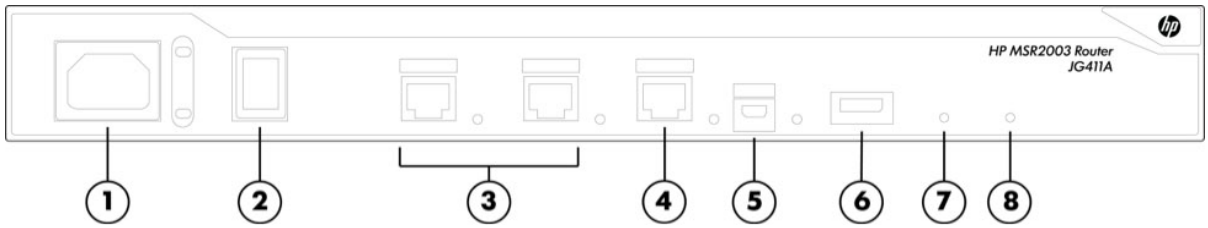
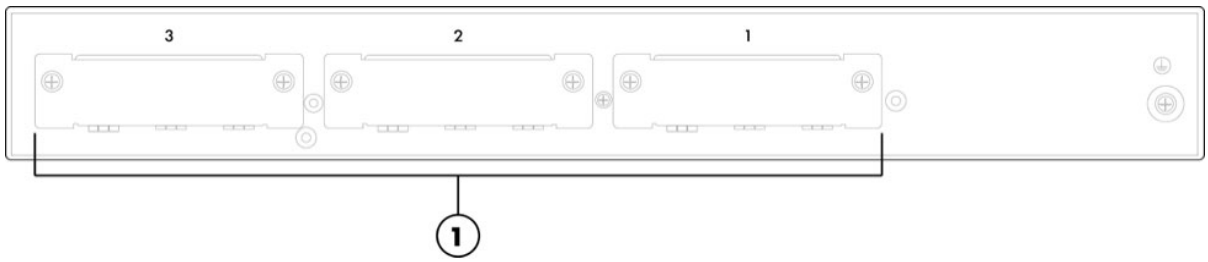
Overview

HPE FlexNetwork MSR2000 Router Series



HPE FlexNetwork MSR2003 AC Router Front View

1. AC Power input
2. Power Switch
3. Fixed 10M/100M/1000M RJ45 Ports
4. CON/AUX port
5. USB console port
6. 1 USB 2.0 Port for 3G modem and USB disk
7. System Activity LED
8. Power LED



HPE FlexNetwork MSR2003 AC Router Rear View

1. SIC module slots / 1 DSIC (Slots 1 + 2)

Models

HPE FlexNetwork MSR2003 AC Router	JG411A
HPE FlexNetwork MSR2004 24 AC Router	JG734A
HPE FlexNetwork MSR2004 48 Router	JG735A

Key features

- Up to 1 Mpps forwarding; converged high-performance routing, switching, security, voice, mobility
- Embedded security features with hardware-based encryption, firewall, NAT, and VPNs
- Industry-leading breadth of LAN and WAN connectivity, up to 24/48 GE switching ports integrated
- No additional licensing complexity; no cost for advanced features
- Zero-touch solution, with single pane-of-glass management

Product overview

The HPE FlexNetwork MSR2000 Router Series, 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 FlexNetwork architecture. These routers feature a modular design that delivers unmatched application services for small- to medium-sized branch offices. This gives your IT personnel the benefit of reduced complexity, and simplified configuration, deployment, and management.

Overview

The MSR2000 series provides an agile, flexible network infrastructure that enables you to quickly adapt to your changing business requirements while delivering integrated concurrent services on a single, easy-to-manage platform.

Features and benefits

Performance

- **Excellent forwarding performance**
  provides forwarding performance up to 1 Mpps (672 Mb/s); meets the bandwidth-intensive application demands of enterprise businesses
- **Powerful security capacity**
  The MSR2000 series is available with standard or high encryption, an embedded hardware encryption accelerator to improve encryption performance; IPSec encryption throughput can be up to 400 Mb/s with a maximum of 1,000 IPSec VPN tunnels

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 multi-service platform**
  provides WAN router, Ethernet switch, 3G/4G WAN, stateful firewall, VPN, and SIP/voice gateway on MSRs
- **Advanced hardware architecture**
  supports multicore processors, gigabit switching, and PCIE bus. Dual internal power supplies(AC or DC) supported on MSR2004-48 for higher reliability and flexibility
- **New operation system version**
  ships with new Comware v7 operating system delivering the latest in virtualization and routing

Connectivity

- **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 24 or 48 Giga LAN switching ports on board (all switching ports can be configured as routed ports), up to 4 interface module slots and up to 30 module options
- **Multiple WAN interfaces**
  provides a traditional link with E1, T1, Serial, ADSL over POTs, ADSL over ISDN, G.SHDSL, ATM and ISDN links; high-density Fast or Giga Ethernet access modules; mobility access with 3G (WCDMA/HSPA)/4G LTE SIC module and 3G/4G USB modems
- **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

Overview

against incorrect cabling or network configurations and can be enabled on a per-port or per-VLAN basis for added flexibility

- **3G/4G LTE 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 LTE USB modems are available
- **USB interface**
  uses USB memory disk to download and upload configuration and 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

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 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 four Fast Ethernet 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
- **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

Overview

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

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

Quality of Service (QoS)

- **Nested QoS**
  provides a built-in QoS engine that supports nested QoS (Same to hierarchical QoS) and can implement a hierarchical scheduling mechanism based on ports, user groups, users, and user services.
- **Traffic policing**
  supports Committed Access Rate (CAR) and line rate
- **Congestion management**

Overview

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**
  supports traffic shaping, MPLS QoS, MP QoS/LFI, and Control Plane Policing (CoPP).

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 utilizing 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 blacklist 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
- **Attack Detection and Protection**

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

Overview

- **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

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

Resiliency and high availability

- **Intelligent Resilient Fabric (IRF)**
  Intelligent Resilient Fabric (IRF), allows the customer 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
- **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

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**

Overview

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 both USB disk auto deployment and 3G SMS auto deployment

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

Investment protection

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

Warranty and support

Overview

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

Configuration

Build To Order:

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

Router Chassis

HPE FlexNetwork MSR2003 AC Router — JG411A

See Configuration **NOTE:**1, 2, 3, 4

- 2 Fixed 10M/100M/1000M RJ45 Ports
- 3 - SIC module slots / 1 DSIC
- 1 USB 2.0 Port for 3G modem and USB disk
- 1 CON/AUX port and 1 USB console port
- 0 - VCPM slots
- 0 - VPM slot
- 1GB DDR3 SDRAM included (default=1GB \ max=1GB DDR SDRAM)
- AC Power Supply included
- 1U - Height

PDU CABLE NA/MEX/TW/JP — JG411A#B2B

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

PDU CABLE ROW — JG411A#B2C

- C15 PDU Jumper Cord (ROW)

High Volt Switch to Wall Power Cord — JG411A#B2E

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

No Power Cord — JG411A#AC3

- No Localized Power Cord Selected

Russian Reduced Encryption — JG411A#A59

HPE FlexNetwork MSR2004 24 AC Router — JG734A

See Configuration **NOTE:** 1, 2, 3, 5, 6

- 24 Fixed 10M/100M/1000M RJ45 Ports
- 3 RJ-45 autosensing 10/100/1000 WAN ports
- 1 SFP port (min=0 \ max=1 SFP Transceiver)
- 4 - SIC module slots / 0 DSIC
- 1 USB 2.0 Port for 3G modem and USB disk
- 1 CON/AUX port and 1 USB console port
- 0 - VCPM slots
- 0 - VPM slot
- 1GB DDR3 SDRAM included (default=1GB \ max=1GB DDR SDRAM)
- AC Power Supply included

Configuration

- 1U - Height

PDU Cable NA/MEX/TW/JP JG734A#B2B
- C15 PDU Jumper Cord (NA/MEX/TW/JP)

PDU Cable ROW JG734A#B2C
- C15 PDU Jumper Cord (ROW)

High Volt Switch to Wall Power Cord JG734A#B2E
- NEMA L6-20P Cord (NA/MEX/JP/TW)

No Power Cord JG734A#AC3
- No Localized Power Cord Selected

HPE FlexNetwork MSR2004 48 Router JG735A
- 48 Fixed 10M/100M/1000M RJ45 Ports
- 3 RJ-45 autosensing 10/100/1000 WAN ports
- 4 - SIC module slots / 0 DSIC
- 1 USB 2.0 Port for 3G modem and USB disk
- 1 CON/AUX port and 1 USB console port
- 0 - VCPM slots
- 0 - VPM slot
- 1GB DDR3 SDRAM included (default=1GB \ max=1GB DDR SDRAM)
- Must select min 1 Power Supply (min=1 \ max=2)
- 1U - Height

Configuration Rules:

Note 1 AC Power Supply included

Note 2 Localization required on orders without #B2B, #B2C or #B2E options.

Note 3 #B2E is Offered only in NA, Mexico,, Taiwan, and Japan.

Note 4 If this product is ordered for delivery to Russia, it must be ordered with the A59 option (also allowed for other countries desiring Low Encryption), then #A59 is the required option for BTO, and must be added in addition to #0D1 for CTO

Note 5 The following Transceivers install into this Router:

HPE X115 100M SFP LC FX Transceiver	JD102B
HPE X110 100M SFP LC LX Transceiver	JD120B
HPE X110 100M SFP LC LH40 Transceiver	JD090A
HPE X110 100M SFP LC LH80 Transceiver	JD091A

Note 6 The following Transceivers install into this Router:

HPE X120 1G SFP LC SX Transceiver	JD118B
HPE X120 1G SFP LC LX Transceiver	JD119B
HPE X125 1G SFP LC LH40 1310nm Transceiver	JD061A

Configuration

HPE X120 1G SFP LC LH40 1550nm Transceiver	JD062A
HPE X125 1G SFP LC LH70 Transceiver	JD063B
HPE X120 1G SFP LC BX 10-U Transceiver	JD098B
HPE X120 1G SFP LC BX 10-D Transceiver	JD099B
HPE X120 1G SFP LC LH100 Transceiver	JD103A
HPE X120 1G SFP RJ45 T Transceiver	JD089B

Box Level Integration CTO Models

CTO Solution Sku

HPE MSR Configure-to-order Router Solution — JG500A
- SSP trigger sku

Router Chassis

HPE FlexNetwork MSR2003 AC Router — JG411A
See Configuration
NOTE: 1, 2, 3, 4, 8
- 2 Fixed 10M/100M/1000M RJ45 Ports
- 3 - SIC module slots / 1 DSIC
- 1 USB 2.0 Port for 3G modem and USB disk
- 1 CON/AUX port and 1 USB console port
- 0 - VCPM slots
- 0 - VPM slot
- 1GB DDR3 SDRAM included (default=1GB \ max=1GB DDR SDRAM)
- AC Power Supply included
- 1U - Height

PDU CABLE NA/MEX/TW/JP — JG411A#B2B
- C15 PDU Jumper Cord (NA/MEX/TW/JP)

PDU CABLE ROW — JG411A#B2C
- C15 PDU Jumper Cord (ROW)

High Volt Switch to Wall Power Cord — JG411A#B2E
- NEMA L6-20P Cord (NA/MEX/JP/TW)

No Power Cord — JG411A#AC3
- No Localized Power Cord Selected

Russian Reduced Encryption — JG411A#A59

HPE FlexNetwork MSR2004 24 AC Router — JG734A
See Configuration
- 24 Fixed 10M/100M/1000M RJ45 Ports

Configuration

- 3 RJ-45 autosensing 10/100/1000 WAN ports
- 1 SFP port (min=0 \ max=1 SFP Transceiver)
- 4 - SIC module slots / 0 DSIC
- 1 USB 2.0 Port for 3G modem and USB disk
- 1 CON/AUX port and 1 USB console port
- 0 - VCPM slots
- 0 - VPM slot
- 1GB DDR3 SDRAM included (default=1GB \ max=1GB DDR SDRAM)
- AC Power Supply included
- 1U - Height

NOTE: 1, 2, 3, 5, 6

PDU Cable NA/MEX/TW/JP — JG734A#B2B
- C15 PDU Jumper Cord (NA/MEX/TW/JP)

PDU Cable ROW — JG734A#B2C
- C15 PDU Jumper Cord (ROW)

High Volt Switch to Wall Power Cord — JG734A#B2E
- NEMA L6-20P Cord (NA/MEX/JP/TW)

No Power Cord — JG734A#AC3
- No Localized Power Cord Selected

HPE FlexNetwork MSR2004 48 Router — JG735A
See Configuration **NOTE:** 1, 4
- 48 Fixed 10M/100M/1000M RJ45 Ports
- 3 RJ-45 autosensing 10/100/1000 WAN ports
- 4 - SIC module slots / 0 DSIC
- 1 USB 2.0 Port for 3G modem and USB disk
- 1 CON/AUX port and 1 USB console port
- 0 - VCPM slots
- 0 - VPM slot
- 1GB DDR3 SDRAM included (default=1GB \ max=1GB DDR SDRAM)
- Must select min 1 Power Supply (min=1 \ max=2)
- 1U - Height

Configuration Rules:

Note 1 — If this Switch is selected integrated to the CTO Switch Solution, Then a Minimum of 1 factory integrated accessory must be ordered and integrated to CTO chassis. See Menu below, option must have a #0D1 to be integrated to the CTO Chassis.

Note 2 — Localization required on orders without #B2B, #B2C or #B2E options.

Note 3 — #B2E is Offered only in NA, Mexico, Taiwan, and Japan.

Note 4 — If the Router Chassis is to be Box Level Factory Integrated (CTO), Then the #0D1 is required on the Router Chassis and integrated to the JG500A - HPE MSR Configure-to-order Router Solution. (Min 1/Max 1 Router per SSP)

Configuration

Note 5	The following Transceivers install into this Router:	
	HPE X115 100M SFP LC FX Transceiver	JD102B
	HPE X110 100M SFP LC LX Transceiver	JD120B
	HPE X110 100M SFP LC LH40 Transceiver	JD090A
	HPE X110 100M SFP LC LH80 Transceiver	JD091A
Note 6	The following Transceivers install into this Router:	
	HPE X120 1G SFP LC SX Transceiver	JD118B
	HPE X120 1G SFP LC LX Transceiver	JD119B
	HPE X125 1G SFP LC LH40 1310nm Transceiver	JD061A
	HPE X120 1G SFP LC LH40 1550nm Transceiver	JD062A
	HPE X125 1G SFP LC LH70 Transceiver	JD063B
	HPE X120 1G SFP LC BX 10-U Transceiver	JD098B
	HPE X120 1G SFP LC BX 10-D Transceiver	JD099B
	HPE X120 1G SFP LC LH100 Transceiver	JD103A
	HPE X120 1G SFP RJ45 T Transceiver	JD089B
Note 8	If this product is ordered for delivery to Russia, it must be ordered with the A59 option (also allowed for other countries desiring Low Encryption), then #A59 is the required option for BTO, and must be added in addition to #0D1 for CTO.	

Remarks:

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)

Internal Power Supplies

Internal Power Supplies included

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 4, 3, 2 or 1) User Selection (min 0 // max 4, 3, 2 or 1) per Host (See Modules for Port information)

HPE FlexNetwork MSR 4-port 10/100 SIC Module	JD573B See Configuration **NOTE:**1, 15
HPE FlexNetwork MSR 9-port 10/100 DSIC Module	JD574B See Configuration **NOTE:**3

Configuration

HP MSR 1-port 10/100 SIC Module	JD545B See Configuration **NOTE:**1, 15
HP 1-port 100Mbt SFP SIC Router Module • min=0 \ max=1 SFP Transceivers	JF280A See Configuration **NOTE:**1, 5, 15
HPE FlexNetwork MSR 2-port FXO SIC Module	JD558A See Configuration **NOTE:**2, 16
HPE FlexNetwork MSR 2-port FXS SIC Module	JD560A See Configuration **NOTE:**2, 16
HP MSR 1-port FXS SIC Module	JD561A See Configuration **NOTE:**2, 16
HPE FlexNetwork MSR 4-port FXS/1-port FXO DSIC Module	JG189A See Configuration **NOTE:**3
HP 2-port ISDN-S/T Voice Interface SIC Module	JF821A See Configuration **NOTE:**2, 16
HPE MSR 1-port E1/T1 Voice SIC Module • min=0 \ max=1 E1 or T1 Cable	JH240A See Configuration **NOTE:** 1, 16, 19
HPE FlexNetwork MSR 2 FXS +1 FXO Voice Interface SIC Module	JD632A See Configuration **NOTE:**2, 16
HPE FlexNetwork MSR 1-port Fractional E1 SIC Module • min=0 \ max=1 E1or 2E1 Cable	JD634B See Configuration **NOTE:**2, 7, 10, 16
HPE FlexNetwork MSR 1-port Fractional SIC Module	JD538A See Configuration **NOTE:**2, 14, 16
HPE FlexNetwork MSR 2-port Fractional E1 SIC Module • min=0 \ max=1 2E1 Cable	JF842A See Configuration **NOTE:**2, 10, 16
HPE FlexNetwork MSR 1-port Enhanced Serial SIC Module	JD557A

Configuration

• min=0 \ max=1 Serial Port Cable	See Configuration **NOTE:**1, 11, 16
HPE FlexNetwork MSR 1-port ISDN S/T SIC Module	JD571A See Configuration **NOTE:**2, 16
HPE FlexNetwork 8-port Asynchronous Serial Interface SIC Router Module • Must select 1 8AS Communication Cable	JF281A See Configuration **NOTE:**2, 12, 16
HPE FlexNetwork MSR 16-port Async Serial SIC Module	JG186A See Configuration **NOTE:**2, 13, 16
HP MSR HSPA/WCDMA SIC Module	JG187A See Configuration **NOTE:**1, 15
HPE MSR HSPA+/WCDMA SIC Module	JG929A See Configuration **NOTE:**1, 15
HP MSR 1-port ADSL2+ SIC Module	JD537A See Configuration **NOTE:**1, 15
HPE FlexNetwork MSR 1-port 8-wire G.SHDSL (RJ45) DSIC Module	JG191A See Configuration **NOTE:** 3
HPE FlexNetwork MSR 1-port E1/CE1/PRI SIC Module • min=0 \ max=1 E1 Cable	JG604A See Configuration **NOTE:**2,7, 16
HP MSR 4G LTE SIC Module for Verizon/LTE 700 MHz/CDMA Rev A	JG742A See Configuration **NOTE:**1, 8, 15
HPE Flex Network MSR 4G LTE SIC Module for LTE 700/1700/2100 MHz CDMA UMTS/HSPA+/HSPA/EDGE/GPRS/GSM	JG742B See Configuration **NOTE:**1, 8, 15
HP MSR 4G LTE SIC Module for ATT/LTE 700/1700/2100 MHz and UMTS/HSPA+/HSPA/EDGE/GRPS/GSM	JG743A See Configuration **NOTE:**1, 8, 15
HP MSR 4G LTE SIC Module for Global/LTE 800/900/1800/2100/2600 MHz and	JG744A

Configuration

UMTS/HSPA+/HSPA/EDGE/GRPS/GSM	See Configuration **NOTE:**1, 8, 15
HPE MSR 4G LTE SIC Module for Global/LTE 800/900/1800/2100/2600MHz UMTS/HSPA+/HSPA/EDGE/GRPS/GSM	JG744B See Configuration **NOTE:**1, 8, 15
HPE FlexNetwork MSR 2-port Enhanced Sync/Async Serial SIC Module • min=0 \ max=2 Serial Port Cable	JG736A See Configuration **NOTE:** 1, 11, 16
HPE FlexNetwork MSR 4-port Enhanced Sync/Async Serial SIC Module • min=0 \ max=4 Serial Port Cable	JG737A See Configuration **NOTE:** 1, 11, 16
HPE FlexNetwork MSR 1-port GbE Combo SIC Module • min=0 \ max=1 SFP Transceiver	JG738A See Configuration **NOTE:** 6, 17,18
HPE FlexNetwork MSR 4-port Gig-T Switch SIC Module	JG739A See Configuration **NOTE:**17, 18
HPE FlexNetwork MSR 4-port Gig-T PoE Switch SIC Module	JG740A See Configuration **NOTE:**17, 18

Configuration Rules:

Note 1 These Modules can install directly to the Routers (JG411A, JG866A)
min=0\ max=2 per enclosure (only supported in Slots 2 and 3)

Note 2 These Modules can install directly to the Routers (JG411A, JG866A)
min=0\ max=3 per enclosure

Note 3 These Modules can install directly to the Routers (JG411A, JG866A)
min=0\ max=1 per enclosure (This Module takes up two slots, and is installed in Slots 1 + 2)

Note 5 The following Transceivers install into this Module:

HPE X115 100M SFP LC FX Transceiver	JD102B
HPE X110 100M SFP LC LX Transceiver	JD120B
HPE X110 100M SFP LC LH40 Transceiver	JD090A
HPE X110 100M SFP LC LH80 Transceiver	JD091A

Note 6 The following Transceivers install into this Module:

HPE X120 1G SFP LC SX Transceiver	JD118B
HPE X120 1G SFP LC LX Transceiver	JD119B
HPE X125 1G SFP LC LH40 1310nm Transceiver	JD061A

Configuration

	HPE X120 1G SFP LC LH40 1550nm Transceiver	JD062A
	HPE X125 1G SFP LC LH70 Transceiver	JD063B
	HPE X120 1G SFP LC BX 10-U Transceiver	JD098B
	HPE X120 1G SFP LC BX 10-D Transceiver	JD099B
	HPE X120 1G SFP LC LH100 Transceiver	JD103A
	HPE X120 1G SFP RJ45 T Transceiver	JD089B
Note 7	The following E1 Cables install into this Module:	
	HPE FlexNetwork X260 E1 (2) BNC 75 ohm 3m Router Cable	JD175A
	HPE FlexNetwork X260 E1 BNC 20m Router Cable	JD514A
	HP X260 E1 2 BNC 75 ohm 40m Router Cable	JD516A
Note 8	The following Antenna Cables install into this Module:	
	HPE MSR 3G RF 2.8m Antenna Cable	JG522A
	HPE MSR 3G RF 6m Antenna Cable	JG666A
	HPE MSR 3G RF 15m Antenna Cable	JG667A
Note 10	The following 2E1 Cables install into this Module:	
	HPE FlexNetwork X260 2E1 BNC 3m Router Cable	JD643A
Note 11	The following Cables install into this Module:	
	HPE FlexNetwork X260 RS449 3m DCE Serial Port Cable	JF826A
	HPE FlexNetwork X260 RS449 3m DTE Serial Port Cable	JF825A
	HPE FlexNetwork X200 V.24 DTE 3m Serial Port Cable	JD519A
	HPE FlexNetwork X200 V.35 DTE 3m Serial Port Cable	JD523A
	HPE FlexNetwork X260 RS530 3m DTE Serial Port Cable	JF827A
	HPE FlexNetwork X200 V.35 DCE 3m Serial Port Cable	JD525A
	HPE FlexNetwork X260 RS530 3m DCE Serial Port Cable	JF828A
	HPE FlexNetwork X200 V.24 DCE 3m Serial Port Cable	JD521A
Note 12	The following Cables install into this Module:	
	HPE FlexNetwork X260 SIC 8AS RJ45 0.28m Router Cable	JD642A
Note 13	If this module is selected Then 4 - JG263A HP X260 mini D-28/4-RJ45 0.3m Rtr Cable are required to be on the same order.	
Note 14	The following T1 Cables install into this Module:	
	HPE FlexNetwork X260 T1 Router Cable	JD518A
Note 15	These Modules can install directly to the Routers (JG734A, JG735A) min=0\ max=2 per enclosure (only supported in Slots 2 and 3)	
Note 16	These Modules can install directly to the Routers (JG734A, JG735A) min=0\ max=4 per enclosure	
Note 17	These Modules can install directly to the Routers (JG734A, JG735A) min=0\ max=1 per enclosure (only supported in Slot 2)	
Note 18	These Modules can install directly to the Routers (JG411A, JG866A) min=0\ max=1 per enclosure (only supported in Slot 2)	

Configuration

Note 19 The following E1/T1 Cables install into this Module:

HPE FlexNetwork X260 E1 RJ45 to 2xBNC 75ohm 3m Router Cable	JH294A
HPE FlexNetwork X260 E1 RJ45 120 ohm 2m Router Cable	JC156A
HPE FlexNetwork X260 E1 RJ45 120 ohm 15m Router Cable	JC151A
HPE FlexNetwork X260 E1 RJ45 120 ohm 30m Router Cable	JC152A
HPE FlexNetwork X260 T1 Router Cable	JD518A

Remarks: PoE Module JG740A can be used as non-POE module on chassis without PoE power supplies.

Transceivers

SFP Transceivers

HPE X115 100M SFP LC FX Transceiver	JD102B
HPE X110 100M SFP LC LX Transceiver	JD120B
HPE X110 100M SFP LC LH80 Transceiver	JD091A
HPE X120 1G SFP LC SX Transceiver	JD118B
HPE X120 1G SFP LC LX Transceiver	JD119B
HPE X120 1G SFP LC LH40 1550nm Transceiver	JD062A
HPE X110 100M SFP LC LH40 Transceiver	JD090A
HPE X125 1G SFP LC LH40 1310nm Transceiver	JD061A
HPE X125 1G SFP LC LH70 Transceiver	JD063B
HPE X120 1G SFP LC BX 10-D Transceiver	JD099B
HPE X120 1G SFP LC BX 10-U Transceiver	JD098B
HPE X120 1G SFP LC LH100 Transceiver	JD103A
HPE X120 1G SFP RJ45 T Transceiver	JD089B

Internal Power Supplies

HPE FlexNetwork X351 150W 48-60VDC to 12VDC Power Supply	JG746A See Configuration **NOTE:** 3
HPE FlexNetwork X351 150W 100-240VAC to 12VDC Power Supply	JG745A

Configuration

	See Configuration **NOTE:**1,2,3
PDU Cable NA/MX/TW/JP • C15 PDU Jumper Cord (NA/MX/TW/JP)	JG745A#B2B
PDU Cable ROW • C15 PDU Jumper Cord (ROW)	JG745A#B2C
High Volt Switch/Router to Wall Power Cord • NEMA L6-20P Cord (NA/MEX/JP/TW0029	JG745A#B2E

Configuration Rules:

Note 1	Localization required on orders without #B2B, #B2C or #B2E options.
Note 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)
Note 3	If 2 power supplies are selected they must be the same Sku number.
Remarks:	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 FlexNetwork X260 Mini D-28 to 4-RJ45 0.3m Router Cable	JG263A
HPE FlexNetwork X200 V.24 DTE 3m Serial Port Cable	JD519A
HPE FlexNetwork X200 V.24 DCE 3m Serial Port Cable	JD521A
HPE FlexNetwork X200 V.35 DTE 3m Serial Port Cable	JD523A
HPE FlexNetwork X200 V.35 DCE 3m Serial Port Cable	JD525A
HPE FlexNetwork X260 RS449 3m DTE Serial Port Cable	JF825A
HPE FlexNetwork X260 RS449 3m DCE Serial Port Cable	JF826A
HPE FlexNetwork X260 RS530 3m DTE Serial Port Cable	JF827A
HPE FlexNetwork X260 RS530 3m DCE Serial Port Cable	JF828A

Configuration

HPE FlexNetwork X260 Auxiliary Router Cable	JD508A
HPE FlexNetwork X260 E1 (2) BNC 75 ohm 3m Router Cable	JD175A
HPE FlexNetwork X260 E1 BNC 20m Router Cable	JD514A
HP X260 E1 2 BNC 75 ohm 40m Router Cable	JD516A
HPE FlexNetwork X260 E1 RJ45 BNC 75-120 ohm Conversion Router Cable	JD511A
HPE FlexNetwork X260 T1 Router Cable	JD518A
HPE FlexNetwork X260 2E1 BNC 3m Router Cable	JD643A
HPE FlexNetwork X260 SIC 8AS RJ45 0.28m Router Cable	JD642A
HPE FlexNetwork X260 E1 RJ45 to 2xBNC 75ohm 3m Router Cable	JH294A
HPE FlexNetwork X260 E1 RJ45 120 ohm 2m Router Cable	JC156A
HPE FlexNetwork X260 E1 RJ45 120 ohm 15m Router Cable	JC151A
HPE FlexNetwork X260 E1 RJ45 120 ohm 30m Router Cable	JC152A

Configuration Rules:

Remarks: The following cable is used for RJ45 BNC Conversion -
HPE FlexNetwork X260 E1 RJ45 BNC 75-120 ohm Conversion Router Cable JD511A

Router Enclosure Options

Antenna Cables

System (std 0 // max 2) User Selection (min 0 // max 2) per SIC Module (JG742A, JG743B, JG743A, JG744A)

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

Opacity Shield Kit

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

Configuration

HPE FlexNetwork MSR2003 Opacity Shield Kit JG598A
NOTE: See Configuration
Supported on the HPE MSR2003/MSR2004 Routers (JG411A, JG866A,JG734A, JG735A). **NOTE:**1

Configuration notes

Note 1 If selected with a CTO Router Solution, Quantity 1 of JG585A#B01 must also be ordered.

Tamper Evidence Labels

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

HPE 12mm x 60mm Tamper Evidence (30) Labels JG585A
NOTE: See Configuration
Supported on the HPE MSR2003/MSR2004 Routers (JG411A, JG866A, JG734A, JG735A). **NOTE:**1

Configuration notes

Note 1 If selected with a CTO Router Solution, Quantity 1 of JG598A#B01 must also be ordered.

Remarks Each JG598A would use 1 of JG585A.

Technical Specifications

HPE FlexNetwork MSR2003 AC Router (JG411A)

I/O ports and slots	3 SIC slots or 1 DSIC slot and 1 SIC slot 2 RJ-45 1000BASE-T ports (IEEE 802.3ab Type 1000BASE-T)	
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	7.61 lb (3.45 kg)
Memory and processor	RISC @ 800 MHz, 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 1 Mpps (64-byte packets)
	Routing table size	300000 entries (IPv4), 200000 entries (IPv6)
	Forwarding table size	300000 entries (IPv4), 200000 entries (IPv6)
Environment	**Operating temperature**	32ºF to 113ºF (0ºC to 45ºC)
	Operating relative humidity	5% to 90%, noncondensing
	Nonoperating/Storage temperature	-40ºF to 158ºF (-40ºC to 70ºC)
	Nonoperating/Storage relative humidity	5% to 90%, noncondensing
	Altitude	up to 16,404 ft (5 km)
Electrical characteristics	**Frequency**	50/60 Hz
	Maximum heat dissipation	78 BTU/hr (82.29 kJ/hr)
	Voltage	100 - 240 VAC, rated
	Maximum power rating	54 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)**	92.73
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	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	

Technical Specifications

	times in your area, please contact your local Hewlett Packard Enterprise sales office.	

HPE FlexNetwork MSR2004 24 AC Router (JG734A)

I/O ports and slots	4 SIC slots 3 RJ-45 1000BASE-T ports (IEEE 802.3ab Type 1000BASE-T) 1 SFP fixed Gigabit Ethernet SFP port 24 RJ-45 autosensing 10/100/1000 LAN ports	
AP characteristics Radios (via optional modules)	3G, 4G LTE	
Physical characteristics	**Dimensions**	17.32(w) x 14.17(d) x 1.74(h) in (43.99 x 35.99 x 4.42 cm) (1U height)
	Weight	15.1 lb (6.85 kg)
Memory and processor	RISC @ 800 MHz, 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 1 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**	32°F to 113°F (0°C to 45°C)
	Operating relative humidity	5% to 90%, noncondensing
	Nonoperating/Storage temperature	-40°F to 158°F (-40°C to 70°C)
	Nonoperating/Storage relative humidity	5% to 90%, noncondensing
	Altitude	up to 16,404 ft (5 km)
Electrical characteristics	**Frequency**	50/60 Hz
	Maximum heat dissipation	170 BTU/hr (179.35 kJ/hr)
	Voltage	100 - 240 VAC, rated
	Maximum power rating	54 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)**	92.2
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; 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 FlexNetwork MSR2004 48 Router (JG735A)

I/O ports and slots	4 SIC slots 3 RJ-45 1000BASE-T ports (IEEE 802.3ab Type 1000BASE-T) 48 RJ-45 autosensing 10/100/1000 LAN ports	
AP characteristics Radios (via optional modules)	3G, 4G LTE	
Physical characteristics	**Dimensions**	17.32(w) x 15.75(d) x 1.74(h) in (43.99 x 40.01 x 4.42 cm) (1U height)
	Weight	17.2 lb (7.8 kg)
Memory and processor	RISC @ 800 MHz, 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 1 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**	32°F to 113°F (0°C to 45°C)
	Operating relative humidity	5% to 90%, noncondensing
	Nonoperating/Storage temperature	-40°F to 158°F (-40°C to 70°C)
	Nonoperating/Storage relative humidity	5% to 90%, noncondensing
	Altitude	up to 16,404 ft (5 km)
Electrical characteristics	**Frequency**	50/60 Hz
	Maximum heat dissipation	499 BTU/hr (526.44 kJ/hr)
	Voltage	100 - 240 VAC, rated -48 to -60 VDC, rated (depending on power supply chosen)
	Maximum power rating	150 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)**	96.2
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; 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

Standards and protocols (applies to all products in series)

BGP	RFC 1163 Border Gateway Protocol (BGP) RFC 1267 Border Gateway Protocol 3 (BGP-3) RFC 1657 Definitions of Managed Objects for BGPv4 RFC 1771 BGPv4 RFC 1772 Application of the BGP RFC 1773 Experience with the BGP-4 Protocol RFC 1774 BGP-4 Protocol Analysis RFC 1965 BGP-4 confederations RFC 1997 BGP Communities Attribute RFC 2439 BGP Route Flap Damping RFC 2547 BGP/MPLS VPNs RFC 2796 BGP Route Reflection RFC 2842 Capability Advertisement with BGP-4 RFC 2858 BGP-4 Multi-Protocol Extensions RFC 2918 Route Refresh Capability RFC 3065 Autonomous System Confederations for BGP RFC 3107 Support BGP carry Label for MPLS RFC 3392 Capabilities Advertisement with BGP-4 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 RFC 4760 Multiprotocol Extensions for BGP-4 RFC1998 An Application of the BGP Community Attribute in Multi-home Routing
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) RFC 1908 (SNMP v1/2 Coexistence) RFC 1945 Hypertext Transfer Protocol -- HTTP/1.0 RFC 2271 Framework RFC 2573 (SNMPv3 Applications) RFC 2576 (Coexistence between SNMP V1, V2, V3) RFC 2578-2580 SMIv2 RFC 2579 (SMIv2 Text Conventions) RFC 2580 (SMIv2 Conformance) RFC 3416 (SNMP Protocol Operations v2) RFC 3417 (SNMP Transport Mappings)
General Protocols	RFC 2385 BGP Session Protection via TCP MD5

Technical Specifications

RFC 1027 Proxy ARP
RFC 1034 Domain names - concepts and facilities
RFC 1035 Domain names - implementation and specification
RFC 1048 BOOTP (Bootstrap Protocol) vendor information extensions
RFC 1054 Host extensions for IP multicasting
RFC 1058 RIPv1
RFC 1059 Network Time Protocol (version 1) specification and implementation
RFC 1060 Assigned numbers
RFC 1063 IP MTU (Maximum Transmission Unit) discovery options
RFC 1071 Computing the Internet Checksum
RFC 1072 TCP extensions for long-delay paths
RFC 1079 Telnet terminal speed option
RFC 1084 BOOTP (Bootstrap Protocol) vendor information extensions
RFC 1091 Telnet Terminal-Type Option
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
RFC 1122 Requirements for Internet Hosts - Communication Layers
RFC 1141 Incremental updating of the Internet checksum
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)
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
RFC 1185 TCP Extension for High-Speed Paths
RFC 1191 Path MTU discovery
RFC 1195 OSI ISIS for IP and Dual Environments
RFC 1213 Management Information Base for Network Management of TCP/IP-based internets
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
RFC 1294 Multiprotocol Interconnect over Frame Relay
RFC 1305 NTPv3 (IPv4 only)
RFC 1321 The MD5 Message-Digest Algorithm
RFC 1323 TCP Extensions for High Performance
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)
RFC 1333 PPP Link Quality Monitoring
RFC 1334 PPP Authentication Protocols
RFC 1349 Type of Service
RFC 1350 TFTP Protocol (revision 2)
RFC 1364 BGP OSPF Interaction
RFC 1370 Applicability Statement for OSPF
RFC 1377 The PPP OSI Network Layer Control Protocol (OSINLCP)
RFC 1393 Traceroute Using an IP Option
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

Technical Specifications

(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
RFC 1490 Multiprotocol Interconnect over Frame Relay
RFC 1497 BOOTP (Bootstrap Protocol) Vendor Information Extensions
RFC 1519 CIDR
RFC 1531 Dynamic Host Configuration Protocol
RFC 1532 Clarifications and Extensions for the Bootstrap Protocol
RFC 1533 DHCP Options and BOOTP Vendor Extensions
RFC 1534 Interoperation Between DHCP and BOOTP
RFC 1541 Dynamic Host Configuration Protocol
RFC 1542 BOOTP Extensions
RFC 1542 Clarifications and Extensions for the Bootstrap Protocol
RFC 1548 The Point-to-Point Protocol (PPP)
RFC 1549 PPP in HDLC Framing
RFC 1570 PPP LCP (Point-to-Point Protocol Link Control Protocol) Extensions
RFC 1577 Classical IP and ARP over ATM
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
RFC 1631 NAT
RFC 1650 Definitions of Managed Objects for the Ethernet-like Interface Types using SMIv2
RFC 1661 The Point-to-Point Protocol (PPP)
RFC 1662 PPP in HDLC-like Framing
RFC 1700 Assigned Numbers
RFC 1701 Generic Routing Encapsulation
RFC 1702 Generic Routing Encapsulation over IPv4 networks
RFC 1717 The PPP Multilink Protocol (MP)
RFC 1721 RIP-2 Analysis
RFC 1722 RIP-2 Applicability
RFC 1723 RIP v2
RFC 1724 RIP Version 2 MIB Extension
RFC 1757 Remote Network Monitoring Management Information Base
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 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
RFC 1962 The PPP Compression Control Protocol (CCP)
RFC 1966 BGP Route Reflection An alternative to full mesh IBGP

Technical Specifications

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
RFC 1982 Serial Number Arithmetic
RFC 1989 PPP Link Quality Monitoring
RFC 1990 The PPP Multilink Protocol (MP)
RFC 1994 PPP Challenge Handshake Authentication Protocol (CHAP)
RFC 2001 TCP Slow Start, Congestion Avoidance, Fast Retransmit, and Fast Recovery Algorithms
RFC 2002 IP Mobility Support
RFC 2003 IP Encapsulation within IP
RFC 2011 SNMPv2 Management Information Base for the Internet Protocol using SMIv2
RFC 2012 SNMPv2 Management Information Base for the Transmission Control Protocol using SMIv2
RFC 2013 SNMPv2 Management Information Base for the User Datagram Protocol using SMIv2
RFC 2018 TCP Selective Acknowledgement Options
RFC 2021 Remote Network Monitoring Management Information Base Version 2 using SMIv2
RFC 2073 An IPv6 Provider-Based Unicast Address Format
RFC 2082 RIP-2 MD5 Authentication
RFC 2091 Triggered Extensions to RIP to Support Demand Circuits
RFC 2104 HMAC: Keyed-Hashing for Message Authentication
RFC 2131 DHCP
RFC 2132 DHCP Options and BOOTP Vendor Extensions
RFC 2136 Dynamic Updates in the Domain Name System (DNS UPDATE)
RFC 2138 Remote Authentication Dial In User Service (RADIUS)
RFC 2205 Resource ReSerVation Protocol (RSVP) -- Version 1 Functional Specification
RFC 2209 Resource ReSerVation Protocol (RSVP) -- Version 1 Message Processing Rules
RFC 2210 Use of RSVP (Resource Reservation Protocol) in Integrated Services
RFC 2225 Classical IP and ARP over ATM
RFC 2236 IGMP Snooping
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 2292 Advanced Sockets API for IPv6
RFC 2309 Recommendations on queue management and congestion avoidance in the Internet
RFC 2327 SDP: Session Description Protocol
RFC 2338 VRRP
RFC 2344 Reverse Tunneling for Mobile IP
RFC 2358 Definitions of Managed Objects for the Ethernet-like Interface Types
RFC 2364 PPP Over AAL5
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
RFC 2427 Multiprotocol Interconnect over Frame Relay
RFC 2428 FTP Extensions for IPv6 and NATs
RFC 2433 Microsoft PPP CHAP (Challenge Handshake Authentication Protocol) Extensions
RFC 2451 The ESP CBC-Mode Cipher Algorithms
RFC 2452 IP Version 6 Management Information Base for the Transmission Control Protocol
RFC 2453 RIPv2
RFC 2454 IP Version 6 Management Information Base for the User Datagram Protocol
RFC 2461 Neighbor Discovery for IP Version 6 (IPv6)
RFC 2462 IPv6 Stateless Address Autoconfiguration
RFC 2463 Internet Control Message Protocol (ICMPv6) for the Internet Protocol Version 6 (IPv6)

Technical Specifications

Specification
RFC 2464 Transmission of IPv6 Packets over Ethernet Networks
RFC 2465 Management Information Base for IP Version 6: Textual Conventions and General Group
RFC 2466 Management Information Base for IP Version 6: ICMPv6 Group
RFC 2472 IP Version 6 over PPP
RFC 2474 Definition of the Differentiated Services Field (DS Field) in the IPv4 and IPv6 Headers
RFC 2507 IP Header Compression
RFC 2508 Compressing IP/UDP/RTP Headers for Low-Speed Serial Links
RFC 2509 IP Header Compression over PPP
RFC 2510 Internet X.509 Public Key Infrastructure Certificate Management Protocols
RFC 2516 A Method for Transmitting PPP Over Ethernet (PPPoE)
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)
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
RFC 2597 Assured Forwarding PHB Group
RFC 2598 An Expedited Forwarding PHB
RFC 2615 PPP over SONET/SDH (Synchronous Optical Network/Synchronous Digital Hierarchy)
RFC 2616 HTTP Compatibility v1.1
RFC 2617 HTTP Authentication: Basic and Digest Access Authentication
RFC 2618 RADIUS Authentication Client MIB
RFC 2620 RADIUS Accounting Client MIB
RFC 2644 Changing the Default for Directed Broadcasts in Routers
RFC 2661 L2TP
RFC 2663 NAT Terminology and Considerations
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
RFC 2684 Multiprotocol Encapsulation over ATM Adaptation Layer 5
RFC 2685 Virtual Private Networks Identifier
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
RFC 2702 Requirements for Traffic Engineering Over MPLS
RFC 2711 IPv6 Router Alert Option
RFC 2716 PPP EAP TLS Authentication Protocol
RFC 2747 RSVP Cryptographic Authentication
RFC 2763 Dynamic Name-to-System ID mapping
RFC 2784 Generic Routing Encapsulation (GRE)
RFC 2787 Definitions of Managed Objects for the Virtual Router Redundancy Protocol
RFC 2827 Network Ingress Filtering: Defeating Denial of Service Attacks Which Employ IP Source Address Spoofing
RFC 2833 RTP Payload for DTMF Digits, Telephony Tones and Telephony Signals
RFC 2865 Remote Authentication Dial In User Service (RADIUS)
RFC 2866 RADIUS Accounting
RFC 2868 RADIUS Attributes for Tunnel Protocol Support
RFC 2869 RADIUS Extensions
RFC 2884 Performance Evaluation of Explicit Congestion Notification (ECN) in IP Networks.
RFC 2894 Router Renumbering for IPv6
RFC 2917 A Core MPLS IP VPN Architecture
RFC 2925 Definitions of Managed Objects for Remote Ping, Traceroute, and Lookup Operations
RFC 2961 RSVP Refresh Overhead Reduction Extensions

Technical Specifications

RFC 2963 A Rate Adaptive Shaper for Differentiated Services
RFC 2965 HTTP State Management Mechanism
RFC 2966 Domain-wide Prefix Distribution with Two-Level IS-IS
RFC 2973 IS-IS Mesh Groups
RFC 2976 The SIP INFO Method
RFC 2993 Architectural Implications of NAT
RFC 3011 The IPv4 Subnet Selection Option for DHCP
RFC 3022 Traditional IP Network Address Translator (Traditional NAT)
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

IP Multicast

RFC 1112 IGMP
RFC 2362 PIM Sparse Mode
RFC 2710 Multicast Listener Discovery (MLD) for IPv6
RFC 2934 Protocol Independent Multicast MIB for IPv4
RFC 3376 IGMPv3
RFC 3376 IGMPv3 (host joins only)
RFC 5059 Bootstrap Router (BSR) Mechanism for Protocol Independent Multicast (PIM)

IPv6

RFC 2080 RIPng for IPv6
RFC 2460 IPv6 Specification
RFC 2473 Generic Packet Tunneling in IPv6
RFC 2475 IPv6 DiffServ Architecture
RFC 2529 Transmission of IPv6 Packets over IPv4
RFC 2545 Use of MP-BGP-4 for IPv6
RFC 2553 Basic Socket Interface Extensions for IPv6
RFC 2740 OSPFv3 for IPv6
RFC 2893 Transition Mechanisms for IPv6 Hosts and Routers
RFC 3056 Connection of IPv6 Domains via IPv4 Clouds
RFC 3162 RADIUS and IPv6
RFC 3315 DHCPv6 (client and relay)
RFC 5340 OSPF for IPv6

MIBs

RFC 1213 MIB II
RFC 1493 Bridge MIB
RFC 1724 RIPv2 MIB
RFC 1850 OSPFv2 MIB
RFC 1907 SNMPv2 MIB
RFC 2011 SNMPv2 MIB for IP
RFC 2012 SNMPv2 MIB for TCP
RFC 2013 SNMPv2 MIB for UDP
RFC 2096 IP Forwarding Table MIB
RFC 2233 Interfaces MIB
RFC 2273 SNMP-NOTIFICATION-MIB
RFC 2571 SNMP Framework MIB
RFC 2572 SNMP-MPD MIB
RFC 2573 SNMP-Notification MIB
RFC 2574 SNMP USM MIB
RFC 2674 802.1p and IEEE 802.1Q Bridge MIB
RFC 2737 Entity MIB (Version 2)
RFC 2863 The Interfaces Group MIB
RFC 3813 MPLS LSR MIB

Technical Specifications

Network Management

IEEE 802.1D (STP)
RFC 1098 Simple Network Management Protocol (SNMP)
RFC 1158 Management Information Base for network management of TCP/IP-based internets: MIB-II
RFC 1212 Concise MIB definitions
RFC 1215 Convention for defining traps for use with the SNMP
RFC 1389 RIPv2 MIB Extension
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 1903 SNMPv2 Textual Conventions
RFC 1904 SNMPv2 Conformance
RFC 1905 SNMPv2 Protocol Operations
RFC 1906 SNMPv2 Transport Mappings
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 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
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)
RFC 3418 Management Information Base (MIB) 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 1765 OSPF Database Overflow
RFC 1850 OSPFv2 Management Information Base (MIB), traps
RFC 2328 OSPFv2
RFC 2370 OSPF Opaque LSA Option
RFC 3101 OSPF NSSA

Technical Specifications

QoS/CoS

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

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 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 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 Protocol
RFC 2402 IP Authentication Header
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)
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

Accessories

HPE FlexNetwork MSR2000 Router Series accessories

Transceivers

HPE X115 100M SFP LC FX Transceiver	JD102B
HPE X110 100M SFP LC LX Transceiver	JD120B
HPE X110 100M SFP LC LH40 Transceiver	JD090A
HPE X110 100M SFP LC LH80 Transceiver	JD091A
HPE X120 1G SFP LC SX Transceiver	JD118B
HPE X120 1G SFP LC LX Transceiver	JD119B
HPE X125 1G SFP LC LH40 1310nm Transceiver	JD061A
HPE X120 1G SFP LC LH40 1550nm Transceiver	JD062A
HPE X125 1G SFP LC LH70 Transceiver	JD063B
HPE X120 1G SFP LC LH100 Transceiver	JD103A
HPE X120 1G SFP LC BX 10-U Transceiver	JD098B
HPE X120 1G SFP LC BX 10-D Transceiver	JD099B
HPE X120 1G SFP RJ45 T Transceiver	JD089B

License

HPE IPS Activation for MSR2000 E-LTU	JH225AAE
HPE DV Essential IPS Filter Service for MSR2000 1yr E-LTU	JH229AAE

Cables

HPE FlexNetwork X200 V.24 DTE 3m Serial Port Cable	JD519A
HPE FlexNetwork X200 V.24 DCE 3m Serial Port Cable	JD521A
HPE FlexNetwork X200 V.35 DTE 3m Serial Port Cable	JD523A
HPE FlexNetwork X200 V.35 DCE 3m Serial Port Cable	JD525A
HPE FlexNetwork X260 RS449 3m DTE Serial Port Cable	JF825A
HPE FlexNetwork X260 RS449 3m DCE Serial Port Cable	JF826A
HPE FlexNetwork X260 RS530 3m DTE Serial Port Cable	JF827A
HPE FlexNetwork X260 RS530 3m DCE Serial Port Cable	JF828A
HPE FlexNetwork X260 Auxiliary Router Cable	JD508A
HPE FlexNetwork X260 E1 (2) BNC 75 ohm 3m Router Cable	JD175A
HPE FlexNetwork X260 E1 BNC 20m Router Cable	JD514A
HPE FlexNetwork X260 E1 RJ45 BNC 75-120 ohm Conversion Router Cable	JD511A
HPE FlexNetwork X260 2E1 BNC 3m Router Cable	JD643A
HPE FlexNetwork X260 T1 Router Cable	JD518A
HPE FlexNetwork X260 SIC 8AS RJ45 0.28m Router Cable	JD642A
HPE FlexNetwork X260 Mini D-28 to 4-RJ45 0.3m Router Cable	JG263A

Router Modules

HPE FlexNetwork MSR 4-port Gig-T Switch SIC Module	JG739A
HPE FlexNetwork MSR 4-port Gig-T PoE Switch SIC Module	JG740A
HPE FlexNetwork MSR 4-port 10/100 SIC Module	JD573B
HPE FlexNetwork MSR 1-port GbE Combo SIC Module	JG738A
HPE FlexNetwork MSR 2-port FXO SIC Module	JD558A
HPE FlexNetwork MSR 2-port FXS SIC Module	JD560A
HPE FlexNetwork MSR 2 FXS +1 FXO Voice Interface SIC Module	JD632A

Accessories

HPE FlexNetwork MSR 1-port E1/CE1/PRI SIC Module	JG604A
HPE FlexNetwork MSR 1-port Fractional E1 SIC Module	JD634B
HPE FlexNetwork MSR 2-port Fractional E1 SIC Module	JF842A
HPE FlexNetwork MSR 1-port Fractional SIC Module	JD538A
HPE FlexNetwork MSR 1-port Enhanced Serial SIC Module	JD557A
HPE FlexNetwork MSR 2-port Enhanced Sync/Async Serial SIC Module	JG736A
HPE FlexNetwork MSR 4-port Enhanced Sync/Async Serial SIC Module	JG737A
HPE FlexNetwork MSR 1-port ISDN S/T SIC Module	JD571A
HPE FlexNetwork 8-port Asynchronous Serial Interface SIC Router Module	JF281A
HPE FlexNetwork MSR 16-port Async Serial SIC Module	JG186A
HP MSR HSPA/WCDMA SIC Module	JG187A
HPE Flex Network MSR 4G LTE SIC Module for LTE 700/1700/2100 MHz CDMA UMTS/HSPA+/HSPA/EDGE/GPRS/GSM	JG742B
HP MSR 4G LTE SIC Module for ATT/LTE 700/1700/2100 MHz and UMTS/HSPA+/HSPA/EDGE/GRPS/GSM	JG743A
HP MSR 4G LTE SIC Module for Global/LTE 800/900/1800/2100/2600 MHz and UMTS/HSPA+/HSPA/EDGE/GRPS/GSM	JG744A
HPE MSR 4G LTE SIC Module for Global/LTE 800/900/1800/2100/2600MHz UMTS/HSPA+/HSPA/EDGE/GRPS/GSM	JG744B
HPE MSR 1-port E1/T1 Voice SIC Module	JH240A

HPE FlexNetwork MSR2003 AC Router (JG411A)

HPE FlexNetwork MSR 9-port 10/100 DSIC Module	JD574B
HPE FlexNetwork MSR 4-port FXS/1-port FXO DSIC Module	JG189A
HPE FlexNetwork MSR 1-port 8-wire G.SHDSL (RJ45) DSIC Module	JG191A

HPE FlexNetwork MSR2004 48 Router (JG735A)

HPE FlexNetwork X351 150W 100-240VAC to 12VDC Power Supply	JG745A
HPE FlexNetwork X351 150W 48-60VDC to 12VDC Power Supply	JG746A

Summary of Changes

Date	Version History	Action	Description of Change:
06-Feb-2017	From Version 19 to 20	Changed	Adding MSR #A59 option on Configuration section
05-Sep-2016	From Version 18 to 19	Added	SKU added: JG742B
		Changed	Features and benefits and Technical Specifications updated
01-Aug-2016	From Version 17 to 18	Changed	Adding #AC3 Option on Configuration section
06-June-2016	From Version 16 to 17	Changed	Document name changed to HPE FlexNetwork MSR2000 Router Series. Product description updated.
08-April-2016	From Version 15 to 16	Changes	Changes made on Configuration section, SKU descriptions updated on all the document.
31-Mar-2016	From Version 14 to 15	Added	SKUs added: JH240A, JH225AAE, JH229AAE
		Changed	Product overview, Features and benefits updated
01-Dec-2015	From Version 13 to 14	Changed	Overview and Technical Specifications updated
07-Oct-2015	From Version 12 to 13	Changed	Minor change made on Technical Specifications
17-Aug-2015	From Version 11 to 12	Added	SKUs added: JG929A
		Changed	Features and Benefits, Technical Specifications and Accessories updated.
06-Oct-2014	From Version 10 to 11	Removed	Removed SKU JD572A
		Changed	Configuration section updated
18-Aug-2014	From Version 9 to 10	Added	2 new models: JG734A, JG735A 7 new accessories: JG736A, JG737A, JG738A, JG739A, JG740A, JG745A, JG746A
10-June-2014	From Version 8 to 9	Added	4 new accessories: JG604A, JG742A, JG743A, JG744A
10-Feb-2014	From Version 7 to 8	Added	GRE tunnels was added to Performance.
22-Nov-2013	From Version 6 to 7	Changed	SIC Modules and Cables were revised in Configuration.
11-Nov-2013	From Version 5 to 6	Changed	Router Chassis and Box Level Integration CTO Models were revised in Configuration.
07-Oct-2013	From Version 4 to 5	Changed	Corrected the callout table in the Overview section (formatting).
04-Oct-2013	From Version 3 to 4	Added	Added 2 images in the Overview section.
30-Sep-2013	From Version 2 to 3	Changed	Minor edits were made throughout Configuration.
27-Sep-2013	From Version 1 to 2	Added	Configuration was added.

Summary of Changes

Sign up for updates

To learn more, visit: **http://www.hpe.com/networking**

c04123120 - 14642 - Worldwide - V20 - 6-February-2017

Hewlett Packard Enterprise