H3C S9857 Series

Data Center Switches

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New H3C Technologies Co., Limited

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Product overview

H3C S9857 series switch is a high-density 800GE/400GE Ethernet switch designed for high-end artificial intelligent data centers. Running H3C's proprietary Comware V9 Network Operating System (NOS), the S9857 leverages a single-forwarding-chip architecture to deliver high-density 800GE/400GE Ethernet interfaces. All ports support wire-speed forwarding at full line rate. This switch is ideally suited for high-density “box-to-box” or “chassis to box” topologies within Leaf and Spine network, addressing the stringent bandwidth and performance demands of Artificial Intelligence Generated Content (AIGC) workloads.

The S9827 series switches includes one model:

- S9857-24DH8EP: 8* 800GE OSFP800 ports and 24* 400GE QSFP112 ports and 2*10GE SFP+ ports

S9857-24DH8EP front view

Features and Benefits

High port density and powerful forwarding capacity

- The S9857 switch supports high-density 800GE/400GE ports, with powerful forwarding capabilities, supporting a maximum of 8 x 800GE OSFP800 and 24 x 400G QSFP112 ports. it meets the networking needs of ultra-large data centers and AIGC computing networks for high-density server non-convergent access.

Enhanced SDN Capabilities

- The S9857 switch uses industry-leading programmable switching chips, allowing flexible definition of forwarding logic based on user needs, and the development of new features that align with user network evolution trends. Simple software upgrades can provide the new features required by users, offering unlimited possibilities for network expansion and timely evolution.

Rich Data Center Features

- The S9857 switch fully supports RoCE features for lossless networks in data centers, including PFC, ECN, AI ECN, IPCC, iNOF, Agile Buffer, etc., creating a zero-loss, low-latency lossless network. It also supports typical box-to-box networking for 800G/400G lossless fabrics, meeting the demands of ultra-large-scale networking and low latency in data centers.
- AI ECN dynamically adjusts the ECN threshold values of each transmission queue to meet varying resource demands based on real-time queue traffic, significantly enhancing data forwarding efficiency and achieving an intelligent, lossless, zero-loss low-latency computing network.
- The S9857 switch supports FGLB (flexible global load balancing) capabilities, global lossless traffic scheduling, and ensures that overall network traffic forwarding remains optimized across link loads. It also supports lossless data plane self-healing (DPSH), enabling microsecond-level switching of data flows. The S9857 supports various load balancing capabilities, including multipath ECMP load balancing, per-flow load balancing, Spraylink per-packet load balancing, and path navigation.

Powerful Visualization Capabilities

- With the rapid development of data center technologies, the scale of data centers is expanding quickly, making reliability and maintainability key bottlenecks for further expansion. The S9857 switches align with the trend of automated operations in data centers, supporting visualization features. Through protocols like ERSPAN and gRPC, real-time resource information, RDMA statistics, and RDMA alarm messages from the switches can be sent to the data center operation platform. The platform can analyze this real-time data to enable functions such as network quality tracing, fault diagnosis, risk warning, and architecture optimization, even allowing for automatic adjustments to network configurations to reduce congestion, thereby making the shift towards automated data center operations possible.

*Multiple Reliability Protection

- The S9857 switch supports redundant hot-swappable power supplies and fans, with power supply supporting 1+1 redundancy and fans supporting 5+1 redundancy.
- The S9857 switch features multiple reliability protections at both the device and link levels. It employs overcurrent protection, overvoltage protection, and overheat protection technologies, supporting hot-swappable redundant power modules that can be flexibly configured for AC or DC power supplies based on actual environmental needs. Additionally, the overall system supports fault detection and alarms for power and fans, provides automatic protection when a fan is not inserted to prevent chip damage due to high temperatures, and can automatically adjust fan speed based on temperature changes, resulting in high reliability for the device.
- The S9857 switch supports nanosecond-level hardware automatic link switchover, enabling network devices to achieve automatic sensing, self-adjustment, and self-diagnosis functions, enhancing the automation level of the network, reducing the impact of faults on network stability and continuity, and ensuring efficient, stable, and secure network operations.

Rich QoS Strategies

- The S9857 switch supports L2 (Layer 2) to L4 (Layer 4) packet filtering functions, providing traffic classification based on source MAC address, destination MAC address, source IP address, destination IP address, TCP/UDP port number, protocol type, and VLAN. Each 400G port supports multiple unicast and queues, offering flexible queue scheduling algorithms that can be set based on both port and queue, supporting five modes: SP (Strict Priority), WRR (Weighted Round Robin), SP+WRR, WFQ, and SP+WFQ. It also supports CAR (Committed Access Rate) functionality with a minimum granularity of 8Kbps. It supports port mirroring in both ingress and egress directions for monitoring packets on designated ports, copying packets to a monitoring port for network detection and troubleshooting.

Excellent Management Capabilities

- The S9857 switch supports a rich set of management interfaces, such as Console, USB ports, and out-of-band (OOB) management copper ports.
- The S9857 switch supports SNMPv1/v2/v3 (Simple Network Management Protocol), compatible with industry-standard network management platforms and the Intelligent Management Center (iMC). It supports CLI command line, TELNET, FTP, as well as encryption methods like SSH2.0 and SSL, enhancing management security.
- The S9857 switch supports the standard Netconf interface, providing a programmable method for configuring and managing network devices. This makes it very convenient for third-party software development, meeting user demands for openness and flexibility in device management.
- The S9857 switch supports sFlow and NetStream functionalities for detailed packet statistics, with support for SPAN/RSPAN/ERSPAN mirroring and multiple mirrored observation ports, allowing for network traffic analysis to take appropriate management and maintenance actions, making previously invisible network service application traffic clear. It can provide users with various NetStream analysis reports, helping optimize network structure and adjust resource deployment in a timely manner.
- The S9857 switch supports real-time monitoring of Buffers and port queues, enabling dynamic adjustments for network operation and maintenance visualization.

Comprehensive Security Control Policies

- The S9857 switch supports AAA and RADIUS authentication, dynamic or static binding of user identity elements such as user accounts, IP, MAC, VLAN, and port; it supports real-time management of online users in conjunction with H3C's iMC platform, allowing for timely diagnostics and dismantling of illegal network activities.
- The S9857 switch provides enhanced ACL control logic, supporting large-capacity ingress and egress port ACLs, and supports VLAN-based ACL deployment, simplifying user configuration processes while avoiding wastage of ACL resources.

Industrial Design and Ease of Use

- The overall system features a super short straight-through heat dissipation duct design to improve power utilization efficiency, being energy-saving and environmentally friendly。
- The device faceplate features a honeycomb hole design that maximizes ventilation area, effectively ensuring the product's heat dissipation functionality requirements.
- The newly designed modularization of fans and power components meets the product's flexible deployment, redundancy design, and reduced operational energy consumption.
- The new product appearance is harmonized with a unified operational identification color, aiming to create a friendly operational experience atmosphere.

Hardware Specification

Item	S9857-24DH8EP
Dimensions (W × D × H)	442×550×44 mm
Weight (Full loaded)	12.3kg
Switching capacity	32 Tbps
Forwarding capacity	5.4 Bpps
Latency	1.2 us ~1.4 us
Serial console port	1
Out-of-band management port	1*1000M copper port
USB port	1*USB2.0 port
800GE OSFP800	8
400GE QSFP112	24
10GE SFP+	2
AC-input voltage	200-240V
HVDC-input voltage	240V
Power module	2*1600W power supply (1+1 redundancy)
Fan tray	6* Hot-swappable fan, front to rear(5+1 redundancy)
CPU	2.6GHZ@4 CORE
Flash	64G
RAM	16G
MTBF (year)	55.87
MTTR (year)	0.5
Power consumption(static)	176W
Power consumption(typical)	401W
Power consumption(max)	1120W
Thermal consumption(static)	601 BTU/hr
Thermal consumption(typical)	1368 BTU/hr
Thermal consumption(max)	37943 BTU/hr
Operating temperature	0°C ~ 40°C
Operating humidity	5 ~ 95%RH

Software Specification

Item	Feature description
Forwarding Mode	Store-forward mode
Network virtualization	BGP-EVPN
	VxLAN
Data center features	VxLAN Mapping
	service chain
	RDMA lossless network RoCEv2
	BUFFER visualization
	DCBX, PFC, ETS, ECN

Item	Feature description
	iNOF, IPCC*
	CNP response and CNP retransmission
	Spraylink, LBN, DLB
	global load balancing FGLB*
	intelligent identification of traffic models, dynamically adjusting AI ECN thresholds
	delay-based ECN for precise traffic control
	PFC deadlock prevention
Programmable	NETCONF
	Python
	Ansible automation configuration
MAC address table	dynamic, static, and black hole MAC address entries
	automatic learning and aging of MAC addresses
	source MAC address filtering
VLAN	port-based, protocol-based, and MAC-based VLAN
	Default VLAN
Traffic Monitoring	sFlow
	Telemetry
	support RoCE cluster intelligent operation and maintenance platform, gRPC high speed data proactive reporting, full network path probing, real-time monitoring of network health
	support microsecond-level PFC and headroom monitoring for precise visual operation and maintenance
ARP	ARP, RARP, gratuitous ARP
	Dynamic ARP Inspection
	ARP anti-attack
	ARP source quench
	ARP Detection function
IP routing	static routes and default routes
	IPv4 dynamic routing protocols such as RIP, OSPF, BGP, ISIS
	IPv6 dynamic routing protocols such as RIPng, OSPFv3, BGP4+, ISISv6
	equal cost routes and policy-based routing
IPv6 features	IPv6 ND (Neighbor Discovery)
	IPv6 VxLAN over IPv4
	PMTU discovery (Path MTU Discovery)
	ICMPv6, Telnetv6, SFTPv6, SNMPv6, VRRPv3
	IPv6 Portal and IPv6 Tunnel
Availability	STP, RSTP, MSTP
	BPDU protection, root protection, loop protection
	LACP
	DLDP
	SmartLink
QoS	port rate limiting
	ACL, CAR, priority re-marking, and queues
	multiple queue scheduling methods such as SP, WRR, WFQ, SP+WRR, SP+WFQ
	Layer 2 to Layer 4 packet filtering
	traffic classification based on source MAC, destination MAC, source IP (IPv4/IPv6), destination IP (IPv4/IPv6), port, protocol, VLAN
	traffic shaping
	congestion avoidance mechanisms such as WRED and tail drop
Mirroring	traffic mirroring
	N:4 port mirroring
	local and remote port mirroring ERSPAN
Security features	user hierarchical management and password protection
	combination binding of IP, MAC, port, and VLAN
	protection against DOS, ARP, ICMP, and other attacks

Item	Feature description
	IP Source Guard and port isolation
	HTTPs and SSL
Management and Maintenance	Telemetry visualization function
	cache micro-burst detection
	zero configuration Auto-config and configuration rollback
	command line interface (CLI) configuration
	configuration via Console, Telnet, SSH, etc.
	RMON (Remote Monitoring)
	SNMP v1/v2c/v3
	network management systems
	Netconf and Python
	system logs and user operation logs
	hierarchical alarms
	power, fan, and temperature alarm functions
	NTP Network Time Protocol
	Jumbo Frame 9216 bytes
	debugging information output for Ping, Tracert, etc.
	uploading and downloading files via FTP, TFTP, USB, etc.
	XModem protocol for loading upgrades

* we plan to support these features.

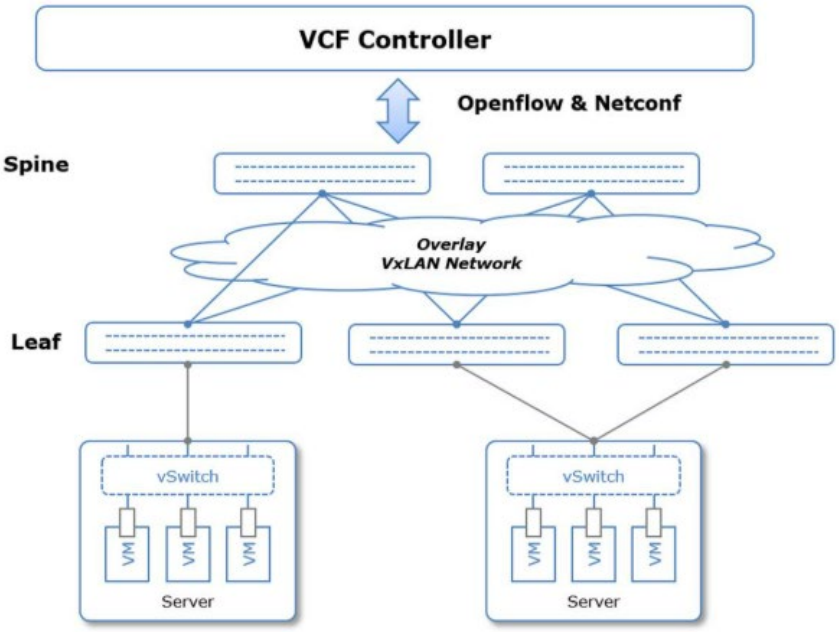
Performance and scalability

Item	Description	S9857-24DH8EP
ACL	max number of ingress ACLs	12287
	max number of ingress Car	200
	max number of egress ACLs	2k
	max number of egress Car	50
Forwarding table	Jumbo frame length(byte)	9216
	Mirroring group	8
	PBR policy	V4-----1024; V6------512
	PBR node	256
	max number of MACs per switch	16k
	OSPF routing table	872K max/ 490K min
	OSPF peer number	1800
	BGP routing table	872K max/ 490K min
	BGP peer number	8200
	ISIS routing table	872K max/ 490K min
	ISIS peer number	1301
	max number of ARP entries IPv4	28k
	max ND table size for IPv6	28k
	max number of unicast routes IPv4	FIB ipv4:1.46M,
	max number of unicast routes IPv6	FIB ipv6(64B):872K
	VRF	4000
Interface	Loopback interface number	1024
	L3 sub interface number	4K
	SVI interface number	4K
	IPv4 tunnel number	1000
	IPv6 tunnel number	500
	VLAN number	4094
Performance	RIB	2M max

	MSTP instance	128
	PVST instance	256
	VRRP VRID	IPV4:255; IPV6:255
	VRRP group	IPV4:255; IPV6:255
	NQA group	no limited, 4096 is Maximum concurrency testing group count
Static table	static mac-address	16K
	static ARP	28k
	static ND	28k
	static IPv4 routing table	906K
	static IPv6 routing table	180K

Data Center Application

Typical Applications in AIGC Computing Data Centers: S9857/S9827 series switches based on the 800GE/400GE platform act as the core of the data center (Spine node). The access layer can use the S9857 switch as a 400G TOR switch (Leaf node), providing a high-density solution for 400G/200G/100G server aggregation, and constructing a high availability (HA), highly redundant large-scale data center network. Meanwhile, the product and chip have already entered mass production, and the switch supports the official Release version, available for use by the entire industry.



Application of S9857 Switches in Overlay Data Center

Order information

PID	Description
LS-S9857-24DH8EP	H3C S9857-24DH8EP L3 Ethernet (24*QSFP112+8*OSFP800) Switch
FAN-40B-1-G	H3C Fan Module (Fan Panel Side Exhaust Airflow)
PSR1600-12A-S-B	1600W AC Power Supply Module (Power Panel Side Exhaust Airflow)

The Leader in Digital Solutions

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