

# H3C S10500X-G Series Next Generation Core Switch

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New H3C Technologies Co., Limited

## Overview

H3C S10500X-G switch series is a series of Ethernet core switches specifically designed for the core layer of cloud computing data centers and next-generation intelligent campuses. Running the H3C proprietary Comware 7 operating system, it offers a trusted and secure platform. With redundancy designs for the main components including the supervisor engine units (also called MPUs), switch fabric modules, fan trays, and power supplies, it delivers carrier-grade high reliability. It offers high-density GE/10GE/25GE/40GE/100GE and 400GE ports, supports mainstream technologies such as VXLAN, MDC, M-LAG and IRF 2, and integrates rich networking services including MPLS VPN, IPv6, embedded AC, and traffic analytics. It uses green designs from the hardware components to the chassis exterior and is fully compliant with the RoHS directive.

The S10500X-G series switch includes the S10506X-G, S10508X-G and S10510X-G models, with port density and performance to fit different deployment scales.



S10506X-G

S10508X-G

S10512X-G

## Features

### Advanced System Architecture

The system architecture incorporates the following advanced designs:

- CLOS architecture and midplane-free design separate the forwarding plane and control plane completely and allows bandwidth scaling as business grows.
- Orthogonal interconnection of switching fabric modules and service modules eliminates cabling on the backplane and thus significantly reduces signal attenuation.

- Compliant with 100G and 400G Ethernet standards, meeting the requirements of non-blocking campus networks today and in the future.
- High-density GE/10GE/25GE/40GE/100GE ports, meeting the requirements of applications today and in the future.
- 400G Ethernet ports, meeting inter-data center and inter-campus connection requirements.
- Thorough system optimization enables the device to forward traffic within 100 seconds after power on, greatly reducing service interruption time.
- New chassis dimension design enables the device to carry high-performance data forwarding within a small size, greatly improving cabinet space usage efficiency.
- Redundancy design for key components including MPUs, switch fabric modules, fan trays, power supplies, and power switches, maximizing the system availability and guarding the device against emergency and unexpected conditions.

### Distributed Multi-Engines

The switch innovatively uses distributed control engines, detection engines, and maintenance engines to deliver powerful control capability and millisecond-level HA.

- Distributed control engines: Each service module is integrated with a strong control and processing system. It can efficiently process varieties of protocol packets and control packets, and provide refined control for protocol packets to safeguard against protocol packet attacks.
- Distributed detection engines: Each service module can use BFD and OAM to detect faults in milliseconds and interact with control plane protocols for fast failover and convergence to ensure service continuity.
- Distributed maintenance engines: The intelligent CPU system supports intelligent power management and online status monitoring of key components. It can power on and off modules in sequence, which reduces power impulse, electromagnetic radiation, and power consumption, and prolongs the device lifespan.

### Intelligent Resilient Framework 2 (IRF 2)

H3C Intelligent Resilient Framework 2 (IRF 2) virtualizes multiple S10500X switches into one logical switch called an IRF fabric. IRF improves system performance and delivers the following benefits:

- High availability: The H3C proprietary routing hot backup technology ensures redundancy and backup of all information on the control and data planes and non-stop Layer 3 data forwarding in an IRF 2 fabric. It also eliminates single point of failure and ensures service continuity.

- Redundancy and load balancing: The distributed link aggregation technology supports load sharing and mutual backup among multiple uplinks, which enhances the network redundancy and improves link resources usage.
- Simplified topology and easy management: An IRF fabric appears as one node and is accessible at a single IP address on the network. This simplifies network device and topology managements, improves operating efficiency, and reduces maintenance cost.

## Multitenant Device Context (MDC)

MDC virtualizes one S10500X-G switch into multiple logical switches, enabling multiple services to share one core switch. The 1:N virtualization maximizes switch utilization, reduces network TCO, and ensures secure isolation of services.

## Multichassis Link Aggregation Group (M-LAG) (Original DRNI)

The S10500X-G series switch supports M-LAG, which enables links of multiple switches to aggregate into one to implement device-level link backup. M-LAG is applicable to servers dual-homed to a pair of access devices for node redundancy.

- Streamlined topology: M-LAG simplifies the network topology and spanning tree configuration by virtualizing two physical devices into one logical device.
- Independent upgrading: The DR member devices can be upgraded independently one by one to minimize the impact on traffic forwarding.
- High availability: The DR system uses a keepalive link to detect multi-active collision to ensure that only one member device forwards traffic after a DR system splits.

## Abundant Data Center Solutions

The switch offers a wide range of solutions for data center virtualization and network convergence, including:

- Virtual eXtensible LAN (VXLAN): A MAC-in-UDP technology that provides Layer 2 connectivity between distant network sites across an IP network. It also enables service isolation between different tenants.
- Edge Virtual Bridging (EVB): Uses the Virtual Ethernet Port Aggregator (VEPA) mode to switch traffic of VMs to a physical switch connected to the server for processing. This not only ensures traffic forwarding between VMs, but also enables VM traffic policing and access control policy deployment.
- Fibre Channel over Ethernet (FCoE): Integrates heterogeneous LANs and storage networks in data centers. In conjunction with Converged Enhanced Ethernet (CEE), FCoE combines the frontend network with the backend networking architecture, and integrates data, computing, and storage networks in data centers, to significantly reduce the costs for building and expanding data centers.



- MP-BGP EVPN (Multiprotocol Border Gateway Protocol Ethernet Virtual Private Network) uses standard-based BGP protocol as the control plane for VXLAN overlay networks, providing BGP based VTEP auto peer discovery and end-host reachability information distribution. MP-BGP EVPN delivers many benefits, such as eliminating traffic flooding, reducing full mesh requirements between VTEPs via the introduction of BGP RR, achieving optimal flow-based end to end load sharing and more.

## Comprehensive IPv6

The switch offers comprehensive IPv6 features, including:

- IPv6 routing: IPv6 static routing, RIPng, OSPFv3, IS-ISv6, and BGP4+.
- IPv4-to-IPv6 transition: IPv6 manual tunnel, 6to4 tunnel, ISATAP tunnel, GRE tunnel, and IPv4-compatible automatic tunnel configuration.

## Media Access Control Security (MACsec)

The switch supports hardware-level encryption technology MACsec (802.1AE), which is an industry-standard security technology that provides secure communication for all traffic on Ethernet links. Compared with traditional application-based software encryption technology, MACsec provides point-to-point security on Ethernet links between directly connected nodes and is capable of identifying and preventing most security threats.

## Green Designs

The device uses green designs from hardware components to the chassis exterior.

- Water-based paint without electroplating for the chassis exterior significantly reduces carbon emissions.
- Strict front-to-rear air flow reduces the airflow resistance and improves heat dissipation efficiency, allowing side-by-side deployment of cabinets.
- The fan trays provide area-based refined, intelligent speed adjustment and reduce the speed regulation response time to seconds, saving power consumption significantly.

## Hardware Specifications

Features	S10506X-G	S10508X-G	S10512X-G
Switching capacity	38.4Tbps	51.2Tbps	76.8Tbps
Forwarding capacity	19200Mpps	25600Mpps	68400Mpps
MPU slots	2		
MPU Console Ports	1x RJ-45	1x RJ-45	1x RJ-45



Features	S10506X-G	S10508X-G	S10512X-G
MPU MGMT Ports	1x 10/100/1000M RJ-45 1x 1000M SFP	1x 10/100/1000M RJ-45 1x 1000M SFP	1x 10/100/1000M RJ-45 1x 1000M SFP
MPU USB Port	1	1	1
LPU slots	6	8	12
Switching fabric module slots	4	6	6
Fan Trays	2	3	3
Power modules	4	6	8
Hardware architecture	Orthogonal CLOS		
Redundancy	Redundant MPUs, switching fabric modules, power modules, and fan trays		
Operating environment	Temperature: 0°C to 45°C (32°F to 113°F) Humidity: 5% to 95% (non-condensing)		
Input voltage	AC: 100V ~ 240V DC: -48V ~ -60V		
Maximum power consumption	2470W	3680W	5240W
MTBF(Year)	36.5	27.05	21
MTTR(Hour)	0.5	0.5	0.5
Dimension (H x W x D)/mm	442×440×520 10U	530×440×640 12RU	796×440×640 18RU
Fully loaded weight	< 85 kg < 187.4 lb	< 130 kg < 286.6 lb	< 180 kg < 396.8 lb

## Software Specifications

Feature	S10500X-G switch series
Ethernet	IEEE 802.1Q VLAN (up to 4094 VLANs) DLDP LLDP Static MAC configuration Limited MAC learning Port mirroring and traffic mirroring



Feature	S10500X-G switch series
	Port aggregation, port isolation, and port mirroring 802.1d(STP)/802.1w(RSTP)/802.1s(MSTP) PVST/PVST+ IEEE 802.3ad (dynamic link aggregation), static port aggregation, and multi-chassis link aggregation IEEE 802.1P (CoS priority) IEEE 802.1ad (QinQ), selective QinQ and Vlan mapping GVRP RRPP (Rapid Ring Protection Protocol) Jumbo frame SuperVLAN PVLAN Multicast VLAN+ Broadcast/multicast/unknown unicast storm constrain Port based, Protocol based, Subnet-based and MAC based VLAN
Routing	Static routing, RIP, OSPF, IS-IS, and BGP4 IPv4/IPv6 ECMP VRRP IPv4/IPv6 Policy-based routing IPv4/IPv6 Routing policy IPv4/IPv6 dual stack IPv6 static routing, RIPng, OSPFv3, IS-ISv6, and BGP4+ VRRPv3 Pingv6, Telnetv6, FTPv6, TFTPv6, DNSv6, ICMPv6 IPv4-to-IPv6 transition technologies, such as IPv6 manual tunnel, 6to4 tunnel, ISATAP tunnel, GRE tunnel, IPv4-compatible IPv6 tunnel
Multicast	PIM-DM, PIM-SM, PIM-SSM, MSDP, MBGP, and Any-RP IGMP V1/V2/V3, IGMP V1/V2/V3 Snooping IGMP Filter and IGMP Fast leave PIM6-DM, PIM6-SM, PIM6-SSM MLD V1/V2, MLD V1/V2 Snooping Multicast policy and Multicast QoS
ACL/QoS	Standard and extended ACLs Ingress and Egress ACL





Feature	S10500X-G switch series
	VLAN ACL Global ACL Ingress/Egress CAR Diff-Serv QoS 802.1P/DSCP Priority marking and remarking 802.1p, TOS, DSCP, and EXP priority mapping Flexible queue scheduling algorithms including SP, WRR, SP+WRR, WFQ Traffic shaping Congestion avoidance, Tail-Drop and WRED
SDN/OPENFLOW	OpenFlow 1.3 Multiple controllers (EQUAL, master/slave) Multiple tables flow Group table Meter
VXLAN	VXLAN L2 switching VXLAN L3 routing VXLAN VTEP IS-IS+ENDP distributed control plane MP-BGP+EVPN distributed control plane OpenFlow+Netconf centralized control plane
Programmability and automation	Ansible Auto DevOps by using Python, NETCONF, TCL, and Restful APIs for automated network programming
MPLS/VPLS	L3 MPLS VPN L2 VPN: VLL (Martini, Kompella) MCE MPLS OAM VPLS, VLL Hierarchy VPLS, QinQ+VPLS P/PE function LDP
Security	Hierarchical user management and password protection EAD





Feature	S10500X-G switch series
	Portal authentication MAC authentication IEEE 802.1x and IEEE 802.1x SERVER AAA/Radius HWTACACS SSHv1.5/SSHv2 Basic and advanced ACLs for packet filtering OSPF, RIPv2, BGPv4 plain text and MD5 authentication IP address, VLAN ID, MAC address multiple binding combination MACsec, Cloudsec uRPF Active/standby data backup
System management	IMC network management system Loading and upgrading through XModem/FTP/TFTP SNMP v1/v2c/v3 SmartMC sFlow gRPC, Telemetry Stream RMON and groups 1,2,3 and 9 NTP and PTP clocks Fault alarm and automatic fault recovery System logs Device status monitoring mechanism, including the CPU engine, backplane, chips and other key components
HA	Independent switching fabric modules 1+1 redundancy for key components such as MPUS and M+N redundancy for power modules N+1 redundancy for switching fabric modules Passive backplane Hot swapping for all components Real-time data backup on active/standby MPUs CPU protection VRRP Hot patching



Feature	S10500X-G switch series
	NSR/GR for OSPF/BGP/IS-IS/RSVP Port aggregation and multi-card link aggregation BFD for VRRP/BGP/IS-IS/OSPF/RSVP/static routing, with a failover detection time less than 50 milliseconds Ethernet QAM (802.1ag and 802.3ah) RRPP/ERPS VCT Smart-Link ISSU Segment Routing
O&M	Telemetry IEEE 1588V2
Green	IEEE (802.3az)
EMC	FCC Part 15 Subpart B CLASS A ICES-003 CLASS A VCCI CLASS A CISPR 32 CLASS A EN 55032 CLASS A AS/NZS CISPR32 CLASS A CISPR 24 EN 55024 EN 61000-3-2 EN 61000-3-3 ETSI EN 300 386
Safety	UL 60950-1 CAN/CSA C22.2 No 60950-1 IEC 60950-1 EN 60950-1 AS/NZS 60950-1 FDA 21 CFR Subchapter J GB 4943.1

## Ordering information

Product ID	Product Description
<b>Chassis</b>	
LS-10506X-G	H3C S10506X-G Ethernet Switch Chassis
LS-10508X-G	H3C S10508X-G Ethernet Switch Chassis
LS-10512X-G	H3C S10512X-G Ethernet Switch Chassis
<b>Power Supply Module</b>	
PSR1600B-12A-B	1600W AC Power Supply Module (Power Panel Side Exhaust Airflow)
<b>Fan Tray Module</b>	
FAN-80B-4-A	Fan Tray Module
FAN-80B-5-A	Fan Tray Module
FAN-80B-8-A	Fan Tray Module
<b>Supervisor Engine Unit</b>	
LSEM1SUPA0	H3C S10500X-G Supervisor Engine Unit,Type A
LSEM3SUPA0	H3C S10500X-G Supervisor Engine Unit,Type A
LSEM1SUPB0	H3C S10512X-G Supervisor Engine Unit,Type B
LSEM3SUPB0	H3C S10512X-G Supervisor Engine Unit,Type B
<b>Switch Fabric Module</b>	
LSEM1SF06D0	H3C S10506X-G Switch Fabric Module,Type D
LSEM1SF08C0	H3C S10508X-G Switch Fabric Module,Type C
LSEM1SF12B0	H3C S10512X-G Switch Fabric Module,Type B
<b>Interface Module</b>	
LSEM1GT48TSSD0	H3C S10500X-G 48-Port 10/100/1000BASE-T Interface(RJ45)+4-Port 10G Ethernet Optical Interface Module (SFP+,LC)(SD)
LSEM1TGS16GP32SD0	H3C S10500X-G 16-Port 10G Ethernet Optical Interface (SFP+,LC) + 32-Port 1000BASE Ethernet Optical Interface Module (SFP,LC)(SD)
LSEM1GT24GP16TSSD0	H3C S10500X-G 24-Port 10/100/1000BASE-T Ethernet Copper Interface(RJ45)+16-Port 1000BASE Ethernet Optical Interface(SFP)+12-Port 10G Ethernet Optical Interface Module (SFP+)(SD)
LSEM1TGS24SD0	H3C S10500X-G 24-Port 10G Ethernet Optical Interface Module (SFP+,LD)(SD)
LSEM1TGS48SD0	H3C S10500X-G 48-Port 10G Ethernet Optical Interface Module (SFP+,LC)(SD)
LSEM1TGS48QSSF0	H3C S10500X-G 48-Port 10G Ethernet Optical Interface(SFP+,LC) + 4-Port 40G



Product ID	Product Description
	Ethernet Optical Interface Module (QSFP+)(SF)
LSEM3TGS48QSSF0	H3C S10500X-G 48-Port 10G Ethernet Optical Interface(SFP+) + 4-Port 40G Ethernet Optical Interface Module (QSFP+)(SF)
LSEM1YGS48CQSF0	H3C S10500X-G 48-Port 25G Ethernet Optical Interface (SFP28)+4-Port 100G Ethernet Optical Interface Module (QSFP28)(SF)
LSEM3YGS48CQSF0	H3C S10500X-G 48-Port 25G Ethernet Optical Interface (SFP28) + 4-Port 100G Ethernet Optical Interface Module (QSFP28)(SF)
LSEM1QGS16SF0	H3C S10500X-G 16-Port 40G Ethernet Optical Interface Ethernet Optical Interface Module (QSFP+)(SF)
LSEM3QGS16SF0	H3C S10500X-G 16-Port 40G Ethernet Optical Interface Module (QSFP+)(SF)
LSEM1CGQ36SF0	H3C S10500X-G 36-Port 100G Ethernet Optical Interface Module (QSFP28)(SF)

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