

High-performance, scalable and ease-of-use for medium-size and enterprise SAN environments



## IBM System Storage SAN64B-2



High port density design with 64 ports in 2U height helps save rack space

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### Highlights

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- **Simple-to-use medium-size and enterprise infrastructure simplification and business continuity solution for IBM® System i™, System p™, System x™ and System z™ servers plus other selected IBM, Intel®-based, UNIX®, Sun and HP servers**
- **Designed to support high availability with redundant, hot-swappable fans and power supplies and non-disruptive software upgrades**
- **Provides a broad range of open server Fibre Channel switching**
- **Designed for high-performance with 4 Gbps ports and enhanced Inter-Switch Link (ISL) trunking with up to 32 Gbps per data path**
- **Multiple management options for medium-size and complex enterprise SAN consolidation solutions**
- **Interoperability with the IBM System Storage™ SAN b-type switch family helps protect switch investment**
- **Pay-as-you-grow scalability with “Ports on Demand” features**

### IBM System Storage medium-size and enterprise solutions

A wide range of IBM System Storage™ medium-size and enterprise storage area network (SAN) infrastructure simplification and business continuity solutions can be created with the IBM System Storage SAN64B-2 fabric switch. Infrastructure simplification solutions for the IBM System i, System p, System x and System z families of servers include storage consolidation and high-availability server clustering with IBM TotalStorage disk storage arrays. Business continuity solutions include data protection with IBM System Storage tape libraries and devices and IBM Tivoli® Storage Manager data protection software.

### Infrastructure simplification solutions

A medium-size consolidation solution consists of up to 28 servers attached to one 32-port SAN64B-2 switch with four paths to a disk storage array. The “Ports on Demand” feature is designed to enable this solution to scale-up to an enterprise 64-port switch without taking the switch offline.

A high-availability server clustering solution can be created with redundant switches (as shown in Diagram #1). A medium-size server clustering solution consists of up to 30 servers—each with dual Fibre Channel adapters—cross-connected to redundant SAN64B-2 switches which are connected to a disk storage array with dual controllers, each with dual adapters.

This server clustering solution can be scaled up to 124 servers by cascading two additional SAN64B-2 switches, each connected to one of the switches shown in Diagram #1. Two 4 Gbps Inter-Switch Links (ISLs) would be used to connect each pair of cascaded switches for optimum performance and resiliency. Additional IBM System Storage SAN b-type switches (IBM 2005 and 2109) can be added for almost unlimited scalability.

#### **Data protection solutions**

A medium-size data protection solution consists of up to 26 servers attached to one 32-port SAN64B-2 switch, with two paths to one disk storage array and four paths to a library with four tape drives.

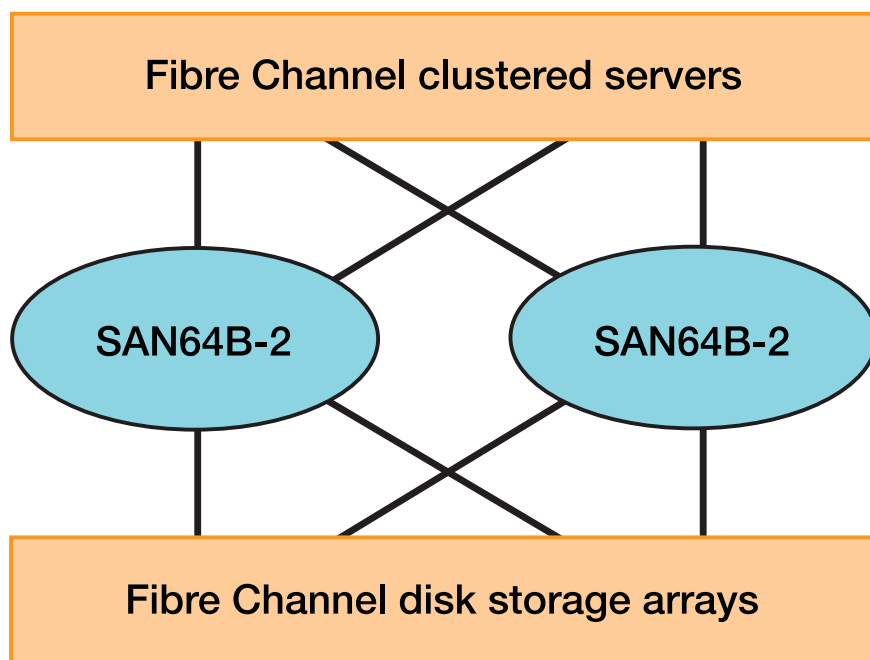


Diagram #1 - High-availability server clustering solution with redundant switch fabrics

An expanded Metro Mirror solution designed to help protect data and provide disaster tolerance can be created by cascading two 64-port SAN64B-2 switches, each with two or more 4 Gbps short wave or long wave ISLs to support resiliency in both sites. The local and remote sites are connected with two or more long wave ISLs that can be supported at 4 km, 10 km or 35 km distances at up to 4 Gbps with standard transceiver features. The Extended Fabric Activation feature helps maintain full 4 Gbps operation at distances up to 100 kilometers. Connectivity via a router (such as the

IBM System Storage SAN18B-R multi-protocol router which can convert Fiber Channel Protocol to Internet Protocol) enables business connectivity solutions over wide area networks (WANs).

The local site and the remote site can support a combination of up to 124 server, disk storage array and tape library drive connections in addition to the four ports used for the ISLs (as shown in Diagram #2 on page 3). Additional IBM System Storage SAN b-type switches can be added for almost unlimited scalability.

**IBM System Storage enterprise solutions**

A wide range of IBM System Storage enterprise SAN infrastructure simplification and business continuity solutions can be created with the IBM System Storage SAN64B-2 fabric switch. The SAN64B-2 switch can be used as a high-performance core switch for enterprise SANs. The switch may also be used as an edge switch with larger IBM b-type directors in large enterprise SANs. Fabric Manager for core-to-edge SAN management is offered as a separate software product through IBM for advanced enterprise solutions including tape and disk SAN island consolidation.

Tape and disk SAN consolidation can be especially attractive when extended-distance links between local and remote sites can be shared. For example, IBM System Storage business continuity Metro Mirror solutions and solutions designed to help protect data and provide disaster tolerance can share links in an enterprise SAN environment.

**High-performance**

The IBM System Storage SAN64B-2 fabric switch provides 4 Gbps full-duplex performance on all ports. Each switch port auto-negotiates to 1, 2 or

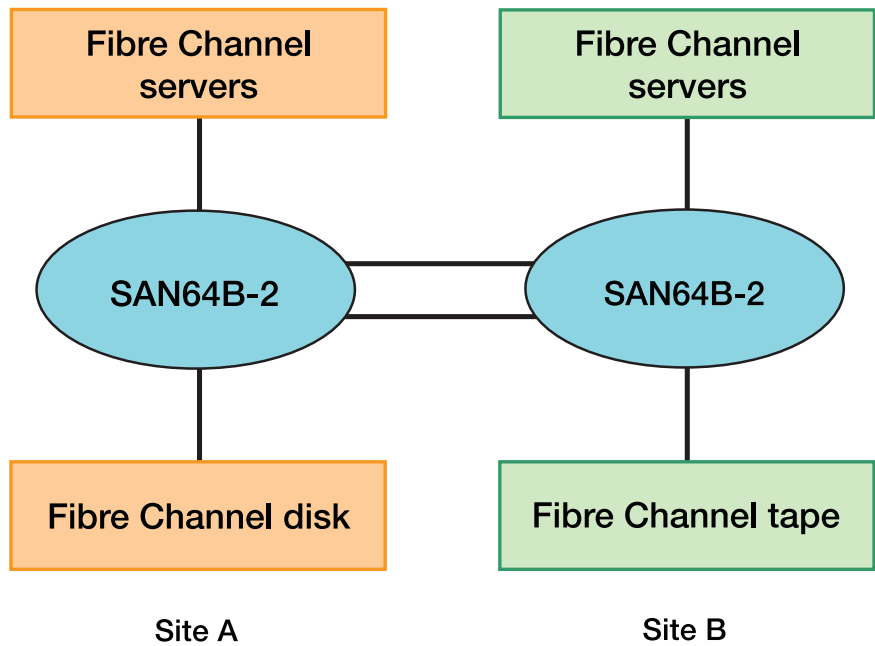


Diagram #2 - Disaster tolerant solutions with 4 Gbps operation up to 35 kilometers between sites

4 Gbps depending upon the capabilities of the device attached at the other end of the fiber optic link. With 64-port configurations, up to 512 Gbps throughput is possible. Up to full 4 Gbps throughput at extended distances of up to 100 km (60 miles) is enabled with additional buffer credits and the optional Extended Fabric Activation feature.

**Pay-as-you-grow scalability**

The “Ports on Demand” feature is designed to support scalable switch upgrades. Each “Ports on Demand” feature provides an activation key that

upgrades the switch in a sixteen-port increment while helping avoid fabric disruption. Short wave and/or long wave small form-factor pluggable (SFP) optical transceiver features are required for each upgrade. The ability to increase switch capacity while maintaining service helps customers implement a pay-as-you-grow strategy.

**High-availability features**

Medium-size and enterprise SAN users require high-availability switch fabric solutions. The IBM System Storage SAN64B-2 fabric switch uses advanced application-specific integrated circuits

(ASICs) to help minimize the number of components and improve reliability. The SAN64B-2 switch provides hot-swappable, load-sharing dual power supplies that are designed to allow the switch to remain online if one power supply fails. Dual power cords allow attachment to separate power sources to help improve availability. Hot-swappable power and cooling components help eliminate downtime for service when replacing a failed component and help reduce or eliminate the risk of erroneously cabling a replacement switch because of a component failure. Hot-pluggable optical transceivers are designed to be replaced without taking the switch offline.

#### **Switch investment protection**

IBM System Storage SAN b-type switches use common switch firmware—from the sixteen-port IBM TotalStorage SAN16B-2 switch to the 256-port SAN256B director—which helps simplify SAN fabric expansion. Common firmware supports forward and backward interoperability of the SAN64B-2 switch and helps simplify deployment. Auto-sensing 1, 2 and 4 Gbps ports help simplify switch deployment with existing SAN infrastructures. IBM SAN64B-2 ISL trunking can interoperate with existing 2 Gbps

switches. The SAN64B-2 switch is 4 Gbps-ready to help take advantage of upgrading to high-performance servers, storage and switches.

#### **Multiple management options**

The IBM System Storage SAN64B-2 switch provides several options to help manage the SAN.

**WEBTOOLS** is provided for users with minimum SAN expertise. WEBTOOLS is integrated with the IBM System Storage SAN64B-2 switch to help simplify monitoring and configuration management. WEBTOOLS is designed to provide a comprehensive set of management tools that support a Web browser interface for flexible easy-to-use integration into existing enterprise storage management structures. WEBTOOLS is designed to support security and data integrity by limiting (zoning) host system attachment to specific storage systems and devices. WEBTOOLS capabilities and functionality can help simplify management of your SAN solution.

Fabric Watch is a standard function of IBM SAN b-type switches. Fabric Watch threshold monitoring is designed to track the health of switches and the

SAN fabric. Fabric Watch monitors fabric resources, port traffic, switch environmental values and operational values for optical transceivers. This information is accessible from WEBTOOLS.

**Performance Bundle Activation** provides support for enhanced ISL trunking and frame filtering-based performance monitoring tools for enhanced end-to-end performance monitoring. WEBTOOLS provides an easy-to-use interface designed to allow end-to-end performance monitoring and ISL trunking. ISL trunking and frame filtering can help simplify storage management and reduce the overall cost of the storage infrastructure.

IBM SAN64B-2 switch enhanced ISL trunking enables as many as eight 4 Gbps links between one SAN64B-2 and another SAN16B-2, SAN32B-2 or SAN64B-2 switch, a SAN256B director, or a SAN18B-R router to form a single logical ISL with an aggregate speed of up to 32 Gbps per trunk. Multiple ISL trunks can be configured to connect to multiple IBM SAN b-type switches and routers.

IBM SAN64B-2 switches may also fully interoperate with existing 2 Gbps IBM SAN b-type switches and directors, which can combine up to four

2 Gbps ISLs to form a single logical ISL with an aggregate speed of up to 8 Gbps.

These high-speed trunks help optimize bandwidth utilization and enhance availability. Load balancing can help distribute the workload across all ISLs through trunking. This enables administrators to focus on overall network performance rather than individual link congestion from multiple high-performance devices sharing a single link.

### **Advanced security**

As entry-level and departmental SAN islands evolve into large enterprise SANs which can interconnect over WANs, advanced security is required to help control and manage fabric access. External threats and internal operational events can compromise valuable enterprise data assets and create data integrity exposures.

**Advanced Security Activation** is designed to help secure storage networking infrastructure required for multiple-protocol operation and SAN island consolidation. Advanced Security Activation extends basic fabric security features provided by Advanced Zoning

hardware-enforced worldwide name (WWN) zoning. It is designed to provide a comprehensive, policy-based security system for IBM SAN b-type switch fabrics with FAB OS V3, V4 and V5.

Support for Fabric OS V2.6 helps protect prior generation switch investment. All switches in an advanced security fabric must be upgraded before Advanced Security Activation can be deployed.

### **Enterprise SAN fabric management**

Fabric Manager V5 is designed to help simplify management, reduce administration costs and accelerate deployment and provisioning. It builds upon previous versions of Fabric Manager by offering new capabilities:

- *Configure change management with fabric snapshot and compare*
- *Secure Fabric OS management features include security policy control, audit and reporting*
- *SAN topology visualization and at-a-glance views*
- *Call-home facility is designed to send e-mail notification to support personnel as certain events occur*

Fabric Manager provides an application based on Java™ technology that can help simplify management of complex multiple-switch fabrics. WEBTOOLS and Fabric Manager work together on the same management server, which can be attached to any switch in the core-to-edge fabric. In addition, Fabric Manager V5 can manage up to 80 switches or up to 2,300 ports. Fabric Manager V5 is supported on Windows® 2000, Windows 2003, Windows XP, Sun™ Solaris 8 or 9 server platforms and is available through IBM as a separate software program.

### **Open fabric management**

The IBM SAN b-type switch management framework is designed to support a wide range of solutions—from very small workgroup SANs to very large enterprise SAN fabrics with thousands of devices. Small SANs require rapid deployment and plug-and-play simplicity. Very large SAN fabrics require centralized management and automated administration.

IBM SAN b-type switch management options include browser-based WEBTOOLS and open standards-based interfaces to enterprise SAN managers.

Fabric Watch can send alerts to enterprise SAN fabric management software from vendors such as Computer Associates, Hewlett-Packard and VERITAS.

**Extended Fabric Activation** extends SAN fabrics beyond the Fibre Channel standard of 10 km. This is designed to enable business continuity solutions to maintain high performance 4 Gbps operation over extended distances up to 100 km. Extended-distance long wave SFP optical transceivers are available for 35 km distance. Extended Fabric Activation helps optimize switch buffering to provide high performance by configuring switch ISLs with additional buffer credits.

#### **Flexible Fibre Channel connectivity**

The System Storage SAN64B-2 switch is designed to provide Fibre Channel connectivity to:

- *IBM System z and selected S/390 servers*
- *IBM System p and selected RS/6000 servers*
- *IBM System i and selected AS/400 servers*
- *IBM System x and selected Netfinity servers*
- *Other Intel-based servers with Linux®, Microsoft Windows 2000 and Windows 2003*
- *Selected Sun and HP servers*
- *IBM TotalStorage SAN Volume Controller (SVC)*

- *IBM TotalStorage SAN File System (SFS)*
- *IBM TotalStorage DS8000*
- *IBM TotalStorage DS6000*
- *IBM TotalStorage DS4000*
- *IBM TotalStorage Enterprise Storage Server*
- *IBM TotalStorage FASiT Family of Storage Servers*
- *IBM TotalStorage 357x, 358x, 359x Tape Drives and Libraries*
- *IBM TotalStorage 3494 Tape Library*
- *Other selected storage systems*

For specific support dates, configuration options, server models, operating system levels, attachment capabilities and throughput connectivity speeds, visit [ibm.com/totalstorage/san/b-type](http://ibm.com/totalstorage/san/b-type)

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## IBM System Storage SAN64B-2 fabric switch at a glance

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### Physical characteristics:

Height (rack mount)	8.6cm (3.4 in)
Width	42.8 cm (16.8 in)
Depth	61.0 cm (24.0 in)
Weight	13.7 kg (30.2 lb) without media

### Operating environment:

Temperature	0 to 40 degrees C (32 to 104 degrees F)
Relative humidity	20% to 85%, noncondensing at 40 C (104 F)

### Electrical requirements:

Power	90 to 264 V ac, Universal
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### Product Numbers

2005 Model B64 – IBM System Storage SAN64B-2 fabric switch with 64 ports, 32 ports activated (0 to 31), no transceivers (minimum of 32 required), embedded WEBTOOLS management, Advanced Zoning, Fabric Watch, dual replaceable power supplies and power cords, rack mount kit

FC 2235 – 2 Gbps 35 km Extended Distance Long Wave SFP Transceiver

FC 2410 – 4 Gbps Short Wave SFP Transceiver

FC 2414 – 4 Gbps Short Wave SFP Transceiver – 4-pack

FC 2420 – 4 Gbps 10 km Long Wave SFP Transceiver

FC 2424 – 4 Gbps 10 km Long Wave SFP Transceiver – 4-pack

FC 2430 – 4 Gbps 4 km Long Wave SFP Transceiver

FC 2434 – 4 Gbps 4 km Long Wave SFP Transceiver – 4-pack

FC 7520 – B64 16-Port Activation

FC 7563 – B64 Extended Fabric Activation

FC 7564 – B64 Advanced Security Activation

FC 7565 – B64 Performance Bundle – Plant

FC 7566 – B64 Performance Monitoring – Field

FC 7567 – B64 Trunking Activation - Field

### Fibre-optic cables

Multimode and single-mode fibre optic cables and couplers are available in various lengths

### Power cords

Country-specific power cords are available for desktop installation

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**For more information**

Contact your IBM representative or  
IBM Business Partner or visit:

**ibm.com**/totalstorage/san/b-type



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