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## Highlights

- Increase performance for demanding workloads across 32 Gbps and 128 Gbps links; shatter performance barriers with up to 100 million input/output operations per second (IOPS)
  - Optimise end-to-end (E2E) performance and availability tuning with IO Insight and VM Insight intelligence
  - Enable flexible 'pay-as-you-grow' scalability
  - Provide high scalability in an ultra-dense, 1U, 64-port switch to support high-density (HD) server virtualisation, cloud architectures and flash-based storage environments
  - Detect degraded application performance with built-in device latency and IOPS metrics.
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# IBM Storage Networking SAN64B-6

*Ultra-dense, highly scalable, easy-to-use,  
enterprise-class storage networking switch*

Today's mission-critical storage environments require greater consistency, predictability and performance to keep pace with growing business demands. Faced with explosive data growth, data centres (DCs) need more I/O capacity to accommodate massive amounts of data, applications and workloads. In addition to this surge in data, collective expectations for availability continue to rise. Users expect applications to be available and accessible from anywhere, at any time, on any device.

To meet these dynamic and growing business demands, organisations need to deploy and scale up applications quickly. As a result, many are moving to higher VM densities to enable rapid deployment of new applications and deploying flash storage to help those applications scale to support thousands of users. To realise the full benefits of these architectures, organisations need the network to deliver the performance required by today's server and storage environments. By treating the network as a strategic part of a highly virtualised environment, organisations can increase optimisation and efficiency even as they rapidly scale their environments.

The IBM® Storage Networking SAN64B-6 switch is designed to meet the demands of hyper-scale virtualisation, larger cloud infrastructures and growing flash-based storage environments by delivering leading-edge Gen 6 FC technology and capabilities.<sup>1</sup>



SAN64B-6 provides a HD storage-networking building block for increased scalability designed to support growth, demanding workloads and DC consolidation in small- to large-scale enterprise infrastructures. Delivering unmatched 32/128 Gbps performance, leading-edge port density and built-in instrumentation, SAN64B-6 accelerates data access and drives always-on business.

SAN64B-6 is built for maximum flexibility, scalability and ease of use. Organisations can scale from 24 to 64 ports with 48 enhanced small-form-factor pluggable (SFP+) transceivers and four Q-Flex ports with four quad small-form-factor pluggable (QSFP) transceivers, all in an efficient 1U package. A simple deployment process and a point-and-click user interface make the switch easy to use. With SAN64B-6, organisations gain the best of both worlds: high-performance access to leading-edge storage technology and 'pay-as-you-grow' scalability to support an evolving storage environment.

### **Maximise performance for application and solid-state storage architectures**

Faced with unpredictable virtualised workloads and growing flash storage environments, organisations need to ensure that the network does not become a bottleneck. SAN64B-6 delivers increased performance for dynamic workloads through a combination of leading-edge throughput and low latency across 32 Gbps and 128 Gbps links. SAN64B-6 shatters application performance barriers with up to 100 million IOPS and 700-nanosecond latency to meet the demands of flash-based storage workloads. At the same time, port-to-port latency is minimised through the use of cut-through switching at 32 Gbps. The 48 SFP+ ports provide 32 Gbps connections and each Q-Flex port is capable of either 128 Gbps parallel FC using QSFP-to-QSFP Inter-Switch Link (ISL) connectivity or 128 Gbps QSFP to four 32 Gbps SFP+ device connectivity using breakout cables, both methods simplifying cabling infrastructure.



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Administrators can achieve optimal bandwidth utilisation, high availability (HA) and load balancing by combining up to eight ISL connections in a 256 Gbps framed-based trunk. This can be achieved through eight individual 32 Gbps SFP+ ports or two 128 Gbps QSFP ports. Moreover, exchange-based Dynamic Path Selection (DPS) optimises fabric-wide performance and load balancing by automatically routing data to the most efficient, available path in the fabric.

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### **Gen 6 Fibre Channel**

Gen 6 Fibre Channel (FC) is the purpose-built network infrastructure for mission-critical storage, delivering breakthrough performance, increased scalability and operational stability. With Gen 6 FC and Fabric Vision technology (including both input/output (IO) Insight and virtual machine (VM) Insight), SAN64B-6 delivers unmatched 32/128 Gigabits per second (Gbps) performance, leading-edge port density and built-in instrumentation. These next-generation storage networking technologies and capabilities enable SAN64B-6 to accelerate data access, adapt to evolving requirements and drive always-on business operations for hyper-scale virtualisation, larger cloud infrastructures and growing flash-based storage environments.

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## Simplify scalability and management complexity

SAN64B-6 features up to 64 FC ports in an efficiently designed 1U form factor, delivering leading-edge space utilisation for simple scalability and consolidation, reducing costs and complexity.

This enterprise-class switch offers 'pay-as-you-grow' scalability with ports on demand (PoD) capability to quickly, easily and cost-effectively scale from 24 to 64 ports with a combination of 12-port SFP+ PoD and 4-port Q-Flex PoD that equates to a 16-port SFP+ PoD. The 48 SFP+ ports support 4, 8, 10, 16 and 32 Gbps FC speeds, while each of the four Q-Flex ports is capable of supporting a single 128 Gbps FC link using QSFP optics to deliver 4-to-1 cable consolidation or four 32 Gbps FC links using QSFP to SFP+ breakout cables. With its flexible PoD capability, SAN64B-6 provides excellent overall value and the agility needed to deliver rapid deployments to meet user demands and support higher growth.

Along with simplifying scalability, SAN64B-6 simplifies E2E network management by automating monitoring and diagnostics through Fabric Vision technology, deploying with the EZSwitchSetup wizard and validating cables, ports and optics with the ClearLink Diagnostic Ports (D\_Ports).

## Gain control and insight to quickly identify problems and meet critical SLAs

SAN64B-6, with its Gen 6 technology and built-in instrumentation, offers organisations the insight and control necessary to meet critical service level agreements (SLAs). IO Insight and VM Insight monitoring gathers statistics, including device and VM latency and IOPS metrics, for early detection of application and device-level performance degradation. Administrators can proactively monitor against SLAs, reduce time to resolution, obtain crucial insight for troubleshooting and take action to optimise the E2E performance that ensures HA.

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## Fabric Vision technology

Fabric Vision technology provides unprecedented insight and visibility across the storage network with powerful built-in instrumentation, management and diagnostic tools that enable organisations to simplify monitoring, increase availability and dramatically reduce costs.<sup>2</sup>

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IO Insight and VM Insight monitoring enables administrators to:

- Gain deep insights into performance and availability across physical and virtual infrastructures
- Quickly identify issues and understand key performance, health and utilisation trends
- Monitor application flows with no physical taps, no downtime and no disruption
- Optimise performance and safeguard operational stability.

## Simplified management and robust network analytics

Fabric Vision technology<sup>2</sup> enables administrators to avoid problems before they impact operations, helping their organisations meet SLAs. Fabric Vision technology includes:

- **IO Insight:** Proactively monitors application- and device-level I/O to gain deep insights into performance and availability, ensuring predictable performance and operational stability
- **VM Insight:** Monitors 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):** Leverages prebuilt, rule-/policy-based templates within MAPS to simplify fabric-wide threshold configuration, monitoring and alerting
- **Fabric Performance Impact (FPI) Monitoring:** Automatically detects and alerts administrators to different latency severity levels, and identifies slow-drain devices that could impact network performance
- **Dashboards:** Displays 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
- **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 FC optics and cables, simplifying deployment and support of high-performance fabrics
- **Flow Vision:** Enables administrators to identify, monitor and analyse specific application flows in order to simplify troubleshooting, maximise performance, avoid congestion and optimise resources. Flow Vision includes flow monitor, flow generator and flow mirroring
- **Forward Error Correction (FEC):** Enables recovery from bit errors in device connections and ISLs, enhancing transmission reliability and performance
- **Credit Loss Recovery:** Helps overcome performance degradation and congestion due to buffer credit loss.

## **IBM Network Advisor**

IBM Network Advisor SAN management simplifies FC network management and helps organisations reduce deployment and configuration times and accelerate troubleshooting by allowing fabrics, switches and ports to be managed as groups with customisable dashboards that graphically display performance and health indicators.<sup>3</sup>

## **A building block for virtualised, private cloud storage**

SAN64B-6 provides a critical building block for today's highly virtualised and cloud environments by meeting the high-throughput demands of solid-state disks (SSDs), supporting multitenancy capabilities required in cloud environments and increasing security and efficiency with in-flight encryption and data compression over ISL connections.

## **Access gateway mode**

SAN64B-6 can be deployed as a full-fabric switch or as an access gateway using the N\_Port ID Virtualisation (NPIV) standards. Access Gateway mode simplifies topologies and heterogeneous connectivity to other SAN fabrics by making the switch transparent to the SAN fabric, greatly reducing device management and allowing greater SAN scalability.

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**IBM Storage Networking SAN64B-6 at a glance**

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<b>Product number</b>	8960-F64 (Front/Port-Side Exhaust) 8960-N64 (Rear/Non-Port Side Exhaust)
<b>Hot-swap components</b>	Power supplies, fan modules, SFPs
<b>Warranty</b>	One-year; customer-replaceable unit (CRU); and onsite, next-business-day response; warranty service upgrades are available
<b>Optional features</b>	Please refer to the <a href="#">IBM Storage Networking SAN64B-6 Redbooks Product Guide</a> to review most current optional features
<b>Size</b>	Width: 44.0 cm (17.32 in.); Depth: 35.56 cm (14 in.); Height: 4.39 cm (1.73 in.)
<b>System weight</b>	7.73 kg (17 lb) with two power supplies, without transceivers

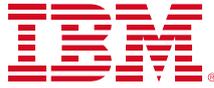
### Why IBM?

Innovative technology, open standards, excellent performance and a broad portfolio of proven storage software, hardware and solutions offerings – all backed by IBM with its recognised leading-edge technology – are just a few of the reasons to consider storage solutions from IBM, including SAN64B-6.

### For more information

To learn more about IBM Storage Networking SAN64B-6, please contact your IBM representative or IBM Business Partner (BP), or visit [ibm.com/us-en/marketplace/san64b-6](http://ibm.com/us-en/marketplace/san64b-6)

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**IBM United Kingdom Limited**

PO Box 41  
North Harbour  
Portsmouth  
Hampshire  
PO6 3AU  
United Kingdom

**IBM Ireland Limited**

Oldbrook House  
24-32 Pembroke Road  
Dublin 4

IBM Ireland Limited registered in Ireland under company number 16226.  
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<sup>1</sup> For more information, please refer to the [IBM Storage Networking SAN64B-6 Redbooks Product Guide](#).

<sup>2</sup> For more information, please refer to the [Fabric Vision Technology web page](#).

<sup>3</sup> For more information refer to the [IBM Network Advisor product page](#).

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