible Authentication Protocol (EAP)

## Summary of Changes

| Date | Version History | Action | Description of Change |
|---|---|---|---|
| 28-Apr-2025 | Version 15 | Changed | Configuration Information section was updated |
| 04-Dec-2023 | Version 14 | Changed | Series name was updated. |
| 01-May-2023 | Version 13 | Changed | Configuration Information section was updated |
| 06-Mar-2023 | Version 12 | Changed | Overview, Standard Features, Configuration Information, and Technical Specifications sections were updated. |
| 04-Sep-2017 | Version 11 | Changed | Configuration section updated |
| 07-Apr-2017 | Version 10 | Changed | Configuration section updated |
| 10-Mar-2017 | Version 9 | Changed | Configuration section updated |
| 17-Feb-2017 | Version 8 | Changed | Configuration section updated: Enabling AMS Region and restricting to Brasil for SKU JH297A |
| 30-Sep-2016 | Version 7 | Changed | Configuration section updated |
| 01-Aug-2016 | Version 6 | Changed | Adding #AC3 Option on Configuration section |
| 06-June-2016 | Version 5<br>Version 4 | Added | Models added: JH300A, JH301A, JH373A<br>Accessories added: JH317A, JH415A |
| | | Changed | Document name changed to HPE Networking Comware Router Series MSR95x. Overview, Features and Benefits, Technical Specifications and Accessories updated. |
| 22-Apr-2016 | Version 3 | Changed | SKU descriptions updated on all document, minor changes on Overview |
| 05-Feb-2016 | Version 3 | Changed | Configuration section updated |
| 08-Jan-2016 | Version 2 | Changed | Warranty and support updated |
| 15-Dec-2015 | Version 1 | New | New QuickSpecs |

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