*Designed for high performance, more scalable and simple-to-use midrange solutions*

**IBM**

# IBM TotalStorage SAN32B-2 Express Model



*High port density design with 32 ports in a 1U height helps save rack space*

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## Highlights

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■ *Simple-to-use midrange infra-structure simplification and business continuity solutions for IBM® @server® xSeries®, iSeries™ and pSeries® servers*

■ *Pay-as-you-grow scalability with Ports on Demand features*

■ *Multiple management options for first-time SAN users*

■ *Designed for high performance with 4 Gigabit per second (Gbps) throughput on all ports and enhanced ISL-Trunking with up to 32 Gbps per data path*

■ *Designed to support high avail-ability with redundant, hot-swappable fans and power supplies and non-disruptive software upgrades*

■ *Interoperability with IBM TotalStorage® SAN b-type switch family helps protect switch investment*

**IBM TotalStorage midrange solutions**
A wide range of IBM TotalStorage midrange storage area network (SAN) infrastructure simplification and busi-ness continuity solutions can be cre-ated with the IBM TotalStorage SAN32B-2 Express Model fabric switch.  Infrastructure simplification solutions for IBM @server xSeries, iSeries and pSeries 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 TotalStorage tape libraries and devices, and IBM Tivoli® Storage Manager data protection software.

**ON DEMAND** EXPRESS PORTFOLIO™
BUILT FOR MID-SIZED BUSINESS.

### Infrastructure simplification solutions

An *entry-level storage consolidation solution* consists of up to 14 servers attached to one 16-port SAN32B-2 Express Model switch with two data paths to one disk storage array. The Ports on Demand feature is designed to enable this solution to scale up to a midrange 32-port switch without taking the switch offline.

A *high-availability server clustering solution* can be created with redundant switches. A midrange server clustering solution consists of up to 30 servers, each with dual Fibre Channel adapters, cross-connected to redundant SAN32B-2 Express Model switches with two disk storage arrays, each with dual adapters.

This server clustering solution can be scaled up to 60 servers by cascading two additional SAN32B-2 Express Model switches, each with two 4 Gbps Inter-Switch Links (ISLs) for optimum performance and resiliency. Additional IBM TotalStorage SAN b-type switches (IBM 2005 and IBM 2109) can be added for almost unlimited scalability.

### Data protection solutions

An *entry-level data protection solution* consists of up to 14 servers attached to one 16-port SAN32B-2 Express Model switch, with one disk storage array and a library with one tape drive.

An expanded Metro Mirror solution designed to help protect data and provide disaster tolerance can be created by cascading two 32-port SAN32B-2 Express Model switches, each with two 4 Gbps shortwave ISLs for resiliency, in both sites. The local and recovery sites are connected with two 2 Gbps longwave ISLs that can be supported at 10, 35 or 80 km distances with standard transceiver features. The Extended Fabric Activation feature helps maintain performance at distances up to 100 km. The Remote Switch Activation feature enables business continuity solutions over wide area networks (WANs).

The local site and the remote site can support a combination of up to 60 server, disk storage array and tape library drive connections. Additional IBM TotalStorage SAN b-type switches can be added for almost unlimited scalability.

**Not too big. Not too small. Designed for mid-sized business, the IBM Express Portfolio of offerings is just right. Each and every offering that's part of the IBM Express Portfolio is certified to ensure three simple features:**

**1. Easy to install and deploy**

**2. Easy to manage**

**3. Competitively priced**

**The IBM Express Portfolio of offerings are scalable and have the features and functionality you'll need to meet your technology needs, including hardware, software, services and financing. Since they are priced just right for mid-sized businesses, you know you'll get more out of your investment.**

### Larger IBM TotalStorage solutions

A wide range of larger IBM TotalStorage SAN infrastructure simplification and business continuity solutions can be created with the IBM TotalStorage SAN32B-2 Express Model fabric switch. The SAN32B-2 Express Model switch can be used as a high performance core switch for SANs. The switch may also be used as edge switches with larger IBM b-type directors in very large SANs. Fabric Manager with core-to-edge SAN management is offered for advanced solutions including disk and tape 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 TotalStorage business continuity Metro Mirror solutions and solutions designed to help protect data and provide disaster tolerance can share links in a large SAN environment.

### High performance

The IBM TotalStorage SAN32B-2 Express Model switch provides 4 Gbps performance on all ports. Each switch port auto-negotiates to 1 Gbps, 2 Gbps or 4 Gbps depending upon the device attachment. With 32-port configurations, up to 256 Gbps throughput is possible. Full 4 Gbps throughput at extended distances up to 100 kilometers (60 miles) is enabled with additional buffer credits and Extended Fabric Activation.

### Pay-as-you-grow scalability

Ports on Demand features are designed to support scalable switch upgrades. All Ports on Demand features provide an activation key that upgrades the switch in eight-port increments while helping avoid fabric disruption. Shortwave and/or longwave small form-factor pluggable (SFP) 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

Midrange SAN users require high-availability switch fabric solutions. The IBM TotalStorage SAN32B-2 Express Model fabric switch uses advanced application-specific integrated circuits (ASICs) to help minimize the number of components and improve reliability. The SAN32B-2 Express Model 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 for improved availability. Hot-swappable power and cooling components 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 simple component failure. Hot-pluggable optical transceivers are designed to be replaced without taking the switch offline.

### Switch investment protection

IBM TotalStorage SAN b-type switches use common switch firmware—from the eight-port IBM TotalStorage SAN switch up to the 128-port SAN director—which helps simplify SAN fabric expansion. Common firmware supports forward and backward interoperability of the SAN32B-2 Express Model switch and helps simplify deployment with existing SAN infrastructures. IBM SAN32B-2 Express Model ISL trunking can interoperate with existing 2 Gbps switches. The SAN32B-2 Express Model switch is 4 Gbps-ready to help take advantage of upgrading to higher-performance servers, storage and switches.

### Multiple management options

The IBM TotalStorage SAN32B-2 Express Model switch provides several options to help manage the SAN.

**WEBTOOLS** is provided for first-time SAN users with minimum SAN expertise. WEBTOOLS is integrated with the IBM TotalStorage SAN32B-2 Express Model 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 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 on 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 to end-to-end performance

monitoring and ISL trunking. ISL trunking and frame filtering can help to simplify storage management and reduce the overall cost of the storage infrastructure.

IBM SAN32B-2 Express Model switch **enhanced ISL trunking** enables as many as eight 4 Gbps links between SAN32B-2 Express Model switches with an aggregate speed of up to 32 Gbps.

IBM SAN32B-2 Express Model switch 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 balance the load across all of the ISLs through trunking. This enables administrators to focus on overall network performance rather than individual link congestion from multiple higher performance devices sharing a single link.

### Advanced security

As entry level and departmental SAN islands evolve into large SANs (which may be interconnected 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 create a secure storage networking infrastructure required for multiple-protocol operation and SAN island consolidation. Advanced Security extends basic fabric security 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 Fabric OS V3 and V4. Support for Fabric OS V2.6.2 helps protect prior generation switch investment. All switches in an advanced security fabric must be upgraded before Advanced Security Activation can be deployed.

### Large SAN fabric management

Fabric Manager V4 is designed to help simplify management, reduce administrative costs and accelerate deployment and provisioning. It builds upon Fabric Manager V3 by offering new capabilities:

- *Configuration 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 V4.4 can manage up to 80 domains or up to 2,300 ports. Fabric Manager V4.4 is supported on Windows® 2000, Windows 3000, Windows XP, Solaris™ 8 or Solaris server platforms.

### Open fabric management

The IBM SAN b-type switch management framework is designed to support the widest range of solutions—from very small workgroup SANs up to very large 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, Tivoli, 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 transceivers are available for 35 km and 80 km distances. Extended Fabric Activation helps optimize switch buffering to provide high performance by configuring switch ISLs with additional buffer credits.

**Remote Switch Activation** is designed to extend the distance of SAN fabrics by enabling two Fibre Channel switches to support asynchronous data transfers across WANs. This feature is designed to allow users to stage and manage data transfers between a pair of CNT Open System Gateways across an asynchronous transfer mode WAN.

**Flexible Fibre Channel connectivity**
The TotalStorage SAN32B-2 Express Model switch is designed to provide Fibre Channel connectivity to:

- *IBM @server xSeries and selected Netfinity® servers*
- *Other Intel® processor–based servers running Microsoft® Windows NT®, Windows 2000, Windows Server™ 2003, Red Hat Enterprise Linux™ 3, SUSE LINUX or Novell NetWare®*
- *IBM @server pSeries and selected RS/6000® servers*
- *IBM @server iSeries servers*
- *Selected Sun and HP servers*
- *IBM TotalStorage Enterprise Storage Server® systems*
- *IBM TotalStorage DS4000 series (formerly FAStT Storage Servers)*

- *IBM TotalStorage DS8000 series and DS6000 series*
- *IBM TotalStorage 3590 and 3592 Tape Drives and IBM TotalStorage 3494 Tape Library*
- *IBM TotalStorage 3582, 3583 and 3584 Tape Libraries*
- *IBM TotalStorage NAS Gateway 500*
- *IBM TotalStorage SAN Volume Controller*
- *IBM TotalStorage SAN b-type and Brocade switches and directors*

## IBM TotalStorage SAN32B-2 Express Model at a glance

| Physical characteristics | |
|---|---|
| Height (rack mount) | 42.4 mm/1.67 in (1U) |
| Width | 429 mm/16.9 in |
| Depth | 584 mm/23 in |
| Weight | 10.2 kg/22.4 lbs |

| Operating environment | |
|---|---|
| Temperature | 0°C to 40°C/32°F to 104°F |
| Relative humidity | 20% to 85% |

| Electrical requirements | |
|---|---|
| Power | 110-230 VAC, 47-63 Hz |

| Product Numbers | |
|---|---|
| | PN 200532B—IBM TotalStorage SAN32B-2 Express Model fabric switch with 32 ports, 16-ports activated (0 to15), sixteen 4 Gbps shortwave transceivers, embedded WEBTOOLS management, Advanced Zoning, Fabric Watch, dual replaceable power supplies and power cords and rack mount kit |
| | PN 22R5078—8-port Upgrade Express Option with eight 4 Gbps shortwave transceivers |
| | PN 22R4902—4 Gbps shortwave SFP transceiver |
| | PN 22R4897—4 Gbps shortwave SFP transceiver – 4 pack |
| | PN 19K1272—2 Gbps longwave SFP transceiver |
| | PN 22R0484—2 Gbps longwave SFP transceiver – 4 pack |
| | PN 17P7405—35 km Extended Distance longwave SFP transceiver |
| | PN 17P7407—80 km Extended Distance longwave SFP transceiver |
| | PN 19K1247—Fibre Channel cable, LC/LC, multimode optical 50.0u, 1 meter |
| | PN 19K1248—Fibre Channel cable, LC/LC, multimode optical 50.0u, 5 meter |
| | PN 19K1249—Fibre Channel cable, LC/LC, multimode optical 50.0u, 25 meter |
| | PN 19K1250—Fibre Channel LC male/SC female Coupling Cable, multimode optical 50.0u |
| | PN 22R0487—Fibre Channel cable, SC male/LC female, single-mode optical, 9u, 31 meters |
| | PN 22R0488—Fibre Channel cable, LC male/LC female, single-mode optical, 9u, 31 meters |
| | PN 22R0489—Fibre Channel cable, LC male/LC female, single-mode optical, 9u, 2 meters |
| | PN 22R5128—Fabric Manager V4 Maximum Domains |
| | PN 22R5129—Remote Switch Activation |
| | PN 22R4894—Extended Fabric Activation |
| | PN 22R4895—Advanced Security Activation |
| | PN 22R4896—Performance Bundle |

| Fibre optic cables | |
|---|---|
| | Multimode and single-mode cables and couplers are available in various lengths. Country-specific power cords are also available for desktop installation. |

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MB, GB and TB equal 1,000,000, 1,000,000,000 and 1,000,000,000,000 bytes, respectively, where referring to storage capacity. Actual storage capacity will vary based upon many factors and may be less than stated. Some numbers given for storage capacities give capacity in native mode followed by capacity using data compression technology.

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