HP ProCurve 6600 Switch Series

Product overview

The HP ProCurve 6600 Switch Series consists of the most advanced data center server edge switches in the HP ProCurve Networking product line. The 6600 series includes 1U 10/100/1000Base-T and 10-GbE SFP+ stackables enhanced for server edge connectivity with front-to-back cooling, redundant hot-swappable power, and redundant hot-swappable fans. The foundation for all of these switches is a purpose-built, programmable ProVision ASIC that allows the most demanding networking features, such as Quality of Service (QoS) and security, to be implemented in a scalable yet granular fashion. With a variety of connectivity interfaces and expanded buffering, the 6600 switches offer excellent investment protection, flexibility, and scalability, as well as ease of deployment and reduced operational expense.

Key features

- Data center server access layer
- Front-to-back cooling, redundant power
- Layer 2 - Layer 4 and intelligent edge feature set
- Enterprise-class performance and security
- Scalable 10/100/1000 and 10-GbE connectivity

Features and benefits

Industry-leading warranty

Data center optimized

• **Front-to-back airflow:** designed to be co-located at the top of a server rack, the 6600 series supports front-to-back, reversible back-to-front airflow to support hot aisle/cold aisle configurations; the N+N fan tray is also hot-swappable, allowing easy replacement in the rack

• **Modular internal power supplies:** supports redundant, hot-swappable power supply configurations (units ship with one supply)

• **Server-to-switch distributed trunking:** supports Layer 2 LACP groups from a single server across two different switches for active-active server NIC teaming configurations

• **Deployment/serviceability:** data connectivity and management ports are all front-side accessible, and power supplies and fan trays are rear-side accessible to allow for easy maintenance; tool-less access to all system components provides easy in-rack serviceability

Management

• **Remote Intelligent Mirroring:** mirrors ingress/egress ACL-selected traffic from a switch port or VLAN to a local or remote 8200zl/6600/6200yl/5400zl/3500yl switch port anywhere on the network

• **RMON, XRMON, and sFlow v5:** provide advanced monitoring and reporting capabilities for statistics, history, alarms, and events

• **Uni-Directional Link Detection (UDLD):** monitors cable between two switches and shuts down the ports on both ends if the cable is broken turning the bi-directional link into uni-directional; this prevents network problems such as loops

• **IEEE 802.1AB Link Layer Discovery Protocol (LLDP):** automated device discovery protocol for easy mapping by network management applications

• **Management simplicity:** common networking features and CLI implementation (common across HP ProCurve 8200zl/6600/6200yl/5400zl/3500yl switches)

• **Command authorization:** leverages RADIUS to link a custom list of CLI commands to individual network administrator's login; also provides an audit trail

• **Friendly port names:** allow assignment of descriptive names to ports

• **Multiple configuration files:** multiple configuration files can be stored to the flash image

• **Dual flash images:** provides independent primary and secondary OS files for backup while upgrading

Connectivity

• **IPv6:**
- **IPv6 host:** switches are managed and deployed at the IPv6 network's edge
- **Dual stack (IPv4/IPv6):** transitions from IPv4 to IPv6, supporting connectivity for both protocols
- **MLD snooping:** forwards IPv6 multicast traffic to the appropriate interface, preventing traffic flooding
- **IPv6 ACL/QoS:** supports ACL and QoS for IPv6 network traffic
- **IPv6 ready:** switch hardware can support IPv6 routing, tunneling, and security--available when enabled via software updates in follow-on releases

• **Auto-MDIX:** automatically adjusts for straight-through or crossover cables on all 10/100/1000 ports

• **Jumbo frames:** on Gigabit and 10-Gigabit ports, allow high-performance remote backup and disaster-recovery services

Performance

• **High-speed/capacity architecture:** based on the purpose-built ProVision ASICs to provide superior system performance and scalability

• **Selectable queue configurations:** increase performance by selecting the number of queues and associated memory buffering that best meet the requirements of your network applications

* For as long as you own the product, with next-business-day advance replacement (available in most countries). The following hardware products and their related series modules have a one-year hardware warranty with extensions available: HP ProCurve Routing Switch 9300m Series, HP ProCurve Switch 8100fl Series, HP ProCurve Network Access Controller 800, and HP ProCurve DCM Controller. The following hardware mobility products have a one-year hardware warranty with extensions available: HP ProCurve M111 Client Bridge, HP ProCurve MSM3xx-R Access Points, HP ProCurve MSM7xx Mobility and Access Controllers, HP ProCurve RF Manager IDS/IPS Systems, HP ProCurve MSM Power Supplies, HP ProCurve 1-Port Power Injector, and HP ProCurve CNMS Appliances. Disk drives in the HP ProCurve ONE Services zl Modules have a five year hardware warranty. Standalone software, upgrades, or licenses may have a different warranty duration. For details, refer to the ProCurve Software License, Warranty, and Support booklet at www.procurve.com/warranty.

Resiliency and high availability

• **IEEE 802.3ad Link Aggregation Control Protocol (LACP) and ProCurve trunking:** support up to 60 trunks, each with up to 8 links (ports) per trunk; trunking across modules is supported

• **IEEE 802.1s Multiple Spanning Tree:** provides high link availability in multiple VLAN environments by allowing multiple spanning trees; provides legacy support for IEEE 802.1d and IEEE 802.1w

• **Virtual Router Redundancy Protocol (requires Premium License):** VRRP allows groups of two routers to dynamically back each other up to create highly available routed environments

• **Server-to-switch distributed trunking:** allows a server to connect to two switches with one logical trunk that consists of multiple physical connections; enables load-balancing and increases resiliency

• **Sparing simplicity:** common power supplies, fan trays, and transceivers are used among the 6600 series products

Layer 2 switching

• **ProCurve switch meshing:** dynamically load-balances across multiple active redundant links to increase available aggregate bandwidth

• **GARP VLAN Registration Protocol:** allows automatic learning and dynamic assignment of VLANs

• **IEEE 802.1ad Q-in-Q (requires Premium License):** increases the scalability of Ethernet network by providing a hierarchical structure; connects multiple LANs on high-speed campus or metro network

• **IEEE 802.1v protocol VLANs:** isolate select non-IPv4 protocols automatically into their own VLANs

Layer 3 services

• **Loopback interface address:** defines an address in RIP and OSPF that can always be reachable, improving diagnostic capability

• **UDP helper function:** UDP broadcasts can be directed across router interfaces to specific IP unicast or subnet broadcast addresses and prevent server spoofing for UDP services such as DHCP

Layer 3 routing

• **RIP:** provides RIPv1 and RIPv2 routing

• **Static IP routing:** provides manually configured routing; includes ECMP capability

• **OSPF (requires Premium License):** includes host-based ECMP to provide link redundancy/scalable bandwidth and NSSA

Security

• **Source-port filtering:** allows only specified ports to communicate with each other

• **RADIUS/TACACS+:** eases switch management security administration by using a password authentication server

• **Secure Shell (SSHv2):** encrypts all transmitted data for secure, remote command-line interface (CLI) access over IP networks

• **Port security:** allows access only to specified MAC addresses, which can be learned or specified by the administrator

• **MAC address lockout:** prevents configured particular MAC addresses from connecting to the network

• **Detection of malicious attacks:** monitors ten types of network traffic and sends a warning when an anomaly that potentially can be caused by malicious attacks is detected

• **Secure FTP:** allows secure file transfer to/from the switch; protects against unwanted file downloads or unauthorized copying of switch configuration file

• **Switch management logon security:** can require either RADIUS or TACACS+ authentication for secure switch CLI logon

• **Secure management access:** all access methods–CLI, GUI, or MIB–are securely encrypted through SSHv2, SSL, and/or SNMPv3

• **ICMP throttling:** defeats ICMP denial-of-service attacks by enabling any switch port to automatically throttle ICMP traffic

• **Virus throttling:** detects traffic patterns typical of WORM-type viruses and either throttles or entirely prevents the ability of the virus to spread across the routed VLANs or bridged interfaces, without requiring external appliances

• **STP BPDU port protection:** blocks Bridge Protocol Data Units (BPDUs) on ports that do not require BPDUs, preventing forged BPDU attacks

• **Dynamic IP lockdown:** works with DHCP protection to block traffic from unauthorized hosts, preventing IP source address spoofing

• **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

• **USB Secure Autorun (requires HP ProCurve Manager Plus):** deploys, diagnoses, and updates switch using USB flash drive; works with secure credential to prevent tampering

• **STP Root Guard:** protects root bridge from malicious attack or configuration mistakes

• **Management Interface Wizard:** CLI-based step-by-step configuration tool to help ensure that management interfaces such as SNMP, telnet, SSH, SSL, Web, and USB are secured to desired level

• **Access control lists (ACLs):** provide filtering based on the IP field, source/destination IP address/subnet, and source/destination TCP/UDP port number on a per-VLAN or per-port basis

• **Multiple user authentication methods:**
- **Multiple IEEE 802.1X users per port:** provides authentication of multiple IEEE 802.1X users per port; prevents user "piggybacking" on another user's IEEE 802.1X authentication
- **Web-based authentication:** authenticates from Web browser for clients that do not support IEEE 802.1X supplicant; customized remediation can be processed on an external Web server
- **MAC-based authentication:** client is authenticated with the RADIUS server based on client's MAC address
- **Concurrent IEEE 802.1X, Web, and MAC authentication schemes per port:** switch port will accept up to 32 sessions of IEEE 802.1X, Web, and MAC authentications

• **Switch CPU protection:** provides automatic protection against malicious network traffic trying to shut down the switch

• **Identity-driven ACL:** enables implementation of a highly granular and flexible access security policy specific to each authenticated network user

• **Secure Sockets Layer (SSL):** encrypts all HTTP traffic, allowing secure access to the browser-based management GUI in the switch

• **Security banner:** displays a customized security policy when users log in to the switch

Multicast support

• **IP multicast routing (requires Premium License):** includes PIM Sparse and Dense modes to route IP multicast traffic

• **IP multicast snooping (data-driven IGMP):** automatically prevents flooding of IP multicast traffic

Quality of Service (QoS)

• **Layer 4 prioritization:** enables prioritization based on TCP/UDP port numbers

• **Class of Service (CoS):** sets the IEEE 802.1p priority tag based on IP address, IP Type of Service (ToS), L3 protocol, TCP/UDP port number, source port, and DiffServ

• **Bandwidth shaping:**
- **Port-based rate limiting:** per-port ingress/egress enforced maximum bandwidth
- **Classifier-based rate limiting:** use ACL to enforce maximum bandwidth for ingress traffic on each port
- **Guaranteed minimum:** per-port, per-queue egress-based guaranteed minimum bandwidth

• **Advanced classifier-based QoS:** classifies traffic using multiple match criteria based on L2/3/4 information; applies QoS policies such as setting priority level and rate limit to selected traffic per port or per VLAN

• **Traffic prioritization:** allows real-time traffic classification into eight priority levels mapped to eight queues

Warranty and support

• **ProCurve Lifetime Warranty:** for as long as you own the product, with next-business-day advance replacement (available in most countries)

• **Electronic and telephone support:** limited electronic and telephone support is available from HP; refer to the HP Web site at www.procurve.com/support for details on the support provided and the period during which support is available

• **Software releases:** refer to the HP Web site at www.procurve.com/support for details on the software releases provided and the period during which software releases are available

HP ProCurve 6600 Switch Series

Specifications

			
	HP ProCurve 6600-24G Switch (J9263A)	**HP ProCurve 6600-24G-4XG Switch (J9264A)**	**HP ProCurve 6600-24XG Switch (J9265A)**
Ports	20 auto-sensing 10/100/1000 ports (IEEE 802.3 Type 10Base-T, IEEE 802.3u Type 100Base-TX, IEEE 802.3ab Type 1000Base-T); Media Type: Auto-MDIX; Duplex: 10Base-T/100Base-TX: half or full; 1000Base-T: full only 4 dual-personality ports; each port can be used as either an RJ-45 10/100/1000 port (IEEE 802.3 Type 10Base-T; IEEE 802.3u Type 100Base-TX; IEEE 802.3ab 1000Base-T Gigabit Ethernet) or an open mini-GBIC slot (for use with mini-GBIC transceivers) 1 RS-232C DB-9 console port	20 auto-sensing 10/100/1000 ports (IEEE 802.3 Type 10Base-T, IEEE 802.3u Type 100Base-TX, IEEE 802.3ab Type 1000Base-T); Media Type: Auto-MDIX; Duplex: 10Base-T/100Base-TX: half or full; 1000Base-T: full only 4 dual-personality ports; each port can be used as either an RJ-45 10/100/1000 port (IEEE 802.3 Type 10Base-T; IEEE 802.3u Type 100Base-TX; IEEE 802.3ab 1000Base-T Gigabit Ethernet) or an open mini-GBIC slot (for use with mini-GBIC transceivers) 4 SFP+ 10-GbE ports; Duplex: full only 1 RS-232C DB-9 console port	24 SFP+ 10-GbE ports; Duplex: full only 1 RJ-45 serial console port
Power supplies	2 power-supply slots includes: 1 x J9269A HP ProCurve 6600 Switch Power Supply	2 power-supply slots includes: 1 x J9269A HP ProCurve 6600 Switch Power Supply	2 power-supply slots includes: 1 x J9269A HP ProCurve 6600 Switch Power Supply
Fan tray	includes: 1 x J9271A 1 fan tray slot Fan tray supports N+N fans for added redundancy.	includes: 1 x J9271A 1 fan tray slot Fan tray supports N+N fans for added redundancy.	includes: 1 x J9271A 1 fan tray slot Fan tray supports N+N fans for added redundancy.
Physical characteristics			
Dimensions	21.5(d) x 17.42(w) x 1.7(h) in. (54.61 x 44.25 x 4.32 cm) (1U height)	21.5(d) x 17.42(w) x 1.7(h) in. (54.61 x 44.25 x 4.32 cm) (1U height)	25.25(d) x 17.42(w) x 1.7(h) in. (64.14 x 44.25 x 4.32 cm) (1U height)
Weight	16.7 lb. (7.58 kg)	17.2 lb. (7.8 kg)	19.7 lb. (8.94 kg)
Memory and processor			
	Freescale PowerPC 8540 @ 666 MHz, 4 MB flash, 256 MB compact flash, 256 MB DDR SDRAM; packet buffer size: 18 MB QDR SDRAM total (for all 1-GbE ports)	Freescale PowerPC 8540 @ 666 MHz, 4 MB flash, 256 MB compact flash, 256 MB DDR SDRAM; packet buffer size: 36 MB QDR SDRAM total (18 MB for 1-GbE & 10-GbE ports)	Freescale PowerPC 8540 @ 666 MHz, 4 MB flash, 1 GB compact flash, 256 MB DDR SDRAM; packet buffer size: 108 MB QDR SDRAM total (for all 10-GbE ports)
Mounting	Telco rack: Mounts in an EIA-standard 19-in. 2-post telco rack or equipment cabinet; horizontal surface mounting only. Rack kit: Rack rails are required for mounting in HP 10000 Series 4-post racks.	Telco rack: Mounts in an EIA-standard 19-in. 2-post telco rack or equipment cabinet; horizontal surface mounting only. Rack kit: Rack rails are required for mounting in HP 10000 Series 4-post racks.	Telco rack: Mounts in an EIA-standard 19-in. 2-post telco rack or equipment cabinet; horizontal surface mounting only. Rack kit: Rack rails are required for mounting in HP 10000 Series 4-post racks.
Performance			
1000 Mb Latency	< 3.7 µs (FIFO 64-byte packets)	< 3.7 µs (FIFO 64-byte packets)	< 3.7 µs (FIFO 64-byte packets)
10 Gbps Latency	< 2.1 µs (FIFO 64-byte packets)	< 2.1 µs (FIFO 64-byte packets)	< 2.1 µs (FIFO 64-byte packets)
Throughput	up to 35.7 million pps	up to 75.7 million pps	up to 240.2 million pps
Routing/Switching capacity	48 Gbps	101.8 Gbps	322.8 Gbps
Switch fabric speed	48 Gbps	105.6 Gbps	345.6 Gbps
Routing table size	10,000 entries	10,000 entries	10,000 entries
MAC address table size	64,000 entries	64,000 entries	64,000 entries
Environment			
Operating temperature	41°F to 104°F (5°C to 40°C)	41°F to 104°F (5°C to 40°C)	32°F to 104°F (0°C to 40°C)
Operating relative humidity	15% to 80% @ 104°F (40°C), non-condensing	15% to 80% @ 104°F (40°C), non-condensing	15% to 80% @ 104°F (40°C), non-condensing
Non-operating/Storage temperature	-40°F to 158°F (-40°C to 70°C)	-40°F to 158°F (-40°C to 70°C)	-40°F to 158°F (-40°C to 70°C)
Non-operating/Storage relative humidity	15% to 90% @ 158°F (70°C), non-condensing	15% to 90% @ 149°F (65°C), non-condensing	15% to 90% @ 149°F (65°C), non-condensing
Altitude	up to 10,000 ft. (3 km)	up to 10,000 ft. (3 km)	up to 10,000 ft. (3 km)
Acoustic	Power: 71 dB, Pressure: 62.3 dB ISO 7779, ISO 9296	Power: 68 dB, Pressure: 59.5 dB ISO 7779, ISO 9296	Power: 72 dB, Pressure: 61.8 dB ISO 7779, ISO 9296
Electrical characteristics			
		Achieved Miercom Certified Green Award	Achieved Miercom Certified Green Award
Description	The switch automatically adjusts to any voltage between 100-120 and 200-240 volts and either 50 or 60 Hz	The switch automatically adjusts to any voltage between 100-120 and 200-240 volts and either 50 or 60 Hz	The switch automatically adjusts to any voltage between 100-120 and 200-240 volts and either 50 or 60 Hz
Maximum heat dissipation	425 BTU/hr (448.38 kJ/hr)	587 BTU/hr (619.29 kJ/hr)	1268 BTU/hr (1337.74 kJ/hr)
Voltage	100-120 / 200-240 VAC	100-120 / 200-240 VAC	100-120 / 200-240 VAC
Idle power	92.5 W	127.4 W	309.8 W
Power consumption	124.6 W	172.1 W	371.6 W
Frequency	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz

Specifications (continued)

	HP ProCurve 6600-24G Switch (J9263A)	HP ProCurve 6600-24G-4XG Switch (J9264A)	HP ProCurve 6600-24XG Switch (J9265A)
Notes	Idle power is the power consumption of the base system with no traffic. 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.	Idle power is the power consumption of the base system with no traffic. 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.	Idle power is the power consumption of the base system with no traffic. 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.
Safety	CSA 22.2 No. 60950; EN 60950/IEC 60950; UL 60950	CSA 22.2 No. 60950; EN 60950/IEC 60950; UL 60950	CSA 22.2 No. 60950; EN 60950/IEC 60950; UL 60950
Emissions	FCC Class A; VCCI Class A; EN 55022/CISPR 22 Class A	FCC Class A; VCCI Class A; EN 55022/CISPR 22 Class A	FCC Class A; VCCI Class A; EN 55022/CISPR 22 Class A
Immunity			
EN	EN 55024, CISPR 24	EN 55024, CISPR 24	EN 55024, CISPR 24
ESD	IEC 61000-4-2	IEC 61000-4-2	IEC 61000-4-2
Radiated	IEC 61000-4-3	IEC 61000-4-3	IEC 61000-4-3
EFT/Burst	IEC 61000-4-4	IEC 61000-4-4	IEC 61000-4-4
Surge	IEC 61000-4-5	IEC 61000-4-5	IEC 61000-4-5
Conducted	IEC 61000-4-6	IEC 61000-4-6	IEC 61000-4-6
Power frequency magnetic field	IEC 61000-4-8	IEC 61000-4-8	IEC 61000-4-8
Voltage dips and interruptions	IEC 61000-4-11	IEC 61000-4-11	IEC 61000-4-11
Harmonics	EN 61000-3-2, IEC 61000-3-2	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	EN 61000-3-3, IEC 61000-3-3
Management	HP ProCurve Manager Plus; HP ProCurve Manager (included); command-line interface; Web browser; configuration menu; out-of-band management (serial RS-232C)	HP ProCurve Manager Plus; HP ProCurve Manager (included); command-line interface; Web browser; configuration menu; out-of-band management (serial RS-232C)	HP ProCurve Manager Plus; HP ProCurve Manager (included); command-line interface; Web browser; configuration menu; out-of-band management (serial RS-232C)
Notes	When using mini-GBICs with this product, mini-GBICs with revision "B" or later (product number ends with the letter "B" or later, e.g., J4858B, J4859C) are required. Gigabit 1000Base-T mini-GBIC (J8177B) is not supported on 6600 series switches.	When using mini-GBICs with this product, mini-GBICs with revision "B" or later (product number ends with the letter "B" or later, e.g., J4858B, J4859C) are required. Gigabit 1000Base-T mini-GBIC (J8177B) is not supported on 6600 series switches.	When using mini-GBICs with this product, mini-GBICs with revision "B" or later (product number ends with the letter "B" or later, e.g., J4858B, J4859C) are required. Gigabit 1000Base-T mini-GBIC (J8177B) is not supported on 6600 series switches.
Services	3-year, 4-hour onsite, 13x5 coverage for hardware (U2855E) 3-year, 4-hour onsite, 24x7 coverage for hardware (U2856E) 3-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone support (U6304E) 3-year, 24x7 SW phone support, software updates (UE262E) Refer to the HP Web site at www.procurve.com/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 HP sales office.	3-year, 4-hour onsite, 13x5 coverage for hardware (U2855E) 3-year, 4-hour onsite, 24x7 coverage for hardware (U2856E) 3-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone support (U6304E) 3-year, 24x7 SW phone support, software updates (UE262E) Refer to the HP Web site at www.procurve.com/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 HP sales office.	3-year, 4-hour onsite, 13x5 coverage for hardware (U2855E) 3-year, 4-hour onsite, 24x7 coverage for hardware (U2856E) 3-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone support (U6304E) 3-year, 24x7 SW phone support, software updates (UE262E) Refer to the HP Web site at www.procurve.com/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 HP sales office.

Specifications (continued)

	HP ProCurve 6600-24G Switch (J9263A)	HP ProCurve 6600-24G-4XG Switch (J9264A)	HP ProCurve 6600-24XG Switch (J9265A)
Standards and protocols (applies to all products in series)	**Device management** RFC 1591 DNS (client) HTML and telnet management **General protocols** IEEE 802.1ad Q-in-Q (Premium License) IEEE 802.1D MAC Bridges IEEE 802.1p Priority IEEE 802.1Q VLANs IEEE 802.1s Multiple Spanning Trees IEEE 802.1v VLAN classification by Protocol and Port IEEE 802.1w Rapid Reconfiguration of Spanning Tree IEEE 802.3ad Link Aggregation Control Protocol (LACP) IEEE 802.3x Flow Control RFC 768 UDP RFC 783 TFTP Protocol (revision 2) RFC 792 ICMP RFC 793 TCP UDLD (Uni-directional Link Detection) RFC 826 ARP RFC 854 TELNET RFC 868 Time Protocol RFC 951 BOOTP RFC 1058 RIPv1 RFC 1350 TFTP Protocol (revision 2) RFC 1519 CIDR RFC 1542 BOOTP Extensions RFC 2030 Simple Network Time Protocol (SNTP) v4 RFC 2131 DHCP RFC 2453 RIPv2 RFC 2548 (MS-RAS-Vendor only) RFC 3046 DHCP Relay Agent Information Option RFC 3576 Ext to RADIUS (CoA only) RFC 3768 VRRP (Premium License) RFC 4675 RADIUS VLAN & Priority	**IP multicast** RFC 3376 IGMPv3 (host joins only) RFC 3973 Draft 2 PIM Dense Mode (Premium License) RFC 4601 Draft 10 PIM Sparse Mode (Premium License) **IPv6** RFC 1981 IPv6 Path MTU Discovery RFC 2460 IPv6 Specification RFC 2461 IPv6 Neighbor Discovery RFC 2462 IPv6 Stateless Address Auto-configuration RFC 2463 ICMPv6 RFC 2710 Multicast Listener Discovery (MLD) for IPv6 RFC 2925 Remote Operations MIB (Ping only) RFC 3019 MLDv1 MIB RFC 3315 DHCPv6 (client only) RFC 3513 IPv6 Addressing Architecture RFC 3596 DNS Extension for IPv6 RFC 3810 MLDv2 (host joins only) RFC 4022 MIB for TCP RFC 4113 MIB for UDP RFC 4251 SSHv6 Architecture RFC 4252 SSHv6 Authentication RFC 4253 SSHv6 Transport Layer RFC 4254 SSHv6 Connection RFC 4293 MIB for IP RFC 4419 Key Exchange for SSH RFC 4541 IGMP & MLD Snooping Switch **MIBs** RFC 1213 MIB II RFC 1493 Bridge MIB RFC 1724 RIPv2 MIB RFC 1850 OSPFv2 MIB RFC 2021 RMONv2 MIB RFC 2096 IP Forwarding Table MIB	RFC 2613 SMON MIB 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 2737 Entity MIB (Version 2) RFC 2787 VRRP MIB RFC 2863 The Interfaces Group MIB RFC 2925 Ping MIB **Network management** IEEE 802.1AB Link Layer Discovery Protocol (LLDP) RFC 2819 Four groups of RMON: 1 (statistics), 2 (history), 3 (alarm) and 9 (events) RFC 3176 sFlow ANSI/TIA-1057 LLDP Media Endpoint Discovery (LLDP-MED) SNMPv1/v2c/v3 XRMON **OSPF** RFC 2328 OSPFv2 (Premium License) RFC 3101 OSPF NSSA **QoS/Cos** RFC 2474 DiffServ Precedence, including 8 queues/port RFC 2597 DiffServ Assured Forwarding (AF) RFC 2598 DiffServ Expedited Forwarding (EF) **Security** IEEE 802.1X Port Based Network Access Control RFC 1492 TACACS+ RFC 2865 RADIUS (client only) RFC 2866 RADIUS Accounting Secure Sockets Layer (SSL) SSHv2 Secure Shell

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Specifications

	HP ProCurve 6600-48G Switch (J9451A)	HP ProCurve 6600-48G-4XG Switch (J9452A)
Ports	44 auto-sensing 10/100/1000 ports (IEEE 802.3 Type 10Base-T, IEEE 802.3u Type 100Base-TX, IEEE 802.3ab Type 1000Base-T); Media Type: Auto-MDIX; Duplex: 10Base-T/100Base-TX: half or full; 1000Base-T: full only 4 dual-personality ports; each port can be used as either an RJ-45 10/100/1000 port (IEEE 802.3 Type 10Base-T; IEEE 802.3u Type 100Base-TX; IEEE 802.3ab 1000Base-T Gigabit Ethernet) or an open mini-GBIC slot (for use with mini-GBIC transceivers) 1 RJ-45 serial console port	48 RJ-45 auto-sensing 10/100/1000 ports (IEEE 802.3 Type 10Base-T, IEEE 802.3u Type 100Base-TX, IEEE 802.3ab Type 1000Base-T); Media Type: Auto-MDIX; Duplex: 10Base-T/100Base-TX: half or full; 1000Base-T: full only 4 SFP+ 10-GbE ports; Duplex: full only 1 RJ-45 serial console port
Power supplies	2 power-supply slots includes: 1 x J9269A HP ProCurve 6600 Switch Power Supply	2 power-supply slots includes: 1 x J9269A HP ProCurve 6600 Switch Power Supply
Fan tray	includes: 1 x J9271A 1 fan tray slot Fan tray supports N+N fans for added redundancy.	includes: 1 x J9271A 1 fan tray slot Fan tray supports N+N fans for added redundancy.
Physical characteristics		
Dimensions	25.25(d) x 17.42(w) x 1.7(h) in. (64.14 x 44.25 x 4.32 cm) (1U height)	25.25(d) x 17.42(w) x 1.7(h) in. (64.14 x 44.25 x 4.32 cm) (1U height)
Weight	19 lb. (8.62 kg)	19 lb. (8.62 kg)
Memory and processor		
	Freescale PowerPC 8540 @ 666 MHz, 4 MB flash, 1 GB compact flash, 256 MB DDR SDRAM; packet buffer size: 36 MB QDR SDRAM total (for all 1-GbE ports)	Freescale PowerPC 8540 @ 666 MHz, 4 MB flash, 1 GB compact flash, 256 MB DDR SDRAM; packet buffer size: 72 MB QDR SDRAM total (36 MB for 1-GbE & 10-GbE ports)
Mounting	Mounts in an EIA-standard 19 in. 2-point telco rack or equipment cabinet (hardware included); horizontal surface mounting only	Mounts in an EIA-standard 19 in. 2-point telco rack or equipment cabinet (hardware included); horizontal surface mounting only
Performance		
1000 Mb Latency	< 3.7 µs (FIFO 64-byte packets)	< 3.7 µs (FIFO 64-byte packets)
10 Gbps Latency	< 2.1 µs (FIFO 64-byte packets)	< 2.1 µs (FIFO 64-byte packets)
Throughput	up to 71.4 million pps	up to 130.9 million pps
Routing/Switching capacity	96 Gbps	176 Gbps
Switch fabric speed	96 Gbps	176 Gbps
Routing table size	10,000 entries	10,000 entries
MAC address table size	64,000 entries	64,000 entries
Environment		
Operating temperature	41°F to 104°F (5°C to 40°C)	41°F to 104°F (5°C to 40°C)
Operating relative humidity	15% to 80% @ 104°F (40°C), non-condensing	15% to 80% @ 104°F (40°C), non-condensing
Non-operating/Storage temperature	-40°F to 158°F (-40°C to 70°C)	-40°F to 158°F (-40°C to 70°C)
Non-operating/Storage relative humidity	15% to 90% @ 158°F (70°C), non-condensing	15% to 90% @ 158°F (70°C), non-condensing
Altitude	up to 10,000 ft. (3 km)	up to 10,000 ft. (3 km)
Acoustic	ISO 7779, ISO 9296	ISO 7779, ISO 9296
Electrical characteristics		
Description	The switch automatically adjusts to any voltage between 100-120 and 200-240 volts and either 50 or 60 Hz	The switch automatically adjusts to any voltage between 100-127 and 200-240 volts and either 50 or 60 Hz
Voltage	100-120 / 200-240 VAC	100-120 / 200-240 VAC
Frequency	50 / 60 Hz	50 / 60 Hz
Safety	CSA 22.2 No. 60950; EN 60950/IEC 60950; UL 60950	CSA 22.2 No. 60950; EN 60950/IEC 60950; UL 60950
Emissions	FCC Class A; VCCI Class A; EN 55022/CISPR 22 Class A	FCC Class A; VCCI Class A; EN 55022/CISPR 22 Class A
Immunity		
EN	EN 55024, CISPR 24	EN 55024, CISPR 24
ESD	IEC 61000-4-2	IEC 61000-4-2
Radiated	IEC 61000-4-3	IEC 61000-4-3
EFT/Burst	IEC 61000-4-4	IEC 61000-4-4
Surge	IEC 61000-4-5	IEC 61000-4-5
Conducted	IEC 61000-4-6	IEC 61000-4-6
Power frequency magnetic field	IEC 61000-4-8	IEC 61000-4-8
Voltage dips and interruptions	IEC 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

Specifications (continued)

	HP ProCurve 6600-48G Switch (J9451A)	HP ProCurve 6600-48G-4XG Switch (J9452A)
Management	HP ProCurve Manager Plus; HP ProCurve Manager (included); command-line interface; Web browser; configuration menu; out-of-band management (serial RS-232C)	HP ProCurve Manager Plus; HP ProCurve Manager (included); command-line interface; Web browser; configuration menu; out-of-band management (serial RS-232C)
Notes	When using mini-GBICs with this product, mini-GBICs with revision "B" or later (product number ends with the letter "B" or later, e.g., J4858B, J4859C) are required. Gigabit 1000Base-T mini-GBIC (J8177B) is not supported on 6600 series switches.	When using mini-GBICs with this product, mini-GBICs with revision "B" or later (product number ends with the letter "B" or later, e.g., J4858B, J4859C) are required. Gigabit 1000Base-T mini-GBIC (J8177B) is not supported on 6600 series switches.
Services	Refer to the HP Web site at www.procurve.com/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 HP sales office.	Refer to the HP Web site at www.procurve.com/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 HP sales office.

Standards and protocols
(applies to all products in series)

Device management
RFC 1591 DNS (client)
HTML and telnet management

General protocols
IEEE 802.1ad Q-in-Q (Premium License)
IEEE 802.1D MAC Bridges
IEEE 802.1p Priority
IEEE 802.1Q VLANs
IEEE 802.1s Multiple Spanning Trees
IEEE 802.1v VLAN classification by Protocol and Port
IEEE 802.1w Rapid Reconfiguration of Spanning Tree
IEEE 802.3ad Link Aggregation Control Protocol (LACP)
IEEE 802.3x Flow Control
RFC 768 UDP
RFC 783 TFTP Protocol (revision 2)
RFC 792 ICMP
RFC 793 TCP
UDLD (Uni-directional Link Detection)
RFC 826 ARP
RFC 854 TELNET
RFC 868 Time Protocol
RFC 951 BOOTP
RFC 1058 RIPv1
RFC 1350 TFTP Protocol (revision 2)
RFC 1519 CIDR
RFC 1542 BOOTP Extensions
RFC 2030 Simple Network Time Protocol (SNTP) v4
RFC 2131 DHCP
RFC 2453 RIPv2
RFC 2548 (MS-RAS-Vendor only)
RFC 3046 DHCP Relay Agent Information Option
RFC 3576 Ext to RADIUS (CoA only)
RFC 3768 VRRP (Premium License)
RFC 4675 RADIUS VLAN & Priority

IP multicast
RFC 3376 IGMPv3 (host joins only)
RFC 3973 Draft 2 PIM Dense Mode (Premium License)
RFC 4601 Draft 10 PIM Sparse Mode (Premium License)

IPv6
RFC 1981 IPv6 Path MTU Discovery
RFC 2460 IPv6 Specification
RFC 2461 IPv6 Neighbor Discovery
RFC 2462 IPv6 Stateless Address Auto-configuration
RFC 2463 ICMPv6
RFC 2710 Multicast Listener Discovery (MLD) for IPv6
RFC 2925 Remote Operations MIB (Ping only)
RFC 3019 MLDv1 MIB
RFC 3315 DHCPv6 (client only)
RFC 3513 IPv6 Addressing Architecture
RFC 3596 DNS Extension for IPv6
RFC 3810 MLDv2 (host joins only)
RFC 4022 MIB for TCP
RFC 4113 MIB for UDP
RFC 4251 SSHv6 Architecture
RFC 4252 SSHv6 Authentication
RFC 4253 SSHv6 Transport Layer
RFC 4254 SSHv6 Connection
RFC 4293 MIB for IP
RFC 4419 Key Exchange for SSH
RFC 4541 IGMP & MLD Snooping Switch

MIBs
RFC 1213 MIB II
RFC 1493 Bridge MIB
RFC 1724 RIPv2 MIB
RFC 1850 OSPFv2 MIB
RFC 2021 RMONv2 MIB
RFC 2096 IP Forwarding Table MIB
RFC 2613 SMON MIB
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 2737 Entity MIB (Version 2)
RFC 2787 VRRP MIB
RFC 2863 The Interfaces Group MIB
RFC 2925 Ping MIB

Network management
IEEE 802.1AB Link Layer Discovery Protocol (LLDP)
RFC 2819 Four groups of RMON: 1 (statistics), 2 (history), 3 (alarm) and 9 (events)
RFC 3176 sFlow
ANSI/TIA-1057 LLDP Media Endpoint Discovery (LLDP-MED)
SNMPv1/v2c/v3
XRMON

OSPF
RFC 2328 OSPFv2 (Premium License)
RFC 3101 OSPF NSSA

QoS/Cos
RFC 2474 DiffServ Precedence, including 8 queues/port
RFC 2597 DiffServ Assured Forwarding (AF)
RFC 2598 DiffServ Expedited Forwarding (EF)

Security
IEEE 802.1X Port Based Network Access Control
RFC 1492 TACACS+
RFC 2865 RADIUS (client only)
RFC 2866 RADIUS Accounting
Secure Sockets Layer (SSL)
SSHv2 Secure Shell

HP ProCurve 6600 Switch Series accessories

NEW HP ProCurve 6600 Switch Power Supply (J9269A)
NEW HP ProCurve 6600 Switch Premium License (J9305A)
HP ProCurve Gigabit-SX-LC Mini-GBIC (J4858C)
HP ProCurve Gigabit-LX-LC Mini-GBIC (J4859C)
HP ProCurve Gigabit-LH-LC Mini-GBIC (J4860C)
NEW HP ProCurve 1000-BX-D SFP-LC Mini-GBIC (J9142B)
NEW HP ProCurve 1000-BX-U SFP-LC Mini-GBIC (J9143B)
HP ProCurve 100-FX SFP-LC Transceiver (J9054B)
NEW HP ProCurve 100-BX-D SFP-LC Transceiver (J9099B)
NEW HP ProCurve 100-BX-U SFP-LC Transceiver (J9100B)
NEW HP ProCurve 10-GbE SFP+ SR Transceiver (J9150A)
NEW HP ProCurve 10-GbE SFP+ LRM Transceiver (J9152A)
NEW HP ProCurve 10-GbE SFP+ LR Transceiver (J9151A)
NEW HP ProCurve 10-GbE SFP+ 1m Direct Attach Cable (J9281A)
NEW HP ProCurve 10-GbE SFP+ 3m Direct Attach Cable (J9283A)
NEW HP ProCurve 10-GbE SFP+ 7m Direct Attach Cable (J9285A)
NEW HP ProCurve 6600 Switch Fan Tray (J9271A)
HP ProCurve Manager 2.3 (-)

Products within this series have achieved sufficient scores in each of the rated criteria to achieve the Miercom Certified Green distinction Award. See the Specifications section of this series for more information.

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ProCurve Networking