IBM b-type Storage Networking

GEN7 FIBRE CHANNEL

SAN512B-7

SAN256B-7

SAN128B-7

SAN24B-7

SAN64B-7

SAN42B-R7

SANnav Management Software

IBM b-type Storage Networking
Enabling a cyber resilient, autonomous SAN

The pace of change in the data center is placing more demands on IT.

Next-generation servers and storage will move more data through your infrastructure than ever before. IBM® Z FICON, DS8900, and FlashSystem are processing things at unimaginable speeds, enabling new applications and capabilities such as advanced analytics, business intelligence, and data-intensive workloads that drive new levels of performance and capacity requirements.

Given these advancements, coupled with the ever-increasing demand for faster, more reliable data access and higher levels of security, the network will need to evolve. As delivery is accelerated, so too is the complexity to manage, protect, and make sense of the data. Humans are just not fast enough.

The SAN needs to be smarter and be able to manage itself. It needs to automate management tasks to simplify and enable non-stop operations while ensuring optimal performance and strengthening the level of security in the network.

With IBM b-type Storage Networking you can realize a cyber resilient, autonomous SAN that unleashes the performance and maximizes the ROI of your server and storage investments.

IBM Storage Networking	GEN 7 DIRECTORS	
IBM Machine Type Model	**SAN256B-7** 8961-F74	**SAN512B-7** 8961-F78
Features		
Fibre Channel (FC) SFP Ports	Up to 256 ports at 32G or 64G	Up to 512 ports at 32G or 64G
Inter-Chassis Link QSFP Ports	Up to 16 Gen 7 ICLs	Up to 32 Gen 7 ICLs
Oversubscription Configurations	256 Ports at 32G line rate 256 Ports at 64G at 1.33:1	512 Ports at 32G line rate 512 Ports at 64G at 1.33:1
Routing Architecture	Cut Through Routing	Cut Through Routing
Latency - Local Switching	460 ns	460 ns
Latency - Maximum	1.4 μs	1.4 μs
FC Frame Level Load Balancing	Yes, Automatic, up to 8 links	Yes, Automatic, up to 8 links
FC Exchange Level Load Balancing	Yes, Exchange Based Routing (EBR) across all ISLs	Yes, Exchange Based Routing (EBR) across all ISLs
Redundancy Architecture	Full Redundant Design (including Core Routing Blades)	Full Redundant Design (including Core Routing Blades)
SAN Analytics Support	Yes (IT, ITL, ITN)[1]	Yes (IT, ITL, ITN)[1]
NVMe-FC Analytics	Yes	Yes
Analytics Flow Learning	Yes	Yes
FCIP Extension Technology	Gen 6 Extension Blade	Gen 6 Extension Blade
CRC Error Handling	Frame marked with error for end device to drop[2]	Frame marked with error for end device to drop[2]
Traffic Flow Optimization	Traffic Optimizer	Traffic Optimizer
Slow Drain Device Quarantine	Auto Quarantine & Auto Un-Quarantine	Auto Quarantine & Auto Un-Quarantine
Fabric Performance Impact Monitoring/Alerting	Automatic	Automatic
FICON Port Decommission/ Recommision	Yes	Yes
Maximum Power (Watts)	1,738 W	3,184 W
Weight	24.5 kg (54 lbs) for chassis 68.95 kg (152.0 lb) maximum fully populated configuration	35.61 kg (78.5 lbs) for chassis 145.8 kg (321.5 lb) maximum fully populated configuration
Director Dimensions	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.)
Airflow	Front to back or Back to front	Front to back or Back to front

1 - SAN Analytics Support includes IT (Initiator-Target), ITL (Initiator-Target-LUN), ITN (Initiator-Target-Namespace ID).
2 - Both options for CRC error handling are based on FC standard.

IBM.

Meet the autonomous SAN

Autonomous SAN technology enables a cyber resilient network with self-learning, self-optimizing, and self-healing.

Cyber resiliency goes beyond safeguarding your SAN against cyber attacks.

IBM b-type Gen 7 also protects your SAN from IT disruptions and disasters with autonomous SAN technology that learns, optimizes, and heals on its own. These capabilities automate processes to ensure optimal performance, enable non-stop operations, and maximize management automation.

IBM b-type products harness powerful analytics and advanced, built-in automation, transforming billions of data points into automated actions. This ensures the reliability and performance of critical applications, virtual infrastructure, FICON and NVMe storage.

By understanding and analyzing network telemetry data in real-time, the SAN can automatically make intelligent decisions on traffic prioritization and congestion mitigation to ensure non-stop operations.

With automated congestion detection and resolution, IBM Gen 7 instantly mitigates impacts to applications and resolves issues much faster, freeing up valuable admin time.
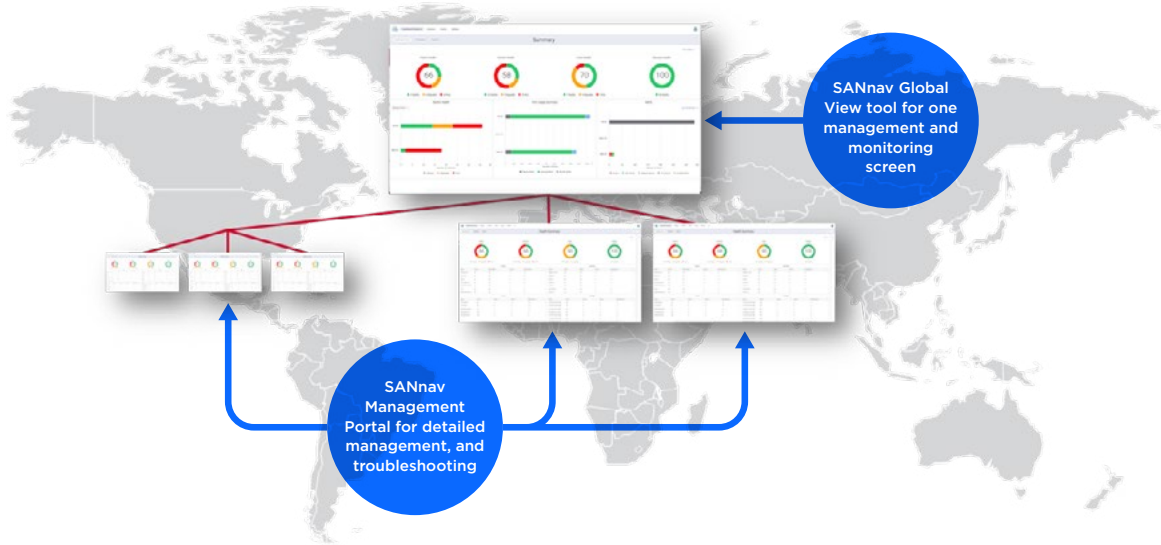
IBM Storage Networking	ENTRY SWITCH		MID RANGE SWITCH	ENTERPRISE SWITCH	
IBM Machine Type Model	**SAN24B-6** 8969-F24	**SAN24B-7** 8969-P24	**SAN64B-7** 8960/8969-P64/R64	**SAN128B-6** 8960-F97/N97	**SAN128B-7** 8969-P96/R96
Features					
Fibre Channel (FC) SFP Ports	8, 16 and 24 ports at 32G	8, 16 and 24 ports at 64G	24, 32, 40, 48, 56, 64[1] ports at 64G	48, 72, 96, and 128[1] ports at 32G	48, 72, 96, and 128[1] ports at 64G
Oversubscription Configurations	None	None	None	None	None
Routing Architecture	Cut Through Routing	Cut Through Routing	Cut Through Routing	Cut Through Routing	Cut Through Routing
Latency - Local	< 780 ns	460 ns	460 ns	< 780 ns	460 ns
Latency - Maximum	< 780 ns	460 ns	460 ns	2.3 µs	1.4 µs
FC Frame Level Load Balancing	Yes, Automatic, up to 8 links	Yes, Automatic, up to 8 links	Yes, Automatic, up to 8 links	Yes, Automatic, up to 8 links	Yes, Automatic, up to 8 links
FC Exchange Level Load Balancing	Yes, Exchange Based Routing (EBR) across all ISLs	Yes, Exchange Based Routing (EBR) across all ISLs	Yes, Exchange Based Routing (EBR) across all ISLs	Yes, Exchange Based Routing (EBR) across all ISLs	Yes, Exchange Based Routing (EBR) across all ISLs
Power/Cooling Redundancy	Integrated Power/Cooling	Integrated Power/Cooling	Redundant, Hot Swappable	Redundant, Hot Swappable	Redundant, Hot Swappable
SAN Analytics Support	Limited	Yes	Yes	Limited	Yes
NVMe-FC Analytics	Yes (IT)[3]	Yes (IT, ITL, ITN)[2]	Yes (IT, ITL, ITN)[3]	Yes (IT)[3]	Yes (IT, ITL, ITN)[3]
Analytics Flow Learning	Yes	Yes	Yes	Yes	Yes
CRC Error Handling	Frame marked with error for end device to drop[2]	Frame marked with error for end device to drop[†]	Frame marked with error for end device to drop[2]	Frame marked with error for end device to drop[2]	Frame marked with error for end device to drop[2]
Traffic Flow Optimization	QoS Zoning	Traffic Optimizer	Traffic Optimizer	QoS Zoning	Traffic Optimizer
Slow Drain Device Quarantine	Auto Quarantine & Auto Un-Quarantine	Auto Quarantine & Auto Un-Quarantine	Auto Quarantine & Auto Un-Quarantine	Auto Quarantine & Auto Un-Quarantine	Auto Quarantine & Auto Un-Quarantine
Fabric Performance Impact Monitoring/Alerting	Automatic	Automatic	Automatic	Automatic	Automatic
FICON Port Decommission/ Recommission	Not Supported	Not Supported	Supported	Not Supported	Not Supported
Maximum Power (Watts)	76 W	105 W	349 W	942 W	969 W
Weight	4.80 kg (10.58 lb)	4.84 kg (10.67 lb)	7.17 kg (15.8 lbs)	21.31 kg (47 lbs)	18.92 kg (41.71 lbs)
Switch Dimensions	Width: 428.80 mm (16.88 in.) Height: 42.90 mm (1.69 in.) Depth: 306.60 mm (12.07 in.)	Width: 428.00 mm (16.8 in.) Height: 42.90 mm (1.69 in.) Depth: 306.60 mm (12.07 in.)	Width: 440.00 mm (17.32 in.) Height: 43.90 mm (1.73 in.) Depth: 355.60 mm (14.00 in.)	Width: 440.00 mm (17.32 in.) Height: 86.70 mm (3.41 in.) Depth: 609.60 mm (24.00 in.)	Width: 440.00 mm (17.32 in.) Height: 86.7 mm (3.41 in.) Depth: 609.6 mm (24.00 in.)
Airflow	Back-to-front	Back-to-front (non-port side intake)	Front-to-back or Back-to-front	Front-to-back or Back-to-front	Front-to-back or Back-to-front

1 - The Quad-SFP (QSFP) Ports or 64G Double Density SFP (SFP-DD) are required to reach the maximum port count for these switches.
2 - Both options for CRC error handling are based on FC standard.
3 - SAN Analytics Support includes IT (Initiator-Target), ITL (Initiator-Target-LUN), ITN (Initiator-Target-Namespace ID).
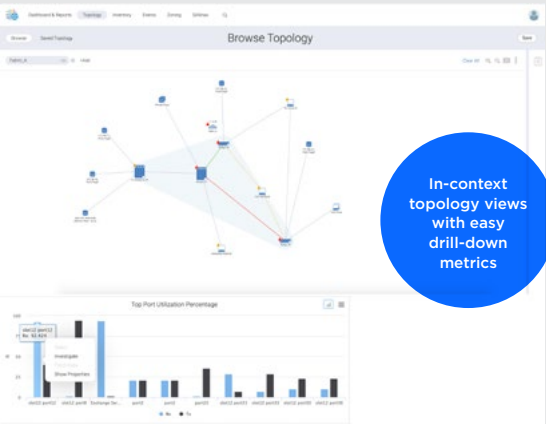
IBM SANnav™ Management Portal

IBM SANnav™ Management Portal gives enterprise users the ability to automatically distribute SSL certificates across the SAN to ensure authenticity and encryption settings. Administrators can set up monitoring and alerts for security configuration changes, customize security thresholds, give proper access control to individual admins, and view switch security events.

SANnav Global View tool for one management and monitoring screen

SANnav Management Portal for detailed management, and troubleshooting

SANnav Highlights

- Accelerate deployment for new applications, switches, hosts, and storage
- Visualize and isolate points-of-interest with simple topology views
- Minimize manual tasks by automating data collection and reporting
- Capture SAN data and translate to health and performance dashboards
- Automate the reconfiguration of out-of-compliance SAN switches
- Increase workflow efficiencies with an intuitive one-click navigation

In-context topology views with easy drill-down metrics

IBM Storage Networking	EXTENSION SWITCHES	
IBM Machine Type Model	**SAN42B-R7** 8969-R42	**IBM SAN18B-6** 8960-R18
Features		
Fibre Channel (FC) Ports	24 ports at 64G[1]	12 ports at 32G
Ethernet Ports	16 x 25/10/1GbE (LAN/WAN) 2 x 100GbE (WAN)	6 ports of 1GbE/10GbE for LAN and WAN connectivity
Oversubscription Configurations	None	None
Routing Architecture	Cut Through Routing	Cut Through Routing
Latency - Local Switching	460 ns	900 ns
Latency - Switch	460 ns	900 ns
FC Frame Level Load Balancing	Yes, Automatic, up to 8 links	Yes, Automatic, up to 8 links
FC Exchange Level Load Balancing	Yes, Exchange Based Routing (EBR) across all ISLs	Yes, Exchange Based Routing (EBR) across all ISLs
Enhanced Extension Technology	Extension Trunking, Adaptive Rate Limiting (ARL), WAN Test Tool (Wtool), Open Systems Tape Pipelining (OSTP), FastWrite (FCIP-FW), QoS Marking, Bandwidth Enforcement, PerPriority TCP QoS, PTQ, Adaptive Networking with QoS, Advanced Extension Integrated Routing (FCR)	Extension Trunking, Adaptive Rate Limiting (ARL), WAN Test Tool (Wtool), Open Systems Tape, Pipelining (OSTP), FastWrite (FCIP-FW), QoS Marking, Bandwidth Enforcement, PerPriority TCP QoS, Adaptive Networking with QoS, Integrated Routing (FCR)
Power/Cooling Redundancy	Redundant, Hot Swappable	Redundant, Hot Swappable
CRC Error Handling	Frame marked with error for end device to drop[2]	Frame marked with error for end device to drop[2]
Fibre Channel Encryption	AES-GCM-256 on ISLs	AES-GCM-256 on ISLs
Extension Encryption	AES-GCM-256 IPsec	AES-GCM-256 IPsec
Mainframe Model Features	64G LWL SFP+ transceivers, FICON CUP, FICON Management Server (FMS), Advanced Accelerator for FICON	Not Supported with FICON
Maximum Power (Watts)	585 W	130 W
Weight	12 kg (26.5 lbs)	8.35 kg (18.4 lb.)
Dimensions	Width: 44 cm (17.32 in.) Height: 4.4 cm (1.73 in.) Depth: 59.03 cm (23.24 in.)	Width: 44.0 cm (17.32 in.) Height: 4.4 cm (1.73 in., 1U) Depth: 45.7 cm (17.74 in.)
Airflow	Back-to-front	Back-to-front

1 - 64G Double Density-SFP (SFP-DD) optics are required to reach the maximum port count for this extension switch.