Hewlett Packard Enterprise

HPE 5830 Switch Series

Key features

- Stackable, high-port density for high scalability

- HPE IRF technology for simpler two-tier networks

- Ultra deep (1 GB and 3 GB) packet buffers

- Full L2/L3 features, IPv4 and IPv6 dual stack

- Lower OpEx and greener data centers

Product overview

HPE 5830AF Switch Series is a family of high-density 1 GbE top-of-rack data center and campus switches that are a part of HPE FlexNetwork Architecture's HPE FlexFabric solution module. The two models, HPE 5830AF-48G and HPE 5830AF-96G Switches Series, are ideally suited for deployments at the server access layer in medium-sized and large enterprise data centers and campus networks. The HPE 5830AF-48G switches deliver 48 1GbE ports and up to four 10GbE ports in a space-saving 1RU package, while the HPE 5830AF-96G switches provide an industry-leading 96 1GbE ports and up to 10 10GbE uplink ports in a 2RU form factor.

Features and benefits

Quality of Service (QoS)

- Traffic policing

  Supports Committed Access Rate (CAR) and line rate

- Powerful QoS feature

  Creates traffic classes based on access control lists (ACLs), IEEE 802.1p precedence, IP, DSCP, or Type of Service (ToS) precedence; supports filter, redirect, mirror, or remark; supports the following congestion actions: strict priority (SP) queuing, weighted round robin (WRR), weighted fair queuing (WFQ), weighted random early discard (WRED), SP+WRR, and SP+WFQ

Management

- sFlow (RFC 3176)

  Provides scalable ASIC-based wire-speed network monitoring and accounting with no impact on network performance; this allows network operators to gather a variety of sophisticated network statistics and information for capacity planning and real-time network monitoring purposes

- Remote configuration and management

  Enables configuration and management through a secure Web browser or a CLI located on a remote device

- Manager and operator privilege levels

  Provides read-only (operator) and read/write (manager) access on CLI and Web browser management interfaces

- Management VLAN

  Segments traffic to and from management interfaces, including CLI/telnet, a Web browser interface, and SNMP

- Multiple configuration files

  Stores easily to the flash image

- Secure Web GUI

  Provides a secure, easy-to-use graphical interface for configuring the module via HTTPS

- SNMPv1, v2c, and v3

  Facilitates centralized discovery, monitoring, and secure management of networking devices

- Remote monitoring (RMON)

  Uses standard SNMP to monitor essential network functions; supports events, alarm, history, and statistics group plus a private alarm extension group

- 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

- Out-of-band interface

  Isolates management traffic from user data plane traffic for complete isolation and total reachability, no matter what happens in the data plane

- Remote intelligent mirroring

  Mirrors ingress/egress ACL-selected traffic from a switch port or VLAN to a local or remote switch port anywhere on the network

Connectivity

- Jumbo frames

  On Gigabit Ethernet and 10 Gigabit Ethernet ports, jumbo frames allow high-performance remote backup and disaster-recovery services

- Auto-MDIX

  Adjusts automatically for straight-through or crossover cables on all 10/100/1000 ports

- IPv6 native support

  – IPv6 host

    Enables switches to be managed and deployed at the IPv6 network's edge

  – Dual stack (IPv4 & IPv6)

    Transitions from IPv4 to IPv6, supporting connectivity for both protocols

  – Multicast Listener Discovery (MLD) snooping

    IPv6 multicast traffic to the appropriate interface

  – IPv6 ACL/QoS

    Supports ACL and QoS for IPv6 network traffic, preventing traffic flooding

  – IPv6 routing

    Supports IPv6 static routes, RIP, BGP4+v6, IS-ISv6, and OSPF routing protocols

Performance

- Extraordinarily high port density

  HPE 5830AF-96G switches are single box-type that can provide 96 1GbE ports and 10 10GbE ports simultaneously with full line-rate switching and forwarding

- Ultra deep packet buffering

  Provides up to a 3 GB packet buffer to help eliminate network congestion at the I/O associated with heavy use of server virtualization, as well as bursty multimedia, storage applications, and other critical services

- Hardware-based wire-speed access control lists (ACLs)

  Helps provide high levels of security and ease of administration without impacting network performance with a feature-rich TCAM-based ACL implementation

- Local Address Resolution Protocol (ARP)

  ARP fast reply feature provides an outstanding utilization of air-interface resources by first issuing an ARP request locally before the AP broadcasts over the radio interface

Resiliency and high availability

- Device Link Detection Protocol (DLDP)

  Monitors link connectivity and shuts down ports at both ends if unidirectional traffic is detected, preventing loops in STP-based networks

- Virtual Router Redundancy Protocol (VRRP)

  Allows groups of two routers to dynamically back each other up to create highly available routed environments

- Intelligent Resilient Framework (IRF)

  Creates virtual resilient switching fabrics, where two or more switches perform as a single L2 switch and L3 router; switches do not have to be co-located and can be part of a disaster-recovery system; servers or switches can be attached using standard LACP for automatic load balancing and high availability; can help eliminate the need for complex protocols such as Spanning Tree Protocol, Equal-Cost Multipath (ECMP), or VRRP, thereby simplifying network operation

- Rapid Ring Protection Protocol (RRPP)

  Connects multiple switches in a high-performance ring using standard Ethernet technology; traffic can be rerouted around the ring in less than 200 ms, reducing the impact on traffic and applications

- Smart link

  Allows 200 ms failover between links

- Data center-optimized design

  Supports front-to-back or back-to-front airflow for hot/cold aisles, rear rackmounts, and redundant hot-swappable AC or DC power and fans

Manageability
- Troubleshooting

  Ingress and egress port monitoring enable network problem solving

Layer 2 switching
- Spanning Tree/MSTP and RSTP

  Prevents network loops

- 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

- 32K MAC addresses

  Provides access to many Layer 2 devices

- IEEE 802.1ad QinQ and selective QinQ

  Increases the scalability of an Ethernet network by providing a hierarchical structure; connects multiple LANs on a high-speed campus or metro network

- 10GbE port aggregation

  Allows grouping of ports to increase overall data throughput to a remote device

- Port isolation

  Increases security by isolating ports within a VLAN while still allowing them to communicate with other VLANs

- Per-VLAN Spanning Tree Plus (PVST+)

  Allows each VLAN to build a separate spanning tree to improve link bandwidth usage in network environments with multiple VLANs

- GVRP VLAN Registration Protocol

  Allows automatic learning and dynamic assignment of VLANs

Layer 3 services
- Loopback interface address

  Defines an address in Routing Information Protocol (RIP) and Open Standard Path First (OSPF), improving diagnostic capability

- User Datagram Protocol (UDP) helper function

  Allows UDP broadcasts to be directed across router interfaces to specific IP unicast or subnet broadcast addresses and prevents server spoofing for UDP services such as DHCP

- Route maps

  Provides more control during route redistribution; allows filtering and altering of route metrics

- Dynamic Host Configuration Protocol (DHCP)

  Simplifies the management of large IP networks and supports client and server; DHCP Relay enables DHCP operation across subnets

Layer 3 routing
- IPv6 tunneling

  Allows IPv6 packets to traverse IPv4-only networks by encapsulating the IPv6 packet into a standard IPv4 packet; supports manually configured, 6 to 4, and Intra-Site Automatic Tunnel Addressing Protocol (ISATAP) tunnels; is an important element for the transition from IPv4 to IPv6

- Bidirectional Forwarding Detection (BFD)

  Enables link connectivity monitoring and reduces network convergence time for RIP, OSPF, BGP, IS-IS, VRRP, and IRF

- Policy-based routing

  Makes routing decisions based on policies set by the network administrator

- IGMPv1, v2, and v3

  Allows individual hosts to be registered on a particular VLAN

- PIM-SSM, PIM-DM, and PIM-SM (for IPv4 and IPv6)

  Supports IP Multicast address management and inhibition of DoS attacks

- Layer 3 IPv4 routing

  Provides routing of IPv4 at media speed; supports static routes, RIP and RIPv2, OSPF, IS-IS, and BGP

- Equal-Cost Multipath (ECMP)

  Enables multiple equal-cost links in a routing environment to increase link redundancy and scale bandwidth

- Layer 3 IPv6 routing

  Provides routing of IPv6 at media speed; supports static routes, RIPng, OSPFv3, IS-ISv6, and MP-BGP

Security
- Access control lists (ACLs)

  Provides IP Layer 3 filtering based on source/destination IP address/subnet, and source/destination TCP/UDP port number

- Secure shell

  Encrypts all transmitted data for secure remote CLI access over IP networks

- Port security

  Allows access only to specified MAC addresses, which can be learned or specified by the administrator

- Secure FTP

  Allows secure file transfer to and from the switch; protects against unwanted file downloads or unauthorized copying of a switch configuration file

- Secure management access

  Delivers secure encryption of all access methods (CLI, GUI, or MIB) through SSHv2, SSL, and/or SNMPv3

- Identity-driven security and access control
  – Per-user ACLs

    Permits or denies user access to specific network resources based on user identity, location, and time of day, allowing multiple types of users on the same network to access specific network services without risk to network security or unauthorized access to sensitive data

  – Automatic VLAN assignment

    Assigns users automatically to the appropriate VLAN based on their identity and location, and the time of day

- STP BPDU port protection

  Blocks Bridge Protocol Data Units (BPDUs) on ports that do not require BPDUs, preventing forged BPDU attacks

- DHCP protection

  Blocks DHCP packets from unauthorized DHCP servers, preventing denial-of-service attacks

- Dynamic ARP protection

  Blocks ARP broadcasts from unauthorized hosts, preventing eavesdropping or theft of network data

- STP root guard

  Protects the root bridge from malicious attacks or configuration mistakes

- Guest VLAN

  Provides a browser-based environment to authenticated clients that is similar to IEEE 802.1X

- MAC-based authentication

  Allows or denies access to the switch based on a client MAC address

- IP source guard

  Helps prevent IP spoofing attacks

- Endpoint Admission Defense (EAD)

  Provides security policies to users accessing a network

- RADIUS/HWTACACS

  Eases switch management security administration by using a password authentication server

Convergence

- IP multicast snooping (data-driven IGMP)

  Prevents flooding of IP multicast traffic

- IEEE 802.1AB Link Layer Discovery Protocol (LLDP)

  Facilitates easy mapping using network management applications with LLDP automated device discovery protocol

- Internet Group Management Protocol (IGMP)

  Utilizes Any-Source Multicast (ASM) or Source-Specific Multicast (SSM) to manage IPv4 multicast networks; supports IGMPv1, v2, and v3

- Protocol Independent Multicast (PIM)

  Defines modes of Internet IPv4 and IPv6 multicasting to allow one-to-many and many-to-many transmission of information; supports PIM Dense Mode (DM), Sparse Mode (SM), and Source-Specific Multicast (SSM)

- Multicast Source Discovery Protocol (MSDP)

  Allows multiple PIM-SM domains to interoperate; is used for inter-domain multicast applications

- Multicast Border Gateway Protocol (MBGP)

  Allows multicast traffic to be forwarded across BGP networks and kept separate from unicast traffic

- Multicast VLAN

  Allows multiple VLANs to receive the same IPv4 or IPv6 multicast traffic, lessening network bandwidth demand by reducing or helping eliminate multiple streams to each VLAN

- LLDP-MED

  Is a standard extension that automatically configures network devices, including LLDP-capable IP phones

- LLDP-CDP compatibility

  Receives and recognizes CDP packets from Cisco's IP phones for seamless interoperation

Monitor and diagnostics

- Port mirroring

  Enables traffic on a port to be simultaneously sent to a network analyzer for monitoring

- OAM (IEEE 802.3ah)

  Operations, administration, and maintenance (OAM) management capability detects data link layer problems that occur in the "last mile"; monitors the status of the link between the two devices

- CFD (IEEE 802.1ag)

  Connectivity fault detection (CFD) provides a Layer 2 link OAM mechanism used for link connectivity detection and fault locating

Additional information

- Green initiative support

  Provides support for RoHS and WEEE regulations

- Green IT and power

  Improves energy efficiency through the use of the latest advances in silicon development; shuts off unused ports and utilizes variable-speed fans, reducing energy costs

Warranty and support

- 1-year warranty

  Advance hardware replacement with next-business-day delivery (available in most countries)

- Electronic and telephone support

  Limited electronic and business-hours telephone support is available from HPE for the entire warranty period; to reach our support centers, refer to **hpe.com/ networking/contact-support**; for details on the duration of support provided with your product purchase, refer to **hpe.com/ networking/warrantysummary**

- Software releases

  To find software for your product, refer to **hpe.com/networking/support**; for details on the software releases available with your product purchase, refer to **hpe.com/ networking/warrantysummary**

HPE 5830 Switch Series

Specifications

	HPE 5830AF-48G Switch with 1 Interface Slot (JC691A)	HPE 5830AF-96G Switch (JC694A)
I/O ports and slots	48 RJ-45 autosensing 10/100/1000 ports (IEEE 802.3 Type 10BASE-T, IEEE 802.3u Type 100BASE-TX, IEEE 802.3ab Type 1000BASE-T); Duplex: 10BASE-T/100BASE-TX: half or full; 1000BASE-T: full only	96 RJ-45 autosensing 10/100/1000 ports (IEEE 802.3 Type 10BASE-T, IEEE 802.3u Type 100BASE-TX, IEEE 802.3ab Type 1000BASE-T); Duplex: 10BASE-T/100BASE-TX: half or full; 1000BASE-T: full only
	2 dual-personality ports; auto-sensing 10/100/1000Base-T or SFP	10 fixed 1000/10000 SFP+ ports
	2 fixed 1000/10000 SFP+ ports	
	1 extended module slot	
Additional ports and slots	1 RJ-45 serial console port 1 RJ-45 out-of-band management port	1 RJ-45 serial console port 1 RJ-45 out-of-band management port
Power supplies	2 power supply slots 1 minimum power supply required (ordered separately)	2 power supply slots 1 minimum power supply required (ordered separately)
Fan tray	1 fan tray slot Base product does not include fan tray.	1 fan tray slot Base product does not include fan tray.
Physical characteristics Dimensions Weight	17.32(w) x 18.11(d) x 1.72(h) in (43.99 x 46 x 4.37 cm) (1U height) 14.53 lb (6.59 kg)	17.32(w) x 25.98(d) x 3.39(h) in (43.99 x 65.99 x8.61 cm) 31.75 lb (14.4 kg)
Memory and processor	64 MB flash, 1 GB SDRAM; packet buffer size: 1 GB	64 MB flash, 1 GB SDRAM; packet buffer size: 3 GB
Performance Throughput Switching capacity Routing table size MAC address table size	119 Mpps (64-byte packets) 160 Gbps 12000 entries (IPv4) 32000 entries	291.6 Mpps (64-byte packets) 392 Gbps 12000 entries (IPv4) 32000 entries
Environment Operating temperature Operating relative humidity Acoustic	32°F to 113°F (0°C to 45°C) 5% to 95% Low-speed fan: 58 dB, High-speed fan: 65 dB	32°F to 113°F (0°C to 45°C) 5% to 95% Low-speed fan: 58 dB, High-speed fan: 65 dB
Electrical characteristics Frequency Maximum heat dissipation AC voltage DC voltage	50/60 Hz 440 BTU/hr (464.2 kJ/hr) 100 - 240 VAC -40 to -60 VDC	50/60 Hz 1209 BTU/hr (1275.49 kJ/hr) 100 - 240 VAC -40 to -60 VDC
Safety	UL 60950-1; 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; Anatel; ULAR; GOST; EN 60950-1/A11; FDA 21 CFR Subchapter J; NOM; ROHS Compliance	UL 60950-1; 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; Anatel; ULAR; GOST; EN 60950-1/A11; FDA 21 CFR Subchapter J; NOM; ROHS Compliance

	HPE 5830AF-48G Switch with 1 Interface Slot (JC691A)	HPE 5830AF-96G Switch (JC694A)
Emissions	VCCI Class A; EN 55022 Class A; ICES-003 Class A; ETSI EN 300 386 V1.3.3; AS/NZS CISPR 22 Class A; EMC Directive 2004/108/EC; EN 55024:1998+ A1:2001 + A2:2003; FCC (CFR 47, Part 15) Subpart B Class A	VCCI Class A; EN 55022 Class A; ICES-003 Class A; ETSI EN 300 386 V1.3.3; AS/NZS CISPR 22 Class A; EMC Directive 2004/108/EC; EN 55024:1998+ A1:2001 + A2:2003; FCC (CFR 47, Part 15) Subpart B Class A
Immunity		
Generic	ETSI EN 300 386 V1.3.3	ETSI EN 300 386 V1.3.3
EN	EN 55024:1998+ A1:2001 + A2:2003	EN 55024:1998+ A1:2001 + A2:2003
ESD	EN 61000-4-2; IEC 61000-4-2	EN 61000-4-2; IEC 61000-4-2
Radiated	EN 61000-4-3; IEC 61000-4-3	EN 61000-4-3; IEC 61000-4-3
EFT/Burst	EN 61000-4-4; IEC 61000-4-4	EN 61000-4-4; IEC 61000-4-4
Surge	EN 61000-4-5; IEC 61000-4-5	EN 61000-4-5; IEC 61000-4-5
Conducted	EN 61000-4-6; IEC 61000-4-6	EN 61000-4-6; IEC 61000-4-6
Power frequency magnetic field	IEC 61000-4-8; IEC 61000-4-8	IEC 61000-4-8; IEC 61000-4-8
Voltage dips and interruptions	EN 61000-4-11; IEC 61000-4-11	EN 61000-4-11; IEC 61000-4-11
Harmonics	EN 61000-3-2, IEC 61000-3-2	EN 61000-3-2, IEC 61000-3-2
Flicker	EN 61000-3-3, IEC 61000-3-3	EN 61000-3-3, IEC 61000-3-3
Management	IMC—Intelligent Management Center; command-line interface; Web browser; out-of-band management; SNMP Manager; Telnet; RMON1; FTP; IEEE 802.3 Ethernet MIB	IMC—Intelligent Management Center; command-line interface; Web browser; out-of-band management; SNMP Manager; Telnet; RMON1; FTP; IEEE 802.3 Ethernet MIB
Notes	Additional specifications • Static MAC table: 5120 • Max VLAN interface: 1,000 • Multicast L2 entries for IPv4: 2,000 • Multicast L2 entries for IPv6: 1,000 • Multicast L3 entries for IPv4: 2,000 • Multicast L3 entries for IPv6: 1,000 • VLAN table: 4,000 • QoS forward queue number: 8 • Static ARP number: 1,000 • Dynamic ARP number: 8,000 • MAX number in one link group: 8 • Link group number: 128 • ACL number: 4,000 (ingress); 512 (egress)	Additional specifications • Static MAC table: 5120 • Max VLAN interface: 1,000 • Multicast L2 entries for IPv4: 2,000 • Multicast L2 entries for IPv6: 1,000 • Multicast L3 entries for IPv4: 2,000 • Multicast L3 entries for IPv6: 1,000 • VLAN table: 4,000 • QoS forward queue number: 8 • Static ARP number: 1,000 • Dynamic ARP number: 8,000 • MAX number in one link group: 8 • Link group number: 128 • ACL number (GbE ports): 8,000 (ingress); 1,000 (egress) • ACL number (10GbE ports): 2,000 (ingress); 512 (egress)
Services	Refer to the HPE website at **hpe.com/networking/services** for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local HPE sales office.	Refer to the HPE website at **hpe.com/networking/services** for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local HPE sales office.

Standards and Protocols

(applies to all products in series)

BGP	RFC 1771 BGPv4 RFC 1772 Application of the BGP RFC 1997 BGP Communities Attribute RFC 1998 An Application of the BGP Community Attribute in Multi-home Routing RFC 2385 BGP Session Protection via TCP MD5 RFC 2439 BGP Route Flap Damping RFC 2796 BGP Route Reflection RFC 2858 BGP-4 Multi-Protocol Extensions RFC 2918 Route Refresh Capability	RFC 3065 Autonomous System Confederations for BGP RFC 3392 Capabilities Advertisement with BGP-4 RFC 4271 A Border Gateway Protocol 4 (BGP-4) RFC 4272 BGP Security Vulnerabilities Analysis 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 5291 Outbound Route Filtering Capability for BGP-4 RFC 5292 Address-Prefix-Based Outbound Route Filter for BGP-4
Denial of service protection	RFC 2267 Network Ingress Filtering	Automatic filtering of well-known denial-of-service packets	CPU DoS Protection Rate Limiting by ACLs
Device management	RFC 1157 SNMPv1/v2c RFC 1305 NTPv3 RFC 1902 (SNMPv2) RFC 2579 (SMIv2 Text Conventions)	RFC 2580 (SMIv2 Conformance) RFC 2819 (RMON groups Alarm, Event, History and Statistics only) HTTP, SSHv1, and Telnet Multiple Configuration Files	Multiple Software Images SSHv1/SSHv2 Secure Shell TACACS/TACACS+ Web UI
General protocols	IEEE 802.1ad Q-in-Q IEEE 802.1ag Service Layer OAM IEEE 802.1p Priority IEEE 802.1Q VLANs IEEE 802.1s Multiple Spanning Trees IEEE 802.1w Rapid Reconfiguration of Spanning Tree IEEE 802.1X PAE IEEE 802.3ab 1000BASE-T IEEE 802.3ac (VLAN Tagging Extension) IEEE 802.3ad Link Aggregation Control Protocol (LACP) IEEE 802.3ae 10-Gigabit Ethernet IEEE 802.3at IEEE 802.3u 100BASE-X IEEE 802.3z 1000BASE-X RFC 768 UDP RFC 783 TFTP Protocol (revision 2) RFC 791 IP RFC 792 ICMP RFC 793 TCP RFC 826 ARP RFC 854 TELNET RFC 894 IP over Ethernet RFC 903 RARP RFC 906 TFTP Bootstrap RFC 925 Multi-LAN Address Resolution RFC 950 Internet Standard Subnetting Procedure	RFC 951 BOOTP RFC 959 File Transfer Protocol (FTP) RFC 1027 Proxy ARP RFC 1035 Domain Implementation and Specification RFC 1042 IP Datagrams RFC 1058 RIPv1 RFC 1142 OSI IS-IS Intra-domain Routing Protocol RFC 1213 Management Information Base for Network Management of TCP/IP-based internets RFC 1256 ICMP Router Discovery Protocol (IRDP) RFC 1293 Inverse Address Resolution Protocol RFC 1305 NTPv3 RFC 1350 TFTP Protocol (revision 2) RFC 1393 Traceroute Using an IP Option RFC 1519 CIDR RFC 1531 Dynamic Host Configuration Protocol RFC 1533 DHCP Options and BOOTP Vendor Extensions RFC 1591 DNS (client only) RFC 1624 Incremental Internet Checksum RFC 1701 Generic Routing Encapsulation RFC 1721 RIP-2 Analysis RFC 1723 RIP v2 RFC 1812 IPv4 Routing RFC 2091 Trigger RIP	RFC 2131 DHCP RFC 2138 Remote Authentication Dial In User Service (RADIUS) RFC 2453 RIPv2 RFC 2644 Directed Broadcast Control RFC 2763 Dynamic Name-to-System ID mapping RFC 2784 Generic Routing Encapsulation (GRE) RFC 2865 Remote Authentication Dial In User Service (RADIUS) RFC 2966 Domain-wide Prefix Distribution with Two-Level IS-IS RFC 2973 IS-IS Mesh Groups RFC 3277 IS-IS Transient Blackhole Avoidance RFC 3567 Intermediate System to Intermediate System (IS-IS) Cryptographic Authentication RFC 3719 Recommendations for Interoperable Networks using Intermediate System to Intermediate System (IS-IS) RFC 3784 ISIS TE support RFC 3786 Extending the Number of IS-IS LSP Fragments Beyond the 256 Limit RFC 3787 Recommendations for Interoperable IP Networks using Intermediate System to Intermediate System (IS-IS) RFC 3847 Restart signaling for IS-IS RFC 4251 The Secure Shell (SSH) Protocol Architecture RFC 5130 A Policy Control Mechanism in IS-IS Using Administrative Tags

Standards and Protocols

(applies to all products in series)

IP multicast	RFC 2236 IGMPv2 RFC 2283 Multiprotocol Extensions for BGP-4 RFC 2362 PIM Sparse Mode (Premium Edge License) RFC 3376 IGMPv3 RFC 3446 Anycast Rendezvous Point (RP) mechanism using Protocol Independent Multicast (PIM) and Multicast Source Discovery Protocol (MSDP)	RFC 3618 Multicast Source Discovery Protocol (MSDP) RFC 3973 PIM Dense Mode RFC 4541 Considerations for Internet Group Management Protocol (IGMP) and Multicast Listener Discovery (MLD) Snooping Switches RFC 4601 Draft 10 PIM Sparse Mode	RFC 4604 Using Internet Group Management Protocol Version 3 (IGMPv3) and Multicast Listener Discovery Protocol Version 2 (MLDv2) for Source-Specific Multicast RFC 4605 IGMP/MLD Proxying RFC 4607 Source-Specific Multicast for IP RFC 4610 Anycast-RP Using Protocol Independent Multicast (PIM) RFC 5059 Bootstrap Router (BSR) Mechanism for Protocol Independent Multicast (PIM)
IPv6	RFC 1886 DNS Extension for IPv6 RFC 1887 IPv6 Unicast Address Allocation Architecture RFC 1981 IPv6 Path MTU Discovery RFC 2080 RIPng for IPv6 RFC 2081 RIPng Protocol Applicability Statement RFC 2292 Advanced Sockets API for IPv6 RFC 2373 IPv6 Addressing Architecture RFC 2375 IPv6 Multicast Address Assignments RFC 2460 IPv6 Specification RFC 2461 IPv6 Neighbor Discovery RFC 2462 IPv6 Stateless Address Auto-configuration	RFC 2463 ICMPv6 RFC 2464 Transmission of IPv6 over Ethernet Networks RFC 2473 Generic Packet Tunneling in IPv6 RFC 2526 Reserved IPv6 Subnet Anycast Addresses 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 2710 Multicast Listener Discovery (MLD) for IPv6 RFC 2740 OSPFv3 for IPv6 RFC 2767 Dual stacks IPv4 & IPv6	RFC 2893 Transition Mechanisms for IPv6 Hosts and Routers RFC 3056 Connection of IPv6 Domains via IPv4 Clouds RFC 3307 IPv6 Multicast Address Allocation RFC 3315 DHCPv6 (client and relay) RFC 3484 Default Address Selection for IPv6 RFC 3513 IPv6 Addressing Architecture RFC 3736 Stateless Dynamic Host Configuration Protocol (DHCP) Service for IPv6 RFC 3810 MLDv2 for IPv6 RFC 4214 Intra-Site Automatic Tunnel Addressing Protocol (ISATAP)
MIBs	RFC 1156 (TCP/IP MIB) RFC 1157 A Simple Network Management Protocol (SNMP) RFC 1213 MIB II RFC 1215 A Convention for Defining Traps for use with the SNMP RFC 1229 Interface MIB Extensions RFC 1493 Bridge MIB RFC 1573 SNMP MIB II RFC 1643 Ethernet MIB RFC 1657 BGP-4 MIB RFC 1724 RIPv2 MIB RFC 1757 Remote Network Monitoring 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 Interface MIB RFC 2452 IPV6-TCP-MIB RFC 2454 IPV6-UDP-MIB RFC 2465 IPv6 MIB RFC 2466 ICMPv6 MIB RFC 2571 SNMP Framework MIB RFC 2572 SNMP-MPD MIB RFC 2573 SNMP-Target MIB RFC 2578 Structure of Management Information Version 2 (SMIv2) RFC 2580 Conformance Statements for SMIv2 RFC 2618 RADIUS Client MIB RFC 2620 RADIUS Accounting MIB RFC 2665 Ethernet-Like-MIB RFC 2668 802.3 MAU MIB RFC 2674 802.1p and IEEE 802.1Q Bridge MIB RFC 2787 VRRP MIB	RFC 2819 RMON MIB RFC 2925 Ping MIB RFC 2932IP (Multicast Routing MIB) RFC 2933 IGMP MIB RFC 2934 Protocol Independent Multicast MIB for IPv4 RFC 3414 SNMP-User based-SM MIB RFC 3415 SNMP-View based-ACM MIB RFC 3417 Simple Network Management Protocol (SNMP) over IEEE 802 Networks RFC 3418 MIB for SNMPv3 RFC 3595 Textual Conventions for IPv6 Flow Label RFC 3826 AES for SNMP's USM MIB RFC 4133 Entity MIB (Version 3) RFC 4444 Management Information Base for Intermediate System to Intermediate System (IS-IS)

Standards and Protocols

(applies to all products in series)

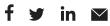| Network management	IEEE 802.1AB Link Layer Discovery Protocol (LLDP) RFC 1155 Structure of Management Information RFC 1157 SNMPv1 RFC 1448 Protocol Operations for version 2 of the Simple Network Management Protocol (SNMPv2)	RFC 2211 Controlled-Load Network RFC 2819 Four groups of RMON: 1 (statistics), 2 (history), 3 (alarm) and 9 (events) RFC 3176 sFlow RFC 3411 SNMP Management Frameworks	RFC 3412 SNMPv3 Message Processing RFC 3414 SNMPv3 User-based Security Model (USM) RFC 3415 SNMPv3 View-based Access Control Model VACM) ANSI/TIA-1057 LLDP Media Endpoint Discovery (LLDP-MED)
OSPF	RFC 1245 OSPF protocol analysis RFC 1246 Experience with OSPF RFC 1765 OSPF Database Overflow RFC 1850 OSPFv2 Management Information Base (MIB), traps RFC 2154 OSPF w/ Digital Signatures (Password, MD-5) RFC 2328 OSPFv2 RFC 2370 OSPF Opaque LSA Option	RFC 3101 OSPF NSSA RFC 3137 OSPF Stub Router Advertisement RFC 3630 Traffic Engineering Extensions to OSPF Version 2 RFC 4061 Benchmarking Basic OSPF Single Router Control Plane Convergence RFC 4062 OSPF Benchmarking Terminology and Concepts	RFC 4063 Considerations When Using Basic OSPF Convergence Benchmarks RFC 4222 Prioritized Treatment of Specific OSPF Version 2 Packets and Congestion Avoidance RFC 4811 OSPF Out-of-Band LSDB Resynchronization RFC 4812 OSPF Restart Signaling RFC 4813 OSPF Link-Local Signaling RFC 4940 IANA Considerations for OSPF
QoS/CoS	IEEE 802.1P (CoS) RFC 1349 Type of Service in the Internet Protocol Suite	RFC 2211 Specification of the Controlled-Load Network Element Service RFC 2212 Guaranteed Quality of Service	RFC 2474 DSCP DiffServ RFC 2475 DiffServ Architecture RFC 2597 DiffServ Assured Forwarding (AF) RFC 2598 DiffServ Expedited Forwarding (EF)
Security	IEEE 802.1X Port Based Network Access Control RFC 1321 The MD5 Message-Digest Algorithm RFC 1334 PPP Authentication Protocols (PAP) RFC 1492 An Access Control Protocol, Sometimes Called TACACS RFC 1994 PPP Challenge Handshake Authentication Protocol (CHAP) RFC 2082 RIP-2 MD5 Authentication	RFC 2104 Keyed-Hashing for Message Authentication RFC 2408 Internet Security Association and Key Management Protocol (ISAKMP) RFC 2409 The Internet Key Exchange (IKE) RFC 2716 PPP EAP TLS Authentication Protocol RFC 2865 RADIUS Authentication RFC 2866 RADIUS Accounting	RFC 2867 RADIUS Accounting Modifications for Tunnel Protocol Support RFC 2868 RADIUS Attributes for Tunnel Protocol Support RFC 2869 RADIUS Extensions Access Control Lists (ACLs) Guest VLAN for 802.1x MAC Authentication Port Security SSHv1/SSHv2 Secure Shell

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