Shape the Future of QuickSpecs - Your Input Matters

HPE Networking Comware Router Series MSR1000 QuickSpecs

The HPE Networking Comware Router Series MSR1000 is a next generation multiservice router designed to deliver unmatched application performance for small branch offices.

The HPE Networking Comware Router Series MSR1000 provides a flexible multiservice endpoint solution that delivers integrated, concurrent services on a single, easy-to-manage platform for small branches and remote offices that are quickly adapting to changing business requirements.

Overview

Key Features

- Up to 500 Kpps IP forwarding; converged high-performance routing, switching, security, voice, and mobility
- Embedded security features with hardware-based encryption, firewall, network address
- translation (NAT), and VPNs
- Industry-leading breadth of LAN and WAN connectivity options
- No additional licensing complexity; no cost for advanced features
- Zero-touch solution, with single-pane-of-glass management
- New SKU R8V33A is a direct replacement of JG875A

Standard Features

Performance

- **Excellent forwarding performance**
  Provides forwarding performance up to 500 Kpps; meets current and future bandwidth-intensive application demands of enterprise businesses
- **Powerful encryption capacity-**
  Includes embedded hardware encryption accelerator to improve encryption performance

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, wireless LAN, 3G/4G WAN, firewall, VPN, and SIP/voice gateway all in one box
- **New operating system version**
  Ships with new Comware v7 Operating System delivering the latest in virtualization and routing
- **High-density voice interfaces**
  Provide flexible analog voice interface options for easy integration within a wide range of deployments
- **USB interface**
  Uses USB memory disk to download and upload configuration files; supports an external USB 3G modem for a 3G WAN uplink
- **Advanced hardware architecture**
  Gigabit ethernet switching and a PCIE bus.

Connectivity

- **Virtual eXtensible LAN (VXLAN)**
  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.
- **Network Mobility (NEMO)**
  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
- **Packet storm protection**
  Protects against broadcast, multicast, or unicast storms with user-defined thresholds

Standard Features

- **Loopback**
  Supports internal loopback testing for maintenance purposes and an increase in availability; loopback detection protects against incorrect cabling or network configurations and can be enabled on a per-port or per-VLAN basis for added flexibility
- **3G/4G access support**
  Provides 3G/4G LTE wireless access for primary or backup connectivity via a 3G/4G LTE SIC modules certified on various cellular networks; optional carrier 3G/4G USB modems available
- **Flexible port selection**
  Provides a combination of fiber and copper interface modules, 100/1000BASE-X auto-speed selection, and 10/100/1000BASE-T auto-speed detection plus auto duplex and MDI/MDI-X
- **Multiple WAN interfaces**
  Provide a traditional link with E1, T1, ADSL, ADSL2, ADSL2+, G.SHDSL, Serial, and ISDN backup; provide high-density Ethernet access with Fast Ethernet/Gigabit Ethernet, mobility access with IEEE 802.11b/g/n Wi-Fi and 3G/4G LTE options
- **High-density port connectivity**
  Integrate 4 or 8 Giga LAN switching ports (all switching ports can be configured as routed ports), 2 or 3 SIC slots and up to 30 module options

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**
  Support 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 (max. eight GE ports)

Layer 3 routing

- **Static IPv4 routing**
  Provides simple manually configured IPv4 routing
- **Routing Information Protocol (RIP)**
  Uses a distance vector algorithm with UDP packets for route determination; supports RIPv1 and RIPv2 routing; includes loop protection
- **Open shortest path first (OSPF)**
  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

Standard Features

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

Standard Features

Layer 3 services

- **NAT-PT**
  Network Address Translation – Protocol Translation (NAT-PT) enables communication between IPv4 and IPv6 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.
- **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.
- **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

Quality of Service (QoS)

- **Traffic policing**
  Supports Committed Access Rate (CAR) and line rate
- **Congestion management**
  Supports FIFO, PQ, CQ, WFQ, CBQ, and RTPQ
- **Weighted random early detection (WRED)/random early detection (RED)**
  Delivers congestion avoidance capabilities through the use of queue management algorithms
- **Other QoS technologies**
  Support traffic shaping, FR QoS, MPLS QoS, and MP QoS/LFI

Standard Features

Security

- **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.
- **Enhanced stateful firewall**
  Application layer protocol inspection, Transport layer protocol inspection, ICMP error message check, and TCP SYN check. Supports more L4 and L7 protocols like TCP, UDP, UDP-Lite, ICMPv4/ICMPv6, SCTP, DCCP, RAWIP, HTTP, FTP, SMTP, DNS, SIP, H.323, SCCP.
- **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
- **Access control list (ACL)**
  Supports powerful ACLs for both IPv4 and IPv6; ACLs are used for filtering traffic to prevent unauthorized users from accessing the network, or for controlling network traffic to save resources; rules can either deny or permit traffic to be forwarded; rules can be based on a Layer 2 header or a Layer 3 protocol header; rules can be set to operate on specific dates or times
- **Terminal Access Controller Access-Control System (TACACS+)**
  Delivers an authentication tool using TCP with encryption of the full authentication request, providing additional security
- **Network login**
  Standard IEEE 802.1x allows authentication of multiple users per port
- **RADIUS**
  Eases security access administration by using a password authentication server
- **Network address translation (NAT)**
  Supports one-to-one NAT, many-to-many NAT, and NAT control, enabling NAT-PT to support multiple connections; supports blacklist in NAT/NAT-PT, and a limit on the number of connections, session logs, and multi-instances
- **Secure Shell (SSHv2)**
  Uses external servers to securely login into a remote device or securely login into MSR from a remote location; with authentication and encryption, it protects against IP spoofing and plain text password interception; increases the security of SFTP transfers
- **Unicast Reverse Path Forwarding (URPF)**
  Allows normal packets to be forwarded correctly, but discards the attaching packet due to lack of reverse path route or incorrect inbound interface; prevents source spoofing and distributed attacks
- **IPSec VPN**
  Supports DES, 3DES, and AES 128/192/256 encryption, and MD5 and SHA-1 authentication
- **Attack Detection and Protection**
  Responding to network attacks and threats by MSR Comware, support max connection limitation, single-packet attacks protection, Scanning attack protection, flood attack protection, TCP and ICMP Attack Protection etc.

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

Resiliency and high availability

- **Backup center**
  Acts as a part of the management and backup function to provide backup for device interfaces; delivers reliability by switching traffic over to a backup interface when the primary one fails
- **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, on-site information will be sent to technical support
- **Multiple internal power supply slots**
  Delivers higher reliability with a maximum of four internal power supplies, which can be installed
- **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
- **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

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

Standard Features

- **SNMPv1, v2, and v3**
  Provide complete support of SNMP; provide full support of industry-standard Management Information Base (MIB) plus private extensions; SNMPv3 supports increased security using encryption
- **Remote monitoring (RMON)**
  Uses standard SNMP to monitor essential network functions; supports events, alarm, history, and statistics group plus a private alarm extension group
- **FTP, TFTP, and SFTP support**
  Offers different mechanisms for configuration updates; FTP allows bidirectional transfers over a TCP/IP network; trivial FTP (TFTP) is a simpler method using User Datagram Protocol (UDP); Secure File Transfer Protocol (SFTP) runs over an SSH tunnel to provide additional security
- **Debug and sampler utility**
  Supports ping and traceroute for both IPv4 and IPv6
- **Network Time Protocol (NTP)**
  Synchronizes timekeeping among distributed time servers and clients; keeps timekeeping consistent among all clock-dependent devices within the network so that the devices can provide diverse applications based on the consistent time
- **Information center**
  Provides a central repository for system and network information; aggregates all logs, traps, and debugging information generated by the system and maintains them in order of severity; outputs the network information to multiple channels based on user-defined rules
- **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

Ease of deployment

- **Zero-touch deployment**
  Supports TR-069, both USB disk auto-deployment and 3G SMS auto-deployment

Standard Features

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
- **High reliability**
  Provides a state-of-the-art unified code base
- **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

Warranty and support

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

Configuration Information

BTO Models

Router Chassis

Rule #	Description	SKU
1, 2, 3, 4, 5	HPE Networking Comware Router 4 AC MSR1002X	R8V33A
	– Comware v7 based	
	– 1 RJ-45 autosensing 10/100/1000 WAN port	
	– 4 RJ-45 autosensing 10/100/1000 LAN ports	
	– 1 SFP port (min=0 \ max=1 SFP Transceiver)	
	– 2 - SIC module slots	
	– 1 USB 2.0 Port for 3G modem and USB disk	
	– 1 CONSOLE port	
	– 0 - VPM slot	
	– 1GB DDR3 SDRAM included (default=1GB \ max=1GB SDRAM)	
	– AC Power Supply included	
	– 1U - Height	
	HPE Networking Comware Router 4 AC MSR1002X PDU	R8V33A#B2B
	– C15 PDU Jumper Cord (NA/MEX/TW/JP)	
	HPE Networking Comware Router 4 AC MSR1002X PDU	R8V33A#B2C
	– C15 PDU Jumper Cord (ROW)	
	HPE Networking Comware Router 4 AC MSR1002X 220v	R8V33A#B2E
	– NEMA L6-20P Cord (NA/MEX/JP/TW)	
	HPE Networking Comware Router 4 AC MSR1002X NoLoc	R8V33A#AC3
	– No Localized Power Cord Selected	

Configuration Rules

Rule #	Description	
1	AC Power Supply included	
2	Localization required on orders without #B2B, #B2C or #B2E options.	
3	#B2E is Offered only in NA, Mexico, Taiwan and Japan.	
4	The following Transceivers install into this Router:	
	HPE Networking X115 100M SFP LC FX Transceiver	JD102B
	HPE Networking X110 100M SFP LC LX Transceiver	JD120B
	HPE Networking X115 100M SFP LC BX 10-U Transceiver	JD100A
	HPE Networking X115 100M SFP LC BX 10-D Transceiver	JD101A
5	The following Transceivers install into this Router:	
	HPE Networking X120 1G SFP LC SX Transceiver	JD118B
	HPE Networking X120 1G SFP LC LX Transceiver	JD119B
	HPE Networking X120 1G SFP LC BX 10-U Transceiver	JD098B
	HPE Networking X120 1G SFP LC BX 10-D Transceiver	JD099B
	HPE Networking X120 1G SFP LC LH100 Transceiver	JD103A
	HPE Networking X120 1G SFP RJ45 T Transceiver	JD089B

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)
  - High Volt Switch/Router/Power Supply to Wall Power Cord - #B2E Option. (Offered only in North America, Mexico, Taiwan, and Japan)
- OCA Only Model Selection Form - HPE Offering > HPE Aruba Networking > Routers Branch: HPE Networking Comware Router Series MSR1000

CTO Modules

SIC Modules

1, 11	HPE Networking Comware MSR 1-port Enhanced Serial SIC Module	JD557A
	– min=0 \ max=1 Serial Port Cable	
2, 11, 15	HPE Networking Comware MSR 4-port Enhanced Sync Serial SIC Module	JG737A
	– min=0 \ max=4 Serial Port Cable	
17	HPE Networking Comware MSR 4-port Gig-T Switch SIC Module	JG739A
17, 21	HPE Networking Comware MSR 4-port GbE Combo SIC Module	R8V29A
	Configuration Rules	
Rule #	**Description**	
1	These Modules can install directly to the Routers (JG732A, JH060A, JG875A) min=0\ max=2 per enclosure (JG732A, JH060A)- only supported in Slots 2 and 3)	
2	These Modules can install directly to Router JG732A, JH060A min=0\ max=3 per enclosure	
4	These Modules can install directly into the following Routers: JH060A, min=0\ max=3 per enclosure, JG875A, min=0\ max=2 per enclosure	
5	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
7	The following E1 Cables install into this Module:	
	HPE Networking Comware X260 E1 (2) BNC 75 ohm 3m Router Cable	JD175A
9	The following E1/T1 Cables install into this Module:	
	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
	HPE Networking Comware X260 T1 Router Cable	JD518A
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
13	If this module is selected Then 4 - JG263A HPE X260 mini D-28/4-RJ45 0.3m Rtr Cable are required to be on the same order.	
14	The following T1 Cables install into this Module:	
	HPE Networking Comware X260 T1 Router Cable	JD518A

Configuration Information

15	These Modules can install directly to Router JG875A and R8V33A min=0\ max=2 per enclosure
17	These Modules can install directly to the Router JG875A, min=0\ max=1 per enclosure (only supported in Slot 2)
21	These Modules can install directly to the Router R8V33A, min=0\ max=1 per enclosure (only supported in Slot 2)
Notes:	PoE Modules JD620A and JD621A can be used as non-POE modules on chassis without PoE power supplies.

Transceivers

SFP Transceivers

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

Internal Power Supplies

Internal Power Supplies included

Cables

Rule #	Description	SKU
	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
	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

Technical Specifications

HPE Networking Comware MSR1002 4 AC Router (JG875A)		
I/O ports and slots	2 SIC slots, or 1 DSIC slot	
	2 RJ-45 autosensing 10/100/1000 WAN ports	
	1 SFP fixed Gigabit Ethernet WAN port	
	3 RJ-45 autosensing 10/100/1000 LAN ports	
Additional ports and slots	1 USB 2.0 1 RJ-45 console port to access limited CLI port	
AP characteristics	**Radios (via optional modules)**	3G, 4G LTE
Physical characteristics	**Dimensions**	14.17(w) x 11.81(d) x 1.74(h) in (36 x 30 x 4.42 cm) (1U height)
	Weight	10.69 (4.85 kg)
Memory and processor	RISC @ 667 MHz, 512 MB DDR3 SDRAM, 256 MB flash	
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 500 Kpps (64-byte packets)
	Routing table size	200000 entries (IPv4), 200000 entries (IPv6)
	Forwarding table size	200000 entries (IPv4), 200000 entries (IPv6)
Environment	**Operating temperature**	32°F to 113°F (0°C to 45°C)
	Operating relative humidity	5% to 95%, noncondensing
	Nonoperating/Storage temperature	-40°F to 158°F (-40°C to 70°C)
	Nonoperating/Storage relative humidity	5% to 95%, noncondensing
	Altitude	up to 16,404 ft (5 km)
Electrical characteristics	**Maximum heat dissipation**	92 BTU/hr (97.06 kJ/hr)
	Voltage	100 - 240 VAC, rated
	Maximum power rating	30 W
	Frequency	50/60 Hz
	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)	71.81
Safety	UL 60950-1; IEC 60950-1; EN 60950-1; CAN/CSA-C22.2 No. 60950-1; FDA 21 CFR Subchapter J; AS/NZS 60950-1; GB 4943.1	
Emissions	VCCI Class A; EN 55022 Class A; CISPR 22 Class A; EN 55024; ICES-003 Class A; EN 300 386 v1.6.1; CISPR 24; AS/NZS CISPR 22 Class A; EN 61000-3-2; EN 61000-3-3; FCC (CFR 47, Part 15) Class A	
Telecom	FCC part 68; CS-03	

Technical Specifications

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 MSR1002X 4 AC Router (R8V33A) Comware V7 based		
I/O ports and slots	2 SIC slots	
	1 RJ-45 autosensing 10/100/1000 WAN	
	1 SFP fixed Gigabit Ethernet SFP port	
	4 RJ-45 autosensing 10/100/1000 LAN	
	1 serial port	
Additional ports and slots	1 USB 2.0 1 RJ-45 console port to access limited	
AP characteristics	**Radios (via optional modules)**	3G, 4G LTE
Physical characteristics	**Dimensions**	14.17(w) x 11.81(d) x 1.74(h) in (36 x 30 x
	Weight	4.42 cm) (1U height) 10.69 lb (4.85 kg)
Memory and processor	RISC @ 1.6 GHz, 1 GB DDR3 SDRAM, 256 MB flash	
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 500 Kpps (64-byte packets)
	Routing table size	90000 entries (IPv4), 90000 entries (IPv6)
	Forwarding table size	90000 entries (IPv4), 90000 entries (IPv6)
Environment	**Operating temperature**	32°F to 113°F (0°C to 45°C)
	Operating relative humidity	5% to 95%, noncondensing
	Nonoperating/Storage temperature	-40°F to 158°F (-40°C to 70°C)
	Nonoperating/Storage relative humidity	5% to 95%, noncondensing
	Altitude	Up to 16,404 ft (5 km)
Electrical characteristics	**Maximum heat dissipation**	50/60 Hz
	Voltage	65 BTU/hr (68.58 kJ/hr)
	Maximum power rating	100 - 240 VAC, rated (Depending on power supply chosen)
	Frequency	30 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)	71.81
Safety	UL 60950-1; IEC 60950-1; EN 60950-1; CAN/CSA-C22.2 No. 60950-1; FDA 21 CFR Subchapter J; AS/NZS 60950-1; GB 4943.1	

Technical Specifications

Emissions	VCCI Class A; EN 55022 Class A; CISPR 22 Class A; EN 55024; ICES-003 Class A; EN 300 386; CISPR 24; AS/NZS CISPR 22 Class A; EN 61000-3-2; EN 61000-3-3; FCC (CFR 47, Part 15) Class A
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 MSR1003 8 AC Router (JG732A) Comware v5 based		
I/O ports and slots	3 SIC slots, or 1 DSIC slot, and 1 SIC slot	
	2 RJ-45 autosensing 10/100/1000 WAN ports	
	8 RJ-45 autosensing 10/100/1000 LAN ports	
Additional ports and slots	1 USB 2.0 1 RJ-45 console port to access limited CLI port	
AP characteristics	**Radios (via optional modules)**	3G, 4G LTE
Physical characteristics	**Dimensions**	14.17(w) x 11.81(d) x 1.744(h) in (36 x 30 x 4.42 cm)
	Weight	10.69 lb (4.85 kg)
Memory and processor	RISC @ 667 MHz, 512 MB DDR3 SDRAM, 256 MB flash	
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 500 Kpps (64-byte packets)
	Routing table size	30000 entries (IPv4), 30000 entries (IPv6)
	Forwarding table size	30000 entries (IPv4), 30000 entries (IPv6)
Environment	**Operating temperature**	32°F to 113°F (0°C to 45°C)
	Operating relative humidity	5% to 95%, noncondensing
	Nonoperating/Storage temperature	-40°F to 158°F (-40°C to 70°C)
	Nonoperating/Storage relative humidity	5% to 95%, noncondensing
	Altitude	up to 16,404 ft (5 km)
Electrical characteristics	**Maximum heat dissipation**	65 BTU/hr (68.58 kJ/hr)
	Voltage	100 - 240 VAC, rated
	Maximum power rating	30 W
	Frequency	50/60 Hz
	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)	137.5
Safety	UL 60950-1; IEC 60950-1; EN 60950-1; CAN/CSA-C22.2 No. 60950-1; FDA 21 CFR Subchapter J; AS/NZS 60950-1; GB 4943.1	
Emissions	VCCI Class A;EN 55022 Class A; CISPR 22 Class A; EN 55024; ICES-003 Class A; EN 300 386 v1.6.1; CISPR 24; AS/NZS CISPR 22 Class A; EN 61000-3-2; EN 61000-3-3; FCC (CFR 47, Part 15) Class A	
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;	

Technical Specifications

	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 MSR1003 8S AC Router (JH060A) Comware v7 based		
I/O ports and slots	3 SIC slots, or 1 DSIC slot, and 1 SIC slot	
	2 RJ-45 autosensing 10/100/1000 WAN ports	
	8 RJ-45 autosensing 10/100/1000 LAN ports	
Additional ports and slots	1 USB 2.0 1 RJ-45 console port to access limited CLI port	
AP characteristics	**Radios (via optional modules)**	3G, 4G LTE
Physical characteristics	**Dimensions**	14.17(w) x 11.81(d) x 1.74(h) in (36 x 30 x 4.42 cm)
	Weight	10.69 lb (4.85 kg)
Memory and processor	RISC @ 667 MHz, 1GB DDR3 SDRAM, 256 MB flash	
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 500 Kpps (64-byte packets)
	Routing table size	200,000 entries (IPv4), 200,000 entries (IPv6)
	Forwarding table size	200,000 entries (IPv4), 200,000 entries (IPv6)
Environment	**Operating temperature**	32°F to 113°F (0°C to 45°C)
	Operating relative humidity	5% to 95%, noncondensing
	Nonoperating/Storage temperature	-40°F to 158°F (-40°C to 70°C)
	Nonoperating/Storage relative humidity	5% to 95%, noncondensing
	Altitude	up to 16,404 ft (5 km)
Electrical characteristics	**Maximum heat dissipation**	65 BTU/hr (68.58 kJ/hr)
	Voltage	100 - 240 VAC, rated
	Maximum power rating	30 W
	Frequency	50/60 Hz
	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)**	137.5
Safety	UL 60950-1; IEC 60950-1; EN 60950-1; CAN/CSA-C22.2 No. 60950-1; FDA 21 CFR Subchapter J; AS/NZS 60950-1; GB 4943.1	
Emissions	VCCI Class A; EN 55022 Class A; CISPR 22 Class A; EN 55024; ICES-003 Class A; EN 300 386 v1.6.1; CISPR 24; AS/NZS CISPR 22 Class A; EN 61000-3-2; EN 61000-3-3; FCC (CFR 47, Part 15) Class A	
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;	

Technical Specifications

	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.

Standards and Protocols (applies to JG875A, JG060A, JG732A and R8V33A models)

BGP

- RFC 1163 Border Gateway Protocol (BGP)
- RFC 1267 Border Gateway Protocol 3 (BGP-3)
- RFC 1657 Definitions of Managed Objects for BGPv4 (V5 support, V7 Obsoleted by RFC4273)
- RFC 4273 Definitions of Managed Objects for BGP-4
- RFC 1771 BGPv4 (V5 support, V7 Obsoleted by RFC4271)
- RFC 4271 A Border Gateway Protocol 4 (BGP-4)
- RFC 1772 Application of the BGP (V5)
- RFC 1773 Experience with the BGP-4 Protocol
- RFC 1774 BGP-4 Protocol Analysis
- RFC 1997 BGP Communities Attribute (V5&V7)
- RFC 1998 An Application of the BGP Community Attribute in Multi-home Routing (V5)
- RFC 2385 BGP Session Protection via TCP MD5 (V5)
- RFC 2439 BGP Route Flap Damping (V5&V7) RFC
- RFC 3618 Multiprotocol Extensions for BGP-4
- RFC 4360 BGP Extended Communities Attribute
- RFC 4364 BGP/MPLS IP Virtual Private Networks
- RFC 4382 MPLS/BGP Layer 3 Virtual Private Network (VPN) Management Information Base
- RFC 4456 BGP Route Reflection: An Alternative to Full Mesh Internal BGP (IBGP)
- RFC 4577 OSPF as the Provider/Customer Edge Protocol for BGP/MPLS IP Virtual Private Networks (VPNs)
- RFC 4659 BGP-MPLS IP Virtual Private Network (VPN) Extension for IPv6 VPN
- RFC 4684 Constrained Route Distribution for Border Gateway Protocol/MultiProtocol Label Switching (BGP/MPLS) Internet Protocol (IP) Virtual Private Networks (VPNs)
- RFC 4724 Graceful Restart Mechanism for BGP
- RFC 4760 Multiprotocol Extensions for BGP-4
- RFC 4760 Virtual Private LAN Service (VPLS) Using BGP for Auto-Discovery and Signaling
- RFC 4893 BGP Support for Four-octet AS Number Space
- RFC 5065 Autonomous System Confederations for BGP
- RFC 5492 Capabilities Advertisement with BGP-4
- RFC 6624 Layer 2 Virtual Private Networks Using BGP for Auto-Discovery and Signaling
- RFC 7432 BGP MPLS-Based Ethernet VPN
- RFC 7752 North-Bound Distribution of Link-State and Traffic Engineering (TE) Information Using BGP

Denial of service protection

- CPU DoS Protection
- Rate Limiting by ACLs

Device management

- RFC 1305 NTPv3(V7)
- RFC 1945 Hypertext Transfer Protocol -- HTTP/1.0(V7)
- RFC 2452 MIB for TCP6(V5 support,V7 Obsoleted by RFC4022)
- RFC 4022 Management Information Base for the Transmission Control Protocol (TCP)
- RFC 2454 MIB for UDP6(V5 support,V7 Obsoleted by RFC4113)
- RFC 4113 Management Information Base for the User Datagram Protocol (UDP)

General Protocols

Technical Specifications

- RFC 2385 BGP Session Protection via TCP MD5(V5)
- RFC 1027 Proxy ARP(V7)
- RFC 1034 Domain names - concepts and facilities(V7)
- RFC 1035 Domain names - implementation and specification(V5&V7)
- RFC 1048 BOOTP (Bootstrap Protocol) vendor information extensions(V7)
- RFC 1054 Host extensions for IP multicasting(V7 Obsoleted by RFC1112)
- RFC 1112 Host Extensions for IP Multicasting
- RFC 1058 RIPv1(V5 support,V7 Updated by RFC1723)
- RFC 1723 RIP Version 2 Carrying Additional Information
- RFC 1059 Network Time Protocol (version 1) specification and implementation(V7 Obsoleted by RFC1305)
- RFC 1305 Network Time Protocol Version 4: Protocol and Algorithms Specification
- RFC 1060 Assigned numbers
- RFC 1063 IP MTU (Maximum Transmission Unit) discovery options
- RFC 1071 Computing the Internet Checksum (V7 Updated by RFC1141)
- RFC 1141 Incremental updating of the Internet checksum (Updated by RFC1624)
- RFC 1072 TCP extensions for long-delay paths(V7 Obsoleted by RFC1323)
- RFC 1323 TCP Selective Acknowledgment Options
- RFC 1079 Telnet terminal speed option
- RFC 1084 BOOTP (Bootstrap Protocol) vendor information extensions
- RFC 1091 Telnet Terminal-Type Option(V5&V7)
- RFC 1093 NSFNET routing architecture
- RFC 1101 DNS encoding of network names and other types
- RFC 1119 Network Time Protocol (version 2) specification and implementation(V7 Obsoleted by RFC1305)
- RFC 1305 Network Time Protocol Version 4: Protocol and Algorithms Specification
- RFC 1122 Requirements for Internet Hosts - Communication Layers(V7 Updated by RFC4379)
- RFC 4379 Detecting Multi-Protocol Label Switched (MPLS) Data Plane Failures
- RFC 1141 Incremental updating of the Internet checksum(V5&V7)
- RFC 1142 OSI IS-IS Intra-domain Routing Protocol
- RFC 1164 Application of the Border Gateway Protocol in the Internet
- RFC 1166 Internet address used by Internet Protocol (IP)(V7)
- RFC 1171 Point-to-Point Protocol for the transmission of multi-protocol datagrams over Point-to-Point links
- RFC 1172 Point-to-Point Protocol (PPP) initial configuration options(V7 Obsoleted by RFC1332)
- RFC 1332 The PPP Internet Protocol Control Protocol (IPCP)
- RFC 1185 TCP Extension for High-Speed Paths(V7 Obsoleted by RFC1323)
- RFC 1323 TCP Selective Acknowledgment Options
- RFC 1191 Path MTU discovery
- RFC 1195 OSI ISIS for IP and Dual Environments(V5&V7)
- RFC 1213 Management Information Base for Network Management of TCP/IP-based internets(V5&V7)
- RFC 1253 (OSPF v2)
- RFC 1265 BGP Protocol Analysis
- RFC 1266 Experience with the BGP Protocol
- RFC 1268 Application of the Border Gateway Protocol in the Internet
- RFC 1271 Remote Network Monitoring Management Information Base
- RFC 1284 Definitions of Managed Objects for the Ethernetlike Interface Types
- RFC 1286 Definitions of Managed Objects for Bridges(V7 Obsoleted by RFC1493)
- RFC 1493 Definitions of Managed Objects for Bridges

Technical Specifications

- RFC 1294 Multiprotocol Interconnect over Frame Relay(V5 support,V7 Obsoleted by RFC2427)
- RFC 2427 Multiprotocol Interconnect over Frame Relay
- RFC 1305 NTPv3 (IPv4 only) (V7 Obsoleted by RFC5905)
- RFC 5905 Network Time Protocol Version 4: Protocol and Algorithms Specification
- RFC 1321 The MD5 Message-Digest Algorithm(V5&V7)
- RFC 1323 TCP Extensions for High Performance(V7)
- RFC 1331 The Point-to-Point Protocol (PPP) for the Transmission of Multi-protocol Datagrams over Point-to-Point

Links

- RFC 1332 The PPP Internet Protocol Control Protocol (IPCP) (V7)
- RFC 1333 PPP Link Quality Monitoring
- RFC 1334 PPP Authentication Protocols(V5&V7)
- RFC 1349 Type of Service
- RFC 1350 TFTP Protocol (revision 2) (V7)
- RFC 1364 BGP OSPF Interaction
- RFC 1370 Applicability Statement for OSPF
- RFC 1377 The PPP OSI Network Layer Control Protocol (OSINLCP) (V7)
- RFC 1393 Traceroute Using an IP Option(V7)
- RFC 1395 BOOTP (Bootstrap Protocol) Vendor Information Extensions
- RFC 1398 Definitions of Managed Objects for the Ethernet-Like Interface Types
- RFC 1403 BGP OSPF Interaction
- RFC 1444 Conformance Statements for version 2 of the Simple Network Management Protocol (SNMPv2)
- RFC 1449 Transport Mappings for version 2 of the Simple Network Management Protocol (SNMPv2)
- RFC 1471 The Definitions of Managed Objects for the Link Control Protocol of the Point-to-Point Protocol
- RFC 1473 The Definitions of Managed Objects for the IP Network Control Protocol of the Point-to-Point Protocol
- RFC 1483 Multiprotocol Encapsulation over ATM Adaptation Layer 5(V7)
- RFC 1490 Multiprotocol Interconnect over Frame Relay (V5 support, V7 Obsoleted by RFC2427)
- RFC 2427 Multiprotocol Interconnect over Frame Relay
- RFC 1497 BOOTP (Bootstrap Protocol) Vendor Information Extensions
- RFC 1519 CIDR(V7 Obsoleted by RFC4632)
- RFC 4632 Classless Inter-domain Routing (CIDR): The Internet Address Assignment and Aggregation Plan
- RFC 1531 Dynamic Host Configuration Protocol
- RFC 1532 Clarifications and Extensions for the Bootstrap Protocol(V7 Obsoleted by RFC1542)
- RFC 1542 Clarifications and Extensions for the Bootstrap Protocol
- RFC 1533 DHCP Options and BOOTP Vendor Extensions(V7 Obsoleted by RFC2132)
- RFC 2132 DHCP Options and BOOTP Vendor Extensions
- RFC 1534 Interoperation Between DHCP and BOOTP
- RFC 1541 Dynamic Host Configuration Protocol(V7 Obsoleted by RFC2131)
- RFC 2131 Dynamic Host Configuration Protocol
- RFC 1542 BOOTP Extensions(V7)
- RFC 1542 Clarifications and Extensions for the Bootstrap Protocol(V7)
- RFC 1548 The Point-to-Point Protocol (PPP) (V7 Obsoleted by RFC1661)
- RFC 1661 The Point-to-Point Protocol (PPP)
- RFC 1549 PPP in HDLC Framing

Technical Specifications

- RFC 1570 PP LCP (Point-to-Point Protocol Link Control Protocol) Extensions(V5)
- RFC 1577 Classical IP and ARP over ATM(V7)
- RFC 1597 Address Allocation for Private Internets
- RFC 1618 PPP over ISDN
- RFC 1619 PPP over SONET/SDH (Synchronous Optical Network/Synchronous Digital Hierarchy)
- RFC 1624 Incremental Internet Checksum(V7)
- RFC 1631 NAT(V7 Obsoleted by RFC3022)
- RFC 3022 Traditional IP Network Address Translator (Traditional NAT)
- RFC 1650 Definitions of Managed Objects for the Ethernet-like Interface Types using SMIv2
- RFC 1661 The Point-to-Point Protocol (PPP) (V7)
- RFC 1662 PPP in HDLC-like Framing
- RFC 1700 Assigned Numbers(V7)
- RFC 1701 Generic Routing Encapsulation(V5&V7)
- RFC 1702 Generic Routing Encapsulation over IPv4 networks(V7)
- RFC 1717 The PPP Multilink Protocol (MP) (V7 Obsoleted by RFC1990)
- RFC 1990 The PPP Multilink Protocol (MP)
- RFC 1721 RIP-2 Analysis
- RFC 1722 RIP-2 Applicability
- RFC 1723 RIP v2(V7 Obsoleted by RFC2453)
- RFC 2453 RIP Version 2
- RFC 1724 RIP Version 2 MIB Extension(V7)
- RFC 1757 Remote Network Monitoring Management Information Base(V7 Obsoleted by RFC2819)
- RFC 2819 Remote Network Monitoring Management Information Base
- RFC 1777 Lightweight Directory Access Protocol(V7)
- RFC 1812 IPv4 Routing(V5&V7)
- RFC 1825 Security Architecture for the Internet Protocol(V5&V7)
- RFC 1826 IP Authentication Header(V5&V7)
- RFC 1827 IP Encapsulating Security Payload (ESP) (V5&V7)
- RFC 1829 The ESP DES-CBC Transform(V5&V7)
- RFC 1877 PPP Internet Protocol Control Protocol Extensions for Name Server Addresses
- RFC 1884 IP Version 6 Addressing Architecture
- RFC 1885 Internet Control Message Protocol (ICMPv6) for the Internet Protocol Version 6 (IPv6) Specification
- RFC 1886 DNS Extensions to support IP version 6
- RFC 1889 RTP (Real-Time Protocol): A Transport Protocol for Real-Time Applications. Audio-Video Transport

Working Group

- RFC 1933 Transition Mechanisms for IPv6 Hosts and Routers
- RFC 1945 Hypertext Transfer Protocol -- HTTP/1.0(V7)
- RFC 1962 The PPP Compression Control Protocol (CCP)
- RFC 1966 BGP Route Reflection An alternative to full mesh IBGP(V7 Obsoleted by RFC4456)
- RFC 4456 BGP Route Reflection: An Alternative to Full Mesh Internal BGP (IBGP)
- RFC 1970 Neighbor Discovery for IP Version 6 (IPv6)
- RFC 1971 IPv6 Stateless Address Autoconfiguration
- RFC 1972 A Method for the Transmission of IPv6 Packets over Ethernet Networks
- RFC 1981 Path MTU Discovery for IP version 6(V5&V7)
- RFC 1982 Serial Number Arithmetic

Technical Specifications

- RFC 1989 PPP Link Quality Monitoring
- RFC 1990 The PPP Multilink Protocol (MP) (V7)
- RFC 1994 PPP Challenge Handshake Authentication Protocol (CHAP) (V5&V7)
- RFC 2001 TCP Slow Start, Congestion Avoidance, Fast Retransmit, and Fast Recovery Algorithms(V7 Obsoleted by RFC2581)
- RFC 2581 The NewReno Modification to TCPs Fast Recovery Algorithm
- RFC 2002 IP Mobility Support
- RFC 2003 IP Encapsulation within IP
- RFC 2011 SNMPv2 Management Information Base for the Internet Protocol using SMIv2(V7 Obsoleted by RFC4293)
- RFC 4293 Management Information Base for the Internet Protocol (IP)
- RFC 2012 SNMPv2 Management Information Base for the Transmission Control Protocol using SMIv2(V7 Obsoleted by RFC4022)
- RFC 4022 Management Information Base for the Transmission Control Protocol (TCP)
- RFC 2013 SNMPv2 Management Information Base for the User Datagram Protocol using SMIv2 (V7 Obsoleted by RFC4113)
- RFC 4113 Management Information Base for the User Datagram Protocol (UDP)
- RFC 2018 TCP Selective Acknowledgement Options(V7)
- RFC 2021 Remote Network Monitoring Management Information Base Version 2 using SMIv2(V7 Obsoleted by RFC4502)
- RFC 4502 Remote Network Monitoring Management Information Base Version 2
- RFC 2073 An IPv6 Provider-Based Unicast Address Format
- RFC 2082 RIP-2 MD5 Authentication(V5&V7)
- RFC 2091 Triggered Extensions to RIP to Support Demand Circuits(V7)
- RFC 2104 HMAC: Keyed-Hashing for Message Authentication
- RFC 2131 DHCP(V5&V7)
- RFC 2132 DHCP Options and BOOTP Vendor Extensions(V5&V7)
- RFC 2136 Dynamic Updates in the Domain Name System (DNS UPDATE) (V7)
- RFC 2138 Remote Authentication Dial In User Service (RADIUS) (V5 Support, V7 Obsoleted by RFC2865)
- RFC 2865 RADIUS Accounting
- RFC 2205 Resource ReSerVation Protocol (RSVP) -- Version 1 Functional Specification(V5&V7)
- RFC 2209 Resource ReSerVation Protocol (RSVP) -- Version 1 Message Processing Rules(V7)
- RFC 2210 Use of RSVP (Resource Reservation Protocol) in Integrated Services
- RFC 2225 Classical IP and ARP over ATM
- RFC 2236 IGMP Snooping(V7)
- RFC 2246 The TLS Protocol Version 1.0(V5&V7)
- RFC 2251 Lightweight Directory Access Protocol (v3) (V7)
- RFC 2252 Lightweight Directory Access Protocol (v3): Attribute Syntax Definitions(V7)
- RFC 2283 MBGP(V5)
- RFC 2292 Advanced Sockets API for IPv6
- RFC 2309 Recommendations on queue management and congestion avoidance in the Internet(V7)
- RFC 2327 SDP: Session Description Protocol(V5)
- RFC 2338 VRRP(V5 Support, V7 Obsoleted by RFC3768)
- RFC 3768 Virtual Router Redundancy Protocol (VRRP) Version 3 for IPv4 and IPv6
- RFC 2344 Reverse Tunneling for Mobile IP
- RFC 2358 Definitions of Managed Objects for the Ethernet-like Interface Types

Technical Specifications

- RFC 2364 PPP Over AAL5(V7)
- RFC 2365 Administratively Scoped IP Multicast
- RFC 2373 IP Version 6 Addressing Architecture
- RFC 2374 An IPv6 Aggregatable Global Unicast Address Format
- RFC 2375 IPv6 Multicast Address Assignments
- RFC 2385 Protection of BGP Sessions via the TCP MD5 Signature Option(V5)
- RFC 2427 Multiprotocol Interconnect over Frame Relay(V7)
- RFC 2428 FTP Extensions for IPv6 and NATs
- RFC 2433 Microsoft PPP CHAP (Challenge Handshake Authentication Protocol) Extensions(V7)
- RFC 2451 The ESP CBC-Mode Cipher Algorithms(V7)
- RFC 2452 IP Version 6 Management Information Base for the Transmission Control Protocol(V5 Support,V7 Obsoleted by lRFC4022)
- RFC 4022 Management Information Base for the Transmission Control Protocol (TCP)
- RFC 2453 RIPv2(V5&V7)
- RFC 2454 IP Version 6 Management Information Base for the User Datagram Protocol(V5 Support,V7 Obsoleted by lRFC4113)
- RFC 4113 Management Information Base for the User Datagram Protocol (UDP)
- RFC 2461 Neighbor Discovery for IP Version 6 (IPv6) (V5 Support,V7 Obsoleted by lRFC4861)
- RFC 4861 Neighbor Discovery for IP version 6 (IPv6)
- RFC 2462 IPv6 Stateless Address Autoconfiguration(V5 Support,V7 Obsoleted by lRFC4862)
- RFC 4862 IPv6 Stateless Address Autoconfiguration
- RFC 2463 Internet Control Message Protocol (ICMPv6) for the Internet Protocol Version 6 (IPv6) Specification(V5 Support,V7 Obsoleted by lRFC4443)
- RFC 4443 Internet Control Message Protocol (ICMPv6) for the Internet Protocol Version 6 (IPv6) Specification
- RFC 2464 Transmission of IPv6 Packets over Ethernet Networks(V5)
- RFC 2465 Management Information Base for IP Version 6: Textual Conventions and General Group(V5&V7)
- RFC 2466 Management Information Base for IP Version 6: ICMPv6 Group(V5 Support,V7 Obsoleted by lRFC4293)
- RFC 4293 Management Information Base for the Internet Protocol (IP)
- RFC 2472 IP Version 6 over PPP(V5&V7)
- RFC 2474 Definition of the Differentiated Services Field (DS Field) in the IPv4 and IPv6 Headers(V7 Updated by RFC 3168 and RFC 3260)
- RFC 3168 The Addition of Explicit Congestion Notification (ECN) to IP.
- RFC 3260 New Terminology and Clarifications for Diffserv
- RFC 2507 IP Header Compression
- RFC 2508 Compressing IP/UDP/RTP Headers for Low-Speed Serial Links
- RFC 2509 IP Header Compression over PPP(V7)
- RFC 2510 Internet X.509 Public Key Infrastructure Certificate Management Protocols
- RFC 2516 A Method for Transmitting PPP Over Ethernet (PPPoE) (V5&V7)
- RFC 2519 A Framework for Inter-Domain Route Aggregation
- RFC 2529 Transmission of IPv6 over IPv4 Domains without Explicit Tunnels
- RFC 2543 SIP: Session Initiation Protocol
- RFC 2548 (MS-RAS-Vendor only) (V7)
- RFC 2553 Basic Socket Interface Extensions for IPv6
- RFC 2570 Introduction to Version 3 of the Internet-standard Network Management Framework
- RFC 2581 TCP Congestion Control (V7)

Technical Specifications

- RFC 2597 Assured Forwarding PHB Group(V7)
- RFC 2598 An Expedited Forwarding PHB(V5 Support,V7 Obsoleted by lRFC3246)
- RFC 3246 An Expedited Forwarding PHB (Per-Hop Behavior)
- RFC 2615 PPP over SONET/SDH (Synchronous Optical Network/Synchronous Digital Hierarchy)
- RFC 2616 HTTP Compatibility v1.1(V7)
- RFC 2617 HTTP Authentication: Basic and Digest Access Authentication(V5&V7)
- RFC 2618 RADIUS Authentication Client MIB(V7)
- RFC 2620 RADIUS Accounting Client MIB(V7)
- RFC 2644 Changing the Default for Directed Broadcasts in Routers(V7)
- RFC 2661 L2TP(V7)
- RFC 2663 NAT Terminology and Considerations(V7)
- RFC 2665 Definitions of Managed Objects for the Ethernet-like Interface Types
- RFC 2668 Definitions of Managed Objects for IEEE 802.3 Medium Attachment Units (MAUs)
- RFC 2675 IPv6 Jumbograms(V7)
- RFC 2684 Multiprotocol Encapsulation over ATM Adaptation Layer 5(V7)
- RFC 2685 Virtual Private Networks Identifier(V7)
- RFC 2686 The Multi-Class Extension to Multi-Link PPP
- RFC 2694 DNS extensions to Network Address Translators (DNS_ALG)
- RFC 2698 A Two Rate Three Color Marker(V7)
- RFC 2702 Requirements for Traffic Engineering Over MPLS(V7)
- RFC 2711 IPv6 Router Alert Option(V7)
- RFC 2716 PPP EAP TLS Authentication Protocol(V7)
- RFC 2747 RSVP Cryptographic Authentication(V5&V7)
- RFC 2763 Dynamic Name-to-System ID mapping(V5 Support,V7 Obsoleted by lRFC5301)
- RFC 5301 Dynamic Hostname Exchange Mechanism for IS-IS
- RFC 2784 Generic Routing Encapsulation (GRE) (V5&V7)
- RFC 2787 Definitions of Managed Objects for the Virtual Router Redundancy Protocol(V7)
- RFC 2827 Network Ingress Filtering: Defeating Denial of Service Attacks Which Employ IP Source Address Spoofing(V7)
- RFC 2833 RTP Payload for DTMF Digits, Telephony Tones and Telephony Signals(V5)
- RFC 2865 Remote Authentication Dial In User Service (RADIUS) (V5&V7)
- RFC 2866 RADIUS Accounting(V5&V7)
- RFC 2868 RADIUS Attributes for Tunnel Protocol Support(V5&V7)
- RFC 2869 RADIUS Extensions(V5&V7)
- RFC 2884 Performance Evaluation of Explicit Congestion Notification (ECN) in IP Networks. (V7)
- RFC 2894 Router Renumbering for IPv6(V7)
- RFC 2917 A Core MPLS IP VPN Architecture
- RFC 2925 Definitions of Managed Objects for Remote Ping, Traceroute, and Lookup Operations(V7)
- RFC 2961 RSVP Refresh Overhead Reduction Extensions(V7)
- RFC 2963 A Rate Adaptive Shaper for Differentiated Services(V7)
- RFC 2965 HTTP State Management Mechanism(V7)
- RFC 2966 Domain-wide Prefix Distribution with Two-Level IS-IS(V5)
- RFC 2973 IS-IS Mesh Groups(V5)
- RFC 2976 The SIP INFO Method(V5&V7)
- RFC 2993 Architectural Implications of NAT
- RFC 3011 The IPv4 Subnet Selection Option for DHCP(V7)

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- RFC 3022 Traditional IP Network Address Translator (Traditional NAT) (V7)
- RFC 3024 Reverse Tunneling for Mobile IP, revised
- RFC 3025 Mobile IP Vendor/Organization-Specific Extensions
- RFC 3027 Protocol Complications with the IP Network Address Translator
- RFC 3031 Multiprotocol Label Switching Architecture (V7)

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- RFC 1112 IGMP(V7)
- RFC 2236 IGMPv2(V7)
- RFC 2283 Multiprotocol Extensions for BGP-4(V5)
- RFC 2362 PIM Sparse Mode(V5 Support,V7 Obsoleted by lRFC4601)
- RFC 4601 Protocol Independent Multicast - Sparse Mode (PIM-SM):Protocol Specification (Revised)
- RFC 2365 Administratively Scoped IP Multicast
- RFC 2710 Multicast Listener Discovery (MLD) for IPv6(V5&V7)
- RFC 2934 Protocol Independent Multicast MIB for IPv4
- RFC 3376 IGMPv3(V7)

IPv6

- RFC 1981 IPv6 Path MTU Discovery(V5&V7)
- RFC 2080 RIPng for IPv6(V5&V7)
- RFC 2292 Advanced Sockets API for IPv6
- RFC 2373 IPv6 Addressing Architecture
- RFC 2460 IPv6 Specification(V5&V7)
- RFC 2461 IPv6 Neighbor Discovery(V5 Support,V7 Obsoleted by RFC4861)
- RFC 4861 Neighbor Discovery for IP version 6 (IPv6)
- RFC 2462 IPv6 Stateless Address Auto-configuration(V5 Support,V7 Obsoleted by RFC4862)
- RFC 4862 IPv6 Stateless Address Autoconfiguration
- RFC 2463 ICMPv6 (V5 Support,V7 Obsoleted by RFC4443)
- RFC 4443 Internet Control Message Protocol (ICMPv6) for the Internet Protocol Version 6 (IPv6) Specification
- RFC 2464 Transmission of IPv6 over Ethernet Networks(V5)
- RFC 2472 IP Version 6 over PPP(V5&V7)
- RFC 2473 Generic Packet Tunneling in IPv6(V5&V7)
- RFC 2475 IPv6 DiffServ Architecture(V7)
- RFC 2529 Transmission of IPv6 Packets over IPv4(V7)
- RFC 2545 Use of MP-BGP-4 for IPv6(V5&V7)
- RFC 2553 Basic Socket Interface Extensions for IPv6
- RFC 2740 OSPFv3 for IPv6(V5 Support,V7 Obsoleted by RFC5340)
- RFC 5340 OSPF for IPv6
- RFC 2893 Transition Mechanisms for IPv6 Hosts and Routers(V5 Support,V7 Obsoleted by RFC4213)
- RFC 4213 Basic Transition Mechanisms for IPv6 Hosts and Routers
- RFC 3056 Connection of IPv6 Domains via IPv4 Clouds(V5&V7)
- RFC 3513 IPv6 Addressing Architecture(V5 Support,V7 Obsoleted by RFC4291)
- RFC 4291 IP Version 6 Addressing Architecture
- RFC 3596 DNS Extension for IPv6

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- RFC 1213 MIB II(V5&V7)
- RFC 1229 Interface MIB Extensions
- RFC 1286 Bridge MIB(V7 Obsoleted by RFC1493)
- RFC 1493 Bridge MIB(V7)
- RFC 1573 SNMP MIB II (V7 Obsoleted by RFC2863)
- RFC 2863 The Interfaces Group MIB
- RFC 1724 RIPv2 MIB(V7)
- RFC 1757 Remote Network Monitoring MIB(V7 Obsoleted by RFC2819)
- RFC 2819 Remote Network Monitoring Management Information Base
- RFC 1850 OSPFv2 MIB(V5 Support,V7 Obsoleted by RFC4750)
- RFC 4750 OSPF Version 2 Management Information Base
- RFC 2011 SNMPv2 MIB for IP(V7 Obsoleted by RFC4293)
- RFC 4293 Management Information Base for the Internet Protocol (IP)
- RFC 2012 SNMPv2 Management Information Base for the Transmission Control Protocol using SMIv2(V7 Obsoleted by RFC4022)
- RFC 4022 Management Information Base for the Transmission Control Protocol (TCP)
- RFC 2013 SNMPv2 Management Information Base for the User Datagram Protocol using SMIv2 (V7 Obsoleted by RFC4113)
- RFC 4113 Management Information Base for the User Datagram Protocol (UDP)
- RFC 2233 Interfaces MIB(V7)
- RFC 2454 IPV6-UDP-MIB(V5 support,V7 Obsoleted by RFC4113)
- RFC 4113 Management Information Base for the User Datagram Protocol (UDP)
- RFC 2465 IPv6 MIB(V5&V7)
- RFC 2466 ICMPv6 MIB(V5 Support,V7 Obsoleted by lRFC4293)
- RFC 4293 Management Information Base for the Internet Protocol (IP)
- RFC 2618 RADIUS Client MIB(V7)
- RFC 2620 RADIUS Accounting MIB(V7)
- RFC 2674 802.1p and IEEE 802.1Q Bridge MIB
- RFC 2737 Entity MIB (Version 2) (V7 Obsoleted by RFC4133)
- RFC 4133 Entity MIB (Version 3)
- RFC 2863 The Interfaces Group MIB(V7)
- RFC 2933 IGMP MIB(V7)
- RFC 3813 MPLS LSR MIB(V7)

Network Management

- IEEE 802.1D (STP) (V5)
- RFC 1155 Structure of Management Information(V5&V7)
- RFC 1157 SNMPv1(V5&V7)
- RFC 1905 SNMPv2 Protocol Operations(V7 Obsoleted by RFC3416)
- RFC 3416 Version 2 of the Protocol Operations for the Simple Network Management Protocol (SNMP).
- RFC 2272 SNMPv3 Management Protocol
- RFC 2273 SNMPv3 Applications
- RFC 2274 USM for SNMPv3
- RFC 2275 VACM for SNMPv3
- RFC 2575 SNMPv3 View-based Access Control Model (VACM)
- RFC 3164 BSD syslog Protocol(V7)

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OSPF

- RFC 1245 OSPF protocol analysis
- RFC 1246 Experience with OSPF
- RFC 1587 OSPF NSSA(V5&V7)
- RFC 1765 OSPF Database Overflow(V5&V7)
- RFC 1850 OSPFv2 Management Information Base (MIB), traps(V5 Support,V7 Obsoleted by RFC4750)
- RFC 4750 OSPF Version 2 Management Information Base
- RFC 2328 OSPFv2(V5&V7)
- RFC 2370 OSPF Opaque LSA Option(V5 Support,V7 Updated by RFC3630)
- RFC 3630 Traffic Engineering (TE) Extensions to OSPF Version 2
- RFC 3101 OSPF NSSA(V7)

QoS / CoS

- IEEE 802.1p (CoS)
- RFC 2474 DS Field in the IPv4 and IPv6 Headers(V7 Updated by RFC 3168 and RFC 3260)
- RFC 3168 The Addition of Explicit Congestion Notification (ECN) to IP.
- RFC 3260 New Terminology and Clarifications for Diffserv
- RFC 2475 DiffServ Architecture(V7)
- RFC 2597 DiffServ Assured Forwarding (AF) (V7)
- RFC 2598 DiffServ Expedited Forwarding (EF) (V5 Support,V7 Obsoleted by lRFC3246)
- RFC 3246 An Expedited Forwarding PHB (Per-Hop Behavior)
- RFC 3168 The Addition of Explicit Congestion Notification (ECN) to IP(V7)

Security

- IEEE 802.1X Port Based Network Access Control
- RFC 1321 The MD5 Message-Digest Algorithm(V5&V7)
- RFC 2082 RIP-2 MD5 Authentication(V5&V7)
- RFC 2104 Keyed-Hashing for Message Authentication
- RFC 2138 RADIUS Authentication(V5 Support,V7 Obsoleted by RFC2865)
- RFC 2865 RADIUS Accounting
- RFC 2209 RSVP-Message Processing(V7)
- RFC 2246 Transport Layer Security (TLS) (V5&V7)
- RFC 2716 PPP EAP TLS Authentication Protocol(V7)
- RFC 2865 RADIUS Authentication(V5&V7)
- RFC 2866 RADIUS Accounting(V5&V7)
- RFC 3567 Intermediate System (IS) to IS Cryptographic Authentication(V5)

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- RFC 2403 - HMAC-MD5-96(V7)
- RFC 2404 - HMAC-SHA1-96
- RFC 2405 - DES-CBC Cipher algorithm
- RFC 2547 BGP/MPLS VPNs(V5 Support,V7 Obsoleted by RFC4364)
- RFC 4364 BGP/MPLS IP Virtual Private Networks
- RFC 2796 BGP Route Reflection - An Alternative to Full Mesh IBGP(V5 Support,V7 Obsoleted by RFC4456)
- RFC 4456 BGP Route Reflection: An Alternative to Full Mesh Internal BGP (IBGP)
- RFC 2842 Capabilities Advertisement with BGP-4(V5)
- RFC 2858 Multiprotocol Extensions for BGP-4(V5 Support,V7 Obsoleted by RFC4760)

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- RFC 4760 Multiprotocol Extensions for BGP-4
- RFC 2918 Route Refresh Capability for BGP-4(V5&V7)
- RFC 3107 Carrying Label Information in BGP-4

IPSec

- RFC 1828 IP Authentication using Keyed MD5
- RFC 2401 IP Security Architecture(V7 Obsoleted by RFC4301)
- RFC 4301 Security Architecture for the Internet Protocol
- RFC 2402 IP Authentication Header(V7 Obsoleted by RFC4302)
- RFC 4302 IP Authentication Header
- RFC 2406 IP Encapsulating Security Payload(V7 Obsoleted by RFC4303)
- RFC 4303 IP Encapsulating Security Payload (ESP)
- RFC 2407 - Domain of interpretation(V7)
- RFC 2410 - The NULL Encryption Algorithm and its use with IPSec(V7)
- RFC 2411 IP Security Document Roadmap
- RFC 2412 – OAKLEY(V7)
- RFC 2865 - Remote Authentication Dial In User Service (RADIUS) (V5&V7)

IKEv1

- RFC 2865 - Remote Authentication Dial In User Service (RADIUS) (V5&V7)
- RFC 3748 - Extensible Authentication Protocol (EAP) (V7)

Summary of Changes

Date	Version History	Action	Description of Change
27-Feb-2026	Version 23	Changed	New branding applied to document
06-Jan-2025	Version 22	Changed	Configuration Information section was updated.
04-Dec-2023	Version 21	Changed	Obsolete SKUs were removed. Configuration Information section was updated. Series name was updated.
05-Dec-2022	Version 20	Changed	Overview and Technical Specifications updated
06-Sep-2022	Version 19	Changed	Overview, Standard Features, and Technical Specifications sections were updated.
11-Apr-2022	Version 18	Changed	Technical Specifications section was updated.
04-Apr-2022	Version 17	Changed	Configuration Information and Technical Specifications sections were updated.
16-Aug-2021	Version 16	Changed	Configuration Information section was updated, obsolete SKUs were removed.
05-Feb-2018	Version 15	Changed	Minor edits on Technical Specification
05-Sep-2016	Version 14	Added	SKU added: JG742B
		Changed	Features and Benefits updated
01-Aug-2016	Version 13	Changed	Adding #AC3 Option on Configuration section Technical Specifications updated
06-Jun-2016	Version 12	Changed	Document name changed to HPE Networking Comware Router Series MSR1000 Product description updated.
29-Apr-2016	Version 11	Changed	SKU descriptions updated on all the document. Accessories updated. Minor changes made on Technical Specifications.
31-Mar-2016	Version 10	Added	SKUs added: JH240A, JH226AAE, JH230AAE
		Changed	Features and Benefits updated
01-Dec-2015	Version 9	Changed	Overview and Technical Specifications updated
28-Aug-2015	Version 8	Changed	Minor edit on Technical Specification
17-Aug-2015	Version 7	Added	Added 1 new model: JH060A Added 1 new accessories: JG929A
		Changed	Updated Features and Benefits, Configuration and Technical Specifications
24-Feb-2015	Version 6	Changed	Minor change on Configuration section
06-Oct-2014	Version 5	Removed	Removed SKU JD572A
		Changed	Configuration section updated
18-Aug-2014	Version 4	Added	Added 1 new model: JG875A Added 7 new accessories: JG736A, JG737A, JG738A, JG739A, JG742A, JG743A, JG744A
		Changed	Content Edits
10-Jun-2014	Version 3	Added	New accessories added.
20-Mar-2014	Version 2	Changed	Configuration was added and Accessories were revised.
18-Feb-2014	Version 1	Created	Document creation

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