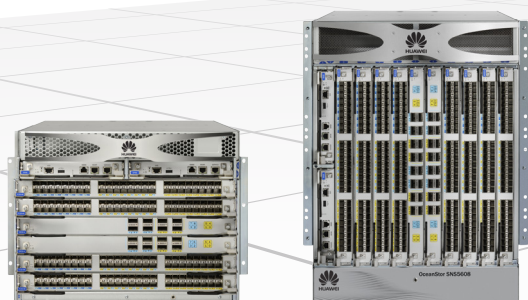




OceanStor SNS5604, SNS5608 FC Storage Switches

HUAWEI OceanStor SNS5604/SNS5608 Directors are proven and dedicated network infrastructure oriented to data centers. Use Gen 6 Fibre Channel, Fabric Vision technology, and IO Insight deliver unmatched 32 Gbps performance, seamless scalability and high reliability to ensure Storage network greater consistency, predictability, and performance.

Product Features

HIGHLIGHTS



- Enhances operational stability, maximizes application performance, and increases business agility with enterprise-class Gen 6 directors
- Accelerates application response time by up to 71 percent across 32 Gbps links
- Consolidates infrastructure with 128 Gbps UltraScale ICL connectivity for simpler, flatter, low-latency fabrics
- Simplifies end-to-end management of large-scale environments by automating monitoring and diagnostics
- Automatically detects degraded application or device performance through integrated network sensors
- Extends replication over distance with a highly scalable extension solution for Fibre Channel, IP, and FICON
- Simplifies configuration automation and enables integrated advanced services across the Fabric with standard REST APIs
- Seamlessly integrates next-generation NVMe over Fabrics with Gen 6 Fibre Channel networks without a disruptive rip and replace
- Mitigates risk with backward-compatibility while further protecting future investments with Gen 7-ready support

Network Innovation for the Virtualized, All-Flash Data Center

- Digital transformation is pushing mission-critical storage environments to the limit, with users expecting data to be accessible from anywhere, at any time, on any device. Faced with exponential data growth, the network must evolve to enable businesses to thrive in this new era. To meet these dynamic and growing business demands, organizations need to deploy infrastructure that can deliver greater consistency, predictability, and performance. Legacy infrastructure, however, was not designed to support the performance requirements of evolving workloads and flash-based storage technology. In fact, an aging network will impede the performance of an all-flash data center. A new approach to storage networking is needed to enable databases, virtual servers, desktops, and critical applications, and to unlock the full capabilities of flash. By treating the network as a strategic part of a storage environment, organizations can maximize their productivity and efficiency even as they rapidly scale their environments.
- The SNS5604/SNS5608 Directors with Fabric Vision technology combines innovative hardware, software, and integrated network sensors to ensure the industry's highest level of operational stability and redefine application performance. It provides a modular building block for increased scalability to accommodate growth for large-scale enterprise infrastructures.

- Fabric Vision technology enhances visibility into the health of storage environments, delivering greater control and insight to quickly identify problems and achieve critical Service Level Agreements (SLAs). Breakthrough 32 Gbps performance accelerates application response time by up to 71 percent, eliminating IO bottlenecks, and unleashes the full performance of flash and next-generation Non-Volatile Memory Express (NVMe)-based storage. And with diverse deployment options, organizations can seamlessly adapt and optimize their businesses to meet next-generation storage requirements.

Purpose-Built for Enterprise Deployments

- Designed to meet relentless growth and mission-critical application demands, SNS5604/ SNS5608 Directors are the right platform for large enterprise environments that require increased capacity, greater throughput, and higher levels of resiliency.
- SNS5604/ SNS5608 are available in two modular form factors. This modular chassis design increases business agility with seamless storage connectivity and flexible deployment offerings.
- Built for large enterprise networks, the 14U SNS5608 has eight vertical blade slots to provide up to 384 32 Gbps Fibre Channel device ports and 32 additional 128 Gbps UltraScale Inter-Chassis Link (ICL) ports.
- Built for midsize networks, the 9U (With airflow diversion rack-mount kit) SNS5604 has four horizontal blade slots to provide up to 192 32 Gbps Fibre Channel device ports and 16 additional 128 Gbps UltraScale ICL ports.
- SNS5604/SNS5608 Directors can consistently deliver five-nines availability in the world's most demanding data centers. And with non-disruptive, hot-pluggable components and a no-single-point-of-failure design, the SNS5604/SNS5608 Directors are truly the enterprise-class directors for today's storage infrastructure.

Enhanced Operational Stability for Always-on Business Operations

The SNS5604/SNS5608 Directors with Fabric Vision technology provides a breakthrough hardware and software solution that helps simplify monitoring, increase operational stability, and dramatically reduce costs. Fabric Vision technology now includes IO

Insight, which provides organizations with deeper visibility into the performance of their environments. This enhanced visibility enables quick identification of degraded application performance at host and storage tiers, reducing time to resolution.

IO Insight proactively monitors IO performance and behavior through integrated network sensors, providing deep insight into problems and helping to ensure service levels. This capability non-disruptively and non-intrusively gathers IO statistics from any device port, which feeds a monitoring policy that measures thresholds and generates alerts. Integrated application- and device-level IO latency and IOPS monitoring provides the ability to baseline application performance and detect degraded performance. Integrated network sensors provide IO performance management that is designed to avoid dependence on invasive and disruptive physical taps.

Innovative Fabric Vision monitoring, management, and diagnostic capabilities enable administrators to avoid problems before they impact operations.

Maximum Performance for Mission-Critical and Highly Virtualized Workloads

Evolving critical workloads and higher density virtualization are continuing to demand greater, more predictable performance. The SNS5604/SNS5608 Directors features industry-leading Gen 6 Fibre Channel that increases performance for demanding workloads across 32 Gbps line-speed links and up to 16.2 Tbps of chassis bandwidth to address next-generation I/O- and bandwidth-intensive applications. Gen 6 Fibre Channel technology provides up to 566 million frames switched per second per ASIC, unlocking the full capability of flash storage. This breakthrough performance speeds up data-intensive application response times, allows more transactions in less time, and enables improved SLAs. In addition, the SNS5604/SNS5608 Directors increases scalability with double the throughput for high-density VM deployments and larger fabrics. This allows organizations to support more storage devices and meet bandwidth requirements using the same number of Fibre Channel links. SNS5604/SNS5608 Directors provide unmatched chassis, slot-to-slot, and port performance and bandwidth. In addition, local switching capabilities ensure that data traffic within the same port group does not consume slot bandwidth, maximizing the number of line-rate ports while reducing latency.

Technical Specifications

Model	SNS5604	SNS5608
System Architecture		
Number of ports	The SNS5604 provides up to 192 32 Gbps ports or a 256-port equivalent with 16 UltraScale ICL ports	The SNS5608 provides up to 384 32 Gbps ports or a 512-port equivalent with 128 Gbps (4x32 Gbps) UltraScale ICL ports (32 Gbpsx4 QSFP ports)
Port types	Each provides support for (E, F, D, M, SIM, AE, and EX) Fibre Channel ports using 48-port 32 Gbps Fibre Channel blades. FC32-48 port blade: F_Port, E_Port, EX_Port, M_Port, SIM, and D_Port SX6 Extension Blade: F_Port, E_Port, and EX_Port on FC, and VE_Port on GbE NOTE: Self-discovery is based on switch type (U_Port) with an optional port-type control Full-fabric architecture with a maximum of 239 switches	
Fibre Channel blades	FC32-48 port blade provides 48 ports of 32 Gbps Gen 6 Fibre Channel	
Extension blades	SX6 Extension Blade provides Fibre Channel extension (16x32 Gbps Fibre Channel ports) and IP extension over IP networks (16x1/10 GbE and 2x40 GbE ports)	
Control processor	Redundant (active/standby) control processor modules	
Scalability	Full-fabric architecture of 239 switches	
Certified maximum	6,000 active devices per switch; 56 switches, 19 hops in fabrics; larger fabrics certified as required	
ISL Trunking	Frame-based trunking with up to eight 32 Gbps ports per ISL trunk; up to 256 Gbps per ISL trunk Exchange-based load balancing across ISLs with DPS included in Switch FOS	
Chassis bandwidth	6.1 Tbps per chassis (192 portsx32 Gbps) data rate + 2.048 Tbps UltraScale ICL bandwidth (16x128 Gbps)	12.2 Tbps per chassis (384 portsx32 Gbps) data rate + 4.096 Tbps UltraScale ICL bandwidth (32x128 Gbps)
Slot bandwidth	1,536 Gbps (line rate)	
Switch latency	FC32-48 blade at Gen 6 32 Gbps speeds: <900 ns (including FEC); any-port-to-any-port local switching and 2.7 µs blade to blade at 32 Gbps, cut-through routingSX6 blade, Fibre Channel to Fibre Channel: <900ns (including FEC) and 2.7 µs any-port-to-any-port at 32 Gbps, cut-through routing	
Maximum frame size	2,112-byte payload	
Frame buffers	15,000 per switching ASIC	
Data traffic types	Fabric switches supporting unicast, multicast (255 groups), and broadcast	
Classes of service	Class 2, Class 3, Class F (inter-switch frames)	
USB	One USB port per control processor for firmware download, support save, and configuration upload or download	
Extension	Supports DWDM, CWDM, and FC-SONET devices; Fibre Channel, in-flight compression (LZO) and encryption (AES-GCM-256); BB credit recovery; FCIP, IP Extension, Adaptive Rate Limiting (ARL), data compression, Fast Write, read/write Tape Pipelining, QoS	
System Components		
ANSI Fibre Channel protocol	FC-PH (Fibre Channel Physical and Signaling Interface standard)	
Fabric initialization	Complies with FC-SW 5.0	
Port to port latency	Local switching: 900 ns Blade to blade: 2.7 µs	
Switching capacity	An aggregate switching capacity of 13.5 billion frames per second (for Class 2, Class 3, and Class F frames for a 384-port chassis)	
High Availability		
Architecture	Non-blocking shared memory; passive backplane; redundant active/passive control processor; redundant active/active core switching blades; redundant WWN cards	
Airflow	Non-port-side intake to port-side exhaust or port-side intake to non-port-side exhaust options are available	
Solution availability	Designed to provide 99.999 percent uptime capabilities; hot-pluggable redundant power supplies, fans, WWN cards, processors, core switching, port blades, and optics; online diagnostics; non-disruptive firmware download and activation	
Chassis power	- The device ships with two power supplies - Suggest install two to provide power efficiency and 1+1 redundancy	- Device ships with three power supplies (3 for 2+1 redundancy) - Suggest install four to provide power efficiency and 2+2 redundancy
Cooling	Requires two fan tray assemblies. Every fan assembly can be hot-swapped.The fan assembly should be replaced immediately in the event of a failure	Requires three fan tray assemblies. Every fan assembly can be hot-swapped.The fan assembly should be replaced immediately in the event of a failure

For More Information

To learn more about Huawei storage, please contact the local office or visit Huawei Enterprise website <http://e.huawei.com>.



Huawei Enterprise APP



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HUAWEI TECHNOLOGIES CO., LTD.
Address: Huawei Industrial Base Bantian, Longgang Shenzhen, PRC
Tel: (0755) 28780808
Zip code: 518129
www.huawei.com

Simplified, Scale-out Network Design

UltraScale chassis connectivity leverages optical Inter-Chassis Links (ICLs), which provide 128 Gbps bandwidth through a QSFP link. These links can support up to 2 kilometers and connect up to 12 SNS5604/SNS5608 Directors, enabling flatter, faster, and simpler fabrics that increase consolidation while reducing network complexity and costs. UltraScale ICLs enable scalable core-edge and active-active mesh chassis topologies. These high-density chassis topologies reduce inter-switch cabling by 75 percent and free up to 25 percent of ports for servers and storage. This maximizes overall port density within the smallest amount of rack space while freeing up front-facing device ports for server and storage connectivity.

Extended Distance and Replication with a Scalable, Multiprotocol Extension Solution

Connecting distributed data centers enables data mobility for advanced data protection. Enterprise data centers need their disaster recovery infrastructure to ensure fast, continuous, and easy replication of mission-critical data to anywhere in the world. Storage administrators need to replicate large amounts of data quickly, securely, reliably, and simply while minimizing operational and capital expenses. With the SX6 Extension Blade, the SNS5604 or SNS5608 Director provides integrated metro and global connectivity with a purpose-built data center extension solution for Fibre Channel and IP storage environments. This solution delivers unprecedented performance, strong security, continuous availability, and simplified management to handle the unrelenting transfer of data between data centers and to maintain SLAs. Additionally, native 10 Gbps Fibre Channel connections are also available on the 48P-32G port blade and include in-flight compression as well as optional support for 10 Gbps Fibre Channel over DWDM and dark fiber.

Adapting to Next-Gen Storage Requirements with Flexible Deployment Options

To realize the full benefits of flash, organizations will need to transition their high-performance, latency-sensitive workloads to flash-based storage with NVMe. The simplicity and efficiency of NVMe over Fibre Channel enable significant performance gains for flash storage. Moreover, NVMe over Fabrics enables users to achieve faster application response times and harness the performance of hundreds of solid state drives for better scalability across virtual data centers with flash. Organizations can seamlessly integrate Gen 6 Fibre Channel networks with next-generation NVMe over Fabrics without a disruptive rip and replace. Leveraging the efficiency of NVMe over Fibre Channel, combined with the high performance and low latency of Gen 6 Fibre Channel, organizations can accelerate IOPS to deliver the performance, application response time, and scalability needed for next-generation data centers. For investment protection, SNS5604/SNS5608 Directors offer three generations of backward-compatibility support for connectivity to 4, 8, and 16 Gbps Fibre Channel products. Furthermore, the SNS5604/SNS5608 supports future Fibre Channel generations as a Gen 7-ready storage networking platform. The SNS5604 or SNS5608 Director allows for current Gen 6 and future generation switch blade modules to be added within the chassis.

Model	SNS2624	SNS3664
Management		
Management	HTTP, SNMP v1/v3 (FE MIB, FC Management MIB), SSH; Auditing, Syslog; Web Tools; Command Line Interface (CLI); SMI-S compliant; RESTful API; trial licenses for add-on capabilities	
Management access	10/100/1000 Ethernet (RJ-45) per control processor, in-band over Fibre Channel; serial port (RJ-45) and one USB per control processor module; DHCP/DHCPv6	
Mechanical Specifications		
Enclosure	8-blade slots: 8U rack-mountable chassis; 27 in. to 31 in. rail, 18 in. to 24 in. rail, and airflow diversion rack mount kits for the four-post rack; mid-mount kit for the two-post rack	12-blade slots: 14U rack-mountable chassis; 27 in. to 31 in. and 22 in. rail kits for the four-post rack; mid-mount kit for the two-post rack
Size	With airflow diversion rack-mount kit (default deliver) : Height: 40.00 cm (15.75 in., 9U) Width: 43.74 cm (17.23 in.) Depth: 61.29 cm (24.09 in.) No airflow diversion rack-mount kit: Height: 34.45 cm (13.56 in., 8U) Width: 43.74 cm (17.23 in.) Depth: 61.04 cm (24.04 in.)	Height: 61.23 cm (24.11 in., 14U) Width: 43.74 cm (17.23 in.) Depth: 61.04 cm (24.04 in.)
System weight	24.5 kg (54 lb) for chassis 68.95 kg (152.0 lb) for 192-port configuration, fully populated	35.61 kg (78.5 lb) for chassis 145.8 kg (321.5 lb) for 384-port configuration, fully populated
Mounting	Rack-mountable in a standard 19-inch EIA cabinet	
Environment		
Temperature	Operating: 0°C to 40°C (32°F to 104°F) Non-operating: –25°C to 70°C (–13°F to 158°F)	
Humidity	Operating humidity: 5% to 93% RH non-condensing at 40°C (104°F) with a maximum gradient of 10% per hour Non-operating humidity: 10% to 93% RH non-condensing at 70°C (158°F)	
Altitude	Up to 3,000 meters (9,842 feet)	
Shock	Operating: 10 g, 11 ms, half sine wave Non-operating: 20 g, 11 ms, half sine wave	
Vibration	Operating: 5 Hz to 10 Hz @ +5 db/Oct; 10 Hz to 200 Hz @ 0.0005 Grms; 200 Hz to 500 Hz @ –5 db/Oct; scale 0.05 Grms Non-operating: 3 Hz to 10 Hz @ +5 db/Oct; 10 Hz to 200 Hz @ 0.0065 Grms; 200 Hz to 500 Hz @ –5db/Oct; scale 1.12 Grms	
Heat dissipation	192-port configuration: Typical: 4,696 BTU/hr; Max: 8,139 BTU/hr Power consumed: Typical: 1,376 W; Max: 2,385 W Note: Input power is at 200 VAC with full PSU redundancy	384-port configuration: Typical: 8,836 BTU/hr; Max: 14,485 BTU/hr Power consumed: Typical: 2,589 W; Max: 4,244 W Note: Input power is at 200 VAC with full PSU redundancy
Power		
Supported power range	Input voltage Standard AC input: Range: 85 VAC to 264 VAC Auto-volt Nominal: 100 VAC to 240 VAC Power 85 to 132 VAC: 1,450 W 180 to 264 VAC: 2,870 W	
In-rush current	35 Amps maximum, peak	
Frequency	50 Hz to 60 Hz (Nominal: 50 Hz to 60 Hz)	