

# HP 1950 Switch Series



## Key features

- Four 10G uplinks for fast connection to servers and storage
- Two SFP+ and two 10GBASE-T ports—supports fiber and cost-effective copper connectivity
- Four-high stacking allows for redundancy while simplifying administration
- Customized operation using intuitive Web interface
- Limited Lifetime warranty

## Product overview

The HP 1950 Switch Series consists of smart web-managed Gigabit Ethernet switches with 10-Gigabit uplinks, for advanced small business customers needing high-performance connections to servers and network storage.

The 1950 Switch Series includes four switches: two standard models and two PoE+ models in 24- and 48-port configurations. The switches each have two 10GBASE-T ports supporting copper-based Category 5e-based cabling, and two 10G SFP+ ports for fiber connectivity. The PoE+ models both have a PoE power budget of 370 W to power up PoE/PoE+ compliant client devices.

The 1950 Switch Series has an intuitive Web-based interface for simple customization of network operation. It supports true-stacking, allowing up to four devices to be logically administered as a single entity, simplifying administration while supporting greater network redundancy. Models support both rack mounting and desktop operation. They have IPv4 and IPv6 operation, with Layer 2 switching as well as Layer 3 static routing. Other features include: link aggregation to boost link performance; VLANs, Access Control Lists, and 802.1X network login for enhanced security; and three versions of Spanning Tree Protocol (STP) for added network resiliency. The switches come with a limited lifetime warranty covering the unit, fans, and power supplies, as well as 24X7 phone support for the first three years of ownership.

## Features and benefits

### Management

- Four-high true stacking

Simplifies administration of multiple devices. Create a single logical managed unit with up to four 1950 switches. Balance connections across multiple units with standard Link Aggregation (LACP) for enhanced network resiliency. Stack using affordable Cat 5e, or long distance fiber, or localized DAC cables. Stacked units can be co-located or separated physically

- Intuitive Web browser-based management

Allows for easy customization of the switch—even by non-technical users

- Secure Web-management sessions with HTTPS/SSL

Encrypts and otherwise protects management sessions through HTTP Secure (HTTPS). Prevents snooping of sensitive management information such as passwords

- SNMPv1, v2c, and v3

Facilitates remote management of the switch, as the device can be discovered and monitored from an SNMP management station

- Complete session logging

Provides detailed information for problem identification and resolution

- Dual flash images

Provides independent primary and secondary operating system files for backup while upgrading

- Port mirroring

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

- Network Time Protocol (NTP)

Synchronizes timekeeping among distributed time servers and clients; keeps timekeeping consistent among all clock-dependent devices within the network so that the devices can provide diverse applications based on the consistent time

- IEEE 802.1AB Link Layer Discovery Protocol (LLDP)

Advertises and receives management information from adjacent devices on a network, facilitating easy mapping by network management applications

- Limited Command Line Interface (CLI)

Facilitates the deployment and initial configuration of the unit. Supports troubleshooting actions as well

- RMON

Provides advanced monitoring and reporting capabilities for statistics, history, alarms, and events

- Default DHCP client mode

Simplifies device deployment. Connect a new out-of-the box switch to a network with a DHCP server and the device will obtain its IP address automatically with plug-and-play operation. In the absence of a DHCP server, the switch will fall back to a unique static address determined by the switch's MAC address

- Cable diagnostic tool

Used to remotely detect cable issues with cables attached to the switch

### Quality of service (QoS)

- Broadcast control

Allows limitation of broadcast traffic rate to cut down on unwanted network broadcast traffic

- Rate limiting

Sets per-port ingress enforced maximums and per-port, per-queue minimums

- Traffic prioritization

Makes it possible to prioritize important and/or time-sensitive traffic ahead of less important traffic. Use with VoIP or video to optimize its performance on the network. Recognizes both IEEE 802.1p and DSCP prioritization tagging. Packets are mapped to four hardware queues for more effective throughput

### Connectivity

- Auto-MDI/MDIX

Adjusts automatically to straight-through or crossover cables on all 10/100/1000 and 10GBASE-T ports

- IEEE 802.3X flow control

Provides a configurable flow throttling mechanism propagated through the network to prevent packet loss at a congested node

- Packet storm protection

Protects against broadcast, multicast, or unicast storms with user-defined thresholds

- Jumbo frame supports up to 10-kilobyte frames

Improves efficiency of data transfers by allowing more data into a given packet. This is especially useful for transfers of large amounts of data. HP 1950 Switches support up to 10 kilobyte frame sizes

- IEEE 802.3at Power over Ethernet (PoE+)

Delivers power to compliant devices over Ethernet cabling, greatly simplifying installation of those devices. The 1950 Series has two PoE+ enabled models. The PoE+ 802.3at standard supports delivery of up to 30 watts of power to the attached devices, enough to support the latest models of IP phones, Wireless Access Points, video surveillance cameras, or other PoE/PoE+ enabled devices. HP 1950 PoE+ models support 370 W of total PoE power

- IEEE 802.3af Power over Ethernet (PoE) ready

Delivers power to compliant devices over Ethernet cabling, greatly simplifying installation of those devices. HP 1950 PoE+ models are fully backward compliant with the older PoE standard which provides up to 15.4 W of PoE power per port to attached devices

- Available redundant power for PoE+ models

Optional Redundant Power System is available to add power redundancy and to supplement the PoE power of the PoE+ switches. With the optional RPS, the PoE+ power budget can be increased to 740 W; additionally, the switch will continue operating and powering downstream PoE devices even if the unit internal power supply should fail. Order the HP RPS1600 Redundant Power System (JG136A)

- Fully IPv6 capable

- IPv6 host

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

- IPv6 routing

Supports IPv6 static routes

- MLD snooping

Forwards IPv6 multicast traffic to the appropriate interface, preventing traffic flooding

- IPv6 ACL/QoS

Supports ACL and QoS for IPv6 network traffic

## Security

- Access Control Lists (ACLs)

Gives granular control over what traffic goes where in the network. Allows for traffic filtering. ACLs rules can be based on MAC-address or IP-address. ACL rules can be time-based to implement access control during certain hours or days

- IEEE 802.1X and RADIUS network logins

Controls port-based access for authentication and accountability

- Automatic VLAN assignment

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

- STP BPDU port protection

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

- STP root guard

Protects the root bridge from malicious attacks or configuration mistakes

- Automatic denial-of-service protection

Protects the network by blocking malicious DoS attacks aimed at the switch itself

- Management password

Provides security so that only authorized access to the Web browser interface is allowed

## Performance

- Half-/full-duplex auto-negotiating capability on every port doubles the throughput of every port

- Selectable queue configurations

Allows for increased performance by selecting the number of queues and associated memory buffering that best meet the requirements of the network applications

- IGMP/MLD Snooping

Improves network performance by filtering multicast traffic when there is no multicast receiver on a connection. Without this, multicast traffic is flooded to all ports. IGMP snooping is used in IPv4 networks. The IPv6 equivalent—MLD Snooping—is also supported

- 10-Gigabit SFP+ based Fiber Uplinks

Supports high-bandwidth connections over fiber. HP 1950 Switches each have two SFP+ transceiver slots supporting 10-Gigabit fiber-based connections using optional 10G transceivers. Fiber is particularly suited for connecting at distances beyond the 100 Meter limitation of copper-based Cat 5e cabling. Alternatively use the SFP+ ports for redundant stacking of up to four units using Direct Attached Cables (DAC)

- 10-Gigabit 10GBASE-T RJ45 Uplinks

Supports high-bandwidth connections over Cat 5e cabling. HP 1950 Switches each have two 10GBASE-t RJ45 ports supporting 10-Gigabit copper-based connections. Cat 5e is economical and practical for distances up to 100 Meters. Alternatively use the 10GBASE-T ports for redundant stacking of up to four units

## Layer 2 switching

- VLAN support and tagging

Supports IEEE 802.1Q (4,094 VLAN IDs) and 256 VLANs simultaneously

- STP

Supports standard IEEE 802.1D STP, IEEE 802.1w Rapid Spanning Tree Protocol (RSTP) for faster convergence, and IEEE 802.1s Multiple Spanning Tree Protocol (MSTP)

- BPDU filtering

Improves network efficiency by filtering unnecessary BPDU packets on a port. When STP is enabled globally but disabled on specific ports, BPDU packets are not sent out the ports where STP is disabled

### Layer 3 services

- Address Resolution Protocol (ARP)

Determines the MAC address of another IP host in the same subnet; supports static ARPs; gratuitous ARP allows detection of duplicate IP addresses; proxy ARP allows normal ARP operation between subnets or when subnets are separated by a Layer 2 network

- DHCP Relay

Simplifies management of DHCP addresses in networks with multiple subnets

### Layer 3 routing

- Static IPv4/IPv6 routing

Provides basic routing (supporting up to 32 static routes and 8 virtual VLAN interfaces); allows manual routing configuration

### Resiliency and high availability

- Link aggregation

Groups together multiple ports (up to a maximum of two ports) automatically using Link Aggregation Control Protocol (LACP), or manually, to form an ultra-high-bandwidth connection to the network backbone; helps prevent traffic bottlenecks

### Convergence

- LLDP-MED (Media Endpoint Discovery)

Defines a standard extension of LLDP that stores values for parameters such as QoS and VLAN to automatically configure network devices such as IP phones

- Auto voice VLAN

Recognizes IP phones and automatically assigns voice traffic to dedicated VLAN for IP phones

- PoE Models For Converged Voice/Data Networks

Simplifies and lowers the cost of installing a converged infrastructure. Power IP phones, Access Points, Video Surveillance cameras, or other PoE-enabled devices. HP 1950 Switches support multiple methods of allocating PoE power—IEEE 802.3af class, LLDP-MED, or user-specified—for more efficient energy usage

### Additional information

- Green initiative support

Provides support for RoHS and WEEE regulations

- Green IT and power

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

### Warranty and support

- Limited Lifetime Warranty 2.0

Advance hardware replacement with next-business-day delivery (available in most countries). See [hp.com/networking/warrantysummary](http://hp.com/networking/warrantysummary) for duration details.

- Electronic and telephone support (for Limited Lifetime Warranty 2.0)

Limited 24x7 telephone support is available from HP for the first 3 years; limited electronic and business hours telephone support is available from HP for the entire warranty period; to reach our support centers, refer to [hp.com/networking/contact-support](http://hp.com/networking/contact-support); for details on the duration of support provided with your product purchase, refer to [hp.com/networking/warrantysummary](http://hp.com/networking/warrantysummary)

## HP 1950 Switch Series

### Specifications



	<b>HP 1950-24G-2SFP+-2XGT Switch (JG960A)</b>	<b>HP 1950-48G-2SFP+-2XGT Switch (JG961A)</b>
<b>I/O ports and slots</b>	24 RJ-45 auto-negotiating 10/100/1000 ports (IEEE 802.3 Type 10BASE-T, IEEE 802.3u Type 100BASE-TX, IEEE 802.3ab Type 1000BASE-T) 2 SFP+ fixed 1000/10000 SFP+ ports 2 RJ-45 1/10GBASE-T ports	48 RJ-45 auto-negotiating 10/100/1000 ports (IEEE 802.3 Type 10BASE-T, IEEE 802.3u Type 100BASE-TX, IEEE 802.3ab Type 1000BASE-T) 2 SFP+ fixed 1000/10000 SFP+ ports 2 RJ-45 1/10GBASE-T ports
<b>Additional ports and slots</b>	1 RJ-45 console port to access limited CLI port	1 RJ-45 console port to access limited CLI port
<b>Physical characteristics</b>		
Dimensions	17.17(w) x 6.3(d) x 1.73(h) in (43.6 x 16 x 4.4 cm) (1U height)	17.32(w) x 10.63(d) x 1.73(h) in (44 x 27 x 4.4 cm) (1U height)
Weight	6.61 lb (3 kg)	11.02 lb (5 kg)
<b>Memory and processor</b>	128 MB flash; packet buffer size: 1.5 MB, 1 GB SDRAM	128 MB flash; packet buffer size: 3 MB, 1 GB SDRAM
<b>Mounting and enclosure</b>	Mounts in an EIA standard 19-inch telco rack or equipment cabinet (hardware included)	Mounts in an EIA standard 19-inch telco rack or equipment cabinet (hardware included)
<b>Performance</b>		
100 Mb Latency	< 5 $\mu$ s	< 5 $\mu$ s
1000 Mb Latency	< 5 $\mu$ s	< 5 $\mu$ s
10 Gbps Latency	< 1.5 $\mu$ s	< 1.5 $\mu$ s
Throughput	up to 95.2 Mpps (64-byte packets)	up to 130.9 Mpps (64-byte packets)
Routing/Switching capacity	128 Gbps	176 Gbps
Routing table size	32 entries (IPv4), 32 entries (IPv6)	32 entries (IPv4), 32 entries (IPv6)
MAC address table size	16384 entries	16384 entries
<b>Reliability</b>		
MTBF (years)	87.2	51
<b>Environment</b>		
Operating temperature	32°F to 113°F (0°C to 45°C)	32°F to 113°F (0°C to 45°C)
Operating relative humidity	10% to 90%, noncondensing	10% to 90%, noncondensing
Nonoperating/Storage temperature	-40°F to 158°F (-40°C to 70°C)	-40°F to 158°F (-40°C to 70°C)
Nonoperating/Storage relative humidity	5% to 95%, noncondensing	5% to 95%, noncondensing
Altitude	up to 16,404 ft (5 km)	up to 16,404 ft (5 km)
Acoustic	Low-speed fan: 19.0 dB, High-speed fan: 44.5 dB; ISO 7779 Dual speed fan	Low-speed fan: 38.4 dB, High-speed fan: 47.0 dB; ISO 7779 Dual speed fan

## HP 1950 Switch Series

### Specifications (continued)

	HP 1950-24G-2SFP+-2XGT Switch (JG960A)	HP 1950-48G-2SFP+-2XGT Switch (JG961A)
<b>Electrical characteristics</b>		
Frequency	50/60 Hz	50/60 Hz
AC voltage	100—240 VAC, rated (depending on power supply chosen)	100—240 VAC, rated (depending on power supply chosen)
Maximum power rating	34 W	54 W
	<b>Notes</b> 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.	<b>Notes</b> 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.
<b>Safety</b>	UL 60950; IEC 60950-1; EN 60950-1; GB 4943.1	UL 60950; IEC 60950-1; EN 60950-1; GB 4943.1
<b>Emissions</b>	FCC part 15 Class A; VCCI Class A; EN 55022 Class A; CISPR 22 Class A; EN 55024; EN 61000-3-2 2000, 61000-3-3; ICES-003 Class A	FCC part 15 Class A; VCCI Class A; EN 55022 Class A; CISPR 22 Class A; EN 55024; EN 61000-3-2 2000, 61000-3-3; ICES-003 Class A
<b>Management</b>	IMC—intelligent management center; Limited command-line interface; Web browser; SNMP manager; HTTPS; RMON1; FTP; Supported by HP IMC and generic SNMP management platforms. Refer to documentation for MIB support details.	IMC—intelligent management center; Limited command-line interface; Web browser; SNMP manager; HTTPS; RMON1; FTP; Supported by HP IMC and generic SNMP management platforms. Refer to documentation for MIB support details.
<b>Notes</b>	Transceivers under accessories are recommended versions. Here is the list of fully supported transceivers. 10G SFP+: JD092B, JD093B, JD094B, JG234A, J9150A, J9151A, J9152A, J9153A. GE SFP: JD118B, JD119B, JD089B, J4858C, J4859C, J8177C.	Transceivers under accessories are recommended versions. Here is the list of fully supported transceivers. 10G SFP+: JD092B, JD093B, JD094B, JG234A, J9150A, J9151A, J9152A, J9153A. GE SFP: JD118B, JD119B, JD089B, J4858C, J4859C, J8177C.
<b>Services</b>	Refer to the HP website at <a href="http://hp.com/networking/services">hp.com/networking/services</a> 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 website at <a href="http://hp.com/networking/services">hp.com/networking/services</a> 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.

## HP 1950 Switch Series

### Specifications (continued)



	<b>HP 1950-24G-2SFP+-2XGT-PoE+(370W) Switch (JG962A)</b>	<b>HP 1950-48G-2SFP+-2XGT-PoE+(370W) Switch (JG963A)</b>
<b>I/O ports and slots</b>	24 RJ-45 auto-negotiating 10/100/1000 PoE+ ports (IEEE 802.3 Type 10BASE-T, IEEE 802.3u Type 100BASE-TX, IEEE 802.3ab Type 1000BASE-T, IEEE 802.3af PoE, IEEE 802.3at) 2 SFP+ fixed 1000/10000 SFP+ ports 2 RJ-45 1/10GBASE-T ports	48 RJ-45 auto-negotiating 10/100/1000 PoE+ ports (IEEE 802.3 Type 10BASE-T, IEEE 802.3u Type 100BASE-TX, IEEE 802.3ab Type 1000BASE-T, IEEE 802.3af PoE, IEEE 802.3at) 2 SFP+ fixed 1000/10000 SFP+ ports 2 RJ-45 1/10GBASE-T ports
<b>Additional ports and slots</b>	1 RJ-45 console port to access limited CLI port	1 RJ-45 console port to access limited CLI port
<b>Physical characteristics</b>		
Dimensions	17.32(w) x 14.17(d) x 1.73(h) in (44 x 36 x 4.4 cm) (1U height)	17.32(w) x 16.54(d) x 1.73(h) in (44 x 42 x 4.4 cm) (1U height)
Weight	13.23 lb (6 kg)	15.43 lb (7 kg)
<b>Memory and processor</b>	128 MB flash; Packet buffer size: 1.5 MB, 1 GB SDRAM	128 MB flash; Packet buffer size: 3 MB, 1 GB SDRAM
<b>Mounting and enclosure</b>	Mounts in an EIA standard 19-inch telco rack or equipment cabinet (hardware included)	Mounts in an EIA standard 19-inch telco rack or equipment cabinet (hardware included)
<b>Performance</b>		
100 Mb Latency	< 5 $\mu$ s	< 5 $\mu$ s
1000 Mb Latency	< 5 $\mu$ s	< 5 $\mu$ s
10 Gbps Latency	< 1.5 $\mu$ s	< 1.5 $\mu$ s
Throughput	up to 95.2 Mpps (64-byte packets)	up to 130.9 Mpps (64-byte packets)
Routing/Switching capacity	128 Gbps	176 Gbps
Routing table size	32 entries (IPv4), 32 entries (IPv6)	32 entries (IPv4), 32 entries (IPv6)
MAC address table size	16384 entries	16384 entries
<b>Reliability</b>		
MTBF (years)	44.4	26.8
<b>Environment</b>		
Operating temperature	32°F to 113°F (0°C to 45°C)	32°F to 113°F (0°C to 45°C)
Operating relative humidity	10% to 90%, noncondensing	10% to 90%, noncondensing
Nonoperating/Storage temperature	-40°F to 158°F (-40°C to 70°C)	-40°F to 158°F (-40°C to 70°C)
Nonoperating/Storage relative humidity	5% to 95%, noncondensing	5% to 95%, noncondensing
Altitude	up to 16,404 ft (5 km)	up to 16,404 ft (5 km)
Acoustic	Low-speed fan: 37.3 dB, High-speed fan: 47.1 dB; ISO 7779 Dual speed fan	Low-speed fan: 47.3 dB, High-speed fan: 50.0 dB; ISO 7779 Dual speed fan



## HP 1950 Switch Series

### Specifications (continued)

	<b>HP 1950-24G-2SFP+-2XGT-PoE+(370W) Switch (JG962A)</b>	<b>HP 1950-48G-2SFP+-2XGT-PoE+(370W) Switch (JG963A)</b>
<b>Electrical characteristics</b>		
Frequency	50/60 Hz	50/60 Hz
Voltage	100—240 VAC, rated (depending on power supply chosen)	100—240 VAC, rated (depending on power supply chosen)
Maximum power rating	425 W	470 W
PoE power	370 W PoE+	370 W PoE+
	<b>Notes</b> 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. PoE power is the power supplied by the internal power supply. It is dependent on the type and quantity of power supplies and may be supplemented with the use of an external power supply (EPS). When supplemented with the use of an HP RPS1600 Redundant Power System, up to 720 W of PoE+ can be supplied. Unit max. power consumption with RPS is 750 W.	<b>Notes</b> 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. PoE power is the power supplied by the internal power supply. It is dependent on the type and quantity of power supplies and may be supplemented with the use of an external power supply (EPS). When supplemented with the use of an HP RPS1600 Redundant Power System, up to 800 W of PoE+ can be supplied. Unit max. power consumption with RPS is 910 W.
<b>Safety</b>	UL 60950; IEC 60950-1; EN 60950-1; GB 4943.1	UL 60950; IEC 60950-1; EN 60950-1; GB 4943.1
<b>Emissions</b>	FCC part 15 Class A; VCCI Class A; EN 55022 Class A; CISPR 22 Class A; EN 55024; EN 61000-3-2 2000, 61000-3-3; ICES-003 Class A	FCC part 15 Class A; VCCI Class A; EN 55022 Class A; CISPR 22 Class A; EN 55024; EN 61000-3-2 2000, 61000-3-3; ICES-003 Class A
<b>Management</b>	IMC—intelligent management center; Limited command-line interface; Web browser; SNMP manager; HTTPS; RMON1; FTP; Supported by HP IMC and generic SNMP management platforms. Refer to documentation for MIB support details.	IMC—intelligent management center; Limited command-line interface; Web browser; SNMP manager; HTTPS; RMON1; FTP; Supported by HP IMC and generic SNMP management platforms. Refer to documentation for MIB support details.
<b>Notes</b>	Transceivers under accessories are recommended versions. Here is the list of fully supported transceivers. 10G SFP+: JD092B, JD093B, JD094B, JG234A, J9150A, J9151A, J9152A, J9153A. GE SFP: JD118B, JD119B, JD089B, J4858C, J4859C, J8177C.	Transceivers under accessories are recommended versions. Here is the list of fully supported transceivers. 10G SFP+: JD092B, JD093B, JD094B, JG234A, J9150A, J9151A, J9152A, J9153A. GE SFP: JD118B, JD119B, JD089B, J4858C, J4859C, J8177C.
<b>Services</b>	Refer to the HP website at <a href="http://hp.com/networking/services">hp.com/networking/services</a> 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 website at <a href="http://hp.com/networking/services">hp.com/networking/services</a> 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)

<b>Device management</b>		RFC 2819 RMON	
<b>General protocols</b>	IEEE 802.1D MAC Bridges IEEE 802.1D Spanning Tree Protocol IEEE 802.1p Priority IEEE 802.1Q VLANs IEEE 802.1s Multiple Spanning Trees	IEEE 802.1w Rapid Spanning Tree Protocol IEEE 802.1X IEEE 802.3 Type 10BASE-T IEEE 802.3ab 1000BASE-T IEEE 802.3ad Link Aggregation Control Protocol (LACP)	IEEE 802.3af Power over Ethernet IEEE 802.3at PoE+ IEEE 802.3i 10BASE-T IEEE 802.3x Flow Control IEEE 802.3z 1000BASE-X
<b>MIBs</b>	RFC 1213 MIB II RFC 1493 Bridge MIB RFC 2021 RMONv2 MIB RFC 2233 Interface MIB RFC 2233 Interfaces MIB RFC 2571 SNMP Framework MIB RFC 2572 SNMP-MPD MIB	RFC 2573 SNMP-Notification MIB RFC 2573 SNMP-Target MIB RFC 2613 SMON MIB RFC 2618 RADIUS Client MIB RFC 2620 RADIUS Accounting MIB RFC 2665 Ethernet-Like-MIB RFC 2667 IP Tunnel MIB	RFC 2668 802.3 MAU MIB RFC 2674 802.1p and IEEE 802.1Q Bridge MIB RFC 2737 Entity MIB (Version 2) RFC 3414 SNMP-User based-SM MIB RFC 3415 SNMP-View based-ACM MIB RFC 3418 MIB for SNMPv3
<b>Network management</b>	IEEE 802.1AB Link Layer Discovery Protocol (LLDP)	IEEE 802.1D (STP)	RFC 1215 SNMP Generic traps
<b>QoS/CoS</b>		IEEE 802.1P (CoS)	
<b>Security</b>		IEEE 802.1X Port Based Network Access Control	

## HP 1950 Switch Series accessories

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### Transceivers

HP X121 1G SFP LC SX Transceiver (J4858C)  
HP X121 1G SFP LC LX Transceiver (J4859C)  
HP X121 1G SFP RJ45 T Transceiver (J8177C)  
HP X132 10G SFP+ LC SR Transceiver (J91 50A)  
HP X132 10G SFP+ LC LR Transceiver (J9151A)  
HP X132 10G SFP+ LC LRM Transceiver (J9152A)

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### Cables


HP 0.5 m Multimode OM3 LC/LC Optical Cable (AJ833A)  
HP 1 m Multimode OM3 LC/LC Optical Cable (AJ834A)  
HP 2 m Multimode OM3 LC/LC Optical Cable (AJ835A)  
HP 5 m Multimode OM3 LC/LC Optical Cable (AJ836A)  
HP 15 m Multimode OM3 LC/LC Optical Cable (AJ837A)  
HP 30 m Multimode OM3 LC/LC Optical Cable (AJ838A)  
HP 50 m Multimode OM3 LC/LC Optical Cable (AJ839A)  
HP Premier Flex LC/LC Multi-mode OM4 2 fiber 1m Cable (QK732A)  
HP Premier Flex LC/LC Multi-mode OM4 2 fiber 2m Cable (QK733A)  
HP Premier Flex LC/LC Multi-mode OM4 2 fiber 5m Cable (QK734A)  
HP Premier Flex LC/LC Multi-mode OM4 2 fiber 15m Cable (QK735A)  
HP Premier Flex LC/LC Multi-mode OM4 2 fiber 30m Cable (QK736A)  
HP Premier Flex LC/LC Multi-mode OM4 2 fiber 50m Cable (QK737A)

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