IBM Storage Networking SAN32C-6

Empowering organizations that are rapidly deploying cloud-scale applications using virtualized servers

Highlights

- Support high density of virtualized servers with low port density
- Reduce network complexity and simplify management
- Leverage lower latency to improve performance of storage workloads
- Support the performance and scale required for a dedicated FC SAN

IBM Storage Networking SAN32C-6 (Figure 1) provides high-speed Fibre Channel connectivity from the server rack to the SAN core. It empowers small, midsized and large enterprises that are rapidly deploying cloud-scale applications using highly dense virtualized servers, by providing dual benefit of higher bandwidth and consolidation.

This switch has been designed to benefit both small-scale and large-scale SAN deployments. Small-scale SAN architectures can be built from the ground up using a low-cost, non-blocking, line-rate and low-latency fixed standalone SAN switch connecting both storage and host ports. Medium- to large-scale SAN architectures built with SAN core directors can expand 32-Gbps connectivity to the server rack using these switches either in switch mode or Network Port Virtualization mode.

Additionally, investing in this switch in the server rack provides the day-one option of upgrading to 32-Gbps server connectivity using the 32-Gbps host bus adapters (HBAs) already available in the market. The SAN32C-6 also provides outstanding flexibility through a unique port expansion module that provides a robust, cost-effective, field-swappable port upgrade option.

Main features

Among the main features of the SAN32C-6 are high performance, high availability, pay-as-you-grow scalability and capital expenditure savings.

- **High performance:** SAN32C-6 architecture, with chip-integrated non-blocking arbitration, provides consistent 32-Gbps low-latency performance across all traffic conditions for every Fibre Channel port on the switch.
- **High availability:** SAN32C-6 switches provide optional redundancy on all major components such as the power supply and fan. Dual power supplies also facilitate redundant power grids.
- **Pay-as-you-grow scalability:** The SAN32C-6 Fibre Channel switch provides an option to deploy as few as eight 32-Gbps Fibre Channel ports in the entry-level variant, which can grow by eight ports to 16 ports and thereafter with a port expansion module with sixteen 32-Gbps ports, to up to 32 ports. This approach results in lower initial investment and power consumption for entry-level configurations of up to 16 ports compared to a fully loaded switch. Upgrading through an expansion module also reduces the overhead of managing multiple instances of port activation licenses on the switch.
- **Capital expenditure (CapEx) savings:** The 32-Gbps ports allow users to deploy them on existing 16/8/4-Gbps transceivers, reducing CapEx with an option to upgrade to 32-Gbps transceivers and adapters as needed.

For details about additional main features, please visit the IBM Storage Networking SAN32C Redbooks Product Guide.

Main benefits

The new 32-Gbps fabric switches address the requirement for highly scalable, virtualized, intelligent SAN infrastructure in current-generation data center environments. The industry is already poised to transition to 32-Gbps fixed switches with the availability of 32-Gbps HBAs and storage arrays from vendors. Additionally, as low-latency flash arrays and highly dense virtualization deployments become more pervasive and as storage ports become 32-Gbps capable, fixed switches will need to provide 32-Gbps connectivity to the SAN core.

Figure 1: IBM Storage Networking SAN32C-6

This solution offers several important benefits:

- **Server port consolidation:** The demand for 32-Gbps fabric switches is driven by hyperscale virtualizations that will significantly increase the virtual machine density per rack, and this growth will push the need for higher bandwidth HBA ports per rack of blade or standalone servers. One way to meet this demand is for 32-Gbps HBA ports to consolidate the current 16-Gbps HBA installed base to meet future needs to grow the number of ports. As a result, the SAN32C-6, with its lower port density, can be a preferred solution and its flexibility to grow can be an added advantage.
- **Simplification:** Through consolidation, a SAN administrator can reduce complexity and simplify management.
- **Multiprotocol convergence:** 32-Gbps links benefit from lower latency compared to lower-bandwidth links, bringing better-performing storage workloads to your storage array. Higher bandwidth also helps ensure less inter-switch link (ISL) congestion for newer storage protocols that are expected to be available on externally attached storage arrays; for instance: Fibre Channel Non-Volatile Memory Express (NVMe) can co-exist on the same link as existing SCSI workloads.
- **Scale and performance:** This small form-factor switch supports the performance and scale required to deploy a dedicated and standalone Fibre Channel SAN connecting both initiators and targets, without requiring any other switching infrastructure.

IBM Storage Networking SAN32C-6 at a glance*	
Product number	8977
Hot-swappable components	Power supplies, fan modules, small form-factor pluggable
Warranty	One-year, customer-replaceable unit (CRU), IBM On-Site Limited, 9x5 Next Business Day; 24×7 same day maintenance service options are available
Dimensions	4.37 cm (1.72 in) H x 43.94 cm (17.3 in) W x 51.08 cm (20.11 in.) D, 1RU; rack-mountable in standard 19-inch Electronic Industries Alliance (EIA) rack
Weight	Fully configured chassis: 9.82 kg (21.65 lb)
Airflow	Back to front (toward ports)
Ports	Available in an 8-port activated base model with different additional pay-as-you-grow scalability options. Enable incremental ports with: • 8-port 16G Bundle (FC AJKN) – Initial order only. Provides eight 16G SW transceivers for the 8 enabled ports in the base. • 8-port 32G Bundle (FC AJKP) – Initial order only. Provides eight 32G SW transceivers for the 8 enabled ports in the base. • 16-port 16G Expansion Module Bundle (FC AJKQ) – Includes 16 enabled ports and sixteen 16G SW transceivers. • 16-port 32G Expansion Module Bundle (FC AJKR) – Includes 16 enabled ports and sixteen 32G SW transceivers. • 24-port 16G Enterprise Bundle (FC AJKM) – Initial orders only. Provides 24 active ports and 24 16G SW transceivers, Enterprise License, 4 Fans, 2 PSU. Up to 32 32-Gbps configurable ports. Additional transceivers available through the T32 16-port expansion module (FC AJKS).
Performance	• Port speed: 4/8/16/32-Gbps autosensing with 32 Gbps of dedicated bandwidth per port • Buffer credits: Up to 8,300 for a group of 16 ports, with a default of 500 buffer credits per port and a maximum of 8,191 buffer credits for a single port in the group • PortChannel: Up to 16 physical links
Other optional features	• Enterprise Package – eDelivery (FC AJJC) • DCNM Advanced Edition – eDelivery (FC AJJD) • 8-port On-Demand – eDelivery (FC AJJE)

Network management	• Access methods
	• 2 Out-of-band 10/100/1000 Ethernet ports
	  - mgmt0: 10/100/1000 optical port
	  - mgmt1: 10/100/1000 base-T port
	• RS-232 serial console port
	• USB power-on-auto-provision
	• Access protocols
	• CLI using the console and Ethernet ports
	• SNMPv3 using the Ethernet port and in-band IP over Fibre Channel access
	• Storage Networking Industry Association (SNIA) Storage Management Initiative Specification (SMI-S)
	• NX-API for restful access of HTTPS
	• Distributed device alias service
	• Network security
	• Per-VSAN RBAC using RADIUS and TACACS+-based authentication, authorization, and accounting (AAA) functions
	• SFTP
	• SSHv2 implementing AES
	• SNMPv3 implementing AES
	• Management applications
	• IBM Storage Networking Family CLI
	• DCNM

Platform compatibility	For detailed information about hardware and software compatibility as well as product interoperability, please visit the IBM System Storage Interoperation Center (SSIC) **ibm.com**/systems/support/storage/ssic/interoperability.wss
Recycling Parts	IBM does not recommend the removal of its products batteries due to safety reasons. Please utilize the IBM Product Collection and Recycling Take Back Programs

* For more information, please refer to the [IBM Storage Networking SAN32C-6 Redbooks Product Guide](#)

Why IBM

Innovative technology, open standards, excellent performance, and a broad portfolio of proven storage software, hardware and solutions offerings—all backed by IBM with its recognized industry leadership—are just a few of the reasons to consider storage solutions from IBM, including the IBM Storage Networking SAN32C-6. In addition, IBM delivers some of the best storage products, technologies, services and solutions in the industry without the complexity of dealing with different hardware and software vendors.

For more information

To learn more about the IBM Storage Networking SAN32C-6, please contact your IBM representative or IBM Business Partner, or visit:
ibm.com/us-en/marketplace/mds9132t

Additionally, IBM Global Financing provides numerous payment options to help you acquire the technology you need to grow your business. We provide full lifecycle management of IT products and services, from acquisition to disposition. For more information, visit: ibm.com/financing

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