Hewlett Packard Enterprise

HPE FlexNetwork MSR95x Router Series

Key features

- Converged high-performance fiber routing, switching, security, and 300 Kpps performance
- Integrated GbE WAN and LAN, fiber (SFP)
- Integrated 4G LTE, 3G as well as IEEE 802.11b/g/n WLAN in one box
- Embedded encryption, stateful firewall, NAT, ADVPN security features
- Unified Comware v7 OS, Comware v7 OS zero-touch solution, and single-pane-of-glass management

Product overview

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

The MSR 95x 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 within small-branch deployments.

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

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 two GbE WAN and four GbE LAN ports onboard
- Multiple advanced WAN interfaces
  Provide traditional connection options including GbE copper (Cat5e/Ethernet) connection and an additional fiber (SFP) port for a total of two WAN Gigabit Ethernet ports; and offer wireless access with 4G LTE, 3G, and 802.11n WLAN connectivity
- 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 Hewlett Packard Enterprise representative

Performance

- Forwarding performance
  Provides up to 300 Kpps; and meets current and future bandwidth-intensive application demands for enterprise businesses
- Embedded encryption
  Supports up to 100 VPN tunnels and up to 160 Mbps 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 back each other up dynamically 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

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

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
- Network login
  Allows authentication of multiple users per port using the IEEE 802.1X standard
- 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 log in to a remote device securely 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

- Auto Discover VPN (ADVPN)
  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, ADVPN technology is more flexible and has richer features, such as NAT traversal of ADVPN 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)
- 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

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

HPE FlexNetwork MSR95x Router Series

Specifications

	HPE FlexNetwork MSR954 1GbE SFP 2GbE-WAN 4GbE-LAN CWv7 Router (JH296A)	HPE FlexNetwork 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	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; 1 RJ45 Console port	2 USB 2.0; 1 RJ45 Console port
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)	10.47(w) x 6.34(d) x 1.72(h) in (26.6 x 16.1 x 4.36 cm) (1U height)
Weight	3.3 lb (1.5 Kg)	3.3 lb (1.5 Kg)
Memory and processor	Marvell A370 @ 800 MHz, 1 GB DDR3 SDRAM, 256 MB NAND flash, 64 GB SD Card	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)	up to 300 Kpps (64-byte packets)
Routing table size	10000 entries (IPv4), 5000 entries (IPv6)	10000 entries (IPv4), 5000 entries (IPv6)
Forwarding table size	10000 entries (IPv4), 5000 entries (IPv6)	10000 entries (IPv4), 5000 entries (IPv6)
Environment		
Operating temperature	32°F to 113°F (0°C to 45°C)	32°F to 113°F (0°C to 45°C)
Operating relative humidity	5% to 90%, noncondensing	5% to 90%, noncondensing
Altitude	up to 5,000 ft (1.5 km)	up to 5,000 ft (1.5 km)
Electrical characteristics		
Voltage	100—240 VAC, rated	100—240 VAC, rated
Maximum power rating	15 W	15 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.	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 C22.2 No 60950-1; IEC 60950-1; EN 60950-1; AS/NZS 60950-1; FDA 21 CFR Subchapter J	UL 60950-1; CAN/CSA C22.2 No 60950-1; IEC 60950-1; EN 60950-1; AS/NZS 60950-1; FDA 21 CFR Subchapter J

EMC	FCC Part 15 B (CFR 47) Class B; ICES-003 Class B; VCCI-3 Class B; VCCI-4 Class B; CISPR 22 Class B; EN 55022 Class B; AS/NZS CISPR22 Class B; CISPR 24; EN 55024; EN 61000-3-2; EN 61000-3-3; EN 300 386	VCCI-3 Class B; VCCI-4 Class B; CISPR 22 Class B; EN 55022 Class B; AS/NZS CISPR22 Class B; CISPR 24; EN 55024; EN 61000-3-2; EN 61000-3-3; EN 301 489-1; EN 301 489-17; EN 300 386
Telecom		FCC Bulletin OET-65C; EN 300 328; EN 62311
Management	IMC—Intelligent Management Center; Command-line interface; SNMP manager; Telnet; RMON1; FTP; IEEE 802.3 Ethernet MIB	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 **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.	Refer to the Hewlett Packard Enterprise website at **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 MSR95x Router Series

Specifications (continued)

		
	HPE FlexNetwork MSR954-W 1GbE SFP LTE (AM) 2GbE-WAN 4GbE-LAN Wireless 802.11n CWv7 Router (JH298A)	**HPE FlexNetwork 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	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 USB 2.0; 1 RJ45 Console port; 1 SIM port	1 USB 2.0; 1 RJ45 Console port; 1 SIM port
Radios (built-in)	802.11b/g/n; 3G, 4G LTE Autonomous	802.11b/g/n; 3G, 4G LTE Autonomous
Physical characteristics Dimensions Weight	 10.47(w) x 6.34(d) x 1.72(h) in (26.6 x 16.1 x 4.36 cm) (1U height) 3.3 lb (1.5 Kg)	 10.47(w) x 6.34(d) x 1.72(h) in (26.6 x 16.1 x 4.36 cm) (1U height) 3.3 lb (1.5 Kg)
Memory and processor	Marvell A370 @ 800 MHz, 1 GB DDR3 SDRAM, 256 MB NAND flash, 64 GB SD Card	Marvell A370 @ 800 MHz, 1 GB DDR3 SDRAM, 256 MB NAND flash, 64 GB SD Card
Performance Throughput Routing table size Forwarding table size	 up to 300 Kpps (64-byte packets) 10000 entries (IPv4), 5000 entries (IPv6) 10000 entries (IPv4), 5000 entries (IPv6)	 up to 300 Kpps (64-byte packets) 10000 entries (IPv4), 5000 entries (IPv6) 10000 entries (IPv4), 5000 entries (IPv6)
Environment Operating temperature Operating relative humidity Altitude	 32°F to 113°F (0°C to 45°C) 5% to 90%, noncondensing up to 5,000 ft (1.5 km)	 32°F to 113°F (0°C to 45°C) 5% to 90%, noncondensing up to 5,000 ft (1.5 km)

Electrical characteristics		
Voltage	100—240 VAC, rated	100—240 VAC, rated
Maximum power rating	15 W	15 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.	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 C22.2 No 60950-1; IEC 60950-1; EN 60950-1; AS/NZS 60950-1; FDA 21 CFR Subchapter J	UL 60950-1; CAN/CSA C22.2 No 60950-1; IEC 60950-1; EN 60950-1; AS/NZS 60950-1; FDA 21 CFR Subchapter J
EMC	FCC Part 15 B (CFR 47) Class B; ICES-003 Class B	EN 55022 Class B; EN 55024; CISPR 22 Class B; CISPR 24; EN 61000-3-2; EN 61000-3-3; EN 300 386; AS/NZS CISPR 22 Class B; EN 301 489-1; EN 301 489-17; EN 301 489-7; EN 301 489-24
Telecom	FCC Part 15.247; FCC Part 22; FCC Part 24; FCC Part 27; FCC Part 90S; FCC Bulletin OET-65C; RSS-132; RSS-133; RSS-139; RSS-130; RSS-247; RSS-102	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	IMC—Intelligent Management Center; Command-line interface; SNMP manager; Telnet; RMON1; FTP; IEEE 802.3 Ethernet MIB
Notes	This router has the Sierra Wireless MC7354 AirPrime Series Module embedded: • Air interface: LTE, HSPA+, GSM/GPRS/EDGE, EV-DO Rev A, 1xRTT • Peak download rate (data speed): 100 Mbps • Peak upload rate (data speed): 50 Mbps • LTE frequencies: B2, B4, B5, B13, B17, B25 • CDMA 1xRTT/EV-DO Rev A: MC7354/50: BC0, BC1, BC10 • Regulatory: FCC, PTCRB • Carriers: AT&T, Verizon, Sprint 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. Default antennas: 2; maximum antennas: 2 Optional antenna cable extensions available: • HPE MSR 3G RF 2.8 m Antenna Cable (JG522A) • HPE MSR 3G RF 6 m Antenna Cable (JG666A) • HPE MSR 3G RF 15 m Antenna Cable (JG667A) Only the HPE MSR 4G 5W TNC Antenna (JG669A) is supported. For local 4G LTE/3G carrier certification, please contact your regional sales team.	This router has the Sierra Wireless MC7304 AirPrime Series Module embedded: • Air interface: LTE, HSPA+, GSM/GPRS/EDGE, EV-DO Rev A, 1xRTT • Peak download rate (data speed): 100 Mbps • Peak upload rate (data speed): 50 Mbps • LTE frequency bands: B1, B3, B7, B8, B20 • UMTS (WCDMA)/HSDPA/HSUPA/HSPA+ bands: B1, B2, B5, B8 • CDMA 1xRTT/EV-DO Rev A: MC7354/50: BC0, BC1, BC10 • Regulatory: CE, GCF, NCC • Carriers: Telstra, Vodafone 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. Optional antenna cable extensions available: • HPE MSR 3G RF 2.8 m Antenna Cable (JG522A) • HPE MSR 3G RF 6 m Antenna Cable (JG666A) • HPE MSR 3G RF 15 m Antenna Cable (JG667A) Only the HPE MSR 4G 5W TNC Antenna (JG669A) is supported. For local 4G LTE/3G carrier certification, please contact your regional sales team.
Services	Refer to the Hewlett Packard Enterprise website at **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.	Refer to the Hewlett Packard Enterprise website at **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 MSR95x Router Series

Specifications (continued)

			
	HPE FlexNetwork MSR954 Serial 1GbE Dual 4G LTE (WW) Router (JH373A)	**HPE FlexNetwork MSR958 1GbE and Combo 2GbE WAN 8GbE LAN Router (JH300A)**	**HPE FlexNetwork MSR958 1GbE and Combo 2GbE WAN 8GbE LAN PoE Router (JH301A)**
I/O ports and slots	1 RJ-45 autosensing 10/100/1000 WAN port 4 RJ-45 autosensing 10/100/1000 LAN ports	1 fixed Gigabit Ethernet SFP combo port 2 RJ-45 autosensing 10/100/1000 WAN port 8 RJ-45 autosensing 10/100/1000 LAN ports	1 fixed Gigabit Ethernet SFP combo port 2 RJ-45 autosensing 10/100/1000 WAN port 8 RJ-45 autosensing 10/100/1000 PoE LAN ports
Additional ports and slots	1 USB 2.0; 1 RJ45 Console port; 2 SIM ports; 1 Serial port	1 USB 2.0; 1 RJ45 Console port 1 SD card slot	1 USB 2.0; 1 RJ45 Console port 1 SD card slot
Radios (built-in)	3G, 4G LTE Autonomous		
Physical characteristics			
Dimensions	11.81(w) x 7.87(d) x 1.74(h) in (30.0 x 20.0 x 4.42 cm) (1U)	13.0(w) x 9.06(d) x 1.74(h) in (33.0 x 23.0 x 4.42 cm) (1U)	13.0(w) x 9.06(d) x 1.74(h) in (33.0 x 23.0 x 4.42 cm) (1U)
Weight	3.5 lb (1.6 Kg)	4.4 lb (2.0 Kg)	4.4 lb (2.0 Kg)
Memory and processor	Freescale P1016 @ 533MHz, 1 GB DDR3 SDRAM; 256MB NAND flash	Marvell PonCat 3 @ 800 MHz, 1 GB DDR3 SDRAM, 256 MB NAND flash, 64 GB SD Card	Marvell PonCat @ 800 MHz, 1 GB DDR3 SDRAM, 256 MB NAND flash, 64 GB SD Card
Performance			
Throughput	up to 300 Kpps (64-byte packets)	up to 300 Kpps (64-byte packets)	up to 300 Kpps (64-byte packets)
Routing table size	10000 entries (IPv4), 5000 entries (IPv6)	10000 entries (IPv4), 5000 entries (IPv6)	10000 entries (IPv4), 5000 entries (IPv6)
Forwarding table size	10000 entries (IPv4), 5000 entries (IPv6)	10000 entries (IPv4), 5000 entries (IPv6)	10000 entries (IPv4), 5000 entries (IPv6)
Environment			
Operating temperature	32°F to 113°F (0°C to 45°C)	32°F to 113°F (0°C to 45°C)	32°F to 113°F (0°C to 45°C)
Operating relative humidity	5% to 90%, noncondensing	5% to 90%, noncondensing	5% to 90%, noncondensing
Altitude	up to 5,000 ft (1.5 km)	up to 5,000 ft (1.5 km)	up to 5,000 ft (1.5 km)
Electrical characteristics			
Voltage	100—240 VAC, rated	100—240 VAC, rated	100—240 VAC, rated
Maximum power rating	24 W	20 W	20 W for the system and 65 W for PoE
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.	Maximum power rating and maximum heat dissipation are the worst-case theoretical maximum numbers provided for planning the infrastructure with fully loaded PoE (if equipped), 100% traffic, all ports plugged in, and all modules populated.	Maximum power rating and maximum heat dissipation are the worst-case theoretical maximum numbers provided for planning the infrastructure with fully loaded PoE (if equipped), 100% traffic, all ports plugged in, and all modules populated.

Safety	UL 60950-1; CAN/CSA C22.2 No 60950-1; IEC 60950-1; EN 60950-1; AS/NZS 60950-1	UL 60950-1; CAN/CSA C22.2 No 60950-1; IEC 60950-1; EN 60950-1; AS/NZS 60950-1; FDA 21 CFR Subchapter J	UL 60950-1; CAN/CSA C22.2 No 60950-1; IEC 60950-1; EN 60950-1; AS/NZS 60950-1; FDA 21 CFR Subchapter J
EMC	CISPR 22 Class B; EN 55022 Class B; CISPR 24; EN 55024; EN 61000-3-2; EN 61000-3-3; EN 301 489-1; EN 301 489-7; EN 301 489-24; EN 300 386; AS/NZS CISPR 22 Class B	FCC Part 15 B (CFR 47) Class A; ICES-003 Class A; VCCI-3 Class A; VCCI-4 Class A; CISPR 22 Class A; EN 55022 Class A; AS/NZS CISPR22 Class A; CISPR 24; EN 55024; EN 61000-3-2, EN 61000-3-3; EN 300 386	FCC Part 15 B (CFR 47) Class A; ICES-003 Class A; VCCI-3 Class A; VCCI-4 Class A; CISPR 22 Class A; EN 55022 Class A; AS/NZS CISPR22 Class A; CISPR 24; EN 55024; EN 61000-3-2, EN 61000-3-3; EN 300 386
Telecom	EN 301 511; EN 301 908-1; EN 62311; FCC Part 22		
Management	IMC—Intelligent Management Center; Command-line interface; Web browser; SNMP manager; Telnet; RMON1; FTP; IEEE 802.3 Ethernet MIB	IMC—Intelligent Management Center; Command-line interface; Web browser; SNMP manager; Telnet; RMON1; FTP; IEEE 802.3 Ethernet MIB	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: IPS will be available when Product goes GA in June 2016		
Services	Refer to the Hewlett Packard Enterprise website at **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.	Refer to the Hewlett Packard Enterprise website at **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.	Refer to the Hewlett Packard Enterprise website at **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 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 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 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 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 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 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

General protocols	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 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 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 RFC 1519 CIDR RFC 1534 DHCP/BOOTP Interoperation RFC 1542 Clarifications and Extensions for the Bootstrap Protocol	RFC 1624 Incremental Internet Checksum 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 RFC 2663 NAT Terminology and Considerations 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 Option
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	• RFC 2370 OSPF Opaque LSA Option • RFC 3101 OSPF NSSA

Standards and protocols
(Applies to all products in series) (continued)

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)
IKEv1		RFC 2865-Remote Authentication Dial In User Service (RADIUS)	RFC 3748—Extensible Authentication Protocol (EAP)

HPE FlexNetwork MSR95x Router Series accessories

Transceivers	HPE X121 1G SFP LC SX Transceiver (J4858C) HPE X121 1G SFP LC LX Transceiver (J4859C) HPE X121 1G SFP LC LH Transceiver (J4860C) HPE X121 1G SFP RJ45 T Transceiver (J8177C) HPE X120 1G SFP LC LH40 1550nm Transceiver (JD062A) HPE X125 1G SFP LC LH70 Transceiver (JD063B) HPE X120 1G SFP LC BX 10-U Transceiver (JD098B) HPE X120 1G SFP LC BX 10-D Transceiver (JD099B) HPE X120 1G SFP LC LH100 Transceiver (JD103A)
Memory	HPE FlexNetwork MSR958 64GB Secure Digital Memory Card (JH415A)
Mounting Kit	HPE FlexNetwork MSR958 Chassis Rack Mount Kit (JH317A)
HPE FlexNetwork MSR95x-W 1GbE SFP LTE (AM) 2GbE-WAN 4GbE-LAN Wireless 802.11n CWv7 Router (JH298A)	HPE MSR 3G RF 6 m Antenna Cable (JG666A) HPE MSR 3G RF 15 m Antenna Cable (JG667A) HPE MSR 4G 5W TNC Antenna (JG669A)
HPE FlexNetwork MSR95x-W 1GbE SFP LTE (WW) 2GbE-WAN 4GbE-LAN Wireless 802.11n CWv7 Router (JH299A)	HPE MSR 3G RF 6 m Antenna Cable (JG666A) HPE MSR 3G RF 15 m Antenna Cable (JG667A) HPE MSR 4G 5W TNC Antenna (JG669A)

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