



8800 Router Series

The HP 8800 Routers series provide wire-speed 10 Gigabit ethernet forwarding as well as carrier-class services, security and availability to meet the robust demands of service and application providers.

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HP 8800 Router Series

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Quality of Service (QoS)

- **Hierarchical QoS (HQoS)** — provides a built-in QoS engine that supports hierarchical QoS (HQoS) and can implement a hierarchical scheduling mechanism based on ports, user groups, users, and user services; also cooperates with MPLS traffic engineering (TE) to implement bandwidth reservation and scheduling based on tunnels and services
- **Schedule algorithm** — supports strict priority (SP) queuing, weighted round robin (WRR) queuing, weighted fair queuing (WFQ), class-based queuing (CBQ), and low latency queuing (LLQ)
- **Congestion avoidance mechanism** — supports tail drop and weighted random early detection (WRED)

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Management

- **Management interface control** — provides management access through modem port and terminal interface, as well as in-band and out-of-band Ethernet ports; provides access through terminal interface, telnet, or SSH
- **Industry-standard CLI with a hierarchical structure** — reduces training time and expenses, and increases productivity in multivendor installations
- **Management security** — includes multiple administration levels, with password protection and restricted access to critical configuration commands; access control lists (ACLs) provide telnet and SNMP access; local and remote syslog capability allows logging of all access
- **SNMP v1, v2, and v3** — provides complete support of SNMP as well as full support of industry-standard MIBs and private MIB extensions
- **Remote monitoring (RMON)** — uses standard SNMP to monitor essential network functions; supports events, alarm, history, and statistics group plus a private alarm extension group
- **Debug and sampler utility** — supports ping and traceroute for both IPv4 and IPv6
- **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 and file transfer rates; allows a network manager to determine overall network performance and to diagnose and locate network congestion points or failures
- **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
- **Info center** — provides a central information center 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
- **FTP and TFTP support** — FTP allows bidirectional transfers over a TCP/IP network and is used for configuration updates; Trivial FTP is a simpler method using User Datagram Protocol (UDP)
- **Loopback** — supports internal loopback testing for maintenance purposes and high availability; loopback detection protects system from incorrect cabling or network configurations, and can be enabled on a port or VLAN
- **Ethernet OAM** — provides a monitoring tool for Layer 2 performance and fault detection, which reduces failover and network convergence times

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Connectivity

- **High port density** — provides up to 12 interface module slots, up to 192 OC3/OC12 POS ports, or 576 Gigabit Ethernet ports per 8812 system
- **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; speed adaptable between 155 M POS and 622 M POS/Gigabit Ethernet
- **Packet storm protection** — protects against broadcast, multicast, or unicast storms with user-defined thresholds
- **Multiple WAN interfaces** — support Fast Ethernet/Gigabit Ethernet/10GbE ports, OC3-OC192 POS, ATM ports, and 10GbE RPR

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Performance

- **Industry-leading performance** — provides switching capacity up to 1440 Gbps and forwarding performance up to 864 Mpps
- **Flexible chassis selection** — offers three models: 12 I/O-slot chassis, 8 I/O-slot chassis, 5 I/O-slot chassis
- **Scalable system design** — enables smooth bandwidth upgrade

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Resiliency and high availability

- **Separate data and control plane** — provides continual services
- **Passive backplane design** — increases system reliability as backplane has no active components
- **Redundant design of main processing unit and power supply** — increases the overall system availability
- **IP Fast Reroute (FRR) framework** — provides nodes that are configured with backup ports and routes; local implementation requires no cooperation of adjacent devices, simplifying deployment; solves the traditional convergence faults in IP forwarding; realizes restoration within 50 ms, with the restoration time independent of the number of routes and fast link switchovers without route convergence
- **Hitless patch upgrades** — allow patches to be installed without restarting the equipment, increasing network uptime and facilitating maintenance
- **Virtual Router Redundancy Protocol** — helps facilitate the system's high availability without changing configurations when a device fails; prevents network interruptions caused by a single link failure
- **Graceful restart** — provides full support of graceful restart for OSPF, IS-IS, BGP, LDP, and RSVP; network remains stable during the active-standby switchover; after the switchover, the device quickly learns the network routes by communicating with adjacent routers; forwarding remains uninterrupted during the switchover to realize NSF
- **Hot-swappable modules** — facilitates the replacement of hardware interface modules without impacting the traffic flow through the system
- **Bidirectional forwarding detection (BFD)** — Enables static routing, RIP, OSPF, OSPFv3, IS-IS, IPv6 IS-IS, BGP, BGP4+, PIM, IPv6 PIM, LDP, RSVP, VPLS PW, LSP, VRRP, VRRP3, VRRPE, policy route, TE FRR, and IP FRR

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Layer 2 switching

- **VLANs** — support up to 4,096 port or IEEE 802.1Q-based VLANs
- **Spanning Tree Protocol** — fully supports standard IEEE 802.1D Spanning Tree Protocol, IEEE 802.1w Rapid Spanning Tree Protocol for faster convergence, and IEEE 802.1s Multiple Spanning Tree Protocol
- **Bridge Protocol Data Unit (BPDU) tunneling** — transmits Spanning Tree Protocol BPDUs transparently, allowing correct tree calculations across service providers, WANs, or MANs
- **Internet Group Management Protocol (IGMP) and Multicast Listener Discovery (MLD) protocol snooping** — effectively control and manage 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; supports 64 mirroring groups, with an unlimited number of ports per group
- **Port isolation** — increases security by isolating ports within a VLAN while still allowing them to communicate with other VLANs

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Layer 3 services

- **Address Resolution Protocol (ARP)** — determines the MAC address of another IP host in the same subnet; supports static ARPs; gratuitous ARP allows detection of duplicate IP addresses; proxy ARP allows normal ARP operation between subnets or when subnets are separated by a Layer 2 network
- **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
- **Domain Name System (DNS)** — provides a distributed database that translates domain names and IP addresses, which simplifies network design; supports client and server

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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
- **OSPF** — Interior Gateway Protocol (IGP) uses link-state protocol for faster convergence; supports ECMP, NSSA, and MD5 authentication for increased security and graceful restart for faster failure recovery
- **Intermediate system to intermediate system (IS-IS)** — Interior Gateway Protocol (IGP) uses path vector protocol, 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
- **Multiprotocol Label Switching Traffic Engineering (MPLS TE)** — Traffic Engineering (TE) is used to enhance traffic over large MPLS networks based on type of traffic and available resources; TE dynamically tunes traffic management attributes and enables true load balancing; MPLS TE supports route backup using Fast Reroute (FRR)
- **Multiprotocol Label Switching (MPLS) Layer 3 VPN** — allows Layer 3 VPNs across a provider network; uses MP-BGP to establish private routes for increased security; supports RFC 2547bis multiple autonomous system VPNs for added flexibility
- **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
- **Virtual Private LAN Service (VPLS)** — establishes point-to-multipoint Layer 2 VPNs across a provider network
- **Policy routing** — allows custom filters for increased performance and security; supports ACLs, IP prefix, AS paths, community lists, and aggregate policies
- **Bidirectional Forwarding Detection (BFD)** — enables link connectivity monitoring and reduces network convergence time for RIP, OSPF, BGP, IS-IS, VRRP, MPLS, and IRF
- **Multicast VPN** — supports Multicast Domain (MD) multicast VPN, which can be distributed on separate service cards, providing high performance and flexible configuration
- **IPv6 tunneling** — is important for the transition from IPv4 to IPv6 as it 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
- **Border Gateway Protocol 4** — Exterior Gateway Protocol (EGP) with path vector protocol uses TCP to enhance reliability for the route discovery process, reduce bandwidth consumption by advertising only incremental updates, and support extensive policies to increase flexibility and scale to large networks

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Security

- **Access control list (ACL)** — supports powerful ACLs for both IPv4 and IPv6; ACLs are used for filtering traffic to prevent unauthorized users from accessing the network, or for controlling network traffic to save resources; rules can either deny or permit traffic to be forwarded; rules can be based on a Layer 2 header or a Layer 3 protocol header; rules can be set to operate on specific dates or times
- **Network login** — standard IEEE 802.1X allows authentication of multiple users per port, or when a port is shared with an IP phone
- **RADIUS** — eases switch security access administration by using a password authentication server
- **TACACS+** — is an authentication tool using TCP with encryption of the full authentication request that provides additional security
- **Media access control (MAC) authentication** — provides simple authentication based on a user's MAC address; supports local or RADIUS-based authentication
- **Attack protection** — protects network from attacks that use a large number of ARP requests by using a host-specific, user-selectable threshold; provides Address Scanning Attack Prevention, MAC Address Flooding Attack Prevention, and STP Attack Prevention
- **Network address translation (NAT)** — supports repeated multiplexing of a port and automatic 5-tuple collision detection, enabling NAT to support unlimited connections; supports blacklist in NAT/NAPT/internal server, a limit on the number of connections, session log, and multi-instance
- **Secure shell (SSHv2)** — uses external servers to securely log in to a remote device; with authentication and encryption, it protects against IP spoofing and plain-text password interception; increases the security of Secure FTP (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; supports distributed URPF

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Multicast support

- **Internet Group Management Protocol (IGMP)** — Establishes and maintains multicast groups; supports v1, v2, and v3; utilizes any-source multicast (ASM) or source-specific multicast (SSM) to manage IPv4 multicast networks
- **Protocol Independent Multicast (PIM)** — is used for IPv4 and IPv6 multicast applications; supports PIM dense mode (PIM-DM), sparse mode (PIM-SM), and source-specific mode (PIM-SSM)
- **Multicast Source Discovery Protocol (MSDP)** — is used for inter-domain multicast applications, allowing multiple PIM-SM domains to interoperate
- **Multicast Border Gateway Protocol (MBGP)** — allows multicast traffic to be forwarded across BGP networks, separate from unicast traffic
- **Multicast Listener Discovery Protocol** — is used by IP hosts to establish and maintain multicast groups; supports v1 and v2 and utilizes any-source multicast (ASM) or source-specific multicast (SSM) to manage IPv6 multicast networks
- **Multicast VLAN** — allows multiple VLANs to receive the same IPv4 or IPv6 multicast traffic, reducing network bandwidth demand by decreasing multiple streams to each VLAN

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Integration

- **Open application architecture** — provides both software and hardware platform based on open standards, so third-party applications can be integrated seamlessly into HP 8800 routers

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Additional information

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

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Product architecture

- **10 Gbps network processor platform** — supports wire-speed 10GbE POS and precise QoS/H-QoS and multicast VPN, making it perfect for new service expansion
- **Crossbar nonblocking switching** — includes two crossbars on MCU to provide performance and reliability; service processing engine and crossbar work together to complete VoQ and E2E flow control and implement granular switch-fabric-level QoS, offering genuine SLA services
- **10 GbE Resilient Packet Ring (RPR)** — provides advanced technology on MAC layer with high usage of ring bandwidth, self-healing, automatic topology discovery, and node plug and play; provides protection switching using steering or wrapping, with fast recovery time of 50 ms, satisfying the carrier-class requirement; provides weighted fair algorithm for bandwidth allocation
- **High-capacity buffer** — provides time-delay-sensitive services, as each network processor of the 8800 router offers a 200 ms ingress buffer and a 200 ms egress buffer
- **Separate service processing engine (SPE) and interface cards** — support flexible service configurations, as the SPE and interface cards can be upgraded separately
- **Dedicated OAM engine** — reduces CPU loads and improves link fault detection performance; realizes 30 ms fault detection and 20 ms service switchover

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Warranty and support

- **1-year warranty** — with advance replacement and 10-calendar-day delivery (available in most countries)
- **Electronic and telephone support** — limited electronic and telephone support is available from HP; to reach our support centers, refer to www.hp.com/networking/contact-support; for details on the duration of support provided with your product purchase, refer to www.hp.com/networking/warrantysummary
- **Software releases** — to find software for your product, refer to www.hp.com/networking/support; for details on the software releases available with your product purchase, refer to www.hp.com/networking/warrantysummary

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