Shape the Future of QuickSpecs - Your Input Matters

HPE Networking Comware Router Series MSR3000 QuickSpecs

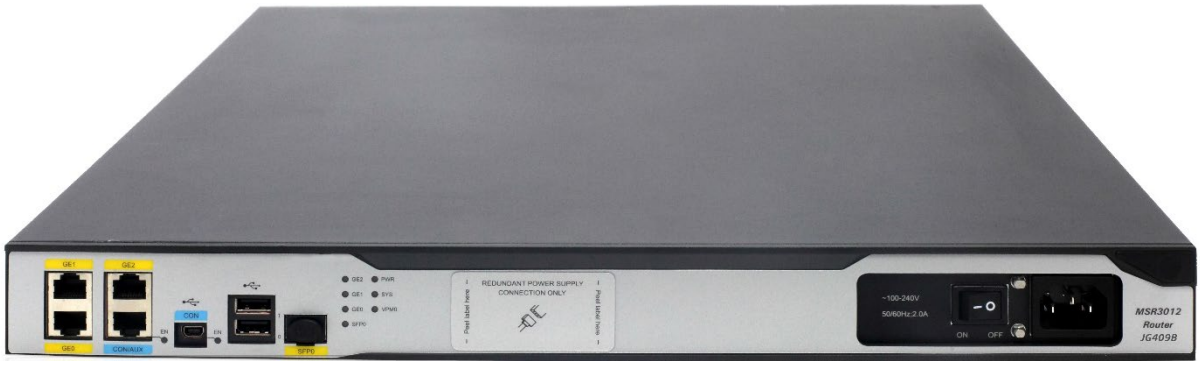
The HPE Networking Comware Router Series MSR3000, the next generation of router from Hewlett Packard Enterprise (HPE), is a component of the HPE FlexBranch solution, which is a part of the comprehensive HPE Networking Comware architecture.

These routers feature a modular design that delivers unmatched application services for medium- to large-sized branch offices. This gives your IT personnel the benefit of reduced complexity, and simplified configuration, deployment, and management.

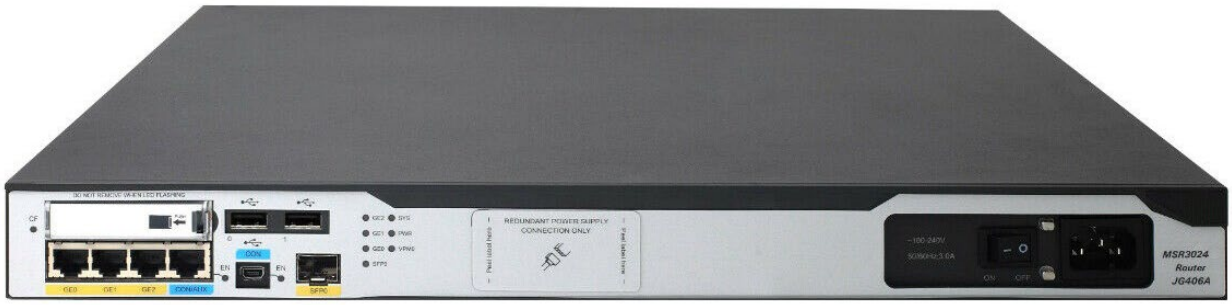
Overview

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

The MSR3000 series provides an agile, flexible network infrastructure that enables you to quickly adapt to changing business requirements while delivering integrated concurrent services on a single, easy-to-manage platform.



HPE Networking Comware MSR3012 AC Router – Front



HPE Networking Comware MSR3024 AC Router – Front



HPE Networking Comware MSR3044 Router- Front

Overview



HPE Networking Comware MSR3064 Router – Front



HPE Networking Comware MSR3016 AC Router – Front



HPE Networking Comware MSR3026 AC Router – Front

Overview



HPE Networking Comware MSR3046 AC Router – Front



HPE Networking Comware MSR3048 Router - Front



HPE Networking Comware MSR3620-DP Router – Front

Overview

Models

Description	SKU
HPE FlexNetwork MSR3024 AC Router	JG406A
HPE Networking Comware Router AC MSR3016	R8V32A
HPE Networking Comware Router MSR3026	R9J03A
HPE Networking Comware Router MSR3046	R9J04A

Key features

- Up to 13 Mpps forwarding performance; support for multiple concurrent services
- Open Application Platform for HPE AllianceOne applications
- Embedded security features with hardware-based encryption, stateful firewall, NAT, and VPNs
- No additional licensing complexity; no cost for advanced features
- Zero-touch solution, with single pane-of-glass management

Standard Features

Performance

- **Excellent forwarding performance**
  Provides forwarding performance up to 13 Mpps to meet the bandwidth-intensive application demands of enterprise businesses
- **Powerful security capacity**
  The MSR3000 series is available with standard or high encryption, an embedded hardware encryption accelerator to improve encryption performance; IPSec encryption throughput can be up to 14 Gb/s with a maximum of 4,000 IPSec VPN tunnels, support up to 2000 VRF instances.

Connectivity

- **Ethernet Virtual Interconnect (EVI)**
  EVI is a MAC-in-IP technology that provides Layer 2 connectivity between distant Layer 2 network sites across an IP routed network. It is used for connecting geographically dispersed sites of a virtualized large-scale data center that requires Layer 2 adjacency.
- **VXLAN (Virtual eXtensible LAN)**
  VXLAN (Virtual eXtensible LAN, scalable virtual local area network) is an IP-based network, using the "MAC in UDP" package of Layer VPN technology. VXLAN can be based on an existing ISP or enterprise IP networks for decentralized physical site provides Layer 2 communication, and can provide service isolation for different tenants.
- **Virtual Private LAN Service (VPLS)**
  Virtual Private LAN Service (VPLS) delivers a point-to-multipoint L2VPN service over an MPLS or IP backbone. The backbone is transparent to the customer sites, which can communicate with each other as if they were on the same LAN. The following protocols support on MSRs, RFC4447, RFC4761 and RFC4762, BFD detection in VPLS, Support hierarchical HOPE (H-VPLS), MAC address recovery in H-VPLS to speed up convergence.
- **NEMO (Network Mobility)**
  Network mobility (NEMO) enables a node to retain the same IP address and maintain application connectivity when the node travels across networks. It allows location-independent routing of IP datagrams on the Internet.
- **High-density port connectivity**
  Provides up to 10 interface module slots and up to three on-board Gigabit Ethernet ports, 8 or 24 ports GE supported on one HMIM module.
- **Multiple WAN interfaces**
  Provides traditional links with E1, T1, G.SHDSL, and ISDN links; high-density Ethernet access with WAN Gigabit Ethernet and LAN 4- and 9-port Fast/Giga Ethernet, POE/POE+; mobility access with 3G (WCDMA/HSPA)/4G LTE SIC modules and 3G/4G USB modems, and high-speed T3 and 155 Mb/s OC3 access options
- **Packet storm protection**
  Protects against broadcast, multicast, or unicast storms with user-defined thresholds
- **Loopback**
  Supports internal loopback testing for maintenance purposes and an increase in availability; loopback detection protects against incorrect cabling or network configurations and can be enabled on a per-port or per-VLAN basis for added flexibility
- **USB interface**
  Uses USB memory disk to download and upload configuration/OS image files; supports an external USB 3G/4G modem for a 3G/4G WAN uplink
- **Flexible port selection**
  Provides a combination of fiber and copper interface modules, 100/1000BASE-X support, and 10/100/1000BASE-T auto-speed detection plus auto duplex and MDI/MDI-X

Standard Features

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
- **Multiprotocol Label Switching (MPLS)**
  Uses BGP to advertise routes across Label Switched Paths (LSPs), but uses simple labels to forward packets from any Layer 2 or Layer 3 protocol, which reduces complexity and increases performance; supports graceful restart for reduced failure impact; supports LSP tunneling and multilevel stacks
- **Multiprotocol Label Switching (MPLS) Layer 3 VPN**
  Allows Layer 3 VPNs across a provider network; uses Multiprotocol BGP (MP-BGP) to establish private routes for increased security; supports RFC 2547bis multiple autonomous system VPNs for added flexibility; supports IPv6 MPLS VPN
- **Multiprotocol Label Switching (MPLS) Layer 2 VPN**
  Establishes simple Layer 2 point-to-point VPNs across a provider network using only MPLS Label Distribution Protocol (LDP); requires no routing and therefore decreases complexity, increases performance, and allows VPNs of non-routable protocols; uses no routing information for increased security; supports Circuit Cross Connect (CCC), Static Virtual Circuits (SVCs), Martini draft, and Kompella-draft technologies

Standard Features

- **Routing policy**
  Allows custom filters for increased performance and security; supports ACLs, IP prefix, AS paths, community lists, and aggregate policies

Standard Features

Security

- **IPS**
  Built-in Intrusion Prevention System (IPS) detects and protects the branch office from security threats. Optional HPE integration filters for client-side, branch protection from exploits and vulnerabilities
- **Enhanced stateful firewall**
  Application layer protocol inspection, Transport layer protocol inspection, ICMP error message check, and TCP SYN check. Support more L4 and L7 protocols like TCP, UDP, UDP-Lite, ICMPv4/ICMPv6, SCTP, DCCP, RAWIP, HTTP, FTP, SMTP, DNS, SIP, H.323, SCCP.
- **Zone based firewall**
  Zone-Based Policy Firewall changes the firewall configuration from the older interface-based model to a more flexible, more easily understood zone-based model. Interfaces are assigned to zones, and inspection policy is applied to traffic moving between the zones. Inter-zone policies offer considerable flexibility and granularity, so different inspection policies can be applied to multiple host groups connected to the same router interface.
- **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
- **IPSec VPN**
  Supports DES, 3DES, and AES 128/192/256 encryption, and MD5 and SHA-1 authentication
- **Access control list (ACL)**
  Supports powerful ACLs for both IPv4 and IPv6; ACLs are used for filtering traffic to prevent unauthorized users from accessing the network, or for controlling network traffic to save resources; rules can either deny or permit traffic to be forwarded; rules can be based on a Layer 2 header or a Layer 3 protocol header; rules can be set to operate on specific dates or times
- **Terminal Access Controller Access-Control System (TACACS+)**
  Delivers an authentication tool using TCP with encryption of the full authentication request, providing additional security
- **Unicast Reverse Path Forwarding (URPF)**
  Allows normal packets to be forwarded correctly, but discards the attaching packet due to lack of reverse path route or incorrect inbound interface; prevents source spoofing and distributed attacks
- **Network login**
  Allows authentication of multiple users per port
- **RADIUS**
  Eases security access administration by using a user/password authentication server
- **Network address translation (NAT)**
  Supports one-to-one NAT, many-to-many NAT, and NAT control, enabling NAPT to support multiple connections; supports deny list in NAT, a limit on the number of connections, session logs, and multi-instances
- **Secure Shell (SSHv2)**
  Uses external servers to securely log in into a remote device; with authentication and encryption, it protects against IP spoofing and plain text password interception; increases the security of SFTP transfers

Standard Features

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

Layer 3 services

- **WAN Optimization**
  MSR performs optimization using TFO and a combination of DRE, Lempel-Ziv (LZ) compression to provide the bandwidth optimization for file service and web applications. The policy engine module determines which traffic can be optimized and which optimization action should be taken. A pair of WAN optimization equipment can discover each other automatically and complete the negotiation to establish a TCP optimization session.
- **NAT-PT**
  Network Address Translation – Protocol Translation (NAT-PT) enables communication between IPv4 andIPv6 nodes by translating between IPv4 and IPv6 packets. It performs IP address translation, and according to different protocols, performs semantic translation for packets. This technology is only suitable for communication between a pure IPv4 node and a pure IPv6 node.
- **Address Resolution Protocol (ARP)**
  Determines the MAC address of another IP host in the same subnet; supports static ARPs; gratuitous ARP allows detection of duplicate IP addresses; proxy ARP allows normal ARP operation between subnets or when subnets are separated by a Layer 2 network
- **User Datagram Protocol (UDP) helper**
  Redirects UDP broadcasts to specific IP subnets to prevent server spoofing
- **Dynamic Host Configuration Protocol (DHCP)**
  Simplifies the management of large IP networks and supports client and server; DHCP Relay enables DHCP operation across subnets

Product architecture

- **SDN/OpenFlow**
  OpenFlow is the communications interface defined between the control and forwarding layers of a SDN (Software-Defined Networking) architecture. OpenFlow separates the data forwarding and routing decision functions. It keeps the flow-based forwarding function and employs a separate controller to make routing decisions. OpenFlow matches packets against one or more flow tables. MSR support OpenFlow 1.3.1
- **Ideal multiservice platform**
  Provides WAN router, Ethernet switch, 3G/4G WAN, stateful firewall, VPN, and SIP/voice gateway on MSRs
- **Advanced hardware architecture**
  Provides multicore processors, gigabit switching, and PCIE bus; external RPS or dual internal power supplies, and internal and external CF cards are offered; new high-performance MIM modules (HMIM) supported

Standard Features

- **New operation system**
  Ships with new Comware v7 operating system delivering the latest in virtualization and routing
- **Open Application Platform architecture**
  Provides unmatched application and services flexibility, with the potential to deliver the functionality of multiple devices, creating capital and operational expense savings and lasting investment protection
- **Distributed architecture with separation of data and control planes**
  Delivers enhanced fault tolerance and facilitates near continuous operation and zero service disruption during planned or unplanned control-plane events; service processing units (SPUs) perform data forwarding, encryption, or decryption, and analyzing or filtering of data packets; main processing units perform route calculation, forward table maintenance, and configure and monitor the SPU
- **Field-programmable gate array (FPGA)**
  Improves the bandwidth of I/O module slots from 100 Mb/s to 1000 Mb/s, and improves uplink performance from 1 Gb/s to 10 Gb/s
- **Multi Gigabit Fabric (MGF)**
  Eases utilization of the main processor by transmitting Layer 2 packets directly via the MGF

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Layer 2 switching

- **Spanning Tree Protocol (STP)**
  Supports standard IEEE 802.1D STP, IEEE 802.1w Rapid Spanning Tree Protocol (RSTP) for faster convergence, and IEEE 802.1s Multiple Spanning Tree Protocol (MSTP)
- **Internet Group Management Protocol (IGMP) and Multicast Listener Discovery (MLD) protocol snooping**
  Controls and manages the flooding of multicast packets in a Layer 2 network
- **Port mirroring**
  Duplicates port traffic (ingress and egress) to a local or remote monitoring port
- **VLANs**
  Supports up to 4,094 VLANs or IEEE 802.1Q-based VLANs
- **sFlow**
  Allows traffic sampling
- **Define port as switched or routed**
  Supports command switch to easily change switched ports to routed (maximum of four Fast Ethernet ports)

Quality of Service (QoS)

- **Traffic policing**
  Supports Committed Access Rate (CAR) and line rate
- **Congestion management**
  Supports FIFO, PQ, CQ, WFQ, CBQ, and RTPQ
- **Weighted random early detection (WRED)/random early detection (RED)**
  Delivers congestion avoidance capabilities through the use of queue management algorithms
- **Hierarchical quality of service (HQoS)/Nested QoS**
  Manages traffic uniformly, and hierarchically schedules traffic by user, network service, and application; provides more granular traffic control and quality assurance services than traditional QoS
- **Other QoS technologies**
  Supports traffic shaping, MPLS QoS, MP QoS/LFI, and Control Plane Policing (CoPP).

Standard Features

Integration

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

Standard Features

Management

- **HPE Intelligent Management Center (IMC)**
  Integrates fault management, element configuration, and network monitoring from a central vantage point; built-in support for third-party devices enables network administrators to centrally manage all network elements with a variety of automated tasks, including discovery, categorization, baseline configurations, and software images; the software also provides configuration comparison tools, version tracking, change alerts, and more
- **Industry-standard CLI with a hierarchical structure**
  Reduces training time and expenses, and increases productivity in multivendor installations
- **Management security**
  Restricts access to critical configuration commands; offers multiple privilege levels with password protection; ACLs provide Telnet and SNMP access; local and remote syslog capabilities allow logging of all access
- **SNMPv1, v2, and v3**
  Provide complete support of SNMP; provide full support of industry-standard Management Information Base (MIB) plus private extensions; SNMPv3 supports increased security using encryption
- **Remote monitoring (RMON)**
  Uses standard SNMP to monitor essential network functions; supports events, alarm, history, and statistics group plus a private alarm extension group
- **FTP, TFTP, and SFTP support**
  Offers different mechanisms for configuration updates; FTP allows bidirectional transfers over a TCP/IP network; trivial FTP (TFTP) is a simpler method using User Datagram Protocol (UDP); Secure File Transfer Protocol (SFTP) runs over an SSH tunnel to provide additional security
- **Debug and sampler utility**
  Supports ping and trace route for both IPv4 and IPv6
- **Network Time Protocol (NTP)**
  Synchronizes timekeeping among distributed time servers and clients; keeps timekeeping consistent among all clock-dependent devices within the network so that the devices can provide diverse applications based on the consistent time
- **Information center**
  Provides a central repository for system and network information; aggregates all logs, traps, and debugging information generated by the system and maintains them in order of severity; outputs the network information to multiple channels based on user-defined rules
- **Management interface control**
  Provides management access through modem port and terminal interface; provides access through terminal interface, telnet, or SSH
- **Network Quality Analyzer (NQA)**
  Analyzes network performance and service quality by sending test packets, and provides network performance and service quality parameters such as jitter, TCP, or FTP connection delays; allows network manager to determine overall network performance and diagnose and locate network congestion points or failures
- **Role-based security**
  Delivers role-based access control (RBAC); supports 16 user levels (0~15)
- **Standards-based authentication support for LDAP**
  Integrates seamlessly into existing authentication services

Standard Features

Ease of deployment

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

Resiliency and high availability

- **Intelligent Resilient Fabric (IRF)**
  Intelligent Resilient Fabric (IRF) allows the customer to build an IRF stack, namely a logical device, by interconnecting multiple devices through stack ports. The customer can manage all the devices in the IRF stack by managing the logical device, which is cost-effective like a box-type device, and scalable and highly reliable like a chassis-type distributed device.
- **Backup Center**
  Acts as a part of the management and backup function to provide backup for device interfaces; delivers reliability by switching traffic over to a backup interface when the primary one fails
- **Virtual Router Redundancy Protocol (VRRP)**
  Allows groups of two routers to dynamically back each other up to create highly available routed environments; supports VRRP load balancing
- **In-Service Software Upgrade (ISSU)**
  Lowers downtime caused by planned maintenance and software upgrades
- **Embedded Automation Architecture (EAA)**
  Monitors the internal event and status of system hardware and software, identifying potential problems as early as possible; collects field information and attempts to automatically repair the issues; based on the user configuration, onsite information will be sent to technical support
- **Bidirectional Forwarding Detection (BFD)**
  Detects quickly the failures of the bidirectional forwarding paths between two devices for upper-layer protocols such as routing protocols and MPLS

Investment protection

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

Additional information

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

Standard Features

Warranty and support

- **1-year Warranty**
  See Warranty and support summary for what is included with your product purchase.
- **Software release**
  To find software for your product, refer to http://www.hpe.com/networking/support; for details on the software releases available with your product purchase, refer to Warranty and support summary.

Configuration Information

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

Router Chassis

Rule#	Description	SKU
3	HPE FlexNetwork MSR3044 Router – 1 Fixed 10M/100M/1000M RJ45 ports – 2 COMBO 1000M RJ45/SFP ports min=0 \ max=2 SFP Transceivers – 4 - SIC module slots / 2 - DSIC module slots – 4 - HMIM module slots (4 - Half Height Slots) / 0 - DHMIM module slot (Double Width Full Height Slot) – 2 - VPM slots – 2 USB 2.0 Port for 3G modem and USB disk – 1 CON/AUX port and 1 USB console port – 2GB DDR3 SDRAM Included (4GB Max, by replacing existing single 2GB SDRAM) – 1 - CF Card Slot – Must select min 1 Power Supply (min=1 \ max=2) 2U - Height	JG405A
3, 4	HPE Networking Comware Router MSR3046 – 1 Fixed 10M/100M/1000M RJ45 ports – 5 Fixed 1/10G SFP/SFP+ ports min=0 \ max=5 SFP/SFP+ Transceivers – 4 - SIC module slots / 0 - DSIC module slots – 4 - HMIM module slots (4 - Half Height Slots) / 0 - DHMIM module slot (Double Width Full Height Slot) – 0 - VPM slots – 1 USB 2.0 Port for 3G modem and USB disk – 1 CON/AUX port and 1 USB console port – 2GB DDR3 SDRAM Included (2GB Max) – 0 - CF Card Slot – Must select min 1 Power Supply (min=1 \ max=2) – 2U - Height	R9J04A
1, 2, 3, 8	HPE FlexNetwork MSR3024 AC Router – 2 Fixed 10M/100M/1000M RJ45 ports – 1 COMBO 1000M RJ45/SFP port min=0 \ max=1 SFP Transceiver – 4 - SIC module slots / 2 - DSIC module slots – 2 - HMIM module slots (2 - Half Height Slots) / 0 - DHMIM module slot (Double Width Full Height Slot) – 2 - VPM slots – 2 USB 2.0 Port for 3G modem and USB disk – 1 CON/AUX port and 1 USB console port – 2GB DDR3 SDRAM Included (4GB Max, by replacing existing single 2GB SDRAM) – 1 - CF Card Slot – AC Power Supply included (+RPS Optional) – 1U - Height	JG406A
3, 4, 6, 7	HPE Networking Comware Router MSR3026	R9J03A

Configuration Information

- 2 Fixed 10M/100M/1000M RJ45 ports
- 5 Fixed 1/10G SFP/SFP+ ports min=0 \ max=5 SFP/SFP+ Transceivers
- 4 - SIC module slots / 0 - DSIC module slots
- 2 - HMIM module slots (2 - Half Height Slots) / 0 - DHMIM module slot (Double Width Full Height Slot)
- 0 - VPM slots
- 1 USB 2.0 Port for 3G modem and USB disk
- 0 CON/AUX port and 0 USB console port
- 4GB DDR3 SDRAM Included (4GB Max)
- 0 - CF Card Slot
- Must select min 1 Power Supply (min=1 \ max=2)
- 1U - Height

1, 2, 3 HPE Networking Comware Router AC MSR3016 R8V32A

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

HPE Networking Comware Router AC MSR3016 PDU R8V32A#B2B

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

HPE Networking Comware Router AC MSR3016 PDU R8V32A#B2C

- C15 PDU Jumper Cord (ROW)

HPE Networking Comware Router AC MSR3016 220v R8V32A#B2E

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

HPE Networking Comware Router AC MSR3016 NoLoc R8V32A#AC3

- No Localized Power Cord Selected

Configuration Rules

Rule#	Description	SKU
1	1 - AC Power Supply included	
2	Localization required on orders without #B2B, #B2C or #B2E. (See Localization Menu)	
3	The following Transceivers install into this Switch:	
	HPE Networking X120 1G SFP LC LH100 Transceiver	JD103A
	HPE Networking X120 1G SFP RJ45 T Transceiver	JD089B
	HPE Networking X120 1G SFP LC BX 10-U Transceiver	JD098B
	HPE Networking X120 1G SFP LC BX 10-D Transceiver	JD099B
4	The following SFP+ 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

Configuration Information

	HPE Networking X130 10G SFP+ LC LR Transceiver	JD094B
	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
5	The following SFP28 Transceivers install into this Router:	
	HPE Networking X190 25G SFP28 LC SR 100m MM Transceiver	JL293A
6	The following SFP28 Transceivers install into this Router:	
	HPE Networking X115 100M SFP LC BX 10-U Transceiver	JD100A
	HPE Networking X115 100M SFP LC FX Transceiver	JD102B
	HPE Networking X110 100M SFP LC LX Transceiver	JD120B
7	The following SFP+ Transceivers install into this Router:	
	HPE Networking Comware 10GBASE-T SFP+ RJ45 30m Cat6A Transceiver	S2N61A

Notes:

– Drop down under power supply should offer the following options and results:
  - Switch/Router/Power Supply to PDU Power Cord - #B2B in North America, Mexico, Taiwan, and Japan or #B2C ROW. (Watson Default B2B or B2C for Rack Level CTO) Switch/Router/Power Supply to Wall Power Cord - Localized Option (Watson Default for BTO and Box Level CTO)
  - High Volt Switch/Router/Power Supply to Wall Power Cord - #B2E Option. (Offered only in North America, Mexico, Taiwan, and Japan)
  - No Power Cord Selected - AC3 Option

– OCA Only Model Selection Form - HPE Offering > HPE Aruba Networking > Routers > Branch: HPE Networking Comware Router Series MSR3000

Configuration Information

Rack Level Integration CTO Models

Router Chassis

Rule#	Description	SKU
3	HPE FlexNetwork MSR3044 Router – 1 Fixed 10M/100M/1000M RJ45 ports – 2 COMBO 1000M RJ45/SFP ports min=0 \ max=2 SFP Transceivers – 4 - SIC module slots / 2 - DSIC module slots – 4 - HMIM module slots (4 - Half Height Slots) / 0 - DHMIM module slot (Double Width Full Height Slot) – 2 - VPM slots – 2 USB 2.0 Port for 3G modem and USB disk – 1 CON/AUX port and 1 USB console port – 2GB DDR3 SDRAM Included (4GB Max, by replacing existing single 2GB SDRAM) – 1 - CF Card Slot – Must select min 1 Power Supply (min=1 \ max=2) – 2U - Height	JG405A
1, 2, 3	HPE FlexNetwork MSR3024 AC Router – 2 Fixed 10M/100M/1000M RJ45 ports – 1 COMBO 1000M RJ45/SFP port min=0 \ max=1 SFP Transceiver – 4 - SIC module slots / 2 - DSIC module slots – 2 - HMIM module slots (2 - Half Height Slots) / 0 - DHMIM module slot (Double Width Full Height Slot) – 2 - VPM slots – 2 USB 2.0 Port for 3G modem and USB disk – 1 CON/AUX port and 1 USB console port – 2GB DDR3 SDRAM Included (4GB Max, by replacing existing single 2GB SDRAM) – 1 - CF Card Slot – AC Power Supply included (+RPS Optional) – 1U - Height	JG406A

Configuration Rules

Rule#	Description	SKU
1	1 - AC Power Supply included	
2	Localization (Wall Power Cord) required on orders without #B2B, #B2C (PDU Power Cord). (See Localization Menu) **Notes:** When Switches/Routers are Factory Racked, Then #B2B, or #B2C should be the Defaulted Power Cable option on the Switches/Routers.	
3	The following Transceivers install into this Router:	
	HPE Networking X120 1G SFP LC LH100 Transceiver	JD103A
	HPE Networking X120 1G SFP RJ45 T Transceiver	JD089B
	HPE Networking X115 100M SFP LC FX Transceiver	JD102B
	HPE Networking X110 100M SFP LC LX Transceiver	JD120B
	HPE Networking X120 1G SFP LC BX 10-U Transceiver	JD098B
	HPE Networking X120 1G SFP LC BX 10-D Transceiver	JD099B

Configuration Information

Notes:
- Drop down under power supply should offer the following options and results: Switch/Router/Power Supply to PDU Power Cord - #B2B in North America, Mexico, Taiwan, and Japan or #B2C ROW. (Watson Default B2B or B2C for Rack Level CTO) Switch/Router/Power Supply to Wall Power Cord - Localized Option (Watson Default for BTO and Box Level CTO)
- Click UNB - If an option is ordered with #0D1/#B01, then the switch must have #0D1 option.

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

SIC Modules

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

Rule#	Description	SKU
2, 11	HPE Networking Comware MSR 1-port Enhanced Serial SIC Module	JD557A
	– min=0 \ max=1 Serial Port Cable	
2, 11, 21	HPE Networking Comware MSR 4-port Enhanced Sync Serial SIC Module	JG737A
	– min=0 \ max=4 Serial Port Cable	
1, 22	HPE Networking Comware MSR 4-port Gig-T Switch SIC Module	JG739A
1, 22	HPE Networking Comware MSR 4-port GbE Combo SIC Module	R8V29A
	Configuration Rules	
1	These Modules can install directly to the Routers (JM044A, JG405A, JG861A, JG406A, min=0\ max=2 per enclosure (only supported in Slots 2 and 4)	
2	These Modules can install directly to the Routers (JM044A, JG405A, JG861A, JG406A, Jmin=0\ max=4 per enclosure	
11	The following Cables install into this Module:	
	HPE Networking Comware X200 V.24 DTE 3m Serial Port Cable	JD519A
	HPE Networking Comware X200 V.35 DTE 3m Serial Port Cable	JD523A
	HPE Networking Comware X200 V.35 DCE 3m Serial Port Cable	JD525A
	HPE Networking Comware X200 V.24 DCE 3m Serial Port Cable	JD521A
21	These Modules can install directly to the Routers (R8V32A, R9J03A, R9J04A) min=0\ max=1 per enclosure	
22	These Modules can install directly to the Routers (R8V32A, R9J03A, R9J04A) min=0\ max=2 per enclosure (slots 2 and 4)	
Notes:	PoE Modules can be used as non-POE modules on chassis without PoE power supplies.	

HMIM Modules

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

Rule#	Description	SKU
4. 15, 25, 27	HPE Networking Comware MSR 4-Port Gig-T HMIM-V2 Module	S0W32A
	– (Half Height Module; Takes up 1 Half Height or 1 Full Height slot)	
3, 15	HPE Networking Comware MSR 16-Port Enhanced Async Serial HMIM-V2 Module	S0W35A
	– (Full Height Module; Takes up 1 - Full Height slot or 2 - Half Height slots, vertically)	

Configuration Information

4, 12, 25, 27	HPE Networking Comware MSR 8-port Gig-T HMIM Module – (Half Height Module; Takes up 1 Half Height or 1 Full Height slot)	JG422A
4, 12, 17, 25, 27	HPE Networking ComwareMSR 8-port 1000BASE-X HMIM Module – (Half Height Module; Takes up 1 Half Height or 1 Full Height slot) – min=0 \ max=8 SFP Modules	JG425A
3, 11, 14, 23, 26	HPE Networking Comware MSR 24-port Gig-T Switch HMIM Module – (Full Height Module; Takes up 1 - Full Height slot or 2 - Half Height slots, vertically)	JG426A
4, 7, 12, 17, 18, 24	HPE Networking Comware MSR 8-port 10/100/1000BASE-T/2-port 1000BASE-X (Combo) Switch HMIM Module – (Half Height Module; Takes up 1 Half Height or 1 Full Height slot) – min=0 \ max=2 SFP Transceivers	JG741A
4, 10, 12, 19, 20, 25, 27	HPE Networking Comware MSR 8-port E1/CE1/T1/CT1/PRI HMIM Module – (Half Height Module; Takes up 1 Half Height or 1 Full Height slot) – min=0 \ max=8 E1/T1 Cable	JH169A
4, 10, 12, 19, 20, 25, 27	HPE Networking Comware MSR 8-port E1/Fractional E1/T1/Fractional T1 HMIM Module – (Half Height Module; Takes up 1 Half Height or 1 Full Height slot) – min=0 \ max=8 E1/T1 Cable	JH172A
4, 7, 12, 17, 24	HPE Networking Comware MSR 8-port 100BASE-FX/1000BASE-X/4-port 1000BASE-T (Combo) L2/L3 HMIM Module – (Half Height Module; Takes up 1 Half Height or 1 Full Height slot) – min=0 \ max=8 SFP Modules	JH238A

Configuration Rules

Rule#	Description	SKU
3	These Modules can install directly to the Router Chassis (JG405A) min=0\ max=2 per enclosure (Full Height Module; Takes up 1 - Full Height slot or 2 - Half Height slots, vertically)	
4	These Modules can install directly to the Router Chassis (JG405A) min=0\ max=4 per enclosure	
7	The following Transceivers install into this Module:	
	HPE Networking X115 100M SFP LC FX Transceiver	JD102B
	HPE Networking X110 100M SFP LC LX Transceiver	JD120B
10	The following T1 Cables install into this Module:	
	HPE Networking Comware X260 T1 Router Cable	JD518A
11	These Modules can install directly to the Router Chassis (JM044A, JG406A) min=0\ max=1 per enclosure (Full Height Module; Takes up 1 - Full Height slot or 2 - Half Height slots, vertically)	

Configuration Information

12	These Modules can install directly to the Router Chassis (JM044A, JG406A) min=0\ max=2 per enclosure	
14	Full Height Module; Takes up 1 - Full Height slot or 2 - Half Height slots, vertically	
15	These Modules can install directly to the Router Chassis (JM044A) min=0\ max=2 per enclosure	
17	The following Transceivers install into this Module:	
	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-U Transceiver	JD098B
	HPE Networking X120 1G SFP LC BX 10-D Transceiver	JD099B
	HPE Networking X120 1G SFP LC LH100 Transceiver	JD103A
18	These Modules can install directly to the Router Chassis (HP MSR3064) min=0\ max=5 per enclosure (Not supported in Slot 7)	
19	The following E1 Cables install into this Module:	
	HPE Networking Comware X260 E1 RJ45 to 2xBNC 75ohm 3m Router Cable	JH294A
20	The following E1 Cables install into this Module:	
	HPE Networking Comware X260 E1 RJ45 120 ohm 2m Router Cable	JC156A
23	These Modules can install directly to the Router Chassis (R9J03A), min=0\ max=1 per enclosure	
24	These Modules can install directly to the Router Chassis (R9J03A, R9J04A(slot 5 and 6)) min=0\ max=2 per enclosure	
25	These Modules can install directly to the Router Chassis (R9J04A), min=0\ max=4 per enclosure	
26	These Modules can install directly to the Router Chassis (R9J04A), min=0\ max=2 per enclosure	
27	These Modules can install directly to the Router Chassis (R9J03A), min=0\ max=2 per enclosure	

Configuration Information

Transceivers

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

Rule#	Description	SKU
	SFP Transceivers	
1, 2	HPE Networking X120 1G SFP LC SX Transceiver	JD118B
1, 2	HPE Networking X120 1G SFP LC LX Transceiver	JD119B
1, 2	HPE Networking X115 100M SFP LC FX Transceiver	JD102B
1, 2	HPE Networking X110 100M SFP LC LX Transceiver	JD120B
1, 2	HPE Networking X115 100M SFP LC BX 10-U Transceiver	JD100A
1, 2	HPE Networking X120 1G SFP LC LH100 Transceiver	JD103A
1, 2	HPE Networking X120 1G SFP LC BX 10-U Transceiver	JD098B
1, 2	HPE Networking X120 1G SFP LC BX 10-D Transceiver	JD099B
1, 2	HPE Networking X120 1G SFP RJ45 T Transceiver	JD089B
	SFP+ Transceivers	
	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
	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
	SFP28 Transceivers	
	HPE Networking X190 25G SFP28 LC SR 100m MM Transceiver	JL293A
	Configuration Rules	
Rule#	**Description**	**SKU**
1	These Transceivers can install directly to JG405A, min=0\ max=2 per enclosure	
2	These Transceivers can install directly to JG406A and JM044A min=0\ max=1 per enclosure	

Power Supplies

Rule#	Description	SKU
	(JG405A/R9J04A and R9J03A only) System (std 0// Max 1 or max 2) User Selection (min 1 // Max 1 or max 2) MSR3064/3044/3026 Router (JM044A only) System (std 0// max 2) User Selection (min 1 // max 2) MSR3620 Router	
3, 6	HPE Networking Comware X351 300W 48-60VDC to 12VDC Power Supply	JG528A
1, 2, 3, 6	HPE Networking Comware X351 300W 100-240VDC to 12VDC Power Supply	JG527A
	HPE Networking Comware X351 300W 100-240VDC to 12VDC Power Supply PDU	JG527A#B2B
	– C15 PDU Jumper Cord (NA/MEX/TW/JP)	

Configuration Information

	HPE Networking Comware X351 300W 100-240VDC to 12VDC Power Supply PDU	JG527A#B2C
	– C15 PDU Jumper Cord (ROW)	
	HPE Networking Comware X351 300W 100-240VDC to 12VDC Power Supply 220v	JG527A#B2E
	– NEMA L6-20P Cord (NA/MEX/JP/TW)	
1, 2,4, 5, 6	HPE Networking X351 150W AC Power Supply	JG745B
	HPE Networking X351 150W AC Power Supply PDU	JG745B#B2B
	– C15 PDU Jumper Cord (NA/MEX/TW/JP)	
	HPE Networking X351 150W AC Power Supply PDU	JG745B#B2C
	– C15 PDU Jumper Cord (ROW)	
	HPE Networking X351 150W AC Power Supply 220v	JG745B#B2E
	– NEMA L6-20P Cord (NA/MEX/JP/TW)	
	HPE Networking X351 150W AC Power Supply NoLoc	JG745B#AC3
	– No Localized Power Cord Selected	

Configuration Rules

Rule#	Description	SKU
1	Localization required on orders without #B2B, #B2C or #B2E options.	
2	If #B2E is selected Then replace Localized option with #B2E for power supply and with #B2E for router. (Offered only in NA, Mexico, Taiwan, and Japan)	
3	Maximum of 2 of this Power Supply for MSR3044 - JG405A, R9J04A.min=0\ max=2 no mixing.	
4	Maximum of 2 of this Power Supply for MSR3620 - JM044A. min=0 \ max=2	
5		
6	Power Supplies cannot be mixed in the same Router enclosure	

Notes:

– Drop down under power supply should offer the following options and results:

- Switch/Router/Power Supply to PDU Power Cord - #B2B in North America, Mexico, Taiwan, and Japan or #B2C ROW. (Watson Default B2B or B2C for Rack Level CTO)
- Switch/Router/Power Supply to Wall Power Cord - Localized Option (Watson Default for BTO and Box Level CTO)
- High Volt Switch/Router/Power Supply to Wall Power Cord - #B2E Option. (Offered only in North America, Mexico, Taiwan, and Japan)

Cables

HPE Networking Comware X260 Mini D-28 to 4-RJ45 0.3m Router Cable	JG263A
HPE Networking Comware X200 V.24 DTE 3m Serial Port Cable	JD519A
HPE Networking Comware X200 V.24 DCE 3m Serial Port Cable	JD521A
HPE Networking Comware X200 V.35 DTE 3m Serial Port Cable	JD523A
HPE Networking Comware X200 V.35 DCE 3m Serial Port Cable	JD525A
HPE Networking Comware X260 E1 (2) BNC 75 ohm 3m Router Cable	JD175A
HPE Networking Comware X260 E1 RJ45 BNC 75-120 ohm Conversion Router Cable	JD511A
HPE Networking Comware X260 T1 Router Cable	JD518A

Configuration Information

	HPE Networking Comware X260 T3/E3 Router Cable	JD531A
	HPE Networking Comware X260 E1 RJ45 to 2xBNC 75ohm 3m Router Cable	JH294A
	HPE Networking Comware X260 E1 RJ45 120 ohm 2m Router Cable	JC156A
	Configuration Rules	
Notes:	The following cable is used for RJ45 BNC Conversion:	
	HPE Networking Comware X260 E1 RJ45 BNC 75-120 ohm Conversion Router Cable	JD511A

Router Enclosure Options

External Redundant Power Supplies

JG406A, JG861A and JG409B only - System (std 0 // max 1) User Selection (min 0 // max 1)

Rule#	Description	SKU
1, 2	HPE Networking X351 150W AC Power Supply	JG745B
1, 2	HPE Networking Comware X351 300W 100-240VDC to 12VDC Power Supply	JG527A
1	HPE Networking Comware X351 300W 48-60VDC to 12VDC Power Supply	JG528A
	Configuration Rules	
Rule#	**Description**	**SKU**
1	These power supplies are supported on the following routers only:	
	HPE FlexNetwork MSR3024 AC Router	JG406A
2	Localization required. (See Localization Menu for list.)	

Technical Specifications

HPE FlexNetwork MSR3024 AC Router (JG406A)		
I/O ports and slots	2 HMIM slots 4 SIC slots or 2 DSIC slots 3 RJ-45 10/100/1000 WAN ports (1 combo can be used as SFP WAN port	
Additional ports and slots	1 VPM slot	
AP characteristics	**Radios (via optional modules)**	3G, 4G LTE
Physical characteristics	**Dimensions**	17.32(w) x 18.9(d) x 1.74(h) in (44 x 48 x 4.42 cm) (1U height)
	Weight	17.42 lb. (9.7 kg)
Memory and processor	RISC, 4 cores @ 1 GHz, 256 MB flash capacity, 2 GB DDR3 SDRAM	
Mounting and enclosure	Desktop or can be mounted in a EIA standard 19-inch telco rack when used with the rack-mount kit in the package.	
Performance	**Throughput**	up to 2.6 Mpps (64-byte packets)
	Routing table size	500000 entries (IPv4), 500000 entries (IPv6)
	Forwarding table size	500000 entries (IPv4), 500000 entries (IPv6)
Environment	**Operating temperature**	32ºF to 113ºF (0ºC to 45ºC)
	Operating relative humidity	5% to 95%, noncondensing
	Nonoperating/Storage temperature	-40ºF to 158ºF (-40ºC to 70ºC)
	Nonoperating/Storage relative humidity	5% to 95%, noncondensing
	Altitude	up to 16,404 ft (5 km)
Electrical characteristics	**Frequency**	50/60 Hz
	Maximum heat dissipation	168 BTU/hr (177.24 kJ/hr)
	Voltage	100-120 / 200-240 VAC, rated
	Maximum power rating	100 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.	
Reliability	**MTBF (years)**	49.61
Safety UL 60950-1; AS/NZS 60950; EN 60825-1 Safety of Laser Products-Part 1; EN 60825-2 Safety of Laser Products-Part 2; IEC 60950-1; CAN/CSA-C22.2 No. 60950-1-03; EN 60950-1/A11; FDA 21 CFR Subchapter J		
Emissions EN 55022 Class A; ICES-003 Class A; ANSI C63.4 2003; ETSI EN 300 386 V1.3.3; AS/NZS CISPR 22 Class A; EN 61000-4-2; EN 61000-4-3; EN 61000-4-4; EN 61000-4-5; EN61000-4-6; EN 61000-3-2:2006; EN 61000-3-3:1995 +A1:2001+A2:2005; EMC Directive 2004/108/EC; FCC (CFR 47, Part 15) Class A; EN 55024:1998+ A1:2001 + A2:2003; EN 61000-4-11:2004; EN 61000-4-8:2001		
Telecom FCC part 68; CS-03		
Management IMC - Intelligent Management Center; command-line interface; limited command-line interface; configuration menu; out-of-band management (RJ-45 Ethernet); SNMP Manager; Telnet; RMON1; FTP; in-line and out-of-band; modem interface; out-of-band management (serial RS-232C or Micro USB); IEEE 802.3 Ethernet MIB		

Technical Specifications

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 Networking Comware MSR3620-DP Router (JM044A)		
I/O ports and slots	2 HMIM slots 4 SIC slots 4 RJ-45 10/100/1000 WAN ports (4 combo can be used as SFP WAN port) 2 SFP fixed Gigabit Ethernet WAN ports	
Additional ports and slots	2 power supply slots	
AP characteristics	**Radios (via optional modules)**	3G, 4G LTE
Physical characteristics	**Dimensions**	17.32(w) x 18.5(d) x 1.74(h) in (44 x 47 x 4.42 cm) (1U height)
	Weight	21.38 lb (9.7 kg)
Memory and processor	RISC, 8 cores @ 1.2 Ghz, 512MB flash capacity, 2GB DDR3 SDRAM	
Mounting and enclosure	Desktop or can be mounted in a EIA standard 19-inch telco rack when used with the rack-mount kit in the package.	
Performance	**Throughput**	up to 5 Mpps (64-byte packets)
	Routing table size	500000 entries (IPv4), 500000 entries (IPv6)
	Forwarding table size	500000 entries (IPv4), 500000 entries (IPv6)
Environment	**Operating temperature**	32ºF to 113ºF (0ºC to 45ºC)
	Operating relative humidity	5% to 95%, noncondensing
	Nonoperating/Storage temperature	-40ºF to 158ºF (-40ºC to 70ºC)
	Nonoperating/Storage relative humidity	5% to 95%, noncondensing
	Altitude	up to 16,404 ft (5 km)
Electrical characteristics	**Frequency**	50/60 Hz
	Maximum heat dissipation	218 BTU/hr. (229.99 kJ/hr.)
	Voltage	100 - 240 VAC, rated
	Maximum power rating	100 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.	
Reliability	**MTBF (years)**	89.87
Safety UL 60950-1; AS/NZS 60950; EN 60825-1 Safety of Laser Products-Part 1; EN 60825-2 Safety of Laser Products-Part 2; IEC 60950-1; CAN/CSA-C22.2 No. 60950-1-03; EN 60950-1/A11; FDA 21 CFR Subchapter J		
Emissions EN 55022 Class A; ICES-003 Class A; ANSI C63.4 2003; ETSI EN 300 386 V1.3.3; AS/NZS CISPR 22 Class A; EN 61000-4-2; EN 61000-4-3; EN 61000-4-4; EN 61000-4-5; EN61000-4-6; EN 61000-3-2:2006; EN 61000-3-3:1995 +A1:2001+A2:2005; EMC Directive 2004/108/EC; FCC (CFR 47, Part 15) Class A; EN 55024:1998+ A1:2001 + A2:2003; EN 61000-4-11:2004; EN 61000-4-8:2001		
Telecom FCC part 68; CS-03		
Management IMC - Intelligent Management Center; command-line interface; limited command-line interface; configuration menu; out-of-band management (RJ-45 Ethernet); SNMP Manager; Telnet; RMON1; FTP; in-line and out-of-band; modem interface; out-of-band management (serial RS-232C or Micro USB); IEEE 802.3 Ethernet MIB		

Technical Specifications

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 Networking Comware MSR3044 Router (JG405A)		
I/O ports and slots	4 HMIM slots 4 SIC slots, or 2 DSIC slots, or a combination 3 RJ-45 10/100/1000 WAN ports (2 combo can be used as SFP WAN port)	
Additional ports and slots	2 VPM slots 2 Power Supply slots	
AP characteristics	**Radios (via optional modules)**	3G, 4G LTE
Physical characteristics	**Dimensions**	17.32(w) x 18.9(d) x 3.47(h) in (44 x 48 x 8.81 cm) (2U height)
	Weight	33.827.45 lb. (152.45 35 kg)
Memory and processor	RISC, 4 cores @ 1 GHz, 256 MB flash capacity, 2 GB DDR3 SDRAM	
Mounting and enclosure	Desktop or can be mounted in a EIA standard 19-inch telco rack when used with the rack-mount kit in the package.	
Performance	**Throughput**	up to 2.5 Mpps (64-byte packets)
	Routing table size	500000 entries (IPv4), 500000 entries (IPv6)
	Forwarding table size	500000 entries (IPv4), 500000 entries (IPv6)
Environment	**Operating temperature**	32ºF to 113ºF (0ºC to 45ºC)
	Operating relative humidity	5% to 95%, noncondensing
	Nonoperating/Storage temperature	-40ºF to 158ºF (-40ºC to 70ºC)
	Nonoperating/Storage relative humidity	5% to 95%, noncondensing
	Altitude	up to 16,404 ft (5 km)
Electrical characteristics	**Frequency**	50/60 Hz
	Maximum heat dissipation	172 BTU/hr (181.46 kJ/hr)
	Voltage	100 - 240 VAC, rated -36 to -75 VDC, rated (depending on power supply chosen)
	Maximum power rating	100 W
	PoE power	450 W 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. PoE Power is the power supplied by the internal power supply, it is dependent on the type and quantity of power supplies and may be supplemented with the use of a External Power Supply (EPS). No default power supply is included in the chassis; a minimum of one/maximum of four power supplies should be ordered.	
Reliability	**MTBF (years)**	82.57
Safety UL 60950-1; AS/NZS 60950; EN 60825-1 Safety of Laser Products-Part 1; EN 60825-2 Safety of Laser Products-Part 2; IEC 60950-1; CAN/CSA-C22.2 No. 60950-1-03; EN 60950-1/A11; FDA 21 CFR Subchapter J		
Emissions EN 55022 Class A; ICES-003 Class A; ANSI C63.4 2003; ETSI EN 300 386 V1.3.3; AS/NZS CISPR 22 Class A; EN 61000-4-2; EN 61000-4-3; EN 61000-4-4; EN 61000-4-5; EN61000-4-6; EN 61000-3-2:2006; EN 61000-3-3:1995 +A1:2001+A2:2005; EMC Directive 2004/108/EC; FCC (CFR 47, Part 15) Class A; EN 55024:1998+ A1:2001 + A2:2003; EN 61000-4-11:2004; EN 61000-4-8:2001		

Technical Specifications

Telecom FCC part 68; CS-03
Management IMC - Intelligent Management Center; command-line interface; limited command-line interface; configuration menu; out-of-band management (RJ-45 Ethernet); SNMP Manager; Telnet; RMON1; FTP; in-line and out-of-band; modem interface; out-of-band management (serial RS-232C or Micro USB); IEEE 802.3 Ethernet MIB
Services 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 Networking Comware MSR3064 Router (JG404A)		
I/O ports and slots	6 HMIM slots or 1 DHMIM slot 4 SIC slots or 2 DSIC slots 3 RJ-45 10/100/1000 WAN ports (2 combo can be used as SFP WAN port)	
Additional ports and slots	2 VPM slots 2 Power Supply slots	
AP characteristics	**Radios (via optional modules)**	3G, 4G LTE
Physical characteristics	**Dimensions**	17.32(w) x 18.9(d) x 5.31(h) in (44 x 48 x 13.5 cm) (3U height)
	Weight	44.42 lb. (20.15 kg)
Memory and processor	RISC, 6 cores @ 1.3 GHz, 256 MB flash capacity, 2 GB DDR3 SDRAM	
Mounting and enclosure	Desktop or can be mounted in a EIA standard 19-inch telco rack when used with the rack-mount kit in the package.	
Performance	**Throughput**	up to 5 Mpps (64-byte packets)
	Routing table size	500000 entries (IPv4), 500000 entries (IPv6)
	Forwarding table size	500000 entries (IPv4), 500000 entries (IPv6)
Environment	**Operating temperature**	32ºF to 113ºF (0ºC to 45ºC)
	Operating relative humidity	5% to 95%, noncondensing
	Nonoperating/Storage temperature	-40ºF to 158ºF (-40ºC to 70ºC)
	Nonoperating/Storage relative humidity	5% to 95%, noncondensing
	Altitude	up to 16,404 ft (5 km)
Electrical characteristics	**Frequency**	50/60 Hz
	Maximum heat dissipation	218 BTU/hr (229.99 kJ/hr)
	Voltage	100 - 240 VAC, rated -36 to -75 VDC, rated (depending on power supply chosen)
	Maximum power rating	100 W
	PoE power	450 W 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. PoE Power is the power supplied by the internal power supply, it is dependent on the type and quantity of power supplies and may be supplemented with the use of a External Power Supply (EPS). No default power supply is included in the chassis; a minimum of one/maximum of four power supplies should be ordered.	
Reliability	**MTBF (years)**	80.58
Safety UL 60950-1; AS/NZS 60950; EN 60825-1 Safety of Laser Products-Part 1; EN 60825-2 Safety of Laser Products-Part 2; IEC 60950-1; CAN/CSA-C22.2 No. 60950-1-03; EN 60950-1/A11; FDA 21 CFR Subchapter J		
Emissions EN 55022 Class A; ICES-003 Class A; ANSI C63.4 2003; ETSI EN 300 386 V1.3.3; AS/NZS CISPR 22 Class A; EN 61000-4-2; EN 61000-4-3; EN 61000-4-4; EN 61000-4-5; EN61000-4-6; EN 61000-3-2:2006; EN 61000-3-3:1995 +A1:2001+A2:2005; EMC Directive 2004/108/EC; FCC (CFR 47, Part 15) Class A; EN 55024:1998+ A1:2001 + A2:2003; EN 61000-4-11:2004; EN 61000-4-8:2001		

Technical Specifications

Telecom FCC part 68; CS-03
Management IMC - Intelligent Management Center; command-line interface; limited command-line interface; configuration menu; out-of-band management (RJ-45 Ethernet); SNMP Manager; Telnet; RMON1; FTP; in-line and out-of-band; modem interface; out-of-band management (serial RS-232C or Micro USB); IEEE 802.3 Ethernet MIB
Services 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 Networking Comware MSR3012 AC Router (JG409B)		
I/O ports and slots	1 HMIM slots 2 SIC slots 3 RJ-45 10/100/1000 WAN ports (1 combo can be used as SFP WAN port)	
Additional ports and slots	1 VPM slot	
AP characteristics	**Radios (via optional modules)**	3G, 4G LTE
Physical characteristics	**Dimensions**	17.32(w) x 18.9(d) x 1.74(h) in (44 x 48 x 4.42 cm) (1U height)
	Weight	15.76 lb. (8.05kg)
Memory and processor	RISC, 4 cores @ 1 GHz, 256 MB flash capacity, 1 GB DDR3 SDRAM	
Mounting and enclosure	Desktop or can be mounted in a EIA standard 19-inch telco rack when used with the rack-mount kit in the package.	
Performance	**Throughput**	up to 2.6 Mpps (64-byte packets)
	Routing table size	200000 entries (IPv4), 200000 entries (IPv6)
	Forwarding table size	200000 entries (IPv4), 200000 entries (IPv6)
Environment	**Operating temperature**	32ºF to 113ºF (0ºC to 45ºC)
	Operating relative humidity	5% to 95%, noncondensing
	Nonoperating/Storage temperature	-40ºF to 158ºF (-40ºC to 70ºC)
	Nonoperating/Storage relative humidity	5% to 95%, noncondensing
	Altitude	up to 16,404 ft (5 km)
Electrical characteristics	**Frequency**	50/60 Hz
	Maximum heat dissipation	127 BTU/hr. (133.98 kJ/hr.)
	Voltage	100-120 / 200-240 VAC, rated
	Maximum power rating	100 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.	
Reliability	**MTBF (years)**	52.56

Safety
UL 60950-1; AS/NZS 60950; EN 60825-1 Safety of Laser Products-Part 1; EN 60825-2 Safety of Laser Products-Part 2; IEC 60950-1; CAN/CSA-C22.2 No. 60950-1-03; EN 60950-1/A11; FDA 21 CFR Subchapter J

Emissions
EN 55022 Class A; ICES-003 Class A; ANSI C63.4 2003; ETSI EN 300 386 V1.3.3; AS/NZS CISPR 22 Class A; EN 61000-4-2; EN 61000-4-3; EN 61000-4-4; EN 61000-4-5; EN61000-4-6; EN 61000-3-2:2006; EN 61000-3-3:1995 +A1:2001+A2:2005; EMC Directive 2004/108/EC; FCC (CFR 47, Part 15) Class A; EN 55024:1998+ A1:2001 + A2:2003; EN 61000-4-11:2004; EN 61000-4-8:2001

Telecom
FCC part 68; CS-03

Management
IMC—Intelligent Management Center; command-line interface; limited command-line interface; configuration menu; out-of-band management (RJ-45 Ethernet); SNMP Manager; Telnet; RMON1; FTP; in-line and out-of-band; modem interface; out-of-band management (serial RS-232C or Micro USB); IEEE 802.3 Ethernet MIB

Technical Specifications

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.

Technical Specifications

HPE Networking Comware MSR3016 AC Router (R8V32A)		
I/O ports and slots	4 SIC slots 4 RJ-45 10/100/1000 WAN ports (2 combo can be used as SFP WAN ports) 2 SFP fixed Gigabit Ethernet WAN ports	
Additional ports and slots	-	
AP characteristics	**Radios (via optional modules)**	3G, 4G LTE
Physical characteristics	**Dimensions**	17.32(w) x 14.17(d) x 1.71(h) in (44 x 36 x 4.36 cm) (1U height)
	Weight	10.36 lb. (4.7 kg)
Memory and processor	RISC, 4 cores @ 1.2 GHz, 512 MB NAND flash capacity, 2 GB DDR3 SDRAM	
Mounting and enclosure	Desktop or can be mounted in a EIA standard 19-inch telco rack when used with the rack-mount kit in the package.	
Performance	**Throughput**	up to 2.2 Mpps (64-byte packets)
	Routing table size	500000 entries (IPv4), 500000 entries (IPv6)
	Forwarding table size	500000 entries (IPv4), 500000 entries (IPv6)
Environment	**Operating temperature**	32ºF to 113ºF (0ºC to 45ºC)
	Operating relative humidity	5% to 95%, noncondensing
	Nonoperating/Storage temperature	-40ºF to 158ºF (-40ºC to 70ºC)
	Nonoperating/Storage relative humidity	5% to 95%, noncondensing
	Altitude	up to 16,404 ft (5 km)
Electrical characteristics	**Frequency**	50/60 Hz
	Maximum heat dissipation	127 BTU/hr. (133.98 kJ/hr.)
	Voltage	100-120 / 200-240 VAC, rated
	Maximum power rating	100 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.	
Reliability	**MTBF (years)**	75.17
Safety UL 60950-1; AS/NZS 60950; EN 60825-1 Safety of Laser Products-Part 1; EN 60825-2 Safety of Laser Products-Part 2; IEC 60950-1; CAN/CSA-C22.2 No. 60950-1-03; EN 60950-1/A11; FDA 21 CFR Subchapter J		
Emissions EN 55022 Class A; ICES-003 Class A; ANSI C63.4 2003; ETSI EN 300 386 V1.3.3; AS/NZS CISPR 22 Class A; EN 61000-4-2; EN 61000-4-3; EN 61000-4-4; EN 61000-4-5; EN61000-4-6; EN 61000-3-2:2006; EN 61000-3-3:1995 +A1:2001+A2:2005; EMC Directive 2004/108/EC; FCC (CFR 47, Part 15) Class A; EN 55024:1998+ A1:2001 + A2:2003; EN 61000-4-11:2004; EN 61000-4-8:2001		
Telecom FCC part 68; CS-03		
Management IMC—Intelligent Management Center; command-line interface; limited command-line interface; configuration menu; out-of-band management (RJ-45 Ethernet); SNMP Manager; Telnet; RMON1; FTP; in-line and out-of-band; modem interface; out-of-band management (serial RS-232C or Micro USB); IEEE 802.3 Ethernet MIB		
Services		

Technical Specifications

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Technical Specifications

HPE Networking Comware MSR3026 AC Router (R9J03A)		
I/O ports and slots	2 HMIM slots 4 SIC slots 8 RJ-45 10/100/1000 WAN ports 8 RJ-45 10/100/1000 LAN ports (IEEE 802.3ab Type 1000BASE-T) 6 fixed 10GE SFP+ ports	
Additional ports and slots	-	
AP characteristics	**Radios (via optional modules)**	3G, 4G LTE
Physical characteristics	**Dimensions**	17.32(w) x 18.5(d) x 1.74(h) in (44 x 47 x 4.42 cm) (1U height)
	Weight	14.77 lb. (6.7 kg)
Memory and processor	RISC, 10 cores @ 1.8 GHz, 1 GB flash capacity, 4 GB DDR3 SDRAM	
Mounting and enclosure	Desktop or can be mounted in a EIA standard 19-inch telco rack when used with the rack-mount kit in the package.	
Performance	**Throughput**	up to 8 Mpps (64-byte packets)
	Routing table size	500000 entries (IPv4), 500000 entries (IPv6)
	Forwarding table size	500000 entries (IPv4), 500000 entries (IPv6)
Environment	**Operating temperature**	32ºF to 113ºF (0ºC to 45ºC)
	Operating relative humidity	5% to 95%, noncondensing
	Nonoperating/Storage temperature	-40ºF to 158ºF (-40ºC to 70ºC)
	Nonoperating/Storage relative humidity	5% to 95%, noncondensing
	Altitude	up to 16,404 ft (5 km)
Electrical characteristics	**Frequency**	50/60 Hz
	Maximum heat dissipation	168 BTU/hr. (177.24 kJ/hr.)
	Voltage	100-120 / 200-240 VAC, rated
	Maximum power rating	100 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.	
Reliability	**MTBF (years)**	135.64
Safety UL 60950-1; AS/NZS 60950; EN 60825-1 Safety of Laser Products-Part 1; EN 60825-2 Safety of Laser Products-Part 2; IEC 60950-1; CAN/CSA-C22.2 No. 60950-1-03; EN 60950-1/A11; FDA 21 CFR Subchapter J		
Emissions EN 55022 Class A; ICES-003 Class A; ANSI C63.4 2003; ETSI EN 300 386 V1.3.3; AS/NZS CISPR 22 Class A; EN 61000-4-2; EN 61000-4-3; EN 61000-4-4; EN 61000-4-5; EN61000-4-6; EN 61000-3-2:2006; EN 61000-3-3:1995 +A1:2001+A2:2005; EMC Directive 2004/108/EC; FCC (CFR 47, Part 15) Class A; EN 55024:1998+ A1:2001 + A2:2003; EN 61000-4-11:2004; EN 61000-4-8:2001		
Telecom FCC part 68; CS-03		
Management IMC—Intelligent Management Center; command-line interface; limited command-line interface; configuration menu; out-of-band management (RJ-45 Ethernet); SNMP Manager; Telnet; RMON1; FTP; in-line and out-of-band; modem interface; out-of-band management (serial RS-232C or Micro USB); IEEE 802.3 Ethernet MIB		

Technical Specifications

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.

Technical Specifications

HPE Networking Comware MSR3046 AC Router (R9J04A)		
I/O ports and slots	4 HMIM slots 4 SIC slots 9 RJ-45 10/100/1000 WAN ports (1 combo can be used as SFP WAN port) 5 fixed 10GE SFP+ ports	
Additional ports and slots	2 power supply slots	
AP characteristics	**Radios (via optional modules)**	3G, 4G LTE
Physical characteristics	**Dimensions**	17.32(w) x 18.9(d) x 3.47(h) in (44 x 48 x 8.81 cm) (1U height)
	Weight	24.69 lb. (11.2 kg)
Memory and processor	RISC, 10 cores @ 1.8 GHz, 1 GB flash capacity, 4 GB DDR3 SDRAM	
Mounting and enclosure	Desktop or can be mounted in a EIA standard 19-inch telco rack when used with the rack-mount kit in the package.	
Performance	**Throughput**	up to 9 Mpps (64-byte packets)
	Routing table size	500000 entries (IPv4), 500000 entries (IPv6)
	Forwarding table size	500000 entries (IPv4), 500000 entries (IPv6)
Environment	**Operating temperature**	32ºF to 113ºF (0ºC to 45ºC)
	Operating relative humidity	5% to 95%, noncondensing
	Nonoperating/Storage temperature	-40ºF to 158ºF (-40ºC to 70ºC)
	Nonoperating/Storage relative humidity	5% to 95%, noncondensing
	Altitude	up to 16,404 ft (5 km)
Electrical characteristics	**Frequency**	50/60 Hz
	Maximum heat dissipation	218 BTU/hr. (229.99 kJ/hr.)
	Voltage	100-120 / 200-240 VAC, rated
	Maximum power rating	100 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.	
Reliability	**MTBF (years)**	141.24
Safety UL 60950-1; AS/NZS 60950; EN 60825-1 Safety of Laser Products-Part 1; EN 60825-2 Safety of Laser Products-Part 2; IEC 60950-1; CAN/CSA-C22.2 No. 60950-1-03; EN 60950-1/A11; FDA 21 CFR Subchapter J		
Emissions EN 55022 Class A; ICES-003 Class A; ANSI C63.4 2003; ETSI EN 300 386 V1.3.3; AS/NZS CISPR 22 Class A; EN 61000-4-2; EN 61000-4-3; EN 61000-4-4; EN 61000-4-5; EN61000-4-6; EN 61000-3-2:2006; EN 61000-3-3:1995 +A1:2001+A2:2005; EMC Directive 2004/108/EC; FCC (CFR 47, Part 15) Class A; EN 55024:1998+ A1:2001 + A2:2003; EN 61000-4-11:2004; EN 61000-4-8:2001		
Telecom FCC part 68; CS-03		
Management IMC—Intelligent Management Center; command-line interface; limited command-line interface; configuration menu; out-of-band management (RJ-45 Ethernet); SNMP Manager; Telnet; RMON1; FTP; in-line and out-of-band; modem interface; out-of-band management (serial RS-232C or Micro USB); IEEE 802.3 Ethernet MIB		

Technical Specifications

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.

Technical Specifications

HPE Networking Comware MSR3048 AC Router (R9J05A)		
I/O ports and slots	4 HMIM slots 4 SIC slots 10 RJ-45 10/100/1000 WAN ports 16 fixed 10GE SFP+ ports 4 fixed 25GE SFP28 ports	
Additional ports and slots	2 power supply slots	
AP characteristics	**Radios (via optional modules)**	3G, 4G LTE
Physical characteristics	**Dimensions**	17.32(w) x 18.9(d) x 3.47(h) in (44 x 48 x 8.81 cm) (1U height)
	Weight	26.00 lb. (11.8 kg)
Memory and processor	RISC, 16 cores @ 1.8 GHz, 1 GB flash capacity, 8 GB DDR3 SDRAM	
Mounting and enclosure	Desktop or can be mounted in a EIA standard 19-inch telco rack when used with the rack-mount kit in the package.	
Performance	**Throughput**	up to 13 Mpps (64-byte packets)
	Routing table size	500000 entries (IPv4), 500000 entries (IPv6)
	Forwarding table size	500000 entries (IPv4), 500000 entries (IPv6)
Environment	**Operating temperature**	32ºF to 113ºF (0ºC to 45ºC)
	Operating relative humidity	5% to 95%, noncondensing
	Nonoperating/Storage temperature	-40ºF to 158ºF (-40ºC to 70ºC)
	Nonoperating/Storage relative humidity	5% to 95%, noncondensing
	Altitude	up to 16,404 ft (5 km)
Electrical characteristics	**Frequency**	50/60 Hz
	Maximum heat dissipation	218 BTU/hr. (229.99 kJ/hr.)
	Voltage	100-120 / 200-240 VAC, rated
	Maximum power rating	100 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.	
Reliability	**MTBF (years)**	112.27
Safety UL 60950-1; AS/NZS 60950; EN 60825-1 Safety of Laser Products-Part 1; EN 60825-2 Safety of Laser Products-Part 2; IEC 60950-1; CAN/CSA-C22.2 No. 60950-1-03; EN 60950-1/A11; FDA 21 CFR Subchapter J		
Emissions EN 55022 Class A; ICES-003 Class A; ANSI C63.4 2003; ETSI EN 300 386 V1.3.3; AS/NZS CISPR 22 Class A; EN 61000-4-2; EN 61000-4-3; EN 61000-4-4; EN 61000-4-5; EN61000-4-6; EN 61000-3-2:2006; EN 61000-3-3:1995 +A1:2001+A2:2005; EMC Directive 2004/108/EC; FCC (CFR 47, Part 15) Class A; EN 55024:1998+ A1:2001 + A2:2003; EN 61000-4-11:2004; EN 61000-4-8:2001		
Telecom FCC part 68; CS-03		
Management IMC—Intelligent Management Center; command-line interface; limited command-line interface; configuration menu; out-of-band management (RJ-45 Ethernet); SNMP Manager; Telnet; RMON1; FTP; in-line and out-of-band; modem interface; out-of-band management (serial RS-232C or Micro USB); IEEE 802.3 Ethernet MIB		

Technical Specifications

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.

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 BGP-4 (Obsoletes)
- RFC 4273 Definitions of Managed Objects for BGP-4 (Obsoletes RFC 1269, RFC 1657) RFC 1771 BGP-4 (Obsoletes)
- RFC 4271 A Border Gateway Protocol 4 (BGP-4) (Obsoletes RFC 1771)
- RFC 1772 Application of the BGP RFC 1773 Experience with the BGP-4 Protocol
- RFC 1774 BGP-4 Protocol Analysis RFC 1965 BGP-4 confederations
- RFC 1997 BGP Communities Attribute
- RFC 1998 PPP Gandalf FZA Compression Protocol
- RFC 2439 BGP Route Flap Damping RFC 2547 BGP/MPLS VPNs (Obsoletes) RFC 4364 BGP/MPLS IP Virtual Private Networks (Obsoletes RFC 2547) (Updated—By RFC 4577, RFC 4684, RFC 5462)
- RFC 2796 BGP Route Reflection (Obsoletes)
- RFC 4456 BGP Route Reflection: An Alternative to Full Mesh Internal BGP (IBGP) (Obsoletes RFC 2796, RFC 1966)
- RFC 2842 Capability Advertisement with BGP-4
- RFC 2858 BGP-4 Multi-Protocol Extensions (Obsoletes)
- RFC 4760 Multiprotocol Extensions for BGP-4 (Obsoletes RFC 2858)
- RFC 2918 Route Refresh Capability RFC 3065 Autonomous System Confederations for BGP (Obsoletes) RFC 5065 Autonomous System Confederations for BGP (Obsoletes RFC 3065)
- RFC 3107 Support BGP carry Label for MPLS
- RFC 3392 Capabilities Advertisement with BGP-4 (Obsoletes)
- RFC 5492 Capabilities Advertisement with BGP-4 (Obsoletes RFC 3392)
- RFC 4271 A Border Gateway Protocol 4 (BGP-4)
- RFC 4273 Definitions of Managed Objects for BGP-4
- RFC 4274 BGP-4 Protocol Analysis RFC 4275 BGP-4 MIB Implementation Survey
- RFC 4276 BGP-4 Implementation Report RFC 4277 Experience with the BGP-4 Protocol
- RFC 4360 BGP Extended Communities Attribute
- RFC 4456 BGP Route Reflection: An Alternative to Full Mesh Internal BGP (IBGP) RFC 4724 Graceful Restart Mechanism for BGP

Denial of service protection

- CPU DoS Protection
- Rate Limiting by ACLs

Device management

- RFC 1155 Structure and Mgmt Information (SMIv1)
- RFC 1157 SNMPv1/v2c
- RFC 1305 NTPv3
- RFC 1591 DNS (client)
- RFC 1902 SNMPv2 (Obsoletes)
- RFC 2578 Structure of Management Information Version 2 (SMIv2) (Obsoletes RFC 1902)
- RFC 1908 SNMPv1/2 Coexistence
- RFC 1945 Hypertext Transfer Protocol—HTTP/1.0
- RFC 2271 Framework

Technical Specifications

- RFC 2573 SNMPv3 Applications (Obsoletes)
- RFC 3413 Simple Network Management Protocol (SNMP) Applications (Obsoletes RFC 2573)
- RFC 2576 Coexistence between SNMPv1, v2, v3 (Obsoletes)
- RFC 3584 Coexistence between Version 1, Version 2, and Version 3 of the Internet-standard Network Management Framework (Obsoletes RFC 2576)
- RFC 2578-2580 SMIv2
- RFC 2579 SMIv2 Text Conventions
- RFC 2580 SMIv2 Conformance
- RFC 3416 SNMP Protocol Operations v2

General Protocols

- RFC 768 UDP
- RFC 783 TFTP Protocol (revision 2) DHCP (Obsoletes)
- RFC 1350 Trivial File Transfer Protocol (TFTP) (Obsoletes RFC 0783) (Updated—By RFC 1782, RFC 1783, RFC 1784, RFC 1785, RFC 2347, RFC 2348, RFC 2349)
- RFC 791 IP
- RFC 792 ICMP (Obsoletes) (Obsoletes RFC 0777) (Updated—By RFC 0950, RFC 4884)
- RFC 793 TCP (Obsoletes) (Updated—By RFC 1122, RFC 3168)
- RFC 826 ARP (Updated—By RFC 5227, RFC 5494)
- RFC 896 Congestion Control in IP/TCP Internetworks RFC 917 Internet Subnets
- RFC 2993 Architectural Implications of NAT RFC 3011 The IPv4 Subnet Selection Option RFC 3022 Traditional IP Network Address Translator
- RFC 1091 Telnet Terminal-Type Option RFC 1093 NSFNET routing architecture RFC 1141 Incremental updating of the Internet checksum (Updates RFC 1071) (Updated—By RFC 1624) RFC 1142 OSI IS-IS Intra-domain Routing Protocol
- RFC 1166 Obsoletes RFC 1117, RFC 1062, RFC 1020 Updated—By RFC 5737 Internet address used by Internet Protocol (IP) RFC 1191 Path MTU discovery
- RFC 1195 OSI IS-IS for IP and Dual Environments (Updated—By RFC 1349, RFC 5302, RFC 5304)
- RFC 4419 Diffie-Hellman Group Exchange for the Secure Shell (SSH) Transport Layer Protocol
- RFC 4446 IANA Allocations for Pseudowire Edge to Edge
- RFC 1305 NTPv3 (IPv4 only)
- RFC 1321 The MD5 Message-Digest Algorithm RFC 1323 TCP Extensions for High Performance RFC 1349 Type of Service
- RFC 1350 TFTP Protocol (revision 2) (Obsoletes RFC 0783) (Updated—By RFC 1782, RFC 1783, RFC 1784, RFC 1785, RFC 2347, RFC 2348, RFC 2349)
- RFC 1449 Transport Mappings for version 2 of the Simple Network Management Protocol (SNMPv2)
- RFC 925 Multi-LAN Address Resolution
- RFC 950 Internet Standard Subnetting Procedure RFC 951 BOOTP (Updated—By RFC 1395, RFC 1497, RFC 1532, RFC 1542, RFC 5494)
- RFC 959 File Transfer Protocol (Obsoletes RFC 0765) (Updated—By RFC 2228, RFC 2640, RFC 2773, RFC 3659) (FTP) RFC 1027 Proxy ARP
- RFC 1048 BOOTP vendor information extensions (Obsoleted-By RFC 1084, RFC 1395, RFC 1497, RFC 1533)
- RFC 3027 Protocol Complications with the IP Network Address Translator
- RFC 3031 Multiprotocol Label Switching Architecture RFC 3032 MPLS Label Stack Encoding
- RFC 3036 LDP Specification
- RFC 3037 LDP Applicability RFC 3046 DHCP Relay Agent Information Option

Technical Specifications

- RFC 3063 MPLS Loop Prevention Mechanism RFC 3137 OSPF Stub Router Advertisement
- RFC 3168 The Addition of Explicit Congestion Notification (ECN) to IP
- RFC 3215 LDP State Machine
- RFC 3246 Expedited Forwarding PHB
- RFC 1213 Management Information Base for Network Management of TCP/IP-based internets (Obsoletes RFC 1158) (Updated—By RFC 2011, RFC 2012, RFC 2013)
- RFC 1253 OSPFv2
- RFC 3268 Advanced Encryption Standard (AES) Cipher suites 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 (Obsoletes)
- RFC 5280 Internet X.509 Public Key Infrastructure Certificate and Certificate Revocation List (CRL) Profile (Obsoletes
- RFC 3280, RFC 4325, RFC 4630)
- RFC 3319 Dynamic Host Configuration Protocol (DHCPv6) Options for Session Initiation Protocol (SIP) Servers
- RFC 3359 Reserved Type, Length and Value (TLV) Codepoints in Intermediate System to Intermediate System
- RFC 3392 Support BGP capabilities (Obsoletes)
- RFC 5492 Capabilities Advertisement with BGP-4 (Obsoletes RFC 3392) advertisement RFC 3443 Time To Live (TTL) Processing in Multi-Protocol Label Switching (MPLS) Networks
- RFC 1519 CIDR (Obsoletes)
- RFC 4632 Classless Inter-domain Routing (CIDR): The Internet Address Assignment and Aggregation Plan (Obsoletes RFC 1519)
- RFC 1542 BOOTP Extensions
- RFC 1542 Clarifications and Extensions for the Bootstrap Protocol
- RFC 1624 Incremental Internet Checksum
- RFC 1631 NAT (Obsoletes)
- RFC 3022 Traditional IP Network Address Translator (Traditional NAT) (Obsoletes RFC 1631)
- RFC 1701 Generic Routing Encapsulation
- RFC 1702 Generic Routing Encapsulation over IPv4 networks
- RFC 1721 RIP-2 Analysis (Traditional NAT)
- RFC 3478 Graceful Restart Mechanism for Label Distribution Protocol
- RFC 3479 Fault Tolerance for the Label Distribution Protocol (LDP)
- RFC 3509 OSPF ABR Behavior
- RFC 3526 More Modular Exponential (MODP) Diffie-Hellman groups for Internet Key Exchange (IKE)
- RFC 3564 Requirements for Support of Differentiated Services-aware MPLS Traffic Engineering (Obsoletes)
- RFC 3567 Intermediate System to Intermediate System (IS-IS) Cryptographic Authentication
- RFC 3584 Coexistence between Version 1 and Version 2 Emulation (PWE3)
- RFC 4447 Pseudowire Setup and Maintenance Using the Label Distribution Protocol (LDP)
- RFC 4448 Encapsulation Methods for Transport of Ethernet over MPLS Networks
- RFC 4451 BGP MULTI_EXIT_DISC (MED) Considerations RFC 4486 Subcodes for BGP Cease Notification Message
- RFC 4541 Considerations for Internet Group Management Protocol (IGMP) and Multicast Listener Discovery (MLD) Snooping Switches
- RFC 4553 Structure-Agnostic Time Division Multiplexing (TDM) over Packet (SAToP)

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- RFC 4562 MAC-Forced Forwarding: A Method for Subscriber Separation on an Ethernet Access Network
- RFC 4576 Using a Link State Advertisement (LSA) Options Bit to Prevent Looping in BGP/MPLS IP Virtual Private Networks (VPNs)
- RFC 4577 OSPF as the Provider/Customer Edge Protocol for BGP/MPLS IP Virtual Private Networks (VPNs)
- RFC 4594 Configuration Guidelines for DiffServ Service Classes
- RFC 4601 Protocol Independent Multicast-Sparse Mode (PIM-SM): Protocol Specification (Revised)
- RFC 4618 Encapsulation Methods for Transport of PPP/High-Level Data Link Control (HDLC) over MPLS Networks
- RFC 4619 Encapsulation Methods for Transport of Frame Relay over Multiprotocol Label Switching (MPLS) Networks
- RFC 4632 Classless Inter-domain Routing (CIDR): The Internet Address Assignment and Aggregation Plan
- RFC 4659 BGP-MPLS IP Virtual Private Network (VPN) Extension for IPv6 VPN
- RFC 4664 Framework for Layer 2 Virtual Private Networks (L2VPNs)
- RFC 4665 Service Requirements for Layer 2 Provider-Provisioned Virtual Private Networks
- RFC 4741 NETCONF Configuration Protocol
- RFC 4742 Using the NETCONF Configuration Protocol over Secure Shell (SSH) (Obsoletes) (Obsoleted-By RFC 6242)
- RFC 4743 Using NETCONF over the Simple Object Access Protocol (SOAP)
- RFC 4765 Service Requirements for Layer 2 Provider Provisioned Virtual Private Networks
- RFC 4781 Graceful Restart Mechanism for BGP
- RFC 1722 RIP-2 Applicability
- RFC 1723 RIPv2 (Obsoletes)
- RFC 2453 RIP Version 2 (Obsoletes)
- RFC 1723 Updated—By RFC 4822
- RFC 1724 RIP Version 2 MIB Extension RFC 1777 Lightweight Directory Access Protocol RFC 1812 IPv4 Routing
- RFC 1825 Security Architecture for the Internet Protocol RFC 1826 IP Authentication Header
- RFC 1827 IP Encapsulating Security Payload (ESP) RFC 1829 The ESP DES-CBC Transform
- RFC 1945 Hypertext Transfer Protocol—HTTP/1.0
- RFC 1966 BGP Route Reflection An alternative to full mesh IBGP (Obsoletes) RFC 4456 BGP Route Reflection: An Alternative to Full Mesh Internal BGP (IBGP) (Obsoletes RFC 2796, RFC 1966)
- RFC 1981 Path MTU Discovery for IP Version 6 RFC 2003 IP Encapsulation within IP
- RFC 2018 TCP Selective Acknowledgement Options RFC 2082 RIP-2 MD5 Authentication
- RFC 2104 HMAC: Keyed-Hashing for Message Authentication
- RFC 2131 DHCP
- RFC 2132 DHCP Options and BOOTP Vendor Extensions
- RFC 2138 Remote Authentication Dial-In User Service (RADIUS) (Obsoletes) RFC 2865 RADIUS Accounting (Obsoletes RFC 2138) (Updated—By RFC 2868, RFC 3575, RFC 5080)
- RFC 2236 IGMP Snooping (Obsoletes) RFC 3376 Internet Group Management Protocol, Version 3 (Obsoletes RFC 2236) (Updated—By RFC 4604)
- RFC 2246 The TLS Protocol Version 1.0 RFC 2251 Lightweight Directory Access Protocol (v3)
- RFC 2252 Lightweight Directory Access Protocol (v3): Attribute Syntax Definitions RFC 2283 MBGP
- RFC 2309 Recommendations on queue management and congestion avoidance in the Internet
- RFC 2338 VRRP (Obsoletes)
- RFC 3768 Virtual Router Redundancy Protocol (VRRP) Version 3 for IPv4 and IPv6 (Obsoletes RFC 2338)
- RFC 2451 The ESP CBC-Mode Cipher Algorithms RFC 2453 RIPv2
- RFC 2474 Definition of the Differentiated Services Field (DS Field) in the IPv4 and IPv6 Headers (Obsoletes)

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- RFC 3260 New Terminology and Clarifications for DiffServ (Updates RFC 2474, RFC 2475, RFC 2597)
- RFC 2510 Internet X.509 Public Key Infrastructure Certificate Management Protocols
- RFC 2519 A Framework for Inter-Domain Route Aggregation
- RFC 2529 Transmission of IPv6 over IPv4 Domains without Explicit Tunnels
- RFC 2548 MS-RAS-Vendor only
- RFC 2581 TCP Congestion Control
- RFC 2597 Assured Forwarding PHB Group (Obsoletes)
- RFC 3246 An Expedited Forwarding PHB (Per-Hop Behavior) (Obsoletes RFC 2598) RFC 2598 An Expedited Forwarding PHB RFC 2616 HTTP Compatibility v1.1
- RFC 2661 L2TP
- RFC 2663 NAT Terminology and Considerations
- RFC 2694 DNS extensions to Network Address Translators (DNS_ALG)
- RFC 2698 A Two Rate Three Color Marker RFC 2716 PPP EAP TLS Authentication Protocol RFC 2747 RSVP Cryptographic Authentication (Obsoletes)
- RFC 3097 RSVP Cryptographic Authentication—Updated Message Type Value (Updates RFC 2747)
- RFC 2763 Dynamic Name-to-System ID mapping (Obsoletes)
- RFC 5301 Dynamic Hostname Exchange Mechanism for IS-IS (Obsoletes RFC 2763) RFC 2784 Generic Routing Encapsulation (GRE)
- RFC 2827 Network Ingress Filtering: Defeating Denial of Service Attacks Which Employ IP Source Address Spoofing (Obsoletes)
- RFC 3704 Ingress Filtering for Multihomed Networks (Updates RFC 2827)
- RFC 2865 Remote Authentication Dial-In User Service (RADIUS) (Obsoletes)
- RFC 2868 RADIUS Attributes for Tunnel Protocol Support (Updates RFC 2865) RFC 2866 RADIUS Accounting
- RFC 2868 RADIUS Attributes for Tunnel Protocol Support of the Internet-standard Network Management Framework
- RFC 3602 The AES-CBC Cipher Algorithm and Its Use with IPSec
- RFC 3612 Applicability Statement for Restart Mechanisms for the Label Distribution Protocol (LDP)
- RFC 3623 Graceful OSPF Restart
- RFC 3646 DNS Configuration options for Dynamic Host Configuration Protocol for IPv6 (DHCPv6)
- RFC 3662 A Lower Effort Per-Domain Behavior (PDB) for Differentiated Services RFC 3704 Unicast Reverse Path Forwarding (URPF)
- RFC 3706 A Traffic-Based Method of Detecting Dead Internet Key Exchange (IKE) Peers
- RFC 3719 Recommendations for Interoperable Networks using Intermediate System to Intermediate System
- (IS-IS)
- RFC 3736 Stateless Dynamic Host Configuration Protocol (DHCP) Service for IPv6
- RFC 3768 Virtual Router Redundancy Protocol (VRRP)
- RFC 3782 The NewReno Modification to TCP's Fast Recovery Algorithm
- RFC 3786 Extending the Number of IS-IS LSP Fragments Beyond the 256 Limit RFC 3787 Recommendations for Interoperable IP Networks using
- Intermediate System to Intermediate System (IS-IS)
- RFC 3810 Multicast Listener Discovery Version 2 (MLDv2) for IPv6 (Obsoletes) RFC 4604 Using Internet Group Management Protocol Version 3 (IGMPv3) and Multicast Listener Discovery Protocol Version 2 (MLDv2) for Source-Specific Multicast (Updates RFC 3376, RFC 3810) RFC 3812 Multiprotocol Label Switching (MPLS) Traffic Engineering (TE) Management Information Base (MIB)
- RFC 3815 Definitions of Managed Objects for the Multiprotocol Label Switching (MPLS), Label Distribution Protocol (LDP) RFC 3847 Restart signaling for IS-IS

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- RFC 3916 Requirements for Pseudowire Emulation Edge-to-Edge (PWE3)
- RFC 3948 UDP Encapsulation of IPSec ESP Packets
- RFC 3973 Protocol Independent Multicast-Dense Mode (PIM-DM): Protocol Specification (Revised)
- RFC 3985 Pseudo Wire EmulationEdge-to-Edge (PWE3) Architecture
- RFC 4061 Benchmarking Basic OSPF Single Router Control Plane Convergence
- RFC 4062 OSPF Benchmarking Terminology and Concepts
- RFC 4063 Considerations When Using Basic OSPF Convergence Benchmarks
- RFC 4109 Algorithms for Internet Key Exchange version 1 (IKEv1)
- RFC 4133 Entity MIB (Version 3)
- RFC 4182 Removing a Restriction on the use of MPLS Explicit NULL
- RFC 4214 Intra-Site Automatic Tunnel Addressing Protocol (ISATAP) (Obsoletes) RFC 5214 Intra-Site Automatic Tunnel Addressing Protocol (ISATAP) (Obsoletes RFC 4214)
- RFC 4222 Prioritized Treatment of Specific OSPF Version 2 Packets and Congestion Avoidance
- RFC 4250 The Secure Shell (SSH) Protocol Assigned Numbers
- RFC 4251 The Secure Shell (SSH) Protocol Architecture
- RFC 4252 The Secure Shell (SSH) Authentication Protocol
- RFC 4253 The Secure Shell (SSH) Transport Layer Protocol
- RFC 4254 The Secure Shell (SSH) Connection Protocol RFC 4291 IP Version 6 Addressing Architecture
- RFC 4305 Cryptographic Algorithm Implementation (Obsoletes)
- RFC 4835 Cryptographic Algorithm Implementation Requirements for
- Encapsulating Security Payload (ESP) and Authentication Header (AH) (Obsoletes
- RFC 4305) MPLS
- RFC 4787 Network Address Translation (NAT) Behavioral Requirements for Unicast UDP
- RFC 4798 Connecting IPv6 Islands over IPv4 MPLS Using IPv6 Provider Edge Routers (6PE)
- RFC 4811 OSPF Out-of-Band Link State Database (LSDB) Resynchronization RFC 4812 OSPF Restart Signaling
- RFC 4813 OSPF Link-Local Signaling
- RFC 4816 Pseudowire EmulationEdge-to-Edge (PWE3) Asynchronous Transfer Mode (ATM) Transparent Cell Transport Service
- RFC 4835 Cryptographic Algorithm Implementation Requirements for Encapsulating Security Payload (ESP) and Authentication Header (AH)
- RFC 4861 Neighbor Discovery for IP Version 6 (IPv6) RFC 4862 IPv6 Stateless Address Autoconfiguration
- RFC 4878 Definitions and Managed Objects for Operations, Administration, and Maintenance (OAM) Functions on
- RFC 4893 BGP Support for Four-octet AS Number Space RFC 4940 IANA Considerations for OSPF
- RFC 4941 Privacy Extensions for Stateless Address Autoconfiguration in IPv6
- RFC 5007 DHCPv6 Leasequery RFC 5036 LDP Specification
- RFC 5065 Autonomous System Confederations for BGP
- RFC 5086 Structure-Aware Time Division Multiplexed (TDM) Circuit Emulation Service over Packet Switched Network (CESoPSN)
- RFC 5095 Deprecation of Type 0 Routing Headers in IPv6
- RFC 5130 A Policy Control Mechanism in IS-IS Using Administrative Tags
- RFC 5187 OSPFv3 Graceful Restart RFC 5214 Intra-Site Automatic Tunnel Addressing Protocol (ISATAP)
- RFC 5254 Requirements for Multi-Segment Pseudowire Emulation Edge-to-Edge (PWE3)
- RFC 5277 NETCONF Event Notifications RFC 5280 Internet X.509 Public Key Infrastructure Certificate and Certificate Revocation List (CRL) Profile
- RFC 5286 Basic Specification for IP Fast Reroute: Loop-Free Alternates

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- RFC 5287 Control Protocol Extensions for the Setup of Time-Division Multiplexing (TDM) Pseudowires in MPLS Networks RFC 5301 Dynamic Hostname Exchange Mechanism for IS-IS
- RFC 5302 Domain-Wide Prefix Distribution with Two-Level IS-IS
- RFC 5304 Intermediate System to Intermediate System (IS-IS) Cryptographic Authentication
- RFC 5306 Restart Signaling for IS-IS
- RFC 5308 Routing IPv6 with IS-IS
- RFC 5309 Point-to-Point Operation over LAN in Link State Routing Protocols RFC 5381 Experience of Implementing NETCONF over SOAP
- RFC 5382 The IP Network Address Translator (NAT)
- RFC 5398 Autonomous System (AS) Number Reservation for Documentation Use
- RFC 5492 Capabilities Advertisement with BGP-4 RFC 5508 NAT Behavioral Requirements for ICMP
- RFC 5539 NETCONF over Transport Layer Security (TLS) RFC 5613 OSPF Link-Local Signaling
- RFC 5659 An Architecture forMulti-Segment Pseudowire
- RFC 2869 RADIUS Extensions (Obsoletes) RFC 3579 RADIUS (Remote Authentication Dial-In User Service) Support For Extensible Authentication Protocol (EAP) (Updates RFC 2869)
- RFC 2884 Performance Evaluation of Explicit Congestion
- Notification (ECN) in IP Networks RFC 2963 A Rate Adaptive Shaper for Differentiated Services
- RFC 2966 Domain-wide Prefix Distribution with Two-Level IS-IS
- RFC 2973 IS-IS Mesh Groups
- Requirements for Encapsulating Security Payload (ESP) and Authentication Header (AH
- RFC 4364 BGP/MPLS IP Virtual Private Networks (VPNs) (Obsoletes)
- RFC 4577 OSPF as the Provider/Customer Edge Protocol for BGP/MPLS IP Virtual Private Networks (VPNs) (Updates RFC 4364)
- RFC 4365 Applicability Statement for BGP/ MPLS IP
- Virtual Private Networks (VPNs)
- RFC 4381 Analyses of the Security of BGP/ MPLS IP VPNs
- RFC 4382 MPLS/BGP Layer 3 Virtual Private Network (VPN) Management Information Base
- RFC 4385 Pseudowire EmulationEdge-to-Edge (PWE3) Control Word for Use over an MPLS PSN
- Emulation Edge-to-Edge
- RFC 5798 Virtual Router Redundancy Protocol (VRRP)
- Version 3 for IPv4 and IPv6
- RFC 5880 Bidirectional Forwarding Detection
- RFC 5881 BFD for IPv4 and IPv6 (Single Hop)
- RFC 5882 Generic Application of BFD RFC 5883 BFD for Multihop Paths
- RFC 5905 Network Time Protocol Version 4: Protocol and Algorithms Specification RFC 854 Telnet Protocol Specification
- RFC 856 Telnet Binary Transmission

IP multicast

- RFC 1112 IGMP (Obsoletes)
- RFC 2236 Internet Group Management Protocol, Version 2 (Obsoleted-By RFC 3376)
- (Updates RFC 1112)
- RFC 2362 PIM Sparse Mode (Obsoletes)
- RFC 5059 Bootstrap Router (BSR) Mechanism for Protocol Independent Multicast (PIM) (Obsoletes RFC 2362) (Updated—By RFC 5059)
- RFC 4604 Using Internet Group

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- Management Protocol Version 3 (IGMPv3) and Multicast Listener Discovery Protocol Version 2 (MLDv2) for Source-Specific Multicast (Updates RFC 3376, RFC 3810)
- RFC 2710 Multicast Listener Discovery (MLD) for IPv6
- RFC 3810 Multicast Listener Discovery Version 2
- (MLDv2) for IPv6 (Updates RFC 2710) (Updated—By RFC 4604)
- RFC 2934 Protocol Independent Multicast MIB for IPv4
- RFC 3376 IGMPv3 (Obsoletes)
- (Obsoletes) RFC 3376 IGMPv3 (host joins only) (Obsoletes)
- RFC 5059 Bootstrap Router (BSR) Mechanism
- Protocol Independent Multicast (PIM)

IPV6

- RFC 2080 RIPng for IPv6
- RFC 2460 IPv6 Specification (Obsoletes) RFC 5095 Deprecation of Type 0 Routing Headers in IPv6 (Updates
- RFC 2460, RFC 4294)
- 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 2475 IPv6 DiffServ Architecture (Obsoletes)
- RFC 2740 OSPFv3 for IPv6 (Obsoletes)
- RFC 3260 New Terminology and Clarifications
- RFC 5340 OSPF for IPv6 (Obsoletes RFC 2740) for DiffServ (Updates RFC 2474, RFC 2475, RFC 2597)
- RFC 2893 Transition Mechanisms for IPv6 Hosts and Routers (Obsoletes)
- RFC 4213 Basic Transition Mechanisms for IPv6 Hosts and Routers (Obsoletes RFC 2893)
- RFC 3056 Connection of IPv6 Domains via IPv4 Clouds
- RFC 3162 RADIUS and IPv6
- RFC 3315 DHCPv6 (client and relay) RFC 5340 OSPF for IPv6

MIBs

- RFC 1213 MIB II
- MIB RFC 1493 Bridge MIB RFC 1724 RIPv2 MIB
- RFC 1850 OSPFv2 MIB (Obsoletes) RFC 4750 OSPF Version 2 Management Information Base (Obsoletes RFC 1850)
- RFC 1907 SNMPv2 MIB (Obsoletes) RFC 3418 Coexistence between Version 1, Version 2, and Version 3 of the Internet-standard
- Network Management Framework (Obsoletes RFC 1907) Frameworks
- RFC 2011 SNMPv2 MIB for IP (Obsoletes)
- RFC 4293 Management Information Base for the Internet Protocol (IP) (Obsoletes RFC 2011, RFC 2465, RFC 2466) MIB
- RFC 2572 SNMP-MPD MIB (Obsoletes)
- RFC 3412 Message Processing and Dispatching for the Simple Network Management Protocol (SNMP) (Obsoletes RFC 2572) (Updated—By RFC 5590)
- RFC 2012 SNMPv2 MIB for TCPRFC 4022 RFC 2013 SNMPv2 MIB for UDP
- RFC 4113
- RFC 2096 IP Forwarding Table MIB
- RFC 4292

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- RFC 2233 Interfaces MIB (Obsoletes)
- RFC 2863 The Interfaces Group MIB (Obsoletes RFC 2233)
- RFC 2273 SNMP-NOTIFICATION-MIB
- RFC 2571 SNMP Framework MIB (Obsoletes)
- RFC 3411 An Architecture for Describing Simple Network Management Protocol (SNMP) Management (Obsoletes RFC 2571) (Updated—By RFC 5343, RFC 5590)
- RFC 3414 User-based Security Model (USM) for version 3 of the Simple Network Management Protocol (SNMPv3)
- RFC 2573 SNMP-Notification (Obsoletes) RFC 2574 SNMP USM MIB
- RFC 3414 User-based Security Model (USM) for version 3 of the Simple Network Management Protocol (SNMPv3)
- RFC 2674 802.1p and IEEE 802.1Q Bridge MIB
- RFC 2737 Entity MIB (Version 2) (Obsoletes)
- RFC 4133 Entity MIB (Version 3) (Obsoletes RFC 2737)
- RFC 2863 The Interfaces Group MIB RFC 3813 MPLS LSR

Network management

- IEEE 802.1D (STP)
- RFC 2580 Conformance Statements for SMIv2) (Obsoletes RFC 1904)
- RFC 1098 Simple Network Management Protocol (SNMP) (Obsoletes)
- RFC 1157 Simple Network Management Protocol (SNMP) (Obsoletes RFC 1098) RFC 1905 SNMPv2 Protocol Operations RFC 1158 Management Information Base for network management of TCP/IP-based internets:
- RFC 1213 MIB-II RFC 1212 Concise MIB
- definitions
- RFC 1215 Convention for defining traps for use with the SNMP
- RFC 1389 RIPv2 MIB Extension
- RFC 1724
- RFC 1448 Protocol Operations for version 2 of the Simple Network Management Protocol (SNMPv2)
- RFC 1450 Management Information Base (MIB) for version 2 of the Simple Network Management Protocol (SNMPv2)
- RFC 1902 Structure of Management Information for Version 2 of the Simple Network Management Protocol (SNMPv2) RFC 2578
- RFC 1903 SNMPv2 Textual Conventions RFC 2579
- RFC 1904 SNMPv2 Conformance (Obsoletes)
- RFC 2273 SNMPv3 Applications RFC 1906 SNMPv2 Transport Mappings RFC 3417
- RFC 1908 Coexistence between Version 1 and Version 2 of the Internet-standard Network Management Framework
- RFC 1918 Private Internet Address Allocation
- RFC 2037 Entity MIB using SMIv2
- RFC 2261 An Architecture for Describing SNMP Management Frameworks
- RFC 2262 Message Processing and Dispatching for the Simple Network Management Protocol (SNMP)
- RFC 2263 SNMPv3 Applications
- RFC 2264 User-based Security Model (USM) for version 3 of the Simple Network Management Protocol (SNMPv3)
- RFC 2265 View-based Access Control Model (VACM) for the Simple Network Management Protocol (SNMP)
- RFC 2272 SNMPv3 Management RFC 2274 USM for SNMPv3

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- RFC 2275 VACM for SNMPv3
- RFC 2575 SNMPv3 View-based Access Control Model (VACM)
- RFC 3164 BSD syslog Protocol
- RFC 3411 An Architecture for Describing Simple Network
- Management Protocol (SNMP) Management Frameworks
- RFC 3412 Message Processing and Dispatching for the Simple Network Management Protocol (SNMP)
- RFC 3413 Simple Network Management Protocol (SNMP) Applications
- RFC 3414 SNMPv3 User-based Security Model (USM)
- RFC 3415 View-based Access Control Model (VACM) for the Simple Network Management Protocol (SNMP)

OSPF

- RFC 1245 OSPF protocol analysis
- RFC 1246 Experience with OSPF
- RFC 1583 OSPFv2
- RFC 1587 OSPF NSSA
- RFC 3101 The OSPF Not- So-Stubby Area (NSSA) Option
- RFC 1765 OSPF Database Overflow
- RFC 1850 OSPFv2 Management Information Base (MIB), traps (Obsoletes)
- RFC 4750 OSPF Version 2 Management Information Base (Obsoletes RFC 1850)
- RFC 2328 OSPFv2
- RFC 2370 OSPF Opaque LSA Option
- RFC 3630

QoS/CoS

- IEEE 802.1P (CoS)
- RFC 2474 DS Field in the IPv4 and IPv6 Headers
- RFC 3260, RFC 3246
- RFC 2475 DiffServ Architecture
- RFC 3260
- RFC 2597 DiffServ Assured Forwarding (AF)
- RFC 2598 DiffServ Expedited Forwarding RFC 2697 A Single Rate Three Color Marker
- RFC 3168 The Addition of Explicit Congestion
- Notification (ECN) to IP (EF)
- RFC 3247 Supplemental Information for the New Definition of the EF PHB (Expedited Forwarding Per-Hop Behavior)

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Security

- IEEE 802.1X Port-Based Network Access Control
- RFC 2082 RIP-2 MD5 Authentication RFC 2104 Keyed-Hashing for Message Authentication RFC 2138 RADIUS Authentication
- RFC 2139 RADIUS Accounting
- RFC 2408 Internet Security Association and Key
- Management Protocol (ISAKMP)
- RFC 2409 The Internet Key Exchange (IKE) RFC 4109
- RFC 2412 The OAKLEY Key Determination Protocol
- RFC 2459 Internet X.509 Public Key Infrastructure Certificate and CRL Profile RFC 2818 HTTP Over TLS
- RFC 2865 RADIUS Authentication
- RFC 2866, RFC 2868
- RFC 2866 RADIUS Accounting
- RFC 3579 RADIUS Support For Extensible Authentication Protocol (EAP)
- RFC 3580 IEEE 802.1X Remote
- Authentication Dial-In User Service (RADIUS) Usage Guidelines

VPN

- RFC 1828 IP Authentication using Keyed MD5 RFC 1853 IP in IP Tunneling
- RFC 2401 Security Architecture for the Internet (Obsoletes)
- RFC 4301 Security Architecture for the Internet Protocol (Obsoletes RFC 2401) (Updated—By RFC 6040)
- Protocol RFC 2402 IP Authentication Header (Obsoletes)
- RFC 4302 IP Authentication Header (Obsoletes RFC 2402)
- RFC 2403 The Use of HMAC-MD5-96
- within ESP and AH
- RFC 2404 The Use of HMAC-SHA-1-96
- within ESP and AH
- RFC 2405 The ESP DES-CBC Cipher
- Algorithm With Explicit IV
- RFC 2406 IP Encapsulating Security Payload (ESP) (Obsoletes)
- RFC 4303 IP Encapsulating Security Payload (ESP) (Obsoletes RFC 2406)
- RFC 2407 The Internet IP Security Domain of Interpretation for ISAKMP
- RFC 2410 The NULL Encryption Algorithm and Its Use With IPSec
- RFC 2411 IP Security Document Roadmap
- RFC 3948—UDP Encapsulation of IPSec ESP Packets
- RFC 4301—Security Architecture for the Internet Protocol
- RFC 4302—IP Authentication Header (AH) RFC 4303—IP Encapsulating Security Payload (ESP)
- RFC 4305—Cryptographic Algorithm Implementation Requirements for ESP and AH (Obsoletes)
- RFC 4835 Cryptographic Algorithm Implementation Requirements for Encapsulating Security Payload (ESP) and Authentication Header (AH) (Obsoletes
- RFC 4305)

Summary of Changes

Date	Version History	Action	Description of Change:
27-Feb-2026	Version 42	Changed	New branding applied to document.
28-Apr-2025	Version 41	Changed	Configuration Information section was updated.
06-Jan-2025	Version 40	Changed	Configuration Information section was updated.
14-Oct-2024	Version 39	Changed	Configuration Information section was updated.
04-Dec-2023	Version 38	Changed	Configuration Information sections was updated. Obsolete SKUs were removed. Series name was updated.
06-Mar-2023	Version 37	Changed	Configuration Information sections was updated.
18-Jul-2022	Version 36	Changed	Overview section was updated.
16-May-2022	Version 35	Changed	Configuration Information section was updated. New SKUs added.
11-Apr-2022	Version 34	Changed	Technical Specifications section was updated.
04-Apr-2022	Version 33	Changed	Standard Features, Configuration Information, and Technical Specifications sections were updated, obsolete SKUs were deleted.
16-Aug-2021	Version 32	Changed	Configuration Information section was updated, obsolete SKUs were deleted.
14-Jun-2021	Version 31	Changed	Technical Specifications section was updated.
07-Jun-2021	Version 30	Changed	Overview, Standard Features, Configuration Information, and Related Options sections were updated.
18-Jan-2021	Version 29	Changed	Standard Features section was updated.
02-Dec-2019	Version 28	Changed	Overview, Standard Features, Configuration Information, related Options and Technical Specifications sections were updated.
07-May-2018	Version 27	Changed	Configuration section updated
04-Dec-2017	Version 26	Changed	Minor edit on Features and benefits
05-Jun-2017	Version 25	Changed	Configuration section updated
07-Apr-2017	Version 24	Changed	Updates made on Features and benefits and Accessories
03-Apr-2017	Version 23	Added	SKU added: JH449A
06-Feb-2017	Version 22	Changed	Adding MSR #A59 option on Configuration section
05-Sep-2016	Version 21	Added	SKU added: JG742B
01-Aug-2016	Version 20	Changed	Adding #AC3 Option on Configuration section
06-Jun-2016	Version 19	Changed	Document name changed to HPE Networking Comware Router Series MSR3000. Product description updated.
29-Apr-2016	Version 18	Changed	SKU descriptions updated, changes made on Technical Specifications
31-Mar-2016	Version 17	Changed	Models added: JG409B SKUs added: JH240A, JH224AAE, JH228AAE Features and benefits updated
01-Dec-2015	Version 16	Changed	Overview and Technical Specifications updated
28-Aug-2015	Version 15	Changed	Configuration section updated
17-Aug-2015	Version 14	Changed	SKUs added: JG445A, JH169A, JH172A, JH238A, JH294A, JG929A Updated Features and benefits, Configuration, Technical Specifications and Accessories
24-Feb-2015	Version 13	Added	Adding new rule 10 to Box Level CTO section
06-Oct-2014	Version 12	Changed	Removed SKU JD572A Configuration section updated

Summary of Changes

18-Aug-2014	Version 11	Changed	Added 9 new accessories: JG428A, JG432A, JG434A, JG741A, JG736A, JG737A, JG738A, JG739A, JG740A Content Edits
10-Jun-2014	Version 10	Added	3 new models: JG407A, JG408A, JG410A; 13 new accessories: JG604A, JG420A, JG421A, JG422A, JG423A, JG424A, JG425A, JG426A, JG427A, JG742A, JG743A, JG744A, JG528A
10-Feb-2014	Version 9	Changed	Key features was revised.
31-Jan-2014	Version 8	Added	GRE tunnels was added to Technical Specifications.
17-Dec-2013	Version 7	Changed	Overview image callout for HP MSR3012 AC Router-Front was revised.
09-Dec-2013	Version 6	Changed	Power Supplies, Modules, and Cables were revised.
22-Nov-2013	Version 5	Changed	Router Chassis, CTO Router Chassis, Power Supplies, Modules, and Cables were revised.
14-Oct-2013	Version 4	Added	Overview images were added.
30-Sep-2013	Version 3	Changed	Minor edits were made throughout Configuration.
27-Sep-2013	Version 2	Added	Configuration was added.
19-Aug-2013	Version 1	New	New QuickSpecs

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