IBM Storage Networking SAN64B-7

Modern storage infrastructure built for flash, NVMe and FICON

Highlights

- Provide high scalability with 64 ports in a 1U switch
- Automate repetitive, administrative tasks
- Maximize NVMe, FICON®,and high transaction workloads with lower latency
- Enable pay-as-you-grow scalability from 24 to 64 ports at 64G
- Simplify troubleshooting by identifying and isolating issues
- Safeguard mission-critical workloads
- Visualize SAN health and performance data

With the growing adoption of flash and the ramp-up of NVMe-based storage, organizations are moving more data through a SAN than ever before, requiring an increase in I/O capacity tokeep up with ever-increasing demand. Coupled with higher expectations for availability and data resiliency, organizations need a network that is capable of maximizing performance while simplifying management and protecting against cybersecurity threats to increase the productivity, efficiency and resiliency of their storage investments and resources.

To meet these requirements, the network must evolve. AnIBM b-type Fibre Channel infrastructure unleashes the performance of NVMe workloads with reduced latency and increased bandwidth. In addition, this infrastructure lays the foundation for an autonomous SAN by combining powerful analytics, advanced automation, and integrated security capabilities to maximize performance, ensure reliability, and protect their data. With autonomous SAN technology, organizations can realize a self-learning, self- optimizing, and self-healing storage network.

The IBM Storage Networking SAN64B-7 is a Gen 7 Fibre Channel 64 port switch in an ultra-dense 1U design. Delivering unmatched 64G performance and 50% lower latency compared to the previous generation, this switch delivers a fixed-port building block designed to maximize the performance of flash, NVMe, and FICON environments to meet demanding workloads.

The SAN64B-7 Switch simplifies deployment, configuration, and management of SAN resources with a collection of easy-to-use tools. With EZSwitchSetup, organizations can reduce the number of steps to deploy and configure a switch. In addition, the simplified user interface of Web Tools makes the SAN easier to manage. To streamline management workflows, organizations can leverage, IBM® SANnav™

Management Portal to understand the health and performance of the SAN and improve operational efficiencies with visual dashboards for instant visibility and faster troubleshooting.

To further simplify operations and increase visibility, the SAN64B-7 includes Fabric Vision® technology to monitor and analyze the SAN. This technology provides visibility and insight to quickly identify problems and achieve critical service-level agreements (SLAs). To streamline management workflows, organizations can leverage IBM SANnav Management Portal to accelerate the deployment of new applications, switches, servers, and storage. Furthermore, amodernized graphical user interface (GUI) improves operational efficiencies with visual dashboards for instant visibility and faster troubleshooting.

Build High-Performance Fabrics

The SAN64B-7 is designed for maximum flexibility and value. This enterprise-class switch offers pay-as-you-grow scalability with Ports on Demand (PoD). Organizations can quickly, easily, and cost-effectively scale from 24 ports to 64 ports to support higher growth. The IBM SAN64B-7 provides 48 ports that support 64G SFP+ optics and eight SFP-DD (double-density) ports that support either 64G SFP+ and 2x64G SFP-DD optics. The SFP-DD optical transceivers provide two ports for device or ISL connectivity. The SAN64B-7 base configuration comes with 24 ports enabled and can scale to 64 ports by installing SFP and SFP-DD POD licenses in any order and any combination.

The SAN64B-7 Switch supports SCSI, FICON, and NVMe over Fibre Channel, enabling organizations to integrate IBM b-type Fibre Channel networks with next-generation flash storage, without a disruptive rip-and-replace. This enables enterprises toachieve faster application response times and harness the performance of new storage technologies to deliver the performance, application response time, and scalability neededfor next-generation data centers.

Protect Mission-Critical Workloads with Gen 7 Integrated Security

The volume of cybercriminal behavior has increased as a direct result of the added reliance on digital data by businesses and has caused billions of dollars in losses across all industries. An IBM SAN64B-7 cyber-resilient storage network helps protect against security threats, enable nonstop operations, and maximize management automation. Fibre Channel fabrics are secure by design based on controlled access between servers and storage and isolation within the data center. IBM Gen 7 technology further reduces the risk of vulnerabilities from malware and hijacking by validating the integrity of the switch operating system, security settings, and hardware.

The IBM b-type Fabric OS® (FOS) adds additional security enhancements to validate the integrity and security of b-type hardware and software. These features include Secure Boot, Trusted FOS (TruFOS) Certificates, FOS hardening with removal of root access, and automated distribution of SSL certificates via SANnav Management Portal. These features ensure that enterprises running IBM b-type directors and switches are currently covered with support and securely enabled to perform critical operations without having to worry about whether the operating system has been tampered with. In addition, the FOS has been hardened by

removing root-level access to the operating system to protect the SAN against malware and hijacking attacks.

Those enterprises using the IBM SANnav Management Portal have the ability to automatically distribute SSL certificates across the SAN to ensure authenticity and encryption settings. With SANnav, administrators can set up monitoring and alerting for security configuration changes, customize security thresholds, give proper access control to individual admins, and view switch security events.

Autonomous SAN Innovation

The SAN64B-7 Switch with Fabric Vision technology provides a robust analytics architecture that delivers autonomous SAN technology through self-learning, self- optimizing, and self-healing capabilities. IBM® b-type Fabric Vision technology is a suite of features that leverage comprehensive data collection capabilities with powerful analytics to quickly understand the health and performance of the environment and identify any potentialimpacts or trending problems.

Automate the SAN to Simplify Management Complexity

IT organizations spend nearly half of their time performing repetitive daily management tasks, such as zoning, inventory reporting, and operational validation checks. By automating these repetitive tasks, IT administrators can significantly improve their efficiency and dramatically decrease the risk of operational mistakes. Automation in large-scale IT environments integrates diverse infrastructure components with consistency and predictability to deliver greater operational efficiency and agility. The SAN64B-7 Switch can automate actions to simplify management and resolve issues without intervention to avoid network disruptions andoutages. Through open DevOps automation technology, organizations can reliably perform resource-intensive tasks, such as infrastructure deployment and provisioning, in a fraction of thetime to expedite IT services while eliminating human error. In addition, automation proactively monitors the network to self-optimize performance and automatically mitigate fabric-related issues with self-healing capabilities.

With self-optimizing capabilities, IBM b-type utilizes actionable intelligence to maximizeperformance. Real-time monitoring of heath and performance characteristics enables the network to make smarter decisions on traffic prioritization, congestion management, and notification to ensure optimal network performance for applications and storage. IBM b-type Gen 7 Traffic Optimizer guarantees critical application performance by automatically prioritizing traffic, such as protocol, speed, and latency. In addition, Traffic Optimizer can help avoid application performance impacts by automatically isolating traffic that is adversely impacting other flows.

IBM Gen 7 raises the bar for network availability through automatic avoidance and recovery features, delivering a self-healing SAN. When potential disruptions are detected, the network will automatically mitigate or resolve issues without intervention. The Fabric OS (FOS) software identifies abnormal or unexpected behavior and automatically takes action to avoid adegradation in performance. If congestion occurs, the software instantly notifies end devices of the congestion problem through an alerting and signaling process. Once the end devices are alerted,the software ensures data delivery with automatic failover or adjustment of traffic to mitigate the impact of the problem. IBM SANnav management tools can identify various latency severitylevels, pinpointing exactly which devices are causing the issues or which devices are impacted by a bottleneck, and they can quarantine misbehaving devices automatically.

Instant Visibility with IBMSANnav

IBM SANnav Management Portal and SANnav Global View empower IT administratorswith comprehensive visibility across the entire SAN, from a global view down to local environments. SANnav contextualizes data into visual dashboards and topology views, whichallows administrators to quickly detect and isolate points of interest to increase operational efficiencies. In addition, IBM SANnav streamlines management workflows to accelerate the deployment of new applications, switches, servers, and storage.

Access Gateway Mode

The SAN64B-7 can be deployed as a full-fabric switch or as an Access Gateway, which simplifies fabric topologies and allows heterogeneous fabric connectivity. Access Gateway mode utilizes N_Port ID Virtualization (NPIV) switch standards to present physical and virtualservers directly to the core of SAN fabrics, allowing you to configure your fabric to handle additional devices without increasing the number of switch domains.

Key benefits of Access Gateway

- Improved scalability for large or rapidly growing server and virtual server environments
- Reduced management since Access Gateway appears transparent to the SAN fabric
- Support for heterogeneous SAN configurations with reduced functionality

SAN64B-7 System Architecture

Fibre Channelports	Switch mode (default): 64 ports (48 64G SFP+ ports, plus 8 2x64G SFP-DD ports), each supporting E_Ports, M_Ports, F_Ports, D_Ports, EX_Ports. 24 -port base configuration; additional ports are enabled with three 8-port SFP+ PODs (Ports on Demand), plus a 16-port SFP-DD POD (8 2x64G SFP-DD transceivers), scaling the switch from 24 ports to 64 ports. Access Gateway default port mapping: 48 F_Ports, 8 N_Ports.
Scalability	Full-fabric architecture with a maximum of 239 switches.
Certified maximum	4K active nodes; 56 switches, 19 hops in Fabric OS® fabrics
Performance	Fibre Channel: 8.5Gb/s line speed, full duplex; 10.53Gb/s line speed, full duplex; 14.025Gb/sline speed, full duplex; 28.05Gb/s line speed, full duplex; 57.8Gb/s line speed, full duplex; auto-sensing of 8, 10, 16, 32, and 64G FC port speeds. 10G optionally programmable to fixed port speed.
Load balancing	**Frame-based ISL Trunking** load balances up to eight SFP+ ports per ISL trunk; up to512Gb/s per ISL trunk when using 64G optics. **Dynamic Path Selection (DPS)** provides exchange-based load balancing across allavailable ISLs.
Aggregate bandwidth	4.096Tb/s
Maximum fabriclatency	Latency for locally switched ports is 460 ns (including FEC).
Maximum frame size	2112-byte payload
Frame buffers	24K per switching ASIC
Classes ofservice	Class 2, Class 3, Class F (inter-switch frames)
Port types	D_Port (ClearLink® Diagnostic Port), E_Port, EX_Port, F_Port; optional port-type control Access Gateway mode: F_Port and NPIV-enabled N_Port
Data traffictypes	Fabric switches supporting unicast.
Media types	64G: Hot-pluggable SFP+, LC connector: SWL, LWL 10 km, ELWL 25 km. 32G: Hot-pluggable SFP+, LC connector: SWL, LWL 10 km, ELWL 25 km. 10G: Hot-pluggable SFP+, LC connector: SWL, LWL 10 km. 2x64G: Hot-pluggable SFP-DD, SN connector: SWL Fibre Channel distance is subject to fiber-optic cable and port speed.
USB	One standard USB port for firmware download, SupportSave, and configuration upload or download.
Fabric Services	Fabric Vision; Monitoring and Alerting Policy Suite (MAPS); Flow Vision; Adaptive Networking (QoS); Fabric Performance Impact (FPI) Monitoring; Slow Drain Device Quarantine (SDDQ); Advanced Zoning (default zoning, port/WWN zoning, broadcast zoning, peer zoning, target-driven zoning); Dynamic Fabric Provisioning (DFP); Dynamic Path Selection (DPS); Extended Fabrics; Enhanced BB Credit Recovery; FDMI; Frame Redirection; Frame-based Trunking; FSPF; Integrated Routing; IPoFC; ISL Trunking; Management Server; Name Server; NPIV; Time Server; Registered State Change Notification (RSCN); Slow Drain Device Quarantine (SDDQ); Reliable Commit Service (RCS); Virtual Fabrics (Logical Switch, Logical Fabric); VMID+; AppServer; Read Diagnostics Parameter (RDP).
Extension	Fibre Channel, in-flight compression (LZO) and encryption (AES-GCM-256); integrated optional10G Fibre Channel for DWDM MAN connectivity.
FICON	FICON cascading; support for lossless DLS; FICON CUP; Advanced Accelerator for FICON (IBM z/OS® Global Mirror and read/write Tape Pipelining). Check IBM FICON Qualification Letters for latest support details.

Management

Supported management software	Brocade Advanced Web Tools; Brocade SANnav Management Portal and SANnav Global View; Command Line Interface (CLI); EZSwitchSetup; HTTP/HTTPS; RESTful API; SNMP v1/v3 (FE MIB, FC Management MIB); SSH.
Security	DH-CHAP (between switches and end devices); FCAP switch authentication; HTTPS; IP filtering; LDAP with IPv6; OpenLDAP; Port Binding; RADIUS; TACACS+;user-defined Role-Based Access Control (RBAC); Secure Copy (SCP); Secure Syslog; SFTP; SSH v2; SSL; Switch Binding; Trusted Switch.
Management Access	10/100/1000Mb/s Ethernet (RJ-45) port, and serial console port (mini-USB).
Diagnostics	ClearLink optics and cable diagnostics, including electrical/optical loopback, link traffic/latency/ distance; flow mirroring; built-in flow generator; POST and embedded online/offline diagnostics, including environmental monitoring; FCping and Pathinfo (FC traceroute); frame viewer; non-disruptive daemon restart; opticshealth monitoring; power monitoring; RAStrace logging; and Rolling Reboot Detection (RRD).

Mechanical

Enclosure	Front-to-back airflow; non-port-side exhaust; power from back, 1UBack-to-front airflow; non-port-side intake; power from back, 1U
Size	Width: 440.00 mm (17.32 in.) Height: 43.90 mm (1.73 in.) Depth: 355.60 mm (14.00 in.)
System Weight	7.17 kg (15.8 lb) with two power supply FRUs, without transceivers

Environment

Operating environment	Temperature: 0°C to 40°C (32°F to 104°F)Humidity: 8% to 90% (non-condensing)
Non-operatingenvironment	Temperature: –25°C to 70°C (–13°F to 158°F)Humidity: 8% to 90% (non-condensing)
Operating Altitude	Up to 3000 m (9842 ft)
Storage altitude	Up to 12 km (39,370 ft)
Shock	Operating: Up to 20G, 6 ms half-sine Non-operating: Half-sine, 33G, 11 ms, 3/eg axis
Vibration	Operating: 0.25 Grms sine, 0.40 Grms random, 5 Hz to 500 Hz Non-operating: 5 Hz at 0.50 Grms; 10–500 Hz at 1.00 Grms (sine vibration); 3–500 Hz at 1.12 Grms (random vibration)
Heat dissipation	64 ports at 1192 Btu/hr

Power

Power supply	Dual, hot-swappable redundant power supplies with integrated system cooling fans. 80 PlusGold.
AC input	90V to 264V, 4.5A
AC input linefrequency	50 Hz to 60 Hz nominal, 47 Hz to 63 Hz range
AC power consumption	349W with all 64ports operating at 64G (48 ports populated with 64G SWL optics and 8 ports populated with 2x64G optics). 57W for an empty chassis with no optics

Why IBM?

Innovative technology, open standards, excellent performance, and a broad portfolioof proven storage software, hardware and solutions offerings—all backed by IBM with its recognized industry leadership—are just afew of the reasons to consider storage solutions from IBM. In addition, IBM deliverssome 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 Networkingb-type family, please contact your IBM representative or IBM Business Partner or visit: https://www.ibm.com/it-infrastructure/storage/san/b-type

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