IBM Storage Networking SAN512B-6 and SAN256B-6

Network innovation for the virtualized, all-flash data center

Highlights

- Enhance operational stability, maximize application performance and increase business agility with enterprise-class b-type Gen 6 directors
- Shatter application performance barriers across 32 Gbps links and support up to 1 billion input/output operations per second (IOPS) without oversubscription[1]
- Consolidate infrastructure with high-density solutions built with 128 Gbps UltraScale ICL connectivity for simpler, flatter, low-latency fabrics
- Increase agility by enabling flexible architectures with concurrent Fibre Channel, FICON, non-volatile memory express NVMe, or FCoE connectivity
- Simplify end-to-end management of large-scale environments by automating monitoring and diagnostics to detect degraded application or device performance with built-in monitoring

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 the consistency, predictability and performance that legacy infrastructures cannot. These outdated architectures were not designed to support the performance requirements of evolving workloads and flash-based storage technology and in fact, an aging network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 and prepare for next generation flash storage technologies such as non-volatile memory express (NVMe) protocol over Fibre Channel.

IBM® Storage Networking SAN512B-6 and SAN256B-6 directors with Fabric Vision technology combine innovative hardware, software and built-in instrumentation to ensure high levels of operational stability and redefine application performance. They provide 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 32/128 Gbps performance shatters application throughput barriers and provides support for more than 1 billion IOPS for flash-based storage workloads. And with diverse deployment options, organizations can smoothly 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, SAN512B-6 and SAN256B-6 directors are an ideal platform for large enterprise environments that require increased capacity, greater throughput and higher levels of resiliency.

SAN512B-6 and SAN256B-6 directors 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 SAN512B-6 director has eight vertical blade slots to provide up to 512 32-Gbps Fibre Channel device or Inter-Switch Link (ISL) ports and 32 additional 128-Gbps UltraScale Inter-Chassis Link (ICL) ports. An ideal choice for midsized networks is the 8U SAN256B-6 director with four horizontal blade slots to provide up to 256 32-Gbps Fibre Channel device or ISL ports and 16 additional 128-Gbps UltraScale ICL ports. Each blade slot can be populated with two optional blades.[2]

IBM b-type directors build upon years of innovation and leverage leading technology to consistently deliver five-nines availability in the world's most demanding data centers. And with nondisruptive, hot-pluggable components and a no-single-point-of-failure design, SAN512B-6 and SAN256B-6 are enterprise-class directors for today's storage infrastructure.

IBM Storage Networking SAN256B-6

Enhanced operational stability for always-on business operations

SAN512B-6 and SAN256B-6 directors with Fabric Vision technology provide a breakthrough hardware and software solution that helps simplify monitoring, increase operational stability and dramatically reduce costs. Fabric Vision technology now includes IO Insight and VM Insight, which provide 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, helping reduce time to resolution.[3]

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

- **IO Insight:** Proactively monitors application- and device-level input/output (I/O) to gain deep insights into performance and availability, ensuring predictable performance and operational stability.
- **VM Insight:** Monitors virtual machine (VM) performance throughout a storage fabric to quickly determine the source of VM/application performance anomalies and fine-tune the infrastructure based on VM/application requirements.

- **Monitoring and Alerting Policy Suite (MAPS):** Simplifies fabric-wide threshold configuration, monitoring and alerting with prebuilt, rule-/policy-based templates.
- **Fabric Performance Impact (FPI) Monitoring:** Leverages predefined MAPS policies to automatically detect and alert administrators to different latency severity levels, and to identify slow-drain devices that could impact network performance.
- **Dashboards:** Provide integrated, at-a-glance views that display an overall storage area network (SAN) health view, along with details on out-of-range conditions, to help administrators easily identify trends and quickly pinpoint issues occurring on a switch or in a fabric.
- **Configuration and Operational Monitoring Policy Automation Services Suite (COMPASS):** Simplifies deployment, safeguards consistency and increases operational efficiencies of larger environments with automated switch and fabric configuration services.
- **ClearLink Diagnostics:** Ensures optical and signal integrity for Fibre Channel optics and cables, simplifying deployment and support of high-performance fabrics.
- **Flow Vision:** Enables administrators to identify, monitor and analyze specific application flows in order to simplify troubleshooting, maximize performance, avoid congestion and optimize resources. Flow Vision includes flow monitor, flow generator, flow mirroring, forward error correction (FEC) and credit loss recovery.[3]
- **Forward Error Correction (FEC):** Enables recovery from bit errors in device connections and ISLs, enhancing transmission reliability and performance.
- **Credit Loss Recovery:** Automatically detects and recovers buffer credit loss at the virtual channel level, providing protection against performance degradation and enhancing application availability.

Gen 6 Fibre Channel

Gen 6 Fibre Channel is the purpose-built network infrastructure for mission-critical storage that delivers operational stability, breakthrough performance and increased business agility to accelerate data access, adapt to evolving requirements and drive always-on business operations. SAN512B-6 and SAN256B-6 b-type directors, with Gen 6 Fibre Channel and Fabric Vision technology with IO Insight and VM Insight, are designed to deliver outstanding 32/128 Gbps performance, data center-proven availability and seamless scalability to ensure greater consistency, predictability and performance.

Simplified Fibre Channel management with IBM Network Advisor

IBM Network Advisor simplifies Gen 6 Fibre Channel management and helps organizations dramatically reduce deployment and configuration times by allowing fabrics, switches and ports to be managed as groups. Customizable dashboards graphically display performance and health indicators out of the box, including all data captured using Fabric Vision technology.[4]

Maximum performance for highly virtualized workloads

Evolving critical workloads and higher density virtualization are continuing to demand greater, more predictable performance. SAN512B-6 and SAN256B-6 directors feature industry-leading Gen 6 Fibre Channel that increases performance for demanding workloads across 32 Gbps line-speed links and up to 20 Tbps of chassis bandwidth to address next-generation I/O- and bandwidth-intensive applications. In addition, SAN512B-6 and SAN256B-6 directors increase scalability with double the throughput for high-density virtual machine deployments and larger fabrics. This allows organizations to support more storage devices and meet bandwidth requirements using the same number of Fibre Channel links.[2]

IBM Storage Networking SAN512B-6

Simplified, scale-out network design

Organizations need to adapt to continuous data growth and seamlessly scale out their storage environments. UltraScale chassis connectivity leverages optical ICLs, which provide 128 Gbps bandwidth through a quad small form-factor pluggable (QSFP) link. These links can support up to 2 kilometers and connect up to 12 directors, enabling flatter, faster and simpler fabrics that increase consolidation while reducing network complexity and costs.[2]

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 32 Gbps Extension Blade, SAN512B-6 and SAN256B-6 directors provide integrated metro and global connectivity with a purpose-built data center extension solution for Fibre Channel and IP storage environments. This solution delivers outstanding performance, strong security, continuous availability and simplified management to handle the unrelenting transfer of data between data centers and maintain SLAs. SAN512B-6 and SAN256B-6 directors can scale up to four 32 Gbps Extension Blades per chassis.[2]

With the 32 Gbps high-density port blade, the IBM b-type Gen 6 Storage Networking Directors can now scale even further—up to 256 and 512 ports - offering 33 percent more device ports than before while increasing total system bandwidth up to 20 Tbps. This blade provides 64 Fibre Channel ports in an elegant, high density form factor designed with Q-Flex connections, enabling administrators to simplify cabling infrastructure.

Extending Fabric Vision technology between data centers provides outstanding insight and visibility across the storage network. With its powerful, built-in monitoring, management and diagnostic tools, Fabric Vision technology enables organizations to minimize the impact of disruptions and outages for nonstop business operations. Consolidating Fibre Channel/FICON flows and IP storage flows into a single tunnel contributes significantly to operational excellence. And by using custom, browser-accessible dashboards for combined Fibre Channel and IP storage, storage administrators have a centralized management tool to monitor the health and performance of their networks.

IBM Fabric Vision technology

Fabric Vision technology with IO Insight and VM Insight, an extension of b-type Gen 6 Fibre Channel, provides outstanding insight and visibility across the storage network. With its powerful built-in instrumentation, management and diagnostic tools, organizations can simplify monitoring, increase availability and dramatically reduce costs.[3]

Flexible deployment options for next-generation storage requirements

To realize the full benefits of flash, organizations must transition their high-performance, latency-sensitive workloads to flash-based storage with non-volatile memory express (NVMe). The simplicity and efficiency of NVMe enable significant performance gains for flash storage. Moreover, NVMe over Fibre Channel 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.

Outstanding mainframe technology innovation and leadership

SAN512B-6 and SAN256B-6 b-type directors deliver seamless FICON® connectivity for mainframe storage environments. SAN512B-6 and SAN256B-6 complement IBM Z® mainframes by offering a fast, reliable and scalable FICON infrastructure, along with innovative features—all of which help deliver significant ROI. These b-type Gen 6 directors are built on mainframe leadership that includes designing the FICON standard and authoring many FICON patents.

IBM Storage Networking SAN512B-6 and IBM Storage Networking SAN256B-6 at a glance

Product numbers	SAN512B-6 (8961-F08)* SAN256B-6 (8961-F04)*
Hot-swap components	Control processors, core routing modules, power supplies, fan modules, Fibre Channel port blades, extension blade, 64-port blade, small form-factor pluggables (SFPs) and quad small form-factor pluggables (QSFPs)
Warranty	One year; 24×7 same-day maintenance; service options are available
Optional features	Please refer to the SAN512B-6 and SAN256B-6 Redbooks Product Guide to review most current optional features
Airflow	Non-port-side intake to port-side exhaust or port-side intake to non-port-side exhaust options are available.
Dimensions	• SAN512B-6 – Width: 43.74 cm (17.23 in.); Height: 61.23 cm (24.11 in., 14U); Depth: 61.04 cm (24.04 in.) • SAN256B-6 – Width: 43.74 cm (17.23 in.); Height: 34.45 cm (13.56 in., 8U); Depth: 61.04 cm (24.04 in.) • SAN256B-6 with airflow diversion rack-mount kit – Width: 43.74 cm (17.23 in.); Height: 40.00 cm (15.75 in., 8U); Depth: 61.29 cm (24.09 in.)
Weight	• SAN512B-6 – 145.8 kg (321.5 lb) for 384-port configuration, fully populated; 35.61 kg (78.5 lb) for chassis • SAN256B-6 – 68.95 kg (152.0 lb) for 192-port configuration, fully populated; 24.5 kg (54 lb) for chassis

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See the full list of specifications.

Organizations also can seamlessly integrate b-type Gen 6 Fibre Channel networks with next-generation NVMe flash storage over Fibre Channel. The efficiency of Fibre Channel-NVMe, combined with the high performance and low latency of Gen 6 Fibre Channel, allows administrators to accelerate IOPS to deliver the performance, application response time and scalability needed for next-generation data centers. Also, when looking for investment protection, SAN512B-6 and SAN256B-6 directors offer three generations of backward-compatibility support for connectivity to 4, 8 and 16 Gbps Fibre Channel products.

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 SAN512B-6 and SAN256B-6 directors. 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 IBM Storage Networking SAN512B-6 and SAN256B-6 directors, please contact your IBM representative or IBM Business Partner, or visit: **ibm.com**/us-en/marketplace/san512-256

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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* The base functionality includes the Enterprise Software bundle which comprises FOS features on top of base FOS functionality included in the hardware. For further details please refer to the IBM Storage Networking SAN512B-6 and SAN256B-6 Redbooks Products Guide.

[1] Based on IBM/Brocade internal test results.

[2] For further details please refer to the IBM Storage Networking SAN512B-6 and SAN256B-6 Redbooks Products Guide.

[3] For further information please refer to the Fabric Vision Technology datasheet

[4] For further details please refer to the IBM Network Advisor product page

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