Hewlett Packard Enterprise

HPE 12500 Switch Series

Key features

- Optimized for data centers with extensive virtualization and convergence features
- Broad interface options from 1G to 100G scaling up to 24.3 Tb/s switching capacity
- SDN ready with OpenFlow 1.3 support
- Large Layer 2 and Layer 3 tables to support large scale deployments
- Fully redundant architecture with hot swappable components

Product overview

The HPE 12500 Switch Series is a family of powerful, next-generation routing switches with outstanding capacity and scale for the network core or data center.

Designed for high performance with non-blocking and distributed Clos architecture, these switches deliver up to 24.3 Tb/s switching capacity and 10.8 Bpps throughput with up to 400 Gb/s per line card slot.

The 12500 switches also have energy-efficiency features that drive down operational expenses and are ideal for organizations contemplating large-scale data center consolidations, business continuity and disaster recovery sites, metropolitan area network deployments, and other applications requiring a robust, reliable, and highly available switching platform.

Features and benefits

Data center optimized

- Scalable Layer 2 fabrics

  Build flexible, resilient, and scalable Layer 2 fabrics with SPB and HPE IRF

- Multi-tenant Device Context (MDC)

  Is an innovative data center virtualization solution that enables multi-tenancy, giving customers the ability to virtualize a physical switch into multiple logical devices, with each logical switch having its own tenants

- HPE Ethernet Virtual Interconnect (EVI)

  Is an HPE Virtual Application Network innovation that provides a Layer 2 extension across the data center to simplify the interconnectivity of geographically disperse data centers

- Data Center Bridging (DCB) protocols

  Provide support for IEEE 802.1Qaz Data Center Bridging Exchange (DCBX), Enhanced Transmission Selection (ETS), and IEEE 802.1Qbb Priority Flow Control (PFC) for converged fabrics

- Fibre Channel over Ethernet (FCoE) features

  Deliver support for FCoE, including expansion, fabric, trunk VF and N ports, and aggregation of E-port and N-port virtualization

- Accelerated performance with jumbo frames

  For intra-data-center communication, or for data center to data center traffic (disaster recovery), reducing the amount of time required for data backup and recovery

- Network load balancing (NLB) multicast ARP

  Microsoft® NLB co-works with multicast ARP to provide servers with load balancing and fault switchover, which lowers costs and investment

Software-defined networking

- Supports OpenFlow 1.3 specifications

  To enable SDN by allowing separation of the data (packet forwarding) and control (routing decision) paths

Performance

- High-performance design with non-blocking and distributed Clos architecture

  Delivers up to 24.3 Tb/s switching capacity and 10.8 Bpps throughput with up to 400 Gb/s per line card slot

- High-density 1/10/40/100GbE interface connectivity

  Offers up to 18 interface module slots to scale up to 864 1GbE or 1/10GbE or 288 40GbE or 72 100GbE ports

- Hardware-based wirespeed access control lists (ACLs)

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

- High-performance processor system

  The supervisor module uses three different processors to isolate key tasks: control plane (STP, OSPF, BGP, MPLS, etc.), fast recovery protocols (RRPP, BFD, etc.), and chassis management (temperature, power, etc.)

Product architecture

- Distributed architecture with separation of data and control planes

  Delivers enhanced fault tolerance and facilitates continuous operation and zero service disruption during planned or unplanned control-plane events

- Advanced Comware modular OS

  Brings modularity, enhanced serviceability, stability, and independent process monitoring through modern Comware v7 Operating System

- In-Service Software Upgrade (ISSU)

  Provides an upgrade of the entire chassis, or an individual task or process, with zero packet loss

Resiliency and high availability

- Intelligent Resilient Framework (IRF)

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

- Ultrafast protocol convergence

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

- Device Link Detection Protocol (DLDP)

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

- Complete set of routing protocols (Layer 3 IPv4 and IPv6)

  Supporting wide range of routing protocols including RIP, OSPF, IS-IS, and BGP for both IPv4 and IPv6 along with complete support of PIM-DM, PIM-SM, PIM-SSM, and MSDP

- Hot patching

  The 12500 Switch Series supports hot patching, allowing in-service patching for some isolated software problems

- Nonstop Forwarding/Graceful Restart (NSF/GR)

  Using standardized-based IETF protocols, the 12500 Switch Series provides nonstop forwarding (switching/routing) for Layer 3 routing protocols (control plane—OSPF, BGP, and MPLS), providing hitless failover

- Fully redundant and hot swappable components

  Providing full hardware redundancy for each component including power supplies, fan trays, supervisor modules, and fabric modules to enable the highest level of availability

- Rapid Ring Protection Protocol (RRPP)

  Provides fast recovery for ring Ethernet-based topology

Quality of Service (QoS)

- Virtual Output Queue (VOQ)

  Prevents head-of-line (HOL) blocking and gracefully handles bursty data center traffic increasing switch performance

- IEEE 802.1p prioritization

  Delivers data to devices based on the priority and type of traffic

- Layer 4 prioritization

  Enables prioritization based on TCP/UDP port numbers

- Broadcast control

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

- Advanced classifier-based QoS

  Classifies traffic using multiple match criteria based on Layer 2, 3, and 4 information; applies QoS policies such as setting priority level and rate limit to selected traffic on a per-port or per-VLAN basis

- Bandwidth shaping

  – Port-based rate limiting

    Provides per-port ingress-/egress-enforced maximum bandwidth

  – Classifier-based rate limiting

    Uses ACLs to enforce maximum bandwidth for ingress/egress traffic on each port

Compartmentalization

- Department protection

  Using network virtualization standards (QinQ, VRF, and MPLS), the 12500 Switch Series allows organizations to isolate different business units with different resources (VRFs); using standard-based mechanisms, the network is completely virtualized, reducing cost and operations

- IEEE 802.1ah Provider Backbone Bridge (MAC in MAC)

  Provider Backbone Bridge (PBB) is a Layer 2 VPN technology that allows a complete separation of customer and provider domains by sealing the user MAC in the service provider MAC, which enhances the scalability of an Ethernet network

Layer 2 switching

- Multiple VLAN Registration Protocol (MVRP)

  Helps to maintain VLAN configuration dynamically based on current network configurations

- GARP VLAN Registration Protocol

  Allows automatic learning and dynamic assignment of VLANs

- IP multicast snooping and data-driven IGMP

  Automatically prevents flooding of IP multicast traffic

- IEEE 802.1ad QinQ

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

- Bridge Protocol Data Unit (BPDU) tunneling

  Transmits STP BPDUs transparently, allowing correct tree calculations across service providers, WANs, or MANs

- VLAN support and tagging

  Supports IEEE 802.1Q (4K VLAN IDs)

- Spanning Tree

  The 12500 Switch Series supports the entire set of STP protocols (STP, RSTP, and MSTP), facilitating a complete integration with standard networks

Layer 3 routing

- Layer 3 IPv4 routing

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

- RIP and RIPng support

  Provides complete support of RIP for both IPv4 and IPv6

- OSPF and OSPFv3 support

  Provides complete support of OSPF for both IPv4 and IPv6

- IS-IS and IS-ISv6 support

  Provides complete support of IS-IS for both IPv4 and IPv6

- Equal-Cost Multipath (ECMP)

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

- Layer 3 IPv6 routing

  Provides routing of IPv6 at media speed; supports static routes, RIPng, OSPFv3, IS-ISv6, and BGP4+

- IPv6 tunneling

  Allows a smooth transition from IPv4 to IPv6 by encapsulating IPv6 traffic over an existing IPv4 infrastructure

- Complete multicast protocol stack

  PIM-DM, PIM-SM, PIM-SSM, MSDP, and extensions to BGP provide one of the most complete multicast protocol stacks

- Policy routing

  Allows custom filters for increased performance and security; supports ACLs, IP prefix, AS paths, community lists, and aggregate policies

- MPLS support

  Provides extended support of MPLS, including MPLS VPNs and MPLS Traffic Engineering (MPLS TE)

- VPLS support

  Provides extended support of VPLS for data center to data center communication at Layer 2; provides support of hierarchical VPLS for scalability

Management

- sFlow®

  Provides scalable, ASIC-based network monitoring and accounting; this allows network operators to gather a variety of sophisticated network statistics and information for capacity planning and real-time network monitoring purposes

- IEEE 802.1AB LLDP discovery

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

- USB support

  – File copy

    Allows users to copy switch files to and from a USB flash drive

- Multiple configuration files

  Stores easily to the flash image

- Command-line interface (CLI)

  Provides a secure, easy-to-use CLI for configuring the module via SSH or a switch console; provides direct real-time session visibility

- Logging

  Provides local and remote logging of events via SNMP (v2c and v3) and syslog; provides log throttling and log filtering to reduce the number of log events generated

- Management interface control

  Enables or disables each of the following interfaces depending on security preferences: console port, telnet port, and SSH port

- Out-of-band interface

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

- Network management

  HPE Intelligent Management Center (IMC) centrally configures, updates, monitors, and troubleshoots

- Network management

  SNMP v2c/v3 MIB-II with traps

- RADIUS accounting

  Logs all session details that can be used to generate usage reports or interface to a billing system

- RMON

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

- Remote Intelligent Mirroring

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

Connectivity

- IPv6 native support
  - IPv6 host

    Enables switches to be managed and deployed at the IPv6 network's edge
  - Dual stack (IPv4 and IPv6)

    Transitions from IPv4 to IPv6, supporting connectivity for both protocols
  - Multicast Listener Discovery (MLD) snooping

    Forwards IPv6 multicast traffic to the appropriate interface
  - IPv6 ACL/QoS

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

    Supports IPv6 static routes and IPv6 versions of RIP and OSPF routing protocols

Security

- Control Plane Policing (CoPP)

  Protection against DoS attacks at infrastructure routers and switches; ease of configuration for control plane policies

- IEEE 802.1X and RADIUS network logins

  Controls port-based access for authentication and accountability

- Secure FTP

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

- Switch management logon security

  Helps secure switch CLI logon by optionally requiring either RADIUS or TACACS+ authentication

- DHCP protection

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

- Dynamic ARP protection

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

- Secure Shell (SSHv2)

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

- Secure management access

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

- ACLs

  Provide IPv4 and IPv6 filtering based on source/destination IP address/subnet and source/destination TCP/UDP port number

- Media access control (MAC) authentication

  Provides simple authentication based on a user's MAC address; supports local or RADIUS-based authentication

Convergence

- Layers 2, 3, and 4 QoS mechanisms

  Support DiffServ priority tagging based on IP address, IP Type of Service (ToS), Layer 3 protocol, TCP/UDP port number, and source port

- IP multicast snooping and data-driven IGMP

  Automatically prevent flooding of IP multicast traffic

- LLDP-MED

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

- Internet Group Management Protocol (IGMP)

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

- Protocol Independent Multicast (PIM)

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

- Multicast Source Discovery Protocol (MSDP)

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

- Multicast VLAN

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

Monitor and diagnostics

- Port mirroring

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

- Connectivity fault detection (IEEE 802.1ag)

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

Integration

- 12500 VPN 20 Gb/s Firewall Module

  Provides enhanced stateful packet inspection and filtering; supports flexible security zones and virtual firewall containment; delivers advanced VPN services with 3DES and AES encryption at high performance and low latency; offers Web content filtering and application prioritization and optimization

Investment protection

- Modular switch fabric

  Provides investment protection by enabling future performance upgrades and increased port density

- Environmentally friendly

  RoHS support and low power consumption based on the latest technology provide outstanding power efficiency

Warranty and support

- 1-year warranty

  See **hpe.com/networking/warrantysummary** for warranty and support information included with your product purchase.

- Software releases

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

HPE 12500 Switch Series

Specifications

	HPE 12504 AC Switch Chassis (JC654A)	HPE 12504 DC Switch Chassis (JC655A)	HPE 12508 AC Switch Chassis (JF431C)
I/O ports and slots	4 open module slots Supports a maximum of 192 Gigabit Ethernet ports or 192 1/10GbE ports or 64 40GbE ports or 16 100GbE ports, or a combination	4 open module slots Supports a maximum of 192 Gigabit Ethernet ports or 192 1/10GbE ports or 64 40GbE ports or 16 100GbE ports, or a combination	8 open module slots Supports a maximum of 384 Gigabit Ethernet ports or 384 1/10GbE ports or 128 40GbE ports or 32 100GbE ports, or a combination
Additional ports and slots	2 MPU (for management modules) slots 4 switch fabric slots	2 MPU (for management modules) slots 4 switch fabric slots	2 MPU (for management modules) slots 9 switch fabric slots
Physical characteristics			
Dimensions	17.4(w) x 27.87(d) x 17.4(h) in. (44.2 x 70.8 x 44.2 cm) (10U height)	17.4(w) x 27.87(d) x 17.4(h) in. (44.2 x 70.8 x 44.2 cm)	17.4(w) x 29.13(d) x 38.39(h) in. (44.2 x 73.99 x 97.51 cm) (22U height)
Weight	132.28 lb (60 kg)	132.28 lb (60 kg)	209.44 lb (95 kg)
Full configuration weight	220.46 lb (100 kg)	220.46 lb (100 kg)	374.78 lb (170 kg)
Memory and processor			
Gigabit module	PowerPC @ 667 MHz, 1 GB RAM; packet buffer size: 512 MB (Ingress, shared by 24 1GbE ports)	PowerPC @ 667 MHz, 1 GB RAM; packet buffer size: 512 MB (Ingress, shared by 24 1GbE ports)	PowerPC @ 667 MHz, 1 GB RAM; packet buffer size: 512 MB (Ingress, shared by 24 1GbE ports)
10G module	PowerPC @ 667 MHz, 1 GB RAM; packet buffer size: 512 MB (Ingress/shared by 2 10GbE ports)	PowerPC @ 667 MHz, 1 GB RAM; packet buffer size: 512 MB (Ingress/shared by 2 10GbE ports)	PowerPC @ 667 MHz, 1 GB RAM; packet buffer size: 512 MB (Ingress/shared by 2 10GbE ports)
Management module	Quad Core CPU @ 1800 MHz, 512 MB flash, 4 GB compact flash, 8 GB RAM	Quad Core CPU @ 1800 MHz, 512 MB flash, 4 GB compact flash, 8 GB RAM	Quad Core CPU @ 1800 MHz, 512 MB flash, 4 GB compact flash, 8 GB RAM
Fabric	PowerPC @ 400 MHz, 128 MB RAM	PowerPC @ 400 MHz, 128 MB RAM	PowerPC @ 400 MHz, 128 MB RAM
Mounting and enclosure	Mounts in an EIA-standard 19 in. Telco rack or equipment cabinet	Mounts in an EIA-standard 19 in. Telco rack or equipment cabinet	Mounts in an EIA-standard 19 in. Telco rack or equipment cabinet
Performance			
Throughput	1920 Mpps	1920 Mpps	3840 Mpps
Routing/Switching capacity	3240 Gb/s	3240 Gb/s	6120 Gb/s
Environment			
Operating temperature	32°F to 104°F (0°C to 40°C)	32°F to 104°F (0°C to 40°C)	32°F to 104°F (0°C to 40°C)
Operating relative humidity	5% to 95%, noncondensing	5% to 95%, noncondensing	5% to 95%, noncondensing
Non-operating/Storage temperature	-40°F to 158°F (-40°C to 70°C)	-40°F to 158°F (-40°C to 70°C)	-40°F to 158°F (-40°C to 70°C)
Non-operating/Storage relative humidity	5% to 95%, noncondensing	5% to 95%, noncondensing	5% to 95%, noncondensing

Specifications (Continued)

	HPE 12504 AC Switch Chassis (JC654A)	HPE 12504 DC Switch Chassis (JC655A)	HPE 12508 AC Switch Chassis (JF431C)
Electrical characteristics			
Frequency	50/60 Hz		50/60 Hz
Description			**Achieved Miercom Certified Green Award** 10GbE modules consume half the power compared to competitive products; redundant, scalable, 90% efficient power supplies deliver high reliability in the data center; new ASIC technology has low power consumption when providing rich features.
Maximum heat dissipation	8123 BTU/hr (8569.77 kJ/hr)	8123 BTU/hr (8569.77 kJ/hr)	14587 BTU/hr (15389.29 kJ/hr)
AC voltage	100–120/200–240 VAC, rated (90–264 VAC, max)		100–120/200–240 VAC, rated (90–264 VAC, max)
DC voltage		-48 to -60 VDC	
Maximum power rating	2380 W	2380 W	4750 W
	Notes 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.	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.	Maximum power rating and maximum heat dissipation are the worst-case theoretical maximum numbers provided for planning the infrastructure with fully loaded PoE (if equipped), 100% traffic, all ports plugged in, and all modules populated.
Safety	CE Labeled; cUL Certified; UL Listed; EN 60825-1 Safety of Laser Products-Part 1; EN 60825-2 Safety of Laser Products-Part 2; IEC 60825; IEC 60950-1:2001 (with CB Report); CAN/CSA-C22.2 No. 60950-1-03; Anatel; ULAR; GOST; EN 60950-1/A11; FDA 21 CFR Subchapter J; NOM; UL 60950-1:2003; EN 60950-1:2001; RoHS Compliance	CE Labeled; cUL Certified; UL Listed; EN 60825-1 Safety of Laser Products-Part 1; EN 60825-2 Safety of Laser Products-Part 2; IEC 60825; IEC 60950-1:2001 (with CB Report); CAN/CSA-C22.2 No. 60950-1-03; Anatel; ULAR; GOST; EN 60950-1/A11; FDA 21 CFR Subchapter J; NOM; UL 60950-1:2003; EN 60950-1:2001; RoHS Compliance	CE Labeled; cUL Certified; UL Listed; EN 60825-1 Safety of Laser Products-Part 1; EN 60825-2 Safety of Laser Products-Part 2; IEC 60825; IEC 60950-1:2001 (with CB Report); CAN/CSA-C22.2 No. 60950-1-03; Anatel; ULAR; GOST; EN 60950-1/A11; FDA 21 CFR Subchapter J; NOM; UL 60950-1:2003; EN 60950-1:2001; RoHS Compliance
Emissions	VCCI Class A; EN 55022 Class A; VCCI V-3/2000.04; ICES-003 Class A; AS/NZS CISPR 22 Class A; EMC Directive 2004/108/EC; FCC (CFR 47, Part 15) Class A	VCCI Class A; EN 55022 Class A; VCCI V-3/2000.04; ICES-003 Class A; AS/NZS CISPR 22 Class A; EMC Directive 2004/108/EC; FCC (CFR 47, Part 15) Class A	VCCI Class A; EN 55022 Class A; VCCI V-3/2000.04; ICES-003 Class A; AS/NZS CISPR 22 Class A; EMC Directive 2004/108/EC; FCC (CFR 47, Part 15) Class A

Specifications (Continued)

	HPE 12504 AC Switch Chassis (JC654A)	HPE 12504 DC Switch Chassis (JC655A)	HPE 12508 AC Switch Chassis (JF431C)
Immunity			
Generic	ETSI EN 300 386 V1.3.3	ETSI EN 300 386 V1.3.3	ETSI EN 300 386 V1.3.3
EN	EN 55024:1998+ A1:2001 + A2:2003	EN 55024:1998+ A1:2001 + A2:2003	EN 55024:1998+ A1:2001 + A2:2003
ESD	EN 61000-4-2; IEC61000-4-2	EN 61000-4-2; IEC61000-4-2	EN 61000-4-2; IEC61000-4-2
Radiated	EN 61000-4-3; IEC61000-4-3	EN 61000-4-3; IEC61000-4-3	EN 61000-4-3; IEC61000-4-3
EFT/Burst	EN 61000-4-4; IEC61000-4-4	EN 61000-4-4; IEC61000-4-4	EN 61000-4-4; IEC61000-4-4
Surge	EN 61000-4-5; IEC61000-4-5	EN 61000-4-5; IEC61000-4-5	EN 61000-4-5; IEC61000-4-5
Conducted	EN 61000-4-6; IEC61000-4-6	EN 61000-4-6; IEC61000-4-6	EN 61000-4-6; IEC61000-4-6
Power frequency magnetic field	IEC 61000-4-8; EN61000-4-8	IEC 61000-4-8; EN61000-4-8	IEC 61000-4-8; EN61000-4-8
Voltage dips and interruptions	EN 61000-4-11; IEC61000-4-11	EN 61000-4-11; IEC61000-4-11	EN 61000-4-11; IEC61000-4-11
Harmonics	EN 61000-3-2, IEC 61000-3-2	EN 61000-3-2, IEC 61000-3-2	EN 61000-3-2, IEC 61000-3-2
Flicker	EN 61000-3-3, IEC 61000-3-3	EN 61000-3-3, IEC 61000-3-3	EN 61000-3-3, IEC 61000-3-3
Management	IMC—Intelligent Management Center; command-line interface; out-of-band management (serial RS-232C); SNMP Manager; Telnet; RMON1; FTP; in-line and out-of-band; terminal interface (serial RS-232C); modem interface	IMC—Intelligent Management Center; command-line interface; out-of-band management (serial RS-232C); SNMP Manager; Telnet; RMON1; FTP; in-line and out-of-band; terminal interface (serial RS-232C); modem interface	IMC—Intelligent Management Center; command-line interface; out-of-band management (serial RS-232C); SNMP Manager; Telnet; RMON1; FTP; in-line and out-of-band; terminal interface (serial RS-232C); modem interface
Services	Refer to the Hewlett Packard Enterprise website at **hpe.com/networking/services** for details on the service-level descriptions and product numbers. For details about services, and response times in your area, please contact your local Hewlett Packard Enterprise sales office.	Refer to the Hewlett Packard Enterprise website at **hpe.com/networking/services** for details on the service-level descriptions and product numbers. For details about services, and response times in your area, please contact your local Hewlett Packard Enterprise sales office.	Refer to the Hewlett Packard Enterprise website at **hpe.com/networking/services** for details on the service-level descriptions and product numbers. For details about services, and response times in your area, please contact your local Hewlett Packard Enterprise sales office.

HPE 12500 Switch Series

Specifications

	HPE 12508 DC Switch Chassis (JC652A)	HPE 12518 DC Switch Chassis (JC653A)
I/O ports and slots	8 open module slots Supports a maximum of 384 Gigabit Ethernet ports or 384 1/10GbE ports or 128 40GbE ports or 32 100GbE ports, or a combination	18 open module slots Supports a maximum of 864 Gigabit Ethernet ports or 864 1/10GbE ports or 288 40GbE ports or 72 100GbE ports, or a combination
Additional ports and slots	2 MPU (for management modules) slots 9 switch fabric slots	2 MPU (for management modules) slots 9 switch fabric slots
Physical characteristics		
Dimensions	17.4(w) x 29.13(d) x 38.39(h) in. (44.2 x 73.99 x 97.51 cm) (22U height)	17.4(w) x 29.13(d) x 66.38(h) in. (44.2 x 73.99 x 168.61 cm) (38U height)
Weight	209.44 lb (95 kg)	352.74 lb (160 kg)
Full configuration weight	374.78 lb (170 kg)	639.33 lb (290 kg)
Memory and processor		
Gigabit module	PowerPC @ 667 MHz, 1 GB RAM; packet buffer size: 512 MB (Ingress, shared by 24 1GbE ports)	PowerPC @ 667 MHz, 1 GB RAM; packet buffer size: 512 MB (Ingress, shared by 24 1GbE ports)
10G module	PowerPC @ 667 MHz, 1 GB RAM; packet buffer size: 512 MB (Ingress/shared by 2 10GbE ports)	PowerPC @ 667 MHz, 1 GB RAM; packet buffer size: 512 MB (Ingress/shared by 2 10GbE ports)
Management module	Quad Core CPU @ 1800 MHz, 512 MB flash, 4 GB compact flash, 8 GB RAM	Quad Core CPU @ 1800 MHz, 512 MB flash, 4 GB compact flash, 8 GB RAM
Fabric	PowerPC @ 400 MHz, 128 MB RAM	PowerPC @ 400 MHz, 128 MB RAM
Mounting and enclosure	Mounts in an EIA-standard 19 in. Telco rack or equipment cabinet	Mounts in an EIA-standard 19 in. Telco rack or equipment cabinet
Performance		
Throughput	3840 Mpps	8640 Mpps
Routing/Switching capacity	6120 Gb/s	13.3 Tb/s

Specifications (Continued)

	HPE 12508 DC Switch Chassis (JC652A)	HPE 12518 DC Switch Chassis (JC653A)
Environment		
Operating temperature	32°F to 104°F (0°C to 40°C)	32°F to 104°F (0°C to 40°C)
Operating relative humidity	5% to 95%, noncondensing	5% to 95%, noncondensing
Non-operating/Storage temperature	-40°F to 158°F (-40°C to 70°C)	-40°F to 158°F (-40°C to 70°C)
Non-operating/Storage relative humidity	5% to 95%, noncondensing	5% to 95%, noncondensing
Electrical characteristics		
Frequency		
Maximum heat dissipation	14587 BTU/hr (15389.29 kJ/hr)	32859 BTU/hr (34666.24 kJ/hr)
AC voltage		
DC voltage	-48 to -60 VDC	-48 to -60 VDC
Maximum power rating	4750 W	10700 W
	Notes 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.	Maximum power rating and maximum heat dissipation are the worst-case theoretical maximum numbers provided for planning the infrastructure with fully loaded PoE (if equipped), 100% traffic, all ports plugged in, and all modules populated.
Safety	CE Labeled; cUL Certified; UL Listed; EN 60825-1 Safety of Laser Products-Part 1; EN 60825-2 Safety of Laser Products-Part 2; IEC 60825; IEC 60950-1:2001 (with CB Report); CAN/CSA-C22.2 No. 60950-1-03; Anatel; ULAR; GOST; EN 60950-1/A11; FDA 21 CFR Subchapter J; NOM; UL 60950-1:2003; EN 60950-1:2001; RoHS Compliance	CE Labeled; cUL Certified; UL Listed; EN 60825-1 Safety of Laser Products-Part 1; EN 60825-2 Safety of Laser Products-Part 2; IEC 60825; IEC 60950-1:2001 (with CB Report); CAN/CSA-C22.2 No. 60950-1-03; Anatel; ULAR; GOST; EN 60950-1/A11; FDA 21 CFR Subchapter J; NOM; UL 60950-1:2003; EN 60950-1:2001; RoHS Compliance
Emissions	VCCI Class A; EN 55022 Class A; VCCI V-3/2000.04; ICES-003 Class A; AS/NZS CISPR 22 Class A; EMC Directive 2004/108/EC; FCC (CFR 47, Part 15) Class A	VCCI Class A; EN 55022 Class A; VCCI V-3/2000.04; ICES-003 Class A; AS/NZS CISPR 22 Class A; EMC Directive 2004/108/EC; FCC (CFR 47, Part 15) Class A

Specifications (Continued)

	HPE 12508 DC Switch Chassis (JC652A)	HPE 12518 DC Switch Chassis (JC653A)
Immunity		
Generic	ETSI EN 300 386 V1.3.3	ETSI EN 300 386 V1.3.3
EN	EN 55024:1998+ A1:2001 + A2:2003	EN 55024:1998+ A1:2001 + A2:2003
ESD	EN 61000-4-2; IEC61000-4-2	EN 61000-4-2; IEC61000-4-2
Radiated	EN 61000-4-3; IEC61000-4-3	EN 61000-4-3; IEC61000-4-3
EFT/Burst	EN 61000-4-4; IEC61000-4-4	EN 61000-4-4; IEC61000-4-4
Surge	EN 61000-4-5; IEC61000-4-5	EN 61000-4-5; IEC61000-4-5
Conducted	EN 61000-4-6; IEC61000-4-6	EN 61000-4-6; IEC61000-4-6
Power frequency magnetic field	IEC 61000-4-8; EN61000-4-8	IEC 61000-4-8; EN61000-4-8
Voltage dips and interruptions	EN 61000-4-11; IEC61000-4-11	EN 61000-4-11; IEC61000-4-11
Harmonics	EN 61000-3-2, IEC 61000-3-2	EN 61000-3-2, IEC 61000-3-2
Flicker	EN 61000-3-3, IEC 61000-3-3	EN 61000-3-3, IEC 61000-3-3
Management	IMC—Intelligent Management Center; command-line interface; out-of-band management (serial RS-232C); SNMP Manager; Telnet; RMON1; FTP; in-line and out-of-band; terminal interface (serial RS-232C); modem interface	IMC—Intelligent Management Center; command-line interface; out-of-band management (serial RS-232C); SNMP Manager; Telnet; RMON1; FTP; in-line and out-of-band; terminal interface (serial RS-232C); modem interface
Services	Refer to the Hewlett Packard Enterprise website at **hpe.com/networking/services** for details on the service-level descriptions and product numbers. For details about services, and response times in your area, please contact your local Hewlett Packard Enterprise sales office.	Refer to the Hewlett Packard Enterprise website at **hpe.com/networking/services** for details on the service-level descriptions and product numbers. For details about services, and response times in your area, please contact your local Hewlett Packard Enterprise sales office.

HPE 12500 Switch Series

Specifications (Continued)

	HPE FlexFabric 12508E AC Switch Chassis (JG782A)	HPE FlexFabric 12508E DC Switch Chassis (JG783A)
I/O ports and slots	8 open module slots Supports a maximum of 384 Gigabit Ethernet ports or 384 1/10GbE ports or 128 40GbE ports or 32 100GbE ports, or a combination	8 open module slots Supports a maximum of 384 Gigabit Ethernet ports or 384 1/10GbE ports or 128 40GbE ports or 32 100GbE ports, or a combination
Additional ports and slots	2 MPU (for management modules) slots 9 switch fabric slots	2 MPU (for management modules) slots 9 switch fabric slots
Physical characteristics		
Dimensions	17.4(w) x 29.13(d) x 38.39(h) in. (44.2 x 74.0 x 97.51 cm) (22U height)	17.4(w) x 29.13(d) x 38.39(h) in. (44.2 x 73.99 x 97.51 cm) (22U height)
Weight	242.51 lb (110 kg)	209.44 lb (95 kg)
Full configuration weight	374.78 lb (170 kg)	374.78 lb (170 kg)
Memory and processor		
Gigabit module	PowerPC @ 667, 1 GB RAM; packet buffer size: 512 MB (Ingress, shared by 24 1GbE ports)	PowerPC @ 667 MHz, 1 GB RAM; packet buffer size: 512 MB (Ingress, shared by 24 1GbE ports)
10G module	PowerPC @ 667 MHz, 1 GB RAM; packet buffer size: 512 MB (Ingress, shared by 24 1GbE ports)	PowerPC @ 667 MHz, 1 GB RAM; packet buffer size: 512 MB (Ingress/shared by 2 10GbE ports)
Management module	Quad Core CPU @ 1800 MHz, 512 MB flash, 4 GB compact flash, 8 GB RAM	Quad Core CPU @ 1800 MHz, 512 MB flash, 4 GB compact flash, 8 GB RAM
Fabric	PowerPC @ 400 MHz, 128 MB RAM	PowerPC @ 400 MHz, 128 MB RAM
Mounting and enclosure	Mounts in an EIA-standard 19 in. Telco rack or equipment cabinet	Mounts in an EIA-standard 19 in. Telco rack or equipment cabinet
Performance		
Throughput	4800 Mpps	4800 Mpps
Routing/Switching capacity	10.8 Tb/s	10.8 Tb/s

Specifications (Continued)

	HPE FlexFabric 12508E AC Switch Chassis (JG782A)	HPE FlexFabric 12508E DC Switch Chassis (JG783A)
Environment		
Operating temperature	32°F to 104°F (0°C to 40°C)	32°F to 104°F (0°C to 40°C)
Operating relative humidity	5% to 95%, noncondensing	5% to 95%, noncondensing
Non-operating/Storage temperature	-40°F to 158°F (-40°C to 70°C)	-40°F to 158°F (-40°C to 70°C)
Non-operating/Storage relative humidity	5% to 95%, noncondensing	5% to 95%, noncondensing
Electrical characteristics		
Frequency	50/60 Hz	
Description	**Achieved Miercom Certified Green Award** 10GbE modules consume half the power compared to competitive products; redundant, scalable, 90% efficient power supplies deliver high reliability in the data center; new ASIC technology has low power consumption when providing rich features.	
Maximum heat dissipation	14587 BTU/hr (15389.29 kJ/hr)	14587 BTU/hr (15389.29 kJ/hr)
AC voltage	100–120/200–240 VAC, rated (90–264 VAC, max)	
DC voltage		-48 to -60 VDC
Maximum power rating	4750 W	4750 W
	Notes 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.	Maximum power rating and maximum heat dissipation are the worst-case theoretical maximum numbers provided for planning the infrastructure with fully loaded PoE (if equipped), 100% traffic, all ports plugged in, and all modules populated.
Safety	CE Labeled; cUL Certified; UL Listed; EN 60825-1 Safety of Laser Products-Part 1; EN 60825-2 Safety of Laser Products-Part 2; IEC 60825; IEC 60950-1:2001 (with CB Report); CAN/CSA-C22.2 No. 60950-1-03; Anatel; ULAR; GOST; EN 60950-1/A11; FDA 21 CFR Subchapter J; NOM; UL 60950-1:2003; EN 60950-1:2001; RoHS Compliance	CE Labeled; cUL Certified; UL Listed; EN 60825-1 Safety of Laser Products-Part 1; EN 60825-2 Safety of Laser Products-Part 2; IEC 60825; IEC 60950-1:2001 (with CB Report); CAN/CSA-C22.2 No. 60950-1-03; Anatel; ULAR; GOST; EN 60950-1/A11; FDA 21 CFR Subchapter J; NOM; UL 60950-1:2003; EN 60950-1:2001; RoHS Compliance

Specifications (Continued)

	HPE FlexFabric 12508E AC Switch Chassis (JG782A)	HPE FlexFabric 12508E DC Switch Chassis (JG783A)
Emissions	VCCI Class A; EN 55022 Class A; VCCI V-3/2000.04; ICES-003 Class A; AS/NZS CISPR 22 Class A; EMC Directive 2004/108/EC; FCC (CFR 47, Part 15) Class A	VCCI Class A; EN 55022 Class A; VCCI V-3/2000.04; ICES-003 Class A; AS/NZS CISPR 22 Class A; EMC Directive 2004/108/EC; FCC (CFR 47, Part 15) Class A
Immunity		
Generic	ETSI EN 300 386 V1.3.3	ETSI EN 300 386 V1.3.3
EN	EN 55024:1998+ A1:2001 + A2:2003	EN 55024:1998+ A1:2001 + A2:2003
ESD	EN 61000-4-2; IEC61000-4-2	EN 61000-4-2; IEC61000-4-2
Radiated	EN 61000-4-3; IEC61000-4-3	EN 61000-4-3; IEC61000-4-3
EFT/Burst	EN 61000-4-4; IEC61000-4-4	EN 61000-4-4; IEC61000-4-4
Surge	EN 61000-4-5; IEC61000-4-5	EN 61000-4-5; IEC61000-4-5
Conducted	EN 61000-4-6; IEC61000-4-6	EN 61000-4-6; IEC61000-4-6
Power frequency magnetic field	IEC 61000-4-8; EN61000-4-8	IEC 61000-4-8; EN61000-4-8
Voltage dips and interruptions	EN 61000-4-11; IEC61000-4-11	EN 61000-4-11; IEC61000-4-11
Harmonics	EN 61000-3-2, IEC 61000-3-2	EN 61000-3-2, IEC 61000-3-2
Flicker	EN 61000-3-3, IEC 61000-3-3	EN 61000-3-3, IEC 61000-3-3
Management	IMC—Intelligent Management Center; command-line interface; out-of-band management (serial RS-232C); SNMP Manager; Telnet; RMON1; FTP; in-line and out-of-band; terminal interface (serial RS-232C); modem interface	IMC—Intelligent Management Center; command-line interface; out-of-band management (serial RS-232C); SNMP Manager; Telnet; RMON1; FTP; in-line and out-of-band; terminal interface (serial RS-232C); modem interface
Services	Refer to the Hewlett Packard Enterprise website at **hpe.com/networking/services** for details on the service-level descriptions and product numbers. For details about services, and response times in your area, please contact your local Hewlett Packard Enterprise sales office.	Refer to the Hewlett Packard Enterprise website at **hpe.com/networking/services** for details on the service-level descriptions and product numbers. For details about services, and response times in your area, please contact your local Hewlett Packard Enterprise sales office.

HPE 12500 Switch Series

Specifications (Continued)

	HPE FlexFabric 12518E AC Switch Chassis (JG784A)	HPE FlexFabric 12518E DC Switch Chassis (JG785A)
I/O ports and slots	18 open module slots Supports a maximum of 864 Gigabit Ethernet ports or 864 1/10GbE ports or 288 40GbE ports or 72 100GbE ports, or a combination	18 open module slots Supports a maximum of 864 Gigabit Ethernet ports or 864 1/10GbE ports or 288 40GbE ports or 72 100GbE ports, or a combination
Additional ports and slots	2 MPU (for management modules) slots 9 switch fabric slots	2 MPU (for management modules) slots 9 switch fabric slots
Physical characteristics		
Dimensions	17.4(w) x 29.13(d) x 66.38(h) in. (44.2 x 73.99 x 168.61 cm) (38U height)	17.4(w) x 29.13(d) x 66.38(h) in. (44.2 x 73.99 x 168.61 cm) (38U height)
Weight	352.74 lb (160 kg)	352.74 lb (160 kg)
Full configuration weight	639.33 lb (290 kg)	639.33 lb (290 kg)
Memory and processor		
Gigabit module	PowerPC @ 667 MHz, 1 GB RAM; packet buffer size: 512 MB (Ingress, shared by 24 1GbE ports)	PowerPC @ 667 MHz, 1 GB RAM; packet buffer size: 512 MB (Ingress, shared by 24 1GbE ports)
10G module	PowerPC @ 667 MHz, 1 GB RAM; packet buffer size: 512 MB (Ingress/shared by 2 10GbE ports)	PowerPC @ 667 MHz, 1 GB RAM; packet buffer size: 512 MB (Ingress/shared by 2 10GbE ports)
Management module	Quad Core CPU @ 1800 MHz, 512 MB flash, 4 GB compact flash, 8 GB RAM	Quad Core CPU @ 1800 MHz, 512 MB flash, 4 GB compact flash, 8 GB RAM
Fabric	PowerPC @ 400 MHz, 128 MB RAM	PowerPC @ 400 MHz, 128 MB RAM
Mounting and enclosure	Mounts in an EIA-standard 19 in. Telco rack or equipment cabinet	Mounts in an EIA-standard 19 in. Telco rack or equipment cabinet
Performance		
Throughput	10.8 Bpps	10.8 Bpps
Routing/Switching capacity	24.3 Tb/s	24.3 Tb/s
Environment		
Operating temperature	32°F to 104°F (0°C to 40°C)	32°F to 104°F (0°C to 40°C)
Operating relative humidity	5% to 95%, noncondensing	5% to 95%, noncondensing
Non-operating/Storage temperature	-40°F to 158°F (-40°C to 70°C)	-40°F to 158°F (-40°C to 70°C)
Non-operating/Storage relative humidity	5% to 95%, noncondensing	5% to 95%, noncondensing

Specifications (Continued)

	HPE FlexFabric 12518E AC Switch Chassis (JG784A)	HPE FlexFabric 12518E DC Switch Chassis (JG785A)
Electrical characteristics		
Frequency	50/60 Hz	
Maximum heat dissipation	32859 BTU/hr (34666.24 kJ/hr)	32859 BTU/hr (34666.24 kJ/hr)
AC voltage	100–120/200–240 VAC, rated (90–264 VAC, max)	
DC voltage		-48 to -60 VDC
Maximum power rating	10700 W	10700 W
	Notes 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.	Maximum power rating and maximum heat dissipation are the worst-case theoretical maximum numbers provided for planning the infrastructure with fully loaded PoE (if equipped), 100% traffic, all ports plugged in, and all modules populated.
Safety	CE Labeled; cUL Certified; UL Listed; EN 60825-1 Safety of Laser Products-Part 1; EN 60825-2 Safety of Laser Products-Part 2; IEC 60825; IEC 60950-1:2001 (with CB Report); CAN/CSA-C22.2 No. 60950-1-03; Anatel; ULAR; GOST; EN 60950-1/A11; FDA 21 CFR Subchapter J; NOM; UL 60950-1:2003; EN 60950-1:2001; RoHS Compliance	CE Labeled; cUL Certified; UL Listed; EN 60825-1 Safety of Laser Products-Part 1; EN 60825-2 Safety of Laser Products-Part 2; IEC 60825; IEC 60950-1:2001 (with CB Report); CAN/CSA-C22.2 No. 60950-1-03; Anatel; ULAR; GOST; EN 60950-1/A11; FDA 21 CFR Subchapter J; NOM; UL 60950-1:2003; EN 60950-1:2001; RoHS Compliance
Emissions	VCCI Class A; EN 55022 Class A; VCCI V-3/2000.04; ICES-003 Class A; AS/NZS CISPR 22 Class A; EMC Directive 2004/108/EC; FCC (CFR 47, Part 15) Class A	VCCI Class A; EN 55022 Class A; VCCI V-3/2000.04; ICES-003 Class A; AS/NZS CISPR 22 Class A; EMC Directive 2004/108/EC; FCC (CFR 47, Part 15) Class A
Immunity		
Generic	ETSI EN 300 386 V1.3.3	ETSI EN 300 386 V1.3.3
EN	EN 55024:1998+ A1:2001 + A2:2003	EN 55024:1998+ A1:2001 + A2:2003
ESD	EN 61000-4-2; IEC61000-4-2	EN 61000-4-2; IEC61000-4-2
Radiated	EN 61000-4-3; IEC61000-4-3	EN 61000-4-3; IEC61000-4-3
EFT/Burst	EN 61000-4-4; IEC61000-4-4	EN 61000-4-4; IEC61000-4-4
Surge	EN 61000-4-5; IEC61000-4-5	EN 61000-4-5; IEC61000-4-5
Conducted	EN 61000-4-6; IEC61000-4-6	EN 61000-4-6; IEC61000-4-6
Power frequency magnetic field	IEC 61000-4-8; EN61000-4-8	IEC 61000-4-8; EN61000-4-8
Voltage dips and interruptions	EN 61000-4-11; IEC61000-4-11	EN 61000-4-11; IEC61000-4-11
Harmonics	EN 61000-3-2, IEC 61000-3-2	EN 61000-3-2, IEC 61000-3-2
Flicker	EN 61000-3-3, IEC 61000-3-3	EN 61000-3-3, IEC 61000-3-3
Management	IMC—Intelligent Management Center; command-line interface; out-of-band management (serial RS-232C); SNMP Manager; Telnet; RMON1; FTP; in-line and out-of-band; terminal interface (serial RS-232C); modem interface	IMC—Intelligent Management Center; command-line interface; out-of-band management (serial RS-232C); SNMP Manager; Telnet; RMON1; FTP; in-line and out-of-band; terminal interface (serial RS-232C); modem interface
Services	Refer to the Hewlett Packard Enterprise website at **hpe.com/networking/services** for details on the service-level descriptions and product numbers. For details about services, and response times in your area, please contact your local Hewlett Packard Enterprise sales office.	Refer to the Hewlett Packard Enterprise website at **hpe.com/networking/services** for details on the service-level descriptions and product numbers. For details about services, and response times in your area, please contact your local Hewlett Packard Enterprise sales office.

STANDARDS AND PROTOCOLS
(applies to all products in series)

BGP	RFC 1657 Definitions of Managed Objects for BGPv4 RFC 1771 BGPv4 RFC 1772 Application of the BGP RFC 1773 Experience with the BGP-4 Protocol	RFC 1774 BGP-4 Protocol Analysis RFC 1997 BGP Communities Attribute RFC 1998 PPP Gandalf FZA Compression Protocol RFC 2385 BGP Session Protection via TCP MD5	RFC 2439 BGP Route Flap Damping RFC 2796 BGP Route Reflection RFC 2842 Capability Advertisement with BGP-4 RFC 2858 BGP-4 Multi-Protocol Extensions RFC 2918 Route Refresh Capability
Denial of service protection	RFC 2267 Network Ingress Filtering	Automatic Filtering of well-known Denial of Service Packets	CPU DoS Protection Rate Limiting by ACLs
Device management	RFC 1155 Structure and Mgmt. Information (SMIv1) RFC 1157 SNMPv1/v2c RFC 1305 NTPv3 RFC 1945 Hypertext Transfer Protocol—HTTP/1.0 RFC 2452 MIB for TCP6	RFC 2454 MIB for UDP6 RFC 2573 (SNMPv3 Applications) RFC 2578-2580 SMIv2 RFC 2579 (SMIv2 Text Conventions) RFC 2580 (SMIv2 Conformance) RFC 2819 (RMON groups Alarm, Event, History, and Statistics only)	RFC 2819 RMON RFC 3417 (SNMP Transport Mappings) SNMPv3 and RMON RFC support SSHv1/SSHv2 Secure Shell TACACS/TACACS+
General protocols	IEEE 802.1ad Q-in-Q IEEE 802.1ag Service Layer OAM IEEE 802.1ah Provider Backbone Bridges IEEE 802.1D MAC Bridges IEEE 802.1p Priority IEEE 802.1Q VLANs IEEE 802.1s Multiple Spanning Trees IEEE 802.1v VLAN classification by Protocol and Port IEEE 802.1w Rapid Reconfiguration of Spanning Tree IEEE 802.1X PAE IEEE 802.3ab 1000BASE-T IEEE 802.3ad Link Aggregation (LAG) IEEE 802.3ae 10-Gigabit Ethernet	IEEE 802.3ah Ethernet in First Mile over Point to Point Fiber—EFMF IEEE 802.3ba 40 and 100 Gigabit Ethernet Architecture IEEE 802.3i 10BASE-T IEEE 802.3u 100BASE-X IEEE 802.3x Flow Control IEEE 802.3z 1000BASE-X RFC 768 UDP RFC 783 TFTP Protocol (revision 2) RFC 791 IP RFC 792 ICMP RFC 793 TCP RFC 826 ARP RFC 854 TELNET RFC 868 Time Protocol	RFC 903 RARP RFC 951 BOOTP RFC 959 File Transfer Protocol (FTP) RFC 1027 Proxy ARP RFC 1042 IP Datagrams RFC 1350 TFTP Protocol (revision 2) RFC 1519 CIDR RFC 1542 BOOTP Extensions RFC 1812 IPv4 Routing RFC 2131 DHCP RFC 2338 VRRP RFC 2784 Generic Routing Encapsulation (GRE) RFC 2865 Remote Authentication Dial In User Service (RADIUS)
IP multicast	RFC 1112 IGMP RFC 2236 IGMPv2 RFC 2283 Multi-protocol Extensions for BGP-4	RFC 2362 PIM Sparse Mode RFC 2934 Protocol Independent Multicast MIB for IPv4 RFC 3376 IGMPv3	RFC 3618 Multicast Source Discovery Protocol (MSDP) RFC 4601 PIM Sparse Mode

STANDARDS AND PROTOCOLS (CONTINUED)
(applies to all products in series)

IPv6	RFC 1350 TFTP RFC 1981 IPv6 Path MTU Discovery RFC 2080 RIPng for IPv6 RFC 2460 IPv6 Specification RFC 2461 IPv6 Neighbor Discovery RFC 2462 IPv6 Stateless Address Auto-configuration RFC 2463 ICMPv6 RFC 2473 Generic Packet Tunneling in IPv6 RFC 2475 IPv6 DiffServ Architecture RFC 2529 Transmission of IPv6 Packets over IPv4	RFC 2710 Multicast Listener Discovery (MLD) for IPv6 RFC 2740 OSPFv3 for IPv6 RFC 2893 Transition Mechanisms for IPv6 Hosts and Routers RFC 2925 Definitions of Managed Objects for Remote Ping, Traceroute, and Lookup Operations (Ping only) RFC 3315 DHCPv6 (client only) RFC 3484 Default Address Selection for IPv6 RFC 3513 IPv6 Addressing Architecture	RFC 3587 IPv6 Global Unicast Address Format RFC 3810 Multicast Listener Discovery Version 2 (MLDv2) for IPv6 RFC 4251 SSHv6 Architecture RFC 4252 SSHv6 Authentication RFC 4253 SSHv6 Transport Layer RFC 4254 SSHv6 Connection RFC 4541 IGMP & MLD Snooping Switch RFC 4862 IPv6 Stateless Address Auto-configuration
MIBs	IEEE8023-LAG-MIB RFC 1213 MIB II RFC 1229 Interface MIB Extensions RFC 1286 Bridge MIB RFC 1493 Bridge MIB RFC 1573 SNMP MIB II RFC 1643 Ethernet MIB RFC 1657 BGP-4 MIB RFC 1724 RIPv2 MIB RFC 1757 Remote Network Monitoring MIB RFC 1850 OSPFv2 MIB RFC 2011 SNMPv2 MIB for IP RFC 2012 SNMPv2 MIB for TCP RFC 2013 SNMPv2 MIB for UDP RFC 2021 RMONv2 MIB RFC 2096 IP Forwarding Table MIB RFC 2233 Interfaces MIB	RFC 2273 SNMP-NOTIFICATION-MIB RFC 2452 IPV6-TCP-MIB RFC 2454 IPV6-UDP-MIB RFC 2465 IPv6 MIB RFC 2466 ICMPv6 MIB RFC 2571 SNMP Framework MIB RFC 2572 SNMP-MPD MIB RFC 2573 SNMP-Target MIB RFC 2613 SMON MIB RFC 2618 RADIUS Client MIB RFC 2620 RADIUS Accounting MIB RFC 2665 Ethernet-Like-MIB RFC 2674 802.1p and IEEE 802.1Q Bridge MIB RFC 2737 Entity MIB (Version 2) RFC 2787 VRRP MIB RFC 2819 RMON MIB RFC 2863 The Interfaces Group MIB	RFC 2925 Ping MIB RFC 2932IP (Multicast Routing MIB) RFC 2933 IGMP MIB RFC 3273 HC-RMON MIB RFC 3414 SNMP-User based-SM MIB RFC 3415 SNMP-View based-ACM MIB RFC 3418 MIB for SNMPv3 RFC 3621 Power Ethernet MIB RFC 3813 MPLS LSR MIB RFC 3814 MPLS FTN MIB RFC 3815 MPLS LDP MIB RFC 3826 AES for SNMP's USM MIB RFC 4133 Entity MIB (Version 3) LLDP-EXT-DOT1-MIB LLDP-EXT-DOT3-MIB LLDP-MIB
MPLS	RFC 2205 Resource ReSerVation Protocol (RSVP)—Version 1 Functional Specification RFC 2209 Resource ReSerVation Protocol (RSVP) RFC 2702 Requirements for Traffic Engineering Over MPLS RFC 2858 Multi-protocol Extensions for BGP-4 RFC 3031 Multi-protocol Label Switching Architecture RFC 3032 MPLS Label Stack Encoding RFC 3036 LDP Specification RFC 3107 Carrying Label Information in BGP-4	RFC 3209 RSVP-TE: Extensions to RSVP for LSP Tunnels RFC 3479 Fault Tolerance for the Label Distribution Protocol (LDP) RFC 3487 Graceful Restart Mechanism for LDP RFC 4090 Fast Reroute Extensions to RSVP-TE for LSP Tunnels RFC 4364 BGP/MPLS IP Virtual Private Networks (VPNs) RFC 4379 Detecting Multi-Protocol Label Switched (MPLS) Data Plane Failures RFC 4447 Pseudowire Setup and Maintenance Using LDP	RFC 4448 Encapsulation Methods for Transport of Ethernet over MPLS Networks RFC 4664 Framework for Layer 2 Virtual Private Networks RFC 4665 Service Requirements for Layer 2 Provider Provisioned Virtual Private Networks RFC 4761 Virtual Private LAN Service (VPLS) Using BGP for Auto-Discovery and Signaling RFC 4762 Virtual Private LAN Service (VPLS) Using Label Distribution Protocol (LDP) Signaling

STANDARDS AND PROTOCOLS (CONTINUED)
(applies to all products in series)

Network management	IEEE 802.1AB Link Layer Discovery Protocol (LLDP) IEEE 802.1D (STP) RFC 1155 Structure of Management Information RFC 1157 SNMPv1 RFC 1215 SNMP Generic traps RFC 1757 RMON 4 groups: Stats, History, Alarms, and Events	RFC 1905 SNMPv2 Protocol Operations RFC 2211 Controlled-Load Network RFC 2272 SNMPv3 Management Protocol RFC 2273 SNMPv3 Applications RFC 2274 USM for SNMPv3 RFC 2571 SNMP Management Frameworks RFC 2572 SNMPv3 Message Processing RFC 2573 SNMPv3 Applications RFC 2576 Coexistence between SNMP versions	RFC 2578 SMIv2 RFC 2819 Four groups of RMON: 1 (statistics), 2 (history), 3 (alarm), and 9 (events) RFC 3164 BSD syslog Protocol RFC 3415 SNMPv3 View-based Access Control Model (VACM) ANSI/TIA-1057 LLDP Media Endpoint Discovery (LLDP-MED) SNMPv1/v2c/v3
OSPF	RFC 1245 OSPF protocol analysis RFC 1246 Experience with OSPF RFC 1587 OSPF NSSA	RFC 1765 OSPF Database Overflow RFC 1850 OSPFv2 Management Information Base (MIB), traps RFC 2328 OSPFv2	RFC 2370 OSPF Opaque LSA Option RFC 3101 OSPF NSSA RFC 3623 Graceful OSPF Restart
QoS/CoS	IEEE 802.1p (CoS) RFC 2212 Guaranteed Quality of Service RFC 2474 DS Field in the IPv4 and IPv6 Headers	RFC 2475 DiffServ Architecture RFC 2597 DiffServ Assured Forwarding (AF) RFC 2598 DiffServ Expedited Forwarding (EF)	RFC 2697 A Single Rate Three Color Marker RFC 2698 A Two Rate Three Color Marker Bidirectional Rate Shaping
Security	IEEE 802.1AE MAC Security Standard (MACSec) IEEE 802.1X Port Based Network Access Control RFC 1321 The MD5 Message-Digest Algorithm RFC 2082 RIP-2 MD5 Authentication RFC 2104 Keyed-Hashing for Message Authentication	RFC 2716 PPP EAP TLS Authentication Protocol RFC 2865 RADIUS Authentication RFC 2866 RADIUS Accounting RFC 2867 RADIUS Accounting Modifications for Tunnel Protocol Support RFC 2868 RADIUS Attributes for Tunnel Protocol Support	RFC 2869 RADIUS Extensions RFC 3567 Intermediate System (IS) to IS Cryptographic Authentication Access Control Lists (ACLs) Guest VLAN for 802.1X MAC Authentication SSHv2 Secure Shell Web Authentication
IKEv1		RFC 2865—Remote Authentication Dial In User Service (RADIUS)	

HPE 12500 Switch Series accessories

Modules	HPE FlexFabric 12500E Main Processing Unit (JG802A) HPE 12500 Type A Main Processing Unit with Comware v7 Operating System (JG497A) HPE 12500 Main Processing Unit (JC072B) HPE FlexFabric 12500 4-port 100GbE CFP FD Module (JG786A) HPE FlexFabric 12500 4-port 100GbE CFP FG Module (JG788A) HPE FlexFabric 12500 16-port 40GbE QSFP+ FD Module (JG790A) HPE FlexFabric 12500 48-port 1/10GbE SFP+ FD Module (JG796A) HPE FlexFabric 12500 40-port 1/10GbE SFP+ FD Module (JG792A) HPE FlexFabric 12500 40-port 1/10GbE SFP+ FG Module (JG794A) HPE 12500 16-port 10GbE SFP+ LEB Module (JC782A) HPE 12500 16-port 10GbE SFP+ LEC Module (JC783A) HPE 12500 32-port 10GbE SFP+ REB Module (JC064B) HPE 12500 32-port 10GbE SFP+ REC Module (JC476B) HPE 12500 8-port 10GbE SFP+ LEB Module (JC780A) HPE 12500 8-port 10GbE SFP+ LEC Module (JC781A) HPE 12500 8-port 10GbE SFP+ LEF Module (JC659A) HPE 12500 48-port Gig-T LEB Module (JC074B) HPE 12500 48-port Gig-T LEC Module (JC065B) HPE 12500 48-port GbE SFP LEB Module (JC075B) HPE 12500 48-port GbE SFP LEC Module (JC069B) HPE 12500 48-port GbE SFP LEF Module (JC660A)

HPE 12500 Switch Series accessories (continued)

Transceivers	HPE X120 100M/1G SFP LC LX Transceiver (JF832A) HPE X114 100M SFP LC FX Transceiver (JF833A) HPE X125 1G SFP LC LH40 1310nm Transceiver (JD061A) HPE X120 1G SFP LC LH40 1550nm Transceiver (JD062A) HPE X125 1G SFP LC LH70 Transceiver (JD063B) HPE X120 1G SFP RJ45 T Transceiver (JD089B) HPE X120 1G SFP LC BX 10-U Transceiver (JD098B) HPE X120 1G SFP LC BX 10-D Transceiver (JD099B) HPE X120 1G SFP LC LH100 Transceiver (JD103A) HPE X170 1G SFP LC LH70 1550 Transceiver (JD109A) HPE X170 1G SFP LC LH70 1570 Transceiver (JD110A) HPE X170 1G SFP LC LH70 1590 Transceiver (JD111A) HPE X170 1G SFP LC LH70 1610 Transceiver (JD112A) HPE X170 1G SFP LC LH70 1470 Transceiver (JD113A) HPE X170 1G SFP LC LH70 1490 Transceiver (JD114A) HPE X170 1G SFP LC LH70 1510 Transceiver (JD115A) HPE X170 1G SFP LC LH70 1530 Transceiver (JD116A) HPE X120 1G SFP LC SX Transceiver (JD118B) HPE X120 1G SFP LC LX Transceiver (JD119B) HPE X130 10G SFP+ LC SR Transceiver (JD092B) HPE X130 10G SFP+ LC LRM Transceiver (JD093B) HPE X130 10G SFP+ LC LR Transceiver (JD094B) HPE X130 10G SFP+ LC ER 40km Transceiver (JG234A) HPE X240 10G SFP+ to SFP+ 3m Direct Attach Copper Cable (JD097C) HPE X240 10G SFP+ to SFP+ 5m Direct Attach Copper Cable (JG081C) HPE X240 10G SFP+ SFP+ 7m Direct Attach Copper Cable (JC784C) HPE X140 40G QSFP+ MPO SR4 Transceiver (JG325B) HPE X140 40G QSFP+ MPO MM 850nm CSR4 300m Transceiver (JG709A) HPE X140 40G QSFP+ LC LR4 SM 10km 1310nm Transceiver (JG661A) HPE X140 40G QSFP+ LC BiDi 100m MM Transceiver (JL251A) HPE X150 100G CFP LC LR4 10km SM Transceiver (JG829A) HPE X130 10G SFP+ LC LH 80km Transceiver (JG915A)
Cables	HPE Premier Flex LC/LC Multi-mode OM4 2 fiber 1m Cable (QK732A) HPE Premier Flex LC/LC Multi-mode OM4 2 fiber 2m Cable (QK733A) HPE Premier Flex LC/LC Multi-mode OM4 2 fiber 5m Cable (QK734A) HPE Premier Flex LC/LC Multi-mode OM4 2 fiber 15m Cable (QK735A) HPE Premier Flex LC/LC Multi-mode OM4 2 fiber 30m Cable (QK736A) HPE Premier Flex LC/LC Multi-mode OM4 2 fiber 50m Cable (QK737A)
Mounting Kit	HPE X421 Chassis Universal 4-post Rack Mounting Kit (JC665A)
Appliance	HPE 12500 20Gbps VPN Firewall Module (JG371A)

HPE 12500 Switch Series accessories (continued)

Memory	HPE FlexFabric 4GB Compact Flash Card (JG806A) HPE FlexFabric 4GB DDR3 SDRAM (JG807A) HPE X600 1G Compact Flash Card (JC684A) HPE 2GB Registered DDR2 SDRAM Memory (JC609A) HPE X610 1GB DDR2 SDRAM Memory (JC071A)
HPE 12504 AC Switch Chassis (JC654A)	HPE 1250x G2 Fabric Module (JC658A) HPE 12500 AC Power Entry Module (JF426A) HPE 12500 2000W AC Power Supply (JF429A) HPE 12504 Fan Assembly (JC664A)
HPE 12504 DC Switch Chassis (JC655A)	HPE 1250x G2 Fabric Module (JC658A) HPE X210 10-meter JG Connector to Bare 6AWG 37800 Watt 72V DC Power Cable (JG280A) HPE 12500 1800W DC Power Supply (JC651A) HPE 12504 Fan Assembly (JC664A)
HPE 12508 AC Switch Chassis (JF431C)	HPE 12508 Fabric Module (JC067B) HPE 1250x G2 Fabric Module (JC658A) HPE 12500 2000W AC Power Supply (JF429A) HPE 12500 AC Power Entry Module (JF426A)
HPE 12508 DC Switch Chassis (JC652A)	HPE 12508 Fabric Module (JC067B) HPE 1250x G2 Fabric Module (JC658A) HPE X210 10-meter JG Connector to Bare 6AWG 37800 Watt 72V DC Power Cable (JG280A) HPE 12500 1800W DC Power Supply (JC651A)
HPE 12518 DC Switch Chassis (JC653A)	HPE 12518 G2 Fabric Module (JC657A) HPE 12518 Fabric Module (JC066A) HPE X210 10-meter JG Connector to Bare 6AWG 37800 Watt 72V DC Power Cable (JG280A) HPE 12500 1800W DC Power Supply (JC651A)
HPE FlexFabric 12508E AC Switch Chassis (JG782A)	HPE FlexFabric 12508E Fabric Module (JG798A) HPE FlexFabric 12508E Optional Extended Cable Guide for AC Powered Switch (JG830A) HPE FlexFabric 12508E Optional Extended Cable Guide for DC Powered Switch (JG832A) HPE 12500 2000W AC Power Supply (JF429A) HPE FlexFabric 12500E Spare Power Monitor Module (JG804A) HPE FlexFabric 12500E Fan Tray Assembly (JG805A) HPE FlexFabric 12508E Optional Air Filter (JG808A)

HPE 12500 Switch Series accessories (continued)

HPE FlexFabric 12508E DC Switch Chassis (JG783A)	HPE FlexFabric 12508E Fabric Module (JG798A) HPE 12508 Top and Bottom Cable Guides for DC Powered Switch (JC787A) HPE 12500 Side Cable Management Guide (JC084A) HPE X210 10-meter JG Connector to Bare 6AWG 37800 Watt 72V DC Power Cable (JG280A) HPE FlexFabric 12508E Optional Extended Cable Guide for DC Powered Switch (JG832A) HPE 12500 1800W DC Power Supply (JC651A) HPE FlexFabric 12500E Spare Power Monitor Module (JG804A) HPE FlexFabric 12500E Fan Tray Assembly (JG805A) HPE FlexFabric 12508E Optional Air Filter (JG808A)
HPE FlexFabric 12518E AC Switch Chassis (JG784A)	HPE FlexFabric 12518E Fabric Module (JG800A) HPE 12518 Top and Bottom Cable Guides for AC Powered Switch (JC786A) HPE 12500 Side Cable Management Guide (JC084A) HPE FlexFabric 12518E Optional Extended Cable Guide for AC Powered Switch (JG831A) HPE 12500 2000W AC Power Supply (JF429A) HPE 12500 AC Power Entry Module (JF426A) HPE FlexFabric 12500E Spare Power Monitor Module (JG804A) HPE FlexFabric 12500E Fan Tray Assembly (JG805A) HPE FlexFabric 12518E Optional Air Filter (JG809A)
HPE FlexFabric 12518E DC Switch Chassis (JG785A)	HPE FlexFabric 12518E Fabric Module (JG800A) HPE 12518 Top and Bottom Cable Guides for DC Powered Switch (JC788A) HPE 12500 Side Cable Management Guide (JC084A) HPE X210 10-meter JG Connector to Bare 6AWG 37800 Watt 72V DC Power Cable (JG280A) HPE FlexFabric 12518E Optional Extended Cable Guide for DC Powered Switch (JG833A) HPE 12500 1800W DC Power Supply (JC651A) HPE FlexFabric 12500E Spare Power Monitor Module (JG804A) HPE FlexFabric 12500E Fan Tray Assembly (JG805A) HPE FlexFabric 12518E Optional Air Filter (JG809A)

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

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