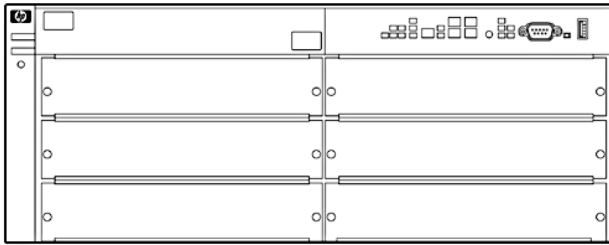
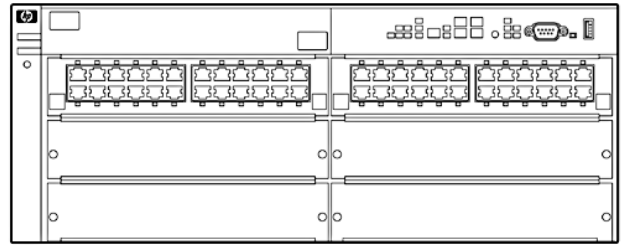


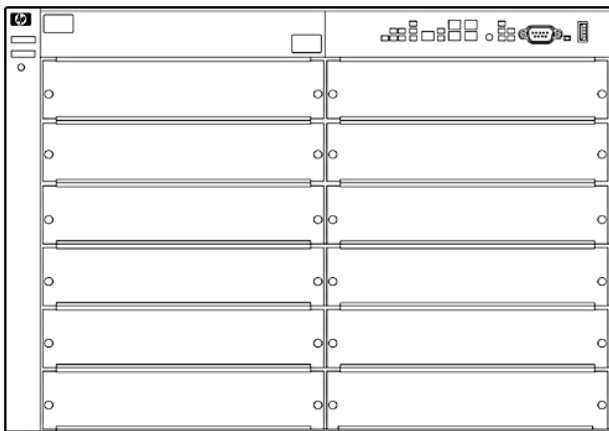
### Overview



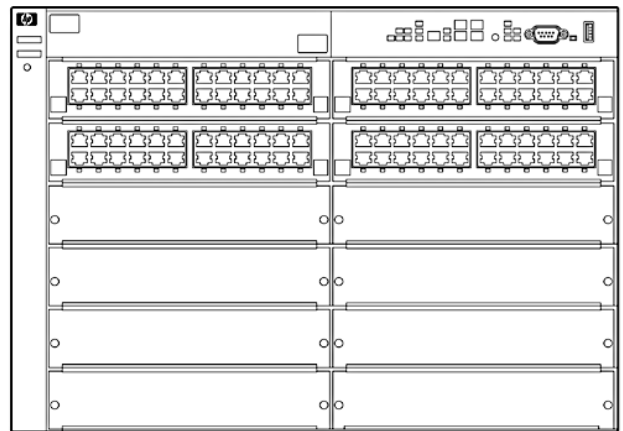
ProCurve Switch 5406zl Intelligent Edge



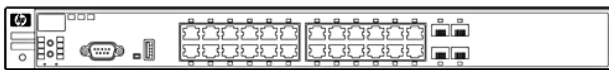
ProCurve Switch 5406zl-48G Intelligent Edge



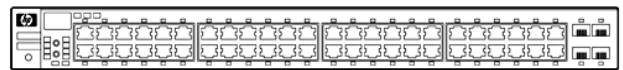
ProCurve Switch 5412zl Intelligent Edge



ProCurve Switch 5412zl-96G Intelligent Edge



ProCurve Switch 3500yl-24G-PWR Intelligent Edge



ProCurve Switch 3500yl-48G-PWR Intelligent Edge

### Models

ProCurve Switch 3500yl-24G-PWR Intelligent Edge	J8692A
ProCurve Switch 3500yl-48G-PWR Intelligent Edge	J8693A
ProCurve Switch 5406zl Intelligent Edge	J8697A
ProCurve Switch 5406zl-48G Intelligent Edge	J8699A
ProCurve Switch 5412zl Intelligent Edge	J8698A
ProCurve Switch 5412zl-96G Intelligent Edge	J8700A

### Overview

#### Introduction

The ProCurve Switch 5400zl/3500yl series consists of the most advanced intelligent edge switches in the ProCurve Networking product line. The 5400zl series includes 6-slot and 12-slot chassis and associated zl modules and bundles, and the 3500yl series includes 24-port and 48-port stackables. The foundation for all these switches is a purpose-built, programmable ProVision ASIC that allows the most demanding networking features, such as QoS and security, to be implemented in a scalable yet granular fashion. With a variety of Gigabit interfaces, integrated PoE on all 10/100/1000Base-T ports, 10-GbE capability, and a choice of form factors, the 5400zl/3500yl switches offer excellent investment protection, flexibility, and scalability, as well as ease of deployment, operation, and maintenance.

#### Features and Benefits

##### Management

- **NEW Remote Intelligent Mirroring:** mirrors ingress/egress ACL-selected traffic from a switch port or VLAN to a local or remote 8200zl/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
- **IEEE 802.1AB Link Layer Discovery Protocol (LLDP):** automated device discovery protocol for easy mapping by network management applications
- **NEW 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
- **Dual flash images:** provides independent primary and secondary OS files for backup while upgrading
- **Multiple configuration files:** multiple config files can be stored to the flash image
- **NEW USB support:**
  - **File copy:** allows users to copy switch files to/from a USB flash drive
- **NEW Uni-Directional Link Detection (UDLD):** monitors a link between two switches and blocks the ports on both ends of the link if the link goes down at any point between the two devices
- **Management simplicity:** ProCurve-common networking features and CLI implementation (common across ProCurve zl and yl switches)

##### Connectivity

- **IEEE 802.3af Power over Ethernet:** provides up to 15.4 W per port to IEEE 802.3af compliant PoE powered devices such as IP phones, wireless access points, and security cameras
- **Pre-standard PoE support:** detects and provides power to pre-standard PoE devices; see list of supported devices in the product FAQ at [www.procurve.com](http://www.procurve.com)
- **Jumbo frames:** on Gigabit and 10-Gigabit ports, allow high-performance remote backup and disaster-recovery services
- **Auto-MDIX:** automatically adjusts for straight-through or crossover cables on all 10/100/1000 ports
- **IPv6 ready:** switch hardware is capable of supporting IPv6 host, routing, and filtering with the ProVision ASIC; IPv6 operation and deployment will be available when enabled via a software update at a later date

##### Performance

- **5400zl/3500yl architecture:** 115 to 692 Gbps crossbar switching fabric provides intra- and inter-module switching with 36 to 428 million pps throughput on the purpose-built ProVision ASICs
- **NEW Selectable queue configurations:** increase performance by selecting the number of queues and associated memory buffering that best meet the requirements of your network applications

##### Resiliency and high availability

- **Virtual Router Redundancy Protocol** (requires Premium license): VRRP allows groups of two routers to dynamically back each

### Overview

other up to create highly available routed environments

- **IEEE 802.1s Multiple Spanning Tree Protocol:** provides high link availability in multiple VLAN environments by allowing multiple spanning trees; encompasses IEEE 802.1D Spanning Tree Protocol and IEEE 802.1w Rapid Spanning Tree Protocol
- **IEEE 802.3ad Link Aggregation Control Protocol (LACP) and ProCurve trunking:** support up to 36 trunks, each with up to 8 links (ports) per trunk; trunking across modules is supported
- **Hot-swappable modules (5400zl series):** permits modules, mini-GBICs, and power supplies in a redundant power supply configuration to be added or swapped without interrupting the network
- **Optional redundant power supply (5400zl series):** provides uninterrupted power and allows hot-swapping of the redundant power supplies when installed
- **Sparing simplicity:** ProCurve zl-common accessories (interface modules, power supplies)

### Layer 2 switching

- **ProCurve switch meshing:** dynamically load-balances across multiple active redundant links to increase available aggregate bandwidth
- **VLAN support and tagging:** supports the IEEE 802.1Q standard and 2,048 VLANs simultaneously
- **IEEE 802.1v protocol VLANs:** isolate select non-IPv4 protocols automatically into their own VLANs
- **GARP VLAN Registration Protocol:** allows automatic learning and dynamic assignment of VLANs

### Layer 3 services

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

### Layer 3 routing

- **Layer 3 IP routing:**
  - **Static IP routing:** provides basic routing
  - **RIP:** provides RIPv1 and RIPv2 routing at media speed
  - **OSPF:** includes ECMP to provide link redundancy/scalable bandwidth and NSSA

### Security

- **Switch CPU protection:** provides automatic protection against malicious network traffic trying to shut down the switch
- **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
- **ICMP throttling:** defeats ICMP denial-of-service attacks by enabling any switch port to automatically throttle ICMP traffic
- **Multiple user authentication methods:**
  - **IEEE 802.1X:** industry-standard way of user authentication using an IEEE 802.1X supplicant on the client in conjunction with a RADIUS server
  - **Web-based authentication:** similar to IEEE 802.1X, provides a browser-based environment to authenticate clients that do not support the IEEE 802.1X supplicant
  - **MAC-based authentication:** client is authenticated with the RADIUS server based on client's MAC address
- **Authentication flexibility:**
  - **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
  - **Concurrent IEEE 802.1X and Web or MAC authentication schemes per port:** switch port will accept any of IEEE 802.1X and either Web or MAC authentications
- **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
- **Identity-driven ACL:** enables implementation of a highly granular and flexible access security policy specific to each

### Overview

- authenticated network user
- **NEW DHCP protection:** blocks DHCP packets from unauthorized DHCP servers, preventing denial-of-service attacks
- **NEW BPDU port protection:** blocks Bridge Protocol Data Units (BPDU) on ports that do not require BPDUs, preventing forged BPDU attacks
- **NEW Dynamic IP lockdown:** works with DHCP protection to block traffic from unauthorized host, preventing IP source address spoofing
- **NEW Dynamic ARP protection:** blocks ARP broadcasts from unauthorized hosts, preventing eavesdropping or data theft of network data
- **NEW Detection of malicious attacks:** monitors 10 types of network traffic and sends a warning when an anomaly that potentially can be caused by malicious attacks is detected
- **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
- **Source-port filtering:** allows only specified ports to communicate with each other
- **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
- **Secure Sockets Layer (SSL):** encrypts all HTTP traffic, allowing secure access to the browser-based management GUI in the switch
- **Secure FTP:** allows secure file transfer to/from the switch; protects against unwanted file downloads or unauthorized copying of switch configuration file
- **Secure management access:** all access methods--CLI, GUI, or MIB--are securely encrypted through SSHv2, SSL, and/or SNMPv3
- **Switch management logon security:** can require either RADIUS or TACACS+ authentication for secure switch CLI logon
- **Security banner:** displays a customized security policy when users log in to the switch

### Convergence

- **IP multicast routing** (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
- **LLDP-MED** (Media Endpoint Discovery): a standard extension of LLDP that stores values for parameters such as QoS and VLAN to automatically configure network devices such as IP phones

### Quality of Service (QoS)

- **Layer 4 prioritization:** enables prioritization based on TCP/UDP port numbers
- **Traffic prioritization:** allows real-time traffic classification into 8 priority levels mapped to 8 queues
- **Bandwidth shaping:**
  - **Rate limiting:** per-port ingress/egress enforced maximum bandwidth
  - **Guaranteed minimum:** per-port, per-queue egress-based guaranteed minimum bandwidth
- **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

### Industry-leading warranty

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

## Services

### ProCurve Switch 3500yl-24G-PWR Intelligent Edge

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



### Overview

3-year, 24x7 SW phone support, software updates	UE262E
Installation with minimum configuration, system-based pricing	U4826E
Installation with HP-provided configuration, system-based pricing	U4830E
<b>ProCurve Switch 3500yl-48G-PWR Intelligent Edge</b>	
3-year, 4-hour onsite, 13x5 coverage for hardware	H4496E
3-year, 4-hour onsite, 24x7 coverage for hardware	H2893E
3-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone support	U6319E
3-year, 24x7 SW phone support, software updates	UE264E
Installation with minimum configuration, system-based pricing	U4826E
Installation with HP-provided configuration, system-based pricing	U4830E
<b>ProCurve Switch 5406zl Intelligent Edge</b>	
3-year, 4-hour onsite, 13x5 coverage for hardware	UE250E
3-year, 4-hour onsite, 13x5 coverage for hardware	H4496E
3-year, 4-hour onsite, 24x7 coverage for hardware	UE251E
3-year, 4-hour onsite, 24x7 coverage for hardware	H2893E
3-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone support	U6319E
3-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone support	UE252E
3-year, 24x7 SW phone support, software updates	UF786E
Installation with minimum configuration, system-based pricing	U4828E
Installation with HP-provided configuration, system-based pricing	U4832E
<b>ProCurve Switch 5406zl-48G Intelligent Edge</b>	
3-year, 4-hour onsite, 13x5 coverage for hardware	UE250E
3-year, 4-hour onsite, 13x5 coverage for hardware	H4496E
3-year, 4-hour onsite, 24x7 coverage for hardware	UE251E
3-year, 4-hour onsite, 24x7 coverage for hardware	H2893E
3-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone support	U6319E
3-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone support	UE252E
3-year, 24x7 SW phone support, software updates	UF786E
Installation with minimum configuration, system-based pricing	U4828E
Installation with HP-provided configuration, system-based pricing	U4832E
<b>ProCurve Switch 5412zl Intelligent Edge</b>	
3-year, 4-hour onsite, 13x5 coverage for hardware	UE253E
3-year, 4-hour onsite, 24x7 coverage for hardware	UE254E
3-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone support	UE255E
3-year, 24x7 SW phone support, software updates	UF788E
Installation with minimum configuration, system-based pricing	U4828E
Installation with HP-provided configuration, system-based pricing	U4832E
<b>ProCurve Switch 5412zl-96G Intelligent Edge</b>	
3-year, 4-hour onsite, 13x5 coverage for hardware	UE253E
3-year, 4-hour onsite, 24x7 coverage for hardware	UE254E
3-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone support	UE255E
3-year, 24x7 SW phone support, software updates	UF788E
Installation with minimum configuration, system-based pricing	U4828E
Installation with HP-provided configuration, system-based pricing	U4832E

### Technical Specifications

ProCurve Switch 3500yl- Ports  
24G-PWR Intelligent Edge  
(J8692A)

	1 open module slot
	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
	1 RS-232C DB-9 console port
	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) with PoE or an open mini-GBIC slot (for use with mini-GBIC transceivers)
	<b>Maximum ports</b> Supports a maximum of 4 10-GbE ports
<b>Physical characteristics</b>	<b>Dimensions</b> 15.43(d) x 17.44(w) x 1.73(h) in. (39.2 x 44.3 x 4.4 cm) (1U height)
	<b>Weight (fully loaded)</b> 14.11 lb. (6.4 kg)
<b>Memory and processor</b>	<b>10G module</b> ARM9 @ 200 MHz; packet buffer size: 36 Mb QDR SDRAM
	<b>Management Module</b> Stackable memory and processor: Freescale PowerPC 8540 @ 666 MHz, 4 MB flash, 128 MB compact flash, 256 MB DDR SDRAM
<b>Mounting</b>	Mounts in an EIA-standard 19 in. telco rack or equipment cabinet (hardware included); horizontal surface mounting only
<b>Performance</b>	<b>Latency</b> 1000 Mb: < 3.7 $\mu$ s (FIFO 64-byte packets); 10 Gbps: < 2.1 $\mu$ s (FIFO 64-byte packets)
	<b>Throughput</b> up to 74 million pps
	<b>Routing/Switching capacity</b> 101 Gbps
	<b>Switch fabric speed</b> 115 Gbps
	<b>Routing table size</b> 10,000 entries
<b>Environment</b>	<b>Operating temperature</b> 32°F to 131°F (0°C to 55°C); 32°F to 104°F (40°C) when used with any X2 10-GbE
	<b>Operating relative humidity</b> 15% to 95% @ 104°F (40°C), non-condensing
	<b>Non-operating/Storage temperature</b> -40°F to 158°F (-40°C to 70°C)
	<b>Non-operating/Storage relative humidity</b> 15% to 90% @ 149°F (65°C), non-condensing
	<b>Altitude</b> up to 15,000 ft. (4.6 km)
	<b>Acoustic</b> Power: 52.7 dB, Pressure: 44.8 dB ISO 7779, ISO 9296
<b>Electrical characteristics</b>	<b>Description</b> The switch automatically adjusts to any voltage between 100-127 and 200-240 volts and either 50 or 60 Hz
	<b>Maximum heat dissipation</b> 670 BTU/hr (706 kJ/hr), (max non-PoE); 940 BTU/hr (991 kJ/hr) (max using PoE)
	<b>Voltage</b> 100-127 / 200-240 VAC
	<b>Current</b> 10.0 / 5.0 A

### Technical Specifications

	<b>Power consumption</b>	723 W
	<b>Frequency</b>	50 / 60 Hz
	<b>Notes</b>	Maximum power draw if not using any PoE power is 200 W (1.8 A @ 110 V, 0.9 A @ 220 V). Full load switch only heat spec listed above subtracts heat dissipated in external PoE powered devices. Heat dissipation does not include heat dissipated by the PoE powered devices themselves.
<b>Safety</b>		CSA 22.2 No. 60950; UL 60950; IEC 60950; EN 60950
<b>Emissions</b>		FCC Class A; VCCI Class A; EN 55022/CISPR 22 Class A
<b>Immunity</b>	<b>EN</b>	EN 55024, CISPR 24
	<b>ESD</b>	IEC 61000-4-2; 4 kV CD, 8 kV AD
	<b>Radiated</b>	IEC 61000-4-3; 3 V/m
	<b>EFT/Burst</b>	IEC 61000-4-4; 1.0 kV (power line), 0.5 kV (signal line)
	<b>Surge</b>	IEC 61000-4-5; 1 kV/2 kV AC
	<b>Conducted</b>	IEC 61000-4-6; 3 V
	<b>Power frequency magnetic field</b>	IEC 61000-4-8; 1 A/m, 50 or 60 Hz
	<b>Voltage dips and interruptions</b>	IEC 61000-4-11; >95% reduction, 0.5 period; 30% reduction, 25 periods
	<b>Harmonics</b>	EN 61000-3-2, IEC 61000-3-2
	<b>Flicker</b>	EN 61000-3-3, IEC 61000-3-3
<b>Management</b>		ProCurve Manager Plus; ProCurve Manager (included); command-line interface; Web browser; configuration menu; out-of-band management (serial RS-232C)
<b>Standards and protocols</b>	<b>Device Management</b>	RFC 1591 DNS (client) HTML and telnet management
	<b>General Protocols</b>	IEEE 802.1D MAC Bridges IEEE 802.1p Priority IEEE 802.1Q VLANs IEEE 802.1s Multiple Spanning Trees IEEE 802.1w Rapid Reconfiguration of Spanning Tree IEEE 802.3ad Link Aggregation Control Protocol (LACP) IEEE 802.3af Power over Ethernet IEEE 802.3x Flow Control RFC 768 UDP RFC 783 TFTP Protocol (revision 2) RFC 792 ICMP RFC 793 TCP RFC 826 ARP RFC 854 TELNET RFC 951 BOOTP RFC 1058 RIPv1 RFC 1519 CIDR

### Technical Specifications

	RFC 1542 BOOTP Extensions
	RFC 2030 Simple Network Time Protocol (SNTP) v4
	RFC 2131 DHCP
	RFC 2453 RIPv2
	RFC 3046 DHCP Relay Agent Information Option
	RFC 3768 VRRP (Premium License)
	UDLD (Uni-directional Link Detection)
<b>IP Multicast</b>	RFC 2362 PIM Sparse Mode (Premium License)
	RFC 3376 IGMPv3 (host joins only)
	RFC 3973 PIM Dense Mode (Premium License)
<b>MIBs</b>	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
<b>Network Management</b>	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
<b>OSPF</b>	RFC 2328 OSPFv2 (Premium License)
	RFC 3101 OSPF NSSA
<b>QoS/Cos</b>	RFC 2474 DiffServ Precedence, including 8 queues/port
	RFC 2597 DiffServ Assured Forwarding (AF)
	RFC 2598 DiffServ Expedited Forwarding (EF)
<b>Security</b>	IEEE 802.1X Port Based Network Access Control
	RFC 1492 TACACS+
	RFC 2138 RADIUS Authentication
	RFC 2866 RADIUS Accounting
	Secure Sockets Layer (SSL)
	SSHv1/SSHv2 Secure Shell



### Technical Specifications

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. J8177B Gigabit 1000Base-T mini-GBIC is not supported on the 3500yl series switches.	
<hr/>		
3500yl-48G-PWR Intelligent Edge (J8693A)	Ports	<p>1 open module slot</p> <p>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</p> <p>1 RS-232C DB-9 console port</p> <p>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) with PoE or an open mini-GBIC slot (for use with mini-GBIC transceivers)</p>
Physical characteristics	Maximum ports	Supports a maximum of 4 10-GbE ports
Physical characteristics	Dimensions	16.93(d) x 17.44(w) x 1.73(h) in. (43.0 x 44.3 x 4.4 cm) (1U height)
Physical characteristics	Weight (fully loaded)	16.09 lb. (7.3 kg)
Memory and processor	10G module	ARM9 @ 200 MHz; packet buffer size: 36 Mb QDR SDRAM
Memory and processor	Management Module	Stackable memory and processor: Freescale PowerPC 8540 @ 666 MHz, 4 MB flash Mb, 128 MB compact flash, 256 MB DDR SDRAM
Mounting	Mounts in an EIA-standard 19 in. telco rack or equipment cabinet (hardware included); horizontal surface mounting only	
Performance	Latency	1000 Mb: < 3.7 $\mu$ s (FIFO 64-byte packets); 10 Gbps: < 2.1 $\mu$ s (FIFO 64-byte packets)
Performance	Throughput	up to 110 million pps
Performance	Routing/Switching capacity	148 Gbps
Performance	Switch fabric speed	173 Gbps
Performance	Routing table size	10,000 entries
Environment	Operating temperature	32°F to 131°F (0°C to 55°C); 32°F to 104°F (40°C) when used with any X2 10-GbE
Environment	Operating relative humidity	15% to 95% @ 104°F (40°C), non-condensing
Environment	Non-operating/Storage temperature	-40°F to 158°F (-40°C to 70°C)
Environment	Non-operating/Storage relative humidity	15% to 95% @ 149°F (65°C), non-condensing
Environment	Altitude	up to 15,000 ft. (4.6 km)
Environment	Acoustic	Power: 55.1 dB, Pressure: 45.3 dB ISO 7779, ISO 9296
Electrical characteristics	Description	The switch automatically adjusts to any voltage between 100-127 and 200-240 volts and either

### Technical Specifications

		50 or 60 Hz
	<b>Maximum heat dissipation</b>	810 BTU/hr (854 kJ/hr), (max non-PoE); 1,090 BTU/hr (1149 kJ/hr) (max using PoE)
	<b>Voltage</b>	100-127 / 200-240 VAC
	<b>Current</b>	10.0 / 5.0 A
	<b>Power consumption</b>	759 W
	<b>Frequency</b>	50 / 60 Hz
	<b>Notes</b>	Maximum power draw if not using any PoE power is 200 W (1.8 A @ 110 V, 0.9 A @ 220 V). Heat dissipation does not include heat dissipated by the PoE powered devices themselves.
<b>Safety</b>		CSA 22.2 No. 60950; UL 60950; IEC 60950; EN 60950
<b>Emissions</b>		FCC Class A; VCCI Class A; EN 55022/CISPR 22 Class A
<b>Immunity</b>	<b>EN</b>	EN 55024, CISPR 24
	<b>ESD</b>	IEC 61000-4-2; 4 kV CD, 8 kV AD
	<b>Radiated</b>	IEC 61000-4-3; 3 V/m
	<b>EFT/Burst</b>	IEC 61000-4-4; 1.0 kV (power line), 0.5 kV (signal line)
	<b>Surge</b>	IEC 61000-4-5; 1 kV/2 kV AC
	<b>Conducted</b>	IEC 61000-4-6; 3 V
	<b>Power frequency magnetic field</b>	IEC 61000-4-8; 1 A/m, 50 or 60 Hz
	<b>Voltage dips and interruptions</b>	IEC 61000-4-11; >95% reduction, 0.5 period; 30% reduction, 25 periods
	<b>Harmonics</b>	EN 61000-3-2, IEC 61000-3-2
	<b>Flicker</b>	EN 61000-3-3, IEC 61000-3-3
<b>Management</b>		ProCurve Manager Plus; ProCurve Manager (included); command-line interface; Web browser; configuration menu; out-of-band management (serial RS-232C)
<b>Standards and protocols</b>	<b>Device Management</b>	RFC 1591 DNS (client) HTML and telnet management
	<b>General Protocols</b>	IEEE 802.1D MAC Bridges IEEE 802.1p Priority IEEE 802.1Q VLANs IEEE 802.1s Multiple Spanning Trees IEEE 802.1w Rapid Reconfiguration of Spanning Tree IEEE 802.3ad Link Aggregation Control Protocol (LACP) IEEE 802.3af Power over Ethernet IEEE 802.3x Flow Control RFC 768 UDP RFC 783 TFTP Protocol (revision 2) RFC 792 ICMP RFC 793 TCP RFC 826 ARP

### Technical Specifications

	RFC 854 TELNET
	RFC 951 BOOTP
	RFC 1058 RIPv1
	RFC 1519 CIDR
	RFC 1542 BOOTP Extensions
	RFC 2030 Simple Network Time Protocol (SNTP) v4
	RFC 2131 DHCP
	RFC 2453 RIPv2
	RFC 3046 DHCP Relay Agent Information Option
	RFC 3768 VRRP (Premium License)
	UDLD (Uni-directional Link Detection)
<b>IP Multicast</b>	RFC 2362 PIM Sparse Mode (Premium License)
	RFC 3376 IGMPv3 (host joins only)
	RFC 3973 PIM Dense Mode (Premium License)
<b>MIBs</b>	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
<b>Network Management</b>	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
<b>OSPF</b>	RFC 2328 OSPFv2 (Premium License)
	RFC 3101 OSPF NSSA
<b>QoS/Cos</b>	RFC 2474 DiffServ Precedence, including 8 queues/port
	RFC 2597 DiffServ Assured Forwarding (AF)
	RFC 2598 DiffServ Expedited Forwarding (EF)

### Technical Specifications

<b>Security</b>	IEEE 802.1X Port Based Network Access Control RFC 1492 TACACS+ RFC 2138 RADIUS Authentication RFC 2866 RADIUS Accounting Secure Sockets Layer (SSL) SSHv1/SSHv2 Secure Shell
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**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. J8177B Gigabit 1000Base-T mini-GBIC is not supported on the 3500yl series switches.

<b>ProCurve Switch 5406zl Intelligent Edge (J8697A)</b>	<b>Ports</b>	6 open module slots 1 RS-232C DB-9 console port
	<b>Maximum ports</b>	Supports a maximum of 144 auto-sensing 10/100/1000 ports or 24 10-GbE ports or 144 mini-GBICs, or a combination
	<b>Power supplies</b>	2 open power supply slots
	<b>Physical characteristics</b>	<b>Dimensions</b> 17.75(d) x 17.5(w) x 6.9(h) in. (45.09 x 44.45 x 17.53 cm) (4U height)
		<b>Weight (fully loaded)</b> 23.55 lb. (10.68 kg)
	<b>Memory and processor</b>	<b>10G module</b> ARM9 @ 200 MHz; packet buffer size: 36 Mb QDR SDRAM
		<b>Management Module</b> Freescale PowerPC 8540 @ 666 MHz, 4 MB flash Mb, 128 MB compact flash, 256 MB DDR SDRAM
		<b>Gigabit Module</b> ARM9 @ 200 MHz; packet buffer size: 144 Mb QDR SDRAM
	<b>Mounting</b>	Mounts in an EIA-standard 19 in. telco rack or equipment cabinet (hardware included); horizontal surface mounting only
	<b>Performance</b>	<b>Latency</b> 1000 Mb: < 3.7 $\mu$ s (FIFO 64-byte packets); 10 Gbps: < 2.1 $\mu$ s (FIFO 64-byte packets)
		<b>Throughput</b> up to 214 million pps
		<b>Routing/Switching capacity</b> 288 Gbps
		<b>Switch fabric speed</b> 346 Gbps
		<b>Routing table size</b> 10,000 entries
	<b>Environment</b>	<b>Operating temperature</b> 32°F to 131°F (0°C to 55°C); 0°C to 40°C with J8705A, J8706A, or J8707A modules installed
		<b>Operating relative humidity</b> 15% to 95% @ 131°F (55°C), non-condensing
		<b>Non-operating/Storage temperature</b> -40°F to 158°F (-40°C to 70°C)
		<b>Non-operating/Storage relative humidity</b> 15% to 95% @ 149°F (65°C), non-condensing
		<b>Altitude</b> up to 15,000 ft. (4.6 km)

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	<b>Acoustic</b>	Power: 57 dB, Pressure: 40.2 dB ISO 7779, ISO 9296
<b>Electrical characteristics</b>	<b>Description</b>	Chassis ships without power supplies. Two power-supply slots available; two different power supplies available. See power-supply products for additional specifications.
	<b>Maximum heat dissipation</b>	2450 BTU/hr (2584 kJ/hr), (max non-PoE); 3700 BTU/hr (3903 kJ/hr) (max using PoE)
	<b>Voltage</b>	100-127 / 200-240 VAC
	<b>Frequency</b>	50 / 60 Hz
	<b>Notes</b>	Power supplies must be ordered separately. One J8712A or J8713A can power the J8697A chassis. Heat dissipation does not include heat dissipated by the PoE powered devices themselves.
<b>Safety</b>	CSA 22.2 No. 60950; UL 60950; IEC 60950; EN 60950	
<b>Emissions</b>	FCC Class A; VCCI Class A; EN 55022/CISPR 22 Class A	
<b>Immunity</b>	<b>EN</b>	EN 55024, CISPR 24
	<b>ESD</b>	IEC 61000-4-2; 4 kV CD, 8 kV AD
	<b>Radiated</b>	IEC 61000-4-3; 3 V/m
	<b>EFT/Burst</b>	IEC 61000-4-4; 1.0 kV (power line), 0.5 kV (signal line)
	<b>Surge</b>	IEC 61000-4-5; 1 kV/2 kV AC
	<b>Conducted</b>	IEC 61000-4-6; 3 V
	<b>Power frequency magnetic field</b>	IEC 61000-4-8; 1 A/m, 50 or 60 Hz
	<b>Voltage dips and interruptions</b>	IEC 61000-4-11; >95% reduction, 0.5 period; 30% reduction, 25 periods
	<b>Harmonics</b>	EN 61000-3-2, IEC 61000-3-2
	<b>Flicker</b>	EN 61000-3-3, IEC 61000-3-3
	<b>Management</b>	ProCurve Manager Plus; ProCurve Manager (included); command-line interface; Web browser; configuration menu; out-of-band management (serial RS-232C)
<b>Standards and protocols</b>	<b>Device Management</b>	RFC 1591 DNS (client) HTML and telnet management
	<b>General Protocols</b>	IEEE 802.1D MAC Bridges IEEE 802.1p Priority IEEE 802.1Q VLANs IEEE 802.1s Multiple Spanning Trees IEEE 802.1w Rapid Reconfiguration of Spanning Tree IEEE 802.3ad Link Aggregation Control Protocol (LACP) IEEE 802.3af Power over Ethernet IEEE 802.3x Flow Control RFC 768 UDP RFC 783 TFTP Protocol (revision 2)

### Technical Specifications

	RFC 792 ICMP
	RFC 793 TCP
	RFC 826 ARP
	RFC 854 TELNET
	RFC 951 BOOTP
	RFC 1058 RIPv1
	RFC 1519 CIDR
	RFC 1542 BOOTP Extensions
	RFC 2030 Simple Network Time Protocol (SNTP) v4
	RFC 2131 DHCP
	RFC 2453 RIPv2
	RFC 3046 DHCP Relay Agent Information Option
	RFC 3768 VRRP (Premium License)
	UDLD (Uni-directional Link Detection)
<b>IP Multicast</b>	RFC 2362 PIM Sparse Mode (Premium License)
	RFC 3376 IGMPv3 (host joins only)
	RFC 3973 PIM Dense Mode (Premium License)
<b>MIBs</b>	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
<b>Network Management</b>	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
<b>OSPF</b>	RFC 2328 OSPFv2 (Premium License)
	RFC 3101 OSPF NSSA
<b>QoS/Cos</b>	RFC 2474 DiffServ Precedence, including 8 queues/port
	RFC 2597 DiffServ Assured Forwarding (AF)
	RFC 2598 DiffServ Expedited Forwarding (EF)

### Technical Specifications

<b>Security</b>	IEEE 802.1X Port Based Network Access Control RFC 1492 TACACS+ RFC 2138 RADIUS Authentication RFC 2866 RADIUS Accounting Secure Sockets Layer (SSL) SSHv1/SSHv2 Secure Shell
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**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.

<b>ProCurve Switch 5406zl-48G Intelligent Edge (J8699A)</b>	<b>Included accessories</b>	2 ProCurve Switch zl 24-Port 10/100/1000 PoE Module (J8702A) 1 ProCurve Switch zl 875W Power Supply (J8712A)
	<b>Ports</b>	4 open module slots 48 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 1 RS-232C DB-9 console port
	<b>Maximum ports</b>	Supports a maximum of 144 auto-sensing 10/100/1000 ports or 16 10-GbE ports or 96 mini-GBICs, or a combination
	<b>Power supplies</b>	includes: 1 x J8712A 1 open power supply slots
	<b>Physical characteristics</b>	<b>Dimensions</b> 17.75(d) x 17.5(w) x 6.9(h) in. (45.09 x 44.45 x 17.53 cm) (4U height)
		<b>Weight (fully loaded)</b> 34.26 lb. (15.54 kg)
	<b>Memory and processor</b>	<b>Gigabit Module</b> ARM9 @ 200 MHz; packet buffer size: 144 Mb QDR SDRAM
		<b>10G Module</b> ARM9 @ 200 MHz; packet buffer size: 36 Mb QDR SDRAM
		<b>Management Module</b> Freescale PowerPC 8540 @ 666 MHz, 4 MB flash Mb, 128 MB compact flash, 256 MB DDR SDRAM
	<b>Mounting</b>	Mounts in an EIA-standard 19 in. telco rack or equipment cabinet (hardware included); horizontal surface mounting only
	<b>Performance</b>	<b>Latency</b> 1000 Mb: < 3.7 $\mu$ s (FIFO 64-byte packets); 10 Gbps: < 2.1 $\mu$ s (FIFO 64-byte packets)
		<b>Throughput</b> up to 214 million pps
		<b>Routing/Switching capacity</b> 288 Gbps
		<b>Switch fabric speed</b> 346 Gbps
		<b>Routing table size</b> 10,000 entries
	<b>Environment</b>	<b>Operating temperature</b> 32°F to 131°F (0°C to 55°C); 0°C to 40°C with J8705A, J8706A, or J8707A modules installed
		<b>Operating relative humidity</b> 15% to 95% @ 131°F (55°C), non-condensing

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	Non-operating/ Storage temperature	-40°F to 158°F (-40°C to 70°C)
	Non-operating/ Storage relative humidity	15% to 95% @ 149°F (65°C), non-condensing
	Altitude	up to 15,000 ft. (4.6 km)
	Acoustic	Power: 57 dB, Pressure: 40.2 dB ISO 7779, ISO 9296
Electrical characteristics	Description	One J8712A installed. One open power-supply slot available; two different power supplies available. See power-supply products for additional specifications.
	Maximum heat dissipation	2450 BTU/hr (2584 kJ/hr), (max non-PoE); 3700 BTU/hr (3903 kJ/hr) (max using PoE)
	Voltage	100-127 / 200-240 VAC
	Frequency	50 / 60 Hz
	Notes	Heat dissipation does not include heat dissipated by the PoE powered devices themselves.
Safety		CSA 22.2 No. 60950; UL 60950; IEC 60950; EN 60950
Emissions		FCC Class A; VCCI Class A; EN 55022/CISPR 22 Class A
Immunity	EN	EN 55024, CISPR 24
	ESD	IEC 61000-4-2; 4 kV CD, 8 kV AD
	Radiated	IEC 61000-4-3; 3 V/m
	EFT/Burst	IEC 61000-4-4; 1.0 kV (power line), 0.5 kV (signal line)
	Surge	IEC 61000-4-5; 1 kV/2 kV AC
	Conducted	IEC 61000-4-6; 3 V
	Power frequency magnetic field	IEC 61000-4-8; 1 A/m, 50 or 60 Hz
	Voltage dips and interruptions	IEC 61000-4-11; >95% reduction, 0.5 period; 30% reduction, 25 periods
	Harmonics	EN 61000-3-2, IEC 61000-3-2
	Flicker	EN 61000-3-3, IEC 61000-3-3
Management		ProCurve Manager Plus; ProCurve Manager (included); command-line interface; Web browser; configuration menu; out-of-band management (serial RS-232C)
Standards and protocols	Device Management	RFC 1591 DNS (client) HTML and telnet management
	General Protocols	IEEE 802.1D MAC Bridges IEEE 802.1p Priority IEEE 802.1Q VLANs IEEE 802.1s Multiple Spanning Trees IEEE 802.1w Rapid Reconfiguration of Spanning Tree IEEE 802.3ad Link Aggregation Control Protocol (LACP) IEEE 802.3af Power over Ethernet



### Technical Specifications

	IEEE 802.3x Flow Control
	RFC 768 UDP
	RFC 783 TFTP Protocol (revision 2)
	RFC 792 ICMP
	RFC 793 TCP
	RFC 826 ARP
	RFC 854 TELNET
	RFC 951 BOOTP
	RFC 1058 RIPv1
	RFC 1519 CIDR
	RFC 1542 BOOTP Extensions
	RFC 2030 Simple Network Time Protocol (SNTP) v4
	RFC 2131 DHCP
	RFC 2453 RIPv2
	RFC 3046 DHCP Relay Agent Information Option
	RFC 3768 VRRP (Premium License)
	UDLD (Uni-directional Link Detection)
<b>IP Multicast</b>	RFC 2362 PIM Sparse Mode (Premium License)
	RFC 3376 IGMPv3 (host joins only)
	RFC 3973 PIM Dense Mode (Premium License)
<b>MIBs</b>	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
<b>Network Management</b>	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
<b>OSPF</b>	RFC 2328 OSPFv2 (Premium License)
	RFC 3101 OSPF NSSA

### Technical Specifications

<b>QoS/Cos</b>	RFC 2474 DiffServ Precedence, including 8 queues/port RFC 2597 DiffServ Assured Forwarding (AF) RFC 2598 DiffServ Expedited Forwarding (EF)
<b>Security</b>	IEEE 802.1X Port Based Network Access Control RFC 1492 TACACS+ RFC 2138 RADIUS Authentication RFC 2866 RADIUS Accounting Secure Sockets Layer (SSL) SSHv1/SSHv2 Secure Shell

**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.

<b>ProCurve Switch 5412zl Intelligent Edge (J8698A)</b>	<b>Ports</b>	12 open module slots 1 RS-232C DB-9 console port
	<b>Maximum ports</b>	Supports a maximum of 288 auto-sensing 10/100/1000 ports or 48 10-GbE ports or 288 mini-GBICs, or a combination
	<b>Power supplies</b>	4 open power supply slots
	<b>Physical characteristics</b>	<b>Dimensions</b> 17.75(d) x 17.5(w) x 12.1(h) in. (45.09 x 44.45 x 30.73 cm) (7U height)
		<b>Weight (fully loaded)</b> 34.94 lb. (15.85 kg)
	<b>Memory and processor</b>	<b>Gigabit Module</b> ARM9 @ 200 MHz; packet buffer size: 144 Mb QDR SDRAM
		<b>10G Module</b> ARM9 @ 200 MHz; packet buffer size: 36 Mb QDR SDRAM
		<b>Management Module</b> Freescale PowerPC 8540 @ 666 MHz, 4 MB flash Mb, 128 MB compact flash, 256 MB DDR SDRAM
	<b>Mounting</b>	Mounts in an EIA-standard 19 in. telco rack or equipment cabinet (hardware included); horizontal surface mounting only
	<b>Performance</b>	<b>Latency</b> 1000 Mb: < 3.7 $\mu$ s (FIFO 64-byte packets); 10 Gbps: < 2.1 $\mu$ s (FIFO 64-byte packets)
		<b>Throughput</b> up to 428 million pps
		<b>Routing/Switching capacity</b> 576 Gbps
		<b>Switch fabric speed</b> 692 Gbps
		<b>Routing table size</b> 10,000 entries
	<b>Environment</b>	<b>Operating temperature</b> 32°F to 131°F (0°C to 55°C); 0°C to 40°C with J8705A, J8706A, or J8707A modules installed
		<b>Operating relative humidity</b> 15% to 95% @ 131°F (55°C), non-condensing
		<b>Non-operating/Storage temperature</b> -40°F to 158°F (-40°C to 70°C)

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	<b>Non-operating/ Storage relative humidity</b>	15% to 95% @ 149°F (65°C), non-condensing
	<b>Altitude</b>	up to 15,000 ft. (4.6 km)
	<b>Acoustic</b>	Power: 64 dB, Pressure: 57.5 dB ISO 7779, ISO 9296
<b>Electrical characteristics</b>	<b>Description</b>	Chassis ships without power supplies. Four power-supply slots available; two different power supplies available. See power-supply products for additional specifications.
	<b>Maximum heat dissipation</b>	4900 BTU/hr (5169 kJ/hr), (max non-PoE); 7400 BTU/hr (7,807 kJ/hr) (max using PoE)
	<b>Voltage</b>	100-127 / 200-240 VAC
	<b>Frequency</b>	50 / 60 Hz
	<b>Notes</b>	Power supplies must be ordered separately. A combination of two power supplies either J8712A or J8713A is required to power the J8698A chassis. Heat dissipation does not include heat dissipated by the PoE powered devices themselves.
<b>Safety</b>		CSA 22.2 No. 60950; UL 60950; IEC 60950; EN 60950
<b>Emissions</b>		FCC Class A; VCCI Class A; EN 55022/CISPR 22 Class A
<b>Immunity</b>	<b>EN</b>	EN 55024, CISPR 24
	<b>ESD</b>	IEC 61000-4-2; 4 kV CD, 8 kV AD
	<b>Radiated</b>	IEC 61000-4-3; 3 V/m
	<b>EFT/Burst</b>	IEC 61000-4-4; 1.0 kV (power line), 0.5 kV (signal line)
	<b>Surge</b>	IEC 61000-4-5; 1 kV/2 kV AC
	<b>Conducted</b>	IEC 61000-4-6; 3 V
	<b>Power frequency magnetic field</b>	IEC 61000-4-8; 1 A/m, 50 or 60 Hz
	<b>Voltage dips and interruptions</b>	IEC 61000-4-11; >95% reduction, 0.5 period; 30% reduction, 25 periods
	<b>Harmonics</b>	EN 61000-3-2, IEC 61000-3-2
	<b>Flicker</b>	EN 61000-3-3, IEC 61000-3-3
<b>Management</b>		ProCurve Manager Plus; ProCurve Manager (included); command-line interface; Web browser; configuration menu; out-of-band management (serial RS-232C)
<b>Standards and protocols</b>	<b>Device Management</b>	RFC 1591 DNS (client) HTML and telnet management
	<b>General Protocols</b>	IEEE 802.1D MAC Bridges IEEE 802.1p Priority IEEE 802.1Q VLANs IEEE 802.1s Multiple Spanning Trees IEEE 802.1w Rapid Reconfiguration of Spanning Tree IEEE 802.3ad Link Aggregation Control Protocol

### Technical Specifications

	(LACP)
	IEEE 802.3af Power over Ethernet
	IEEE 802.3x Flow Control
	RFC 768 UDP
	RFC 783 TFTP Protocol (revision 2)
	RFC 792 ICMP
	RFC 793 TCP
	RFC 826 ARP
	RFC 854 TELNET
	RFC 951 BOOTP
	RFC 1058 RIPv1
	RFC 1519 CIDR
	RFC 1542 BOOTP Extensions
	RFC 2030 Simple Network Time Protocol (SNTP) v4
	RFC 2131 DHCP
	RFC 2453 RIPv2
	RFC 3046 DHCP Relay Agent Information Option
	RFC 3768 VRRP (Premium License)
	UDLD (Uni-directional Link Detection)
<b>IP Multicast</b>	RFC 2362 PIM Sparse Mode (Premium License)
	RFC 3376 IGMPv3 (host joins only)
	RFC 3973 PIM Dense Mode (Premium License)
<b>MIBs</b>	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
<b>Network Management</b>	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
<b>OSPF</b>	RFC 2328 OSPFv2 (Premium License)
	RFC 3101 OSPF NSSA

### Technical Specifications

<b>QoS/Cos</b>	RFC 2474 DiffServ Precedence, including 8 queues/port RFC 2597 DiffServ Assured Forwarding (AF) RFC 2598 DiffServ Expedited Forwarding (EF)
<b>Security</b>	IEEE 802.1X Port Based Network Access Control RFC 1492 TACACS+ RFC 2138 RADIUS Authentication RFC 2866 RADIUS Accounting Secure Sockets Layer (SSL) SSHv1/SSHv2 Secure Shell

**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.

<b>ProCurve Switch 5412zl-96G Intelligent Edge (J8700A)</b>	<b>Included accessories</b>	4 ProCurve Switch zl 24-Port 10/100/1000 PoE Module (J8702A) 2 ProCurve Switch zl 875W Power Supply (J8712A)
	<b>Ports</b>	8 open module slots 96 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 1 RS-232C DB-9 console port
	<b>Maximum ports</b>	Supports a maximum of 288 auto-sensing 10/100/1000 ports or 32 10-GbE ports or 192 mini-GBICs, or a combination
	<b>Power supplies</b>	includes: 2 x J8712A 2 open power supply slots
	<b>Physical characteristics</b>	<b>Dimensions</b> 17.75(d) x 17.5(w) x 12.1(h) in. (45.09 x 44.45 x 30.73 cm) (7U height)
		<b>Weight (fully loaded)</b> 58 lb. (26.31 kg)
	<b>Memory and processor</b>	<b>Gigabit Module</b> ARM9 @ 200 MHz; packet buffer size: 144 Mb QDR SDRAM
		<b>10G Module</b> ARM9 @ 200 MHz; packet buffer size: 144 Mb QDR SDRAM
		<b>Management Module</b> Freescale PowerPC 8540 @ 666 MHz, 4 MB flash Mb, 128 MB compact flash, 256 MB DDR SDRAM
	<b>Mounting</b>	Mounts in an EIA-standard 19 in. telco rack or equipment cabinet (hardware included); horizontal surface mounting only
	<b>Performance</b>	<b>Latency</b> 1000 Mb: < 3.7 $\mu$ s (FIFO 64-byte packets); 10 Gbps: < 2.1 $\mu$ s (FIFO 64-byte packets)
		<b>Throughput</b> up to 428 million pps
		<b>Routing/Switching capacity</b> 576 Gbps
		<b>Switch fabric speed</b> 692 Gbps
		<b>Routing table size</b> 10,000 entries
	<b>Environment</b>	<b>Operating temperature</b> 32°F to 131°F (0°C to 55°C); 0°C to 40°C with

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		J8705A, J8706A, or J8707A modules installed
	<b>Operating relative humidity</b>	15% to 95% @ 131°F (55°C), non-condensing
	<b>Non-operating/Storage temperature</b>	-40°F to 158°F (-40°C to 70°C)
	<b>Non-operating/Storage relative humidity</b>	15% to 95% @ 149°F (65°C), non-condensing
	<b>Altitude</b>	up to 15,000 ft. (4.6 km)
	<b>Acoustic</b>	Power: 64 dB, Pressure: 57.5 dB ISO 7779, ISO 9296
<b>Electrical characteristics</b>	<b>Description</b>	Two J8712A installed. Two open power-supply slots available; two different power supplies available. See power-supply products for additional specifications.
	<b>Maximum heat dissipation</b>	4900 BTU/hr (5169 kJ/hr), (max non-PoE); 7400 BTU/hr (7,807 kJ/hr) (max using PoE)
	<b>Voltage</b>	100-127 / 200-240 VAC
	<b>Frequency</b>	50 / 60 Hz
	<b>Notes</b>	Heat dissipation does not include heat dissipated by the PoE powered devices themselves.
<b>Safety</b>		CSA 22.2 No. 60950; UL 60950; IEC 60950; EN 60950
<b>Emissions</b>		FCC Class A; VCCI Class A; EN 55022/CISPR 22 Class A
<b>Immunity</b>	<b>EN</b>	EN 55024, CISPR 24
	<b>ESD</b>	IEC 61000-4-2; 4 kV CD, 8 kV AD
	<b>Radiated</b>	IEC 61000-4-3; 3 V/m
	<b>EFT/Burst</b>	IEC 61000-4-4; 1.0 kV (power line), 0.5 kV (signal line)
	<b>Surge</b>	IEC 61000-4-5; 1 kV/2 kV AC
	<b>Conducted</b>	IEC 61000-4-6; 3 V
	<b>Power frequency magnetic field</b>	IEC 61000-4-8; 1 A/m, 50 or 60 Hz
	<b>Voltage dips and interruptions</b>	IEC 61000-4-11; >95% reduction, 0.5 period; 30% reduction, 25 periods
	<b>Harmonics</b>	EN 61000-3-2, IEC 61000-3-2
	<b>Flicker</b>	EN 61000-3-3, IEC 61000-3-3
<b>Management</b>		ProCurve Manager Plus; ProCurve Manager (included); command-line interface; Web browser; configuration menu; out-of-band management (serial RS-232C)
<b>Standards and protocols</b>	<b>Device Management</b>	RFC 1591 DNS (client) HTML and telnet management
	<b>General Protocols</b>	IEEE 802.1D MAC Bridges IEEE 802.1p Priority IEEE 802.1Q VLANs IEEE 802.1s Multiple Spanning Trees IEEE 802.1w Rapid Reconfiguration of Spanning Tree

### Technical Specifications

	IEEE 802.3ad Link Aggregation Control Protocol (LACP)
	IEEE 802.3af Power over Ethernet
	IEEE 802.3x Flow Control
	RFC 768 UDP
	RFC 783 TFTP Protocol (revision 2)
	RFC 792 ICMP
	RFC 793 TCP
	RFC 826 ARP
	RFC 854 TELNET
	RFC 951 BOOTP
	RFC 1058 RIPv1
	RFC 1519 CIDR
	RFC 1542 BOOTP Extensions
	RFC 2030 Simple Network Time Protocol (SNTP) v4
	RFC 2131 DHCP
	RFC 2453 RIPv2
	RFC 3046 DHCP Relay Agent Information Option
	RFC 3768 VRRP (Premium License)
	UDLD (Uni-directional Link Detection)
<b>IP Multicast</b>	RFC 2362 PIM Sparse Mode (Premium License)
	RFC 3376 IGMPv3 (host joins only)
	RFC 3973 PIM Dense Mode (Premium License)
<b>MIBs</b>	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
<b>Network Management</b>	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

### Technical Specifications

<b>OSPF</b>	RFC 2328 OSPFv2 (Premium License) RFC 3101 OSPF NSSA
<b>QoS/Cos</b>	RFC 2474 DiffServ Precedence, including 8 queues/port RFC 2597 DiffServ Assured Forwarding (AF) RFC 2598 DiffServ Expedited Forwarding (EF)
<b>Security</b>	IEEE 802.1X Port Based Network Access Control RFC 1492 TACACS+ RFC 2138 RADIUS Authentication RFC 2866 RADIUS Accounting Secure Sockets Layer (SSL) SSHv1/SSHv2 Secure Shell

#### 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.



### Accessories

<p><b>Premium License for Switch 3500 Series (J8993A)</b></p> <p>ProCurve 3500yl switch management software featuring OSPF, PIM Dense mode, PIM Sparse mode, VRRP</p>	<p><b>Notes</b></p>	<p>The following features are included in this license:</p> <ul style="list-style-type: none"> <li>● OSPF</li> <li>● PIM Dense mode</li> <li>● PIM Sparse mode</li> <li>● VRRP</li> </ul>
<p><b>Premium License for Switch 5400 Series (J8994A)</b></p> <p>License to enable OSPFv2, PIM Dense mode, PIM Sparse mode, VRRP in the ProCurve 5400zl switch.</p>	<p><b>Notes</b></p>	<p>The following features are included in this license:</p> <ul style="list-style-type: none"> <li>● OSPF</li> <li>● PIM Dense mode</li> <li>● PIM Sparse mode</li> <li>● VRRP</li> </ul>
<p><b>ProCurve Switch zl 1500W Power Supply (J8713A)</b></p> <p>High-power 1500 W power supply for zl series switches. Supplies 900 W for PoE power plus 600 W for switch power. 220–240 V only.</p>	<p><b>Physical characteristics</b></p> <p><b>Environment</b></p> <p><b>Electrical characteristics</b></p>	<p>Dimensions: 6.05(d) x 7.45(w) x 5.1(h) in. (15.37 x 18.92 x 12.95 cm) Weight: 7.5 lb. (3.4 kg)</p> <p>Operating temperature: 32°F to 131°F (0°C to 55°C) Operating relative humidity: 15% to 95%, non-condensing Non-operating/Storage temperature: -40°F to 158°F (-40°C to 70°C) Non-operating/Storage relative humidity: 15% to 95%, non-condensing Altitude: up to 10000 ft. (3 km)</p> <p>Voltage: 200-240 VAC Current: 10 A Power consumption: 1800 W Frequency: 50 / 60 Hz</p>
	<p><b>Notes</b></p>	<p>220–240 V only. Installation of the J8713A reduces the chassis altitude specification to 10,000 ft. (3677m).</p> <ul style="list-style-type: none"> <li>● J8713A supplies 600 W chassis power and 900 W PoE power. See the Ordering Guide for more details on power supply selection for PoE power.</li> </ul> <p>Units shipped to North America include a NEMA L6-20P twist lock power cord. Non-locking NEMA 6-20P optionally available - see the Ordering Guide for more details.</p> <p>When used in the J8714A power shelf, the following specs apply (at full load):</p> <ul style="list-style-type: none"> <li>● Heat dissipation: 450 BTU/hr (475 kJ/hr) @ 220V</li> <li>● Maximum current: 5.1 A @ 220 V</li> </ul>

### Accessories

<p><b>ProCurve Switch zl 875W Power Supply (J8712A)</b></p> <p>Standard 875 W power supply for zl series switches. Supplies 273 W for PoE power and 600 W for switch power.</p>	<p><b>Physical characteristics</b></p> <p><b>Environment</b></p> <p><b>Electrical characteristics</b></p> <p><b>Notes</b></p>	<p>Dimensions: 6.05(d) x 7.45(w) x 5.1(h) in. (15.37 x 18.92 x 12.95 cm) Weight: 7.05 lb. (3.2 kg)</p> <p>Operating temperature: 32°F to 131°F (0°C to 55°C) Operating relative humidity: 15% to 95%, non-condensing Non-operating/Storage temperature: -40°F to 158°F (-40°C to 70°C) Non-operating/Storage relative humidity: 15% to 95%, non-condensing Altitude: up to 10000 ft. (3 km)</p> <p>Voltage: 100-127 / 200-240 VAC Current: 12 / 5.7 A Power consumption: 1050 W Frequency: 50 / 60 Hz</p> <p>J8712A supplies 600 W chassis power and 273 W PoE power.</p> <p>One J8712A can power the J8697A chassis.</p> <p>Two J8712A supplies are required to power the J8698A chassis.</p> <p>Two J8712A supplies are required to power the J8715A chassis.</p> <p>See the Ordering Guide for more details on power supply selection for PoE power.</p> <p>When used in the J8714A power shelf, the following specs apply (at full load):</p> <ul style="list-style-type: none"> <li>● Heat dissipation: 250 BTU/hr (263 kJ/hr) @ 110 V, 210 BTU/hr (222 kJ/hr) @ 220 V</li> <li>● Maximum current: 3.2 A @ 110 V, 1.7 A @ 220 V</li> </ul>
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<p><b>ProCurve 620 Redundant/External Power Supply (J8696A)</b></p> <p>Provides redundant system power and/or extra PoE power for up to two switches simultaneously</p>	<p><b>Ports</b></p> <p><b>Physical characteristics</b></p> <p><b>Mounting</b></p> <p><b>Environment</b></p> <p><b>Electrical characteristics</b></p>	<p>2 redundant power supply ports Restrictions: 195 W available per port 2 external power supply ports Restrictions: 398 W available per port</p> <p>Dimensions: 15.4(d) x 17.4(w) x 1.73(h) in. (39.12 x 44.2 x 4.39 cm) (1U height) Weight: 15.2 lb. (6.89 kg)</p> <p>Mounts in an EIA-standard 19 in. telco rack or equipment cabinet (hardware included); horizontal surface mounting only</p> <p>Operating temperature: 32°F to 131°F (0°C to 55°C) Operating relative humidity: 15% to 95% @ 104°F (40°C), non-condensing Non-operating/Storage temperature: -40°F to 158°F (-40°C to 70°C) Non-operating/Storage relative humidity: 15% to 90% @ 149°F (65°C), non-condensing Altitude: up to 10000 ft. (3 km) Acoustic: LwA per ISO 7779: 54.2 dB</p> <p>Maximum heat dissipation: 400 BTU/hr (422 kJ/hr), for the actual 620 itself. PoE-powered device heat dissipation assumed to be outside the 620. Voltage: 100-127 / 200-240 VAC Current: 16 / 8 A</p>
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### Accessories

	Power consumption: 1440 W
	RPS power: 390 W
	PoE power: 796 W
	RPS: 12 V
	PoE: -50 V
	Frequency: 50 / 60 Hz
	<b>NOTES:</b> Above figures are for maximum RPS and PoE power being supplied to 2 switches simultaneously. 200 - 240 V power cords shipped with the 620 have a wall plug rated as close to 13 A as specific country standards allow.
<b>Safety</b>	CSA 22.2 No. 60950 EN 60950/IEC 60950 UL 60950
<b>Emissions</b>	FCC Class A VCCI Class A EN 55022/CISPR 22 Class A
<b>Immunity</b>	EN: EN 55024, CISPR 24 ESD: IEC 61000-4-2 Radiated: IEC 61000-4-3 EFT/Burst: IEC 61000-4-4 Surge: IEC 61000-4-5 Conducted: IEC 61000-4-6 Power frequency magnetic field: IEC 61000-4-8 Voltage dips and interruptions: IEC 61000-4-11 Harmonics: EN 61000-3-2, IEC 61000-3-2 Flicker: EN 61000-3-3, IEC 61000-3-3
<b>Management</b>	Unmanaged power supply; provides information via LEDs (LEDs repeated on front and back panel) or through port interfaces of attached devices
<b>Notes</b>	The ProCurve 620 supports the ProCurve 2900 series (RPS), 3500yl series (RPS/PoE), and 6200yl (RPS) switches. The ProCurve 5400zl switches are not supported.
	The ProCurve 620 includes 4 2-meter RPS/EPs cables. These cables can be used to carry either RPS or PoE power to the switch being powered.

### Accessories

<p><b>ProCurve Switch zl Power Supply Shelf (J8714A)</b></p> <p>A rack-mountable chassis with two slots for Switch zl power supplies to supply additional PoE power to a zl switch beyond what can be provided by the switch internal power supplies alone</p>	<p><b>Ports</b></p> <p>0 redundant power supply port 2 external power supply ports Restrictions: PoE power available depends on power supplies installed</p> <p><b>Physical characteristics</b></p> <p>Dimensions (D x W x H): 9.73(d) x 17.44(w) x 5.2(h) in. (24.71 x 44.3 x 13.2 cm) (3U height) Weight: 9.26 lb. (4.2 kg)(no power supplies installed)</p> <p><b>Mounting</b></p> <p>3U rack mountable, either forward or rear facing. Two Power Shelf units can be mounted front-to-front in a 4-post rack, taking only 3U total to conserve rack space.</p> <p><b>Environment</b></p> <p>Operating temperature: 32°F to 131°F (0°C to 55°C) Operating relative humidity: 15% to 95% @ 104°F (40°C), non-condensing Non-operating/Storage temperature: -40°F to 158°F (-40°C to 70°C) Non-operating/Storage relative humidity: 15% to 95% @ 104°F (40°C), non-condensing Altitude: up to 10000 ft. (3 km) Acoustic: Power: 52.9 dB Pressure: 42.9 dB</p> <p><b>Electrical characteristics</b></p> <p>Description: Power draw and heat dissipation for the power shelf are dependent on the power supplies installed. See the J8712A and J8713A zl power supply specification notes for more details.</p> <p><b>Notes</b></p> <p>The ProCurve Switch zl Power Supply Shelf has two slots for zl power supplies. It supplies PoE power only to zl switches. For yl switches, see the ProCurve 620 Redundant/External Power Supply.</p> <p>Power shelf depth includes 0.75 in. (1.9 cm) due to the power supply handles.</p> <p>Power supplies not included.</p>
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<p><b>ProCurve Gigabit-SX-LC Mini-GBIC (J4858C)</b></p> <p>A small form factor pluggable (SFP) gigabit SX transceiver that provides a full-duplex gigabit solution up to 550 meters on multimode fiber.</p>	<p><b>Ports</b></p> <p>1 LC 1000Base-SX port (IEEE 802.3z Type 1000Base-SX) Duplex: full only</p> <p><b>Physical characteristics</b></p> <p>Dimensions: 2.24(d) x 0.54(w) x 0.486(h) in. (5.69 x 1.37 x 1.23 cm) Weight: 0.04 lb. (0.02 kg)</p> <p><b>Cabling</b></p> <p>Type:</p> <ul style="list-style-type: none"> <li>● 62.5/125 <math>\mu\text{m}</math> or 50/125 <math>\mu\text{m}</math> (core/cladding) diameter, graded-index, low metal content, multimode fiber optic, complying with ITU-T G.651 and ISO/IEC 793-2 Type A1b or A1a, respectively</li> </ul> <p>Maximum distance:</p> <ul style="list-style-type: none"> <li>● 220 m (62.5 <math>\mu\text{m}</math> core diameter, 160 MHz*km bandwidth)</li> <li>● 275 m (62.5 <math>\mu\text{m}</math> core diameter, 200 MHz*km bandwidth)</li> <li>● 500 m (50 <math>\mu\text{m}</math> core diameter, 400 MHz*km bandwidth)</li> <li>● 550 m (50 <math>\mu\text{m}</math> core diameter, 500 MHz*km bandwidth)</li> </ul>
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### Accessories

<b>ProCurve Gigabit-LX-LC Mini-GBIC (J4859C)</b>	<b>Ports</b>	1 LC 1000Base-LX port (IEEE 802.3z Type 1000Base-LX) Duplex: full only
A small form factor pluggable (SFP) gigabit LX transceiver that provides a full-duplex gigabit solution up to 10 km (singlemode) or 550 m (multimode).	<b>Physical characteristics</b>	Dimensions: 2.24(d) x 0.54(w) x 0.486(h) in. (5.69 x 1.37 x 1.23 cm) Weight: 0.04 lb. (0.02 kg)
	<b>Cabling</b>	Type:  Either single mode or multimode <ul style="list-style-type: none"> <li>● 62.5/125 <math>\mu\text{m}</math> or 50/125 <math>\mu\text{m}</math> (core/cladding) diameter, graded-index, low metal content, multimode fiber optic, complying with ITU-T G.651 and ISO/IEC 793-2 Type A1b or A1a, respectively</li> <li>● Low metal content, single-mode fiber-optic, complying with ITU-T G.652 and ISO/IEC 793-2 Type B1</li> </ul>
	<b>Notes</b>	Maximum distance: <ul style="list-style-type: none"> <li>● 10 km (single mode) or 550 m (multimode)</li> </ul> A mode conditioning patch cord may be needed in some multimode fiber installations.
<b>ProCurve Gigabit-LH-LC Mini-GBIC (J4860C)</b>	<b>Ports</b>	1 LC 1000Base-LH port (no IEEE standard exists for 1550 nm optics) Duplex: full only
A small form factor pluggable (SFP) gigabit LH transceiver that provides a full-duplex gigabit solution up to 70 km on singlemode fiber.	<b>Physical characteristics</b>	Dimensions: 2.17(d) x 0.60(w) x 0.46(h) in. (5.5 x 1.53 x 1.18 cm) Weight: 0.04 lb. (0.02 kg)
	<b>Cabling</b>	Type: <ul style="list-style-type: none"> <li>● Low metal content, single-mode fiber-optic, complying with ITU-T G.652 and ISO/IEC 793-2 Type B1</li> </ul>
		Maximum distance: <ul style="list-style-type: none"> <li>● 70 km</li> </ul>
<b>ProCurve Gigabit 1000Base-T Mini-GBIC (J8177B)</b>	<b>Ports</b>	1 RJ-45 1000Base-T port (IEEE 802.3ab Type 1000Base-T) Duplex: full only
A small form-factor pluggable (SFP) gigabit copper transceiver that provides a full-duplex gigabit solution up to 100 meters on Category 5 or better cable.	<b>Physical characteristics</b>	Dimensions: 2.71(d) x 0.54(w) x 0.55(h) in. (6.88 x 1.37 x 1.4 cm) Weight: 0.06 lb. (0.03 kg)
	<b>Cabling</b>	Type:  1000Base-T: Category 5 (5E or better recommended), 100 $\Omega$ differential 4-pair unshielded twisted pair (UTP) or shielded twisted pair (STP) balanced, complying with IEEE 802.3ab 1000Base-T
		Maximum distance:  100 m
	<b>Notes</b>	When used in the ProCurve Switch gl 20-Port 10/100/1000 Module (J4908A), the J8177B mini-GBIC can be installed in either the upper or lower mini-GBIC port, but will block access to the other port.

### Accessories

See the document titled "Support for the J8177B 1000Base-T Mini-GBIC", on the "ProCurve Mini-GBICs and SFPs" Manuals Web page, for supported platforms and minimum software requirements to support this product.

The J8177B gigabit copper mini-GBIC is not supported on dual-personality ports.

#### NEW ProCurve 100-FX SFP-LC Transceiver (J9054B)

A small form-factor pluggable (SFP) 100-FX transceiver that provides 100 Mbps full-duplex connectivity up to 2 km on multimode fiber.

<b>Ports</b>	1 LC 100Base-FX port (IEEE 802.3u Type 100Base-FX) Duplex: half or full
<b>Physical characteristics</b>	Dimensions: 2.7(d) x 0.54(w) x 0.48(h) in. (6.86 x 1.38 x 1.22 cm) Weight: 0.06 lb. (0.03 kg)
<b>Environment</b>	Operating temperature: 32°F to 158°F (0°C to 70°C) Operating relative humidity: 5% to 95% Non-operating/Storage temperature: -40°F to 185°F (-40°C to 85°C) Non-operating/Storage relative humidity: 5% to 85% Altitude: up to 10000 ft. (3 km)
<b>Cabling</b>	Type: <ul style="list-style-type: none"> <li>● 62.5/125 <math>\mu\text{m}</math> or 50/125 <math>\mu\text{m}</math> (core/cladding) diameter, graded-index, low metal content, multimode fiber optic, complying with ITU-T G.651 and ISO/IEC 793-2 Type A1b or A1a, respectively</li> </ul> <p>Maximum distance:</p> <ul style="list-style-type: none"> <li>● 2 km (full duplex) or 412 m (half duplex)</li> </ul>
<b>Notes</b>	See the document titled "Support for the J9054B 100-FX SFP-LC Transceiver", on the "ProCurve Mini-GBICs and SFPs" Manuals Web page, for supported platforms and minimum software requirements to support this product.

#### ProCurve 10-GbE X2-SC SR Optic (J8436A)

An X2 form-factor transceiver that supports the 10-Gigabit SR standard, providing 10-Gigabit connectivity up to 300 meters on multimode fiber.

<b>Ports</b>	1 SC 10-GbE port (IEEE 802.3ae Type 10Gbase-SR) Duplex: full only
<b>Dimensions</b>	3.48(d) x 1.42(w) x 0.43(h) in. (8.84 x 3.61 x 1.09 cm)
<b>Weight</b>	0.64 lb. (0.29 kg)
<b>Environment</b>	Operating temperature: 32°F to 104°F (0°C to 40°C) Operating relative humidity: 15% to 95%, non-condensing
<b>Cabling</b>	Type: <ul style="list-style-type: none"> <li>● 62.5/125 <math>\mu\text{m}</math> or 50/125 <math>\mu\text{m}</math> (core/cladding) diameter, graded-index, low metal content, multimode fiber optic, complying with ITU-T G.651 and ISO/IEC 793-2 Type A1b or A1a, respectively</li> </ul> <p>Maximum distance:</p> <ul style="list-style-type: none"> <li>● 62.5 <math>\mu\text{m}</math> multimode cable @ 160 MHz*km = 2-26 meters</li> <li>● 62.5 <math>\mu\text{m}</math> multimode cable @ 200 MHz*km = 2-33 meters</li> <li>● 50 <math>\mu\text{m}</math> multimode cable @ 400 MHz*km = 2-66 meters</li> <li>● 50 <math>\mu\text{m}</math> multimode cable @ 500 MHz*km = 2-82 meters</li> <li>● 50 <math>\mu\text{m}</math> multimode cable @ 2000 MHz*km = 2-300 meters</li> </ul>

### Accessories

Notes 850 nm serial optics

#### ProCurve 10-GbE X2-SC LR Optic (J8437A)

An X2 form-factor transceiver that supports the 10-Gigabit LR standard, providing 10-Gigabit connectivity up to 10 km on singlemode fiber.

#### Ports

1 SC 10-GbE port (IEEE 802.3ae Type 10Gbase-LR)  
Duplex: full only

#### Dimensions

3.48(d) x 1.42(w) x 0.43(h) in. (8.84 x 3.61 x 1.09 cm)

#### Weight

0.16 lb. (0.07 kg)

#### Environment

Operating temperature: 32°F to 104°F (0°C to 40°C)  
Operating relative humidity: 15% to 95%, non-condensing

#### Cabling

Type:

- Low metal content, single-mode fiber-optic, complying with ITU-T G.652 and ISO/IEC 793-2 Type B1

Maximum distance:

- 9/125  $\mu$ m single-mode cable = 2 m-10 km

#### Notes

1310 nm serial optics

Conditioning patch cord cables are not supported.

#### ProCurve 10-GbE X2-SC ER Optic (J8438A)

An X2 form-factor transceiver that supports the 10-Gigabit ER standard, providing 10-Gigabit connectivity up to 30 km on singlemode fiber (40 km on engineered links).

#### Ports

1 SC 10-GbE port (IEEE 802.3ae Type 10Gbase-ER)  
Duplex: full only

#### Dimensions

3.48(d) x 1.42(w) x 0.43(h) in. (8.84 x 3.61 x 1.09 cm)

#### Weight

0.15 lb. (0.07 kg)

#### Environment

Operating temperature: 32°F to 104°F (0°C to 40°C)  
Operating relative humidity: 15% to 95%, non-condensing

#### Cabling

Type:

- Low metal content, single-mode fiber-optic, complying with ITU-T G.652 and ISO/IEC 793-2 Type B1

Maximum distance:

- 30 km (40 km on engineered links)

#### Notes

1550 nm serial optics

Conditioning patch cord cables are not supported.

### Accessories

<b>ProCurve 10-GbE CX4 Media Converter (J8439A)</b>  An optical media converter that connects to CX4 ports, providing 10-Gigabit connectivity up to 300 meters on multimode fiber.	<b>Physical characteristics</b>	Dimensions: 2.83(d) x 0.98(w) x 0.59(h) in. (7.19 x 2.49 x 1.5 cm) Weight: 0.06 lb. (0.03 kg)
	<b>Cabling</b>	Maximum distance: <ul style="list-style-type: none"> <li>● 62.5 <math>\mu</math>m multimode cable @ 150 MHz*km = 1-50 meters</li> <li>● 50 <math>\mu</math>m multimode cable @ 500 MHz*km = 1-100 meters</li> <li>● 50 <math>\mu</math>m multimode cable @ 2000 MHz*km = 1-300 meters</li> </ul>
	<b>Notes</b>	Duplex: full  Cabling type: 12 fiber 62.5/125 $\mu$ m (core/cladding) diameter or 12 fiber 50/125 $\mu$ m diameter, multimode ribbon cable with MPO/MTP to MPO/MTP connectors

<b>ProCurve 10-GbE X2-CX4 Ports Transceiver (J8440B)</b>  An X2 form-factor transceiver with a CX4 connector that provides 10-Gigabit connectivity up to 15 meters over CX4 (copper) cable.	<b>Physical characteristics</b>	1 CX4 transceiver port Dimensions: 3.54(d) x 1.42(w) x 0.53(h) in. (8.99 x 3.61 x 1.35 cm) Weight: 0.18 lb. (0.08 kg)
	<b>Environment</b>	Operating temperature: 32°F to 131°F (0°C to 55°C) Operating relative humidity: 15% to 95% @ 149°F (65°C), non-condensing
	<b>Cabling</b>	Maximum distance: <ul style="list-style-type: none"> <li>● 15 m using CX4 cables</li> <li>● 300 m using optical media converters and multimode fiber cable</li> </ul>
	<b>Notes</b>	Connector: CX4; Duplex: full  Use CX4 10-GbE cable (0.5-15 m) or ProCurve 10-GbE CX4 Media Converter (J8439A).  For suggested vendors of CX4 cables, please see the "Cabling" answers on the "ProCurve 10-GbE Transceivers" FAQs Web page.

<b>ProCurve Identity Driven Manager 2.2 base product--500-user license (J9012A)</b>  ProCurve Identity Driven Manager is a plug-in to ProCurve Manager Plus that dynamically applies security and performance settings based on user, device, location, time, and client system state -- 500 user license	<b>System requirements</b>	Please see ProCurve Manager Plus for system requirements.
	<b>Required platforms</b>	
	<b>Supported platforms</b>	
	<b>RADIUS server support</b>	Free RADIUS Funk Steelbelted RADIUS Server Microsoft IAS
	<b>Features</b>	<ul style="list-style-type: none"> <li>● Intuitive Explorer-style interface</li> <li>● OpenView NNM integration</li> <li>● Application of policies by user identity                             <ul style="list-style-type: none"> <li>○ Auto VLAN assignment</li> <li>○ Auto set quality of service by user</li> <li>○ Auto set bandwidth assignment by user</li> </ul> </li> <li>● Rule-based access rights deployment</li> <li>● Dynamic rights assignment based on:                             <ul style="list-style-type: none"> <li>○ Time</li> <li>○ Location</li> <li>○ User system</li> </ul> </li> <li>● Auto-discovery of:</li> </ul>



### Accessories

<b>Notes</b>	<ul style="list-style-type: none"> <li>○ RADIUS servers</li> <li>○ Realms</li> <li>○ Users</li> </ul> <p>The base product for Identity Driven Manager allows for managing up to 500 users. Customers may add users in quantities of 2,000 by purchasing J9014A.</p>
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### Wireless Access Controllers

#### NEW ProCurve Wireless Edge Services zl Module (J9051A)

Working in conjunction with ProCurve radio ports, the ProCurve Wireless Edge Services zl Module provides centralized wireless LAN management of advanced wireless services, enabling a highly secure, multi-service network on ProCurve zl switches.

<b>Physical characteristics</b>	Dimensions: 10.3(d) x 8.13(w) x 1.75(h) in. (26.16 x 20.65 x 4.45 cm) Weight: 2.05 lb. (0.93 kg)
<b>Environment</b>	Non-operating/Storage temperature: -40°F to 158°F (-40°C to 70°C) Non-operating/Storage relative humidity: 15% to 95%, non-condensing
<b>Wireless interface</b>	Microsoft Internet Explorer 5.5 or higher
<b>Standards and protocols</b>	<p>Device Management: RFC 2068 Hypertext Transfer Protocol -- HTTP/1.1 HTML and telnet management</p> <p>General Protocols: IEEE 802.1p Priority IEEE 802.1Q VLANs 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 959 File Transfer Protocol (FTP) RFC 1541 DHCP RFC 2030 Simple Network Time Protocol (SNTP) v4 RFC 3046 DHCP Relay Agent Information Option IPv6: RFC 3162 RADIUS and IPv6 MIBs: RFC 1213 MIB II RFC 1493 Bridge MIB</p> <p>Mobility: IEEE 802.11a High Speed Physical Layer in the 5 GHz Band IEEE 802.11b Higher-Speed Physical Layer Extension in the 2.4 GHz Band IEEE 802.11g Further Higher Data Rate Extension in the 2.4 GHz Band IEEE 802.11i Medium Access Control (MAC) Security Enhancements</p> <p>Network Management: RFC 3164 BSD syslog Protocol RFC 3176 sFlow SNMPv1/v2c/v3</p> <p>Security: IEEE 802.1X Port Based Network Access Control RFC 2138 RADIUS Authentication RFC 2548 Microsoft Vendor-specific RADIUS Attributes RFC 2809 L2TP Compulsory Tunneling via RADIUS RFC 2865 RADIUS Authentication RFC 2866 RADIUS Accounting RFC 2867 RADIUS Accounting</p> <p>Modifications for Tunnel Protocol Support RFC 2868 RADIUS Attributes for Tunnel Protocol Support RFC 2869 RADIUS Extensions</p>

### Accessories

RFC 2882 NAS Requirements: Extended RADIUS Practices  
 RFC 3576 Dynamic Authorization Extensions to RADIUS  
 RFC 3579 RADIUS Support For Extensible Authentication Protocol (EAP)  
 RFC 4590 RADIUS Extension for Digest Authentication  
 Secure Sockets Layer (SSL)  
 SSHv2 Secure Shell  
 WPA (Wi-Fi Protected Access)

#### NEW ProCurve Redundant Physical characteristics Wireless Services zl Module (J9052A)

Dimensions: 10.3(d) x 8.13(w) x 1.75(h) in. (26.16 x 20.65 x 4.45 cm)  
 Weight: 2.05 lb. (0.93 kg)

The ProCurve Redundant Wireless Services zl Module automatically adopts ProCurve radio ports if the primary Wireless Edge Services zl Module is unavailable or fails.

#### Environment

Non-operating/Storage temperature: -40°F to 158°F (-40°C to 70°C)  
 Non-operating/Storage relative humidity: 15% to 95%, non-condensing

### yl Modules

#### ProCurve Switch yl 10-GbE 2-Port CX4 + 2-Port X2 Module (J8694A)

10-GbE module with two fixed CX4 ports and two X2 slots for ProCurve Switch 3500yl series and Switch 6200yl-24G-mGBIC

#### Ports

2 open 10-GbE X2 transceiver slots  
 2 10-GbE ports (IEEE 802.3ak Type 10Gbase-CX4)  
 Duplex: full only

#### Physical characteristics

Dimensions: 7.76(d) x 7.52(w) x 14.29(h) in. (19.7 x 19.1 x 36.3 cm)  
 Weight: 1.54 lb. (0.7 kg)

#### Environment

Operating temperature: 32°F to 131°F (0°C to 55°C)  
 Operating relative humidity: 15% to 95%, non-condensing  
 Non-operating/Storage temperature: -40°F to 158°F (-40°C to 70°C)  
 Non-operating/Storage relative humidity: 15% to 90%, non-condensing

#### Cabling

Maximum distance:

- CX4: 15 m using CX4 cable or 300 m using media converter with ribbon MMF

#### Notes

Only the two fixed CX4 ports on this module support ProCurve 10-GbE CX4 Media Converter (J8439A).

Operating temperature is 32°F to 104°F (0°C to 40°C) if any X2 10-GbE optic or transceiver is inserted in any X2 slot.

One 0.5 m CX4 cable is included.

### yl Modules

### Accessories

<b>ProCurve Switch zl 4-Port 10-GbE X2 Module (J8707A)</b>	<b>Ports</b>  <b>Physical characteristics</b>	4 open 10-GbE X2 transceiver slots Dimensions: 10.3(d) x 8.13(w) x 1.75(h) in. (26.16 x 20.65 x 4.45 cm) Weight: 1.74 lb. (0.79 kg)
4-port 10-GbE X2 module for zl series switches	<b>Environment</b>  <b>Notes</b>	Operating temperature: 32°F to 104°F (0°C to 40°C) When installed in a zl chassis, the J8707A module limits the operating temperature range of the chassis to 32°F to 104°F (0°C to 40°C).
<b>ProCurve Switch zl 24-Port 10/100/1000 PoE Module (J8702A)</b>	<b>Ports</b>  <b>Physical characteristics</b>	24 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: IEEE Auto-MDI/MDIX Duplex: 10Base-T/100Base-TX: half or full; 1000Base-T: full only
24-port 10/100/1000 PoE module for zl series switches	<b>Physical characteristics</b>  <b>Cabling</b>	Dimensions: 10.3(d) x 8.13(w) x 1.75(h) in. (26.16 x 20.65 x 4.45 cm) Weight: 2.16 lb. (0.98 kg)
		Type: <ul style="list-style-type: none"> <li>1000Base-T: Category 5 (5E or better recommended), 100 Ω differential 4-pair unshielded twisted pair (UTP) or shielded twisted pair (STP) balanced, complying with IEEE 802.3ab 1000Base-T</li> </ul>
<b>ProCurve Switch zl 20-Port 10/100/1000 + 4-Port Mini-GBIC Module (J8705A)</b>	<b>Ports</b>  <b>Physical characteristics</b>	4 open mini-GBIC (SFP) slots 20 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: IEEE Auto-MDI/MDIX Duplex: 10Base-T/100Base-TX: half or full; 1000Base-T: full only
20-port 10/100/1000 PoE + 4-port mini-GBIC module for zl series switches	<b>Physical characteristics</b>  <b>Notes</b>	Dimensions: 10.3(d) x 8.13(w) x 1.75(h) in. (26.16 x 20.65 x 4.45 cm) Weight: 2.2 lb. (1 kg)
		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.  When installed in a zl chassis, the J8705A module limits the operating temperature range of the chassis to 32°F to 104°F (0°C to 40°C).

### Accessories

<b>ProCurve Switch zl 4-Port 10-GbE CX4 Module (J8708A)</b>	<b>Ports</b>	4 CX4 10-GbE ports (IEEE 802.3ak Type 10Gbase-CX4) Duplex: full only
4-port 10-GbE CX4 module for zl series switches	<b>Physical characteristics</b>	Dimensions: 10.3(d) x 8.13(w) x 1.75(h) in. (26.16 x 20.65 x 4.45 cm) Weight: 1.74 lb. (0.79 kg)
	<b>Environment</b>	Operating temperature: 32°F to 131°F (0°C to 55°C)
	<b>Cabling</b>	Maximum distance: <ul style="list-style-type: none"><li>• 15 m using CX4 cable</li><li>• 300 m using optical media converters and multimode fiber cable</li></ul>
	<b>Notes</b>	Use CX4 10-GbE cable (0.5 m-15 m) or ProCurve 10-GbE CX4 Media Converter (J8439A).  No CX4 cables are included with this module.

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<b>ProCurve Switch zl 24-Port Mini-GBIC Module (J8706A)</b>	<b>Ports</b>	24 open mini-GBIC (SFP) slots
24-port mini-GBIC module for zl series switches	<b>Physical characteristics</b>	Dimensions: 10.3(d) x 8.13(w) x 1.75(h) in. (26.16 x 20.65 x 4.45 cm) Weight: 2.01 lb. (0.91 kg)
	<b>Notes</b>	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.  When installed in a zl chassis, the J8706A module limits the operating temperature range of the chassis to 32°F to 104°F (0°C to 40°C).

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