IBM System Networking SAN24B-5 switch

Flexible, easy-to-use, entry-level SAN switch for private cloud storage

To keep pace with growing business demands, data centers are transitioning to highly virtualized, private cloud storage environments. This approach enables organizations to consolidate and simplify their IT resources, resulting in increased business agility and lower capital and operating expenses. But virtualization is not without its challenges. Data centers must keep up with the explosive data growth and dynamic changes driven by virtualized workloads. Selecting the right network is key to realizing the full benefits of these cloud-based architectures.

The IBM System Networking SAN24B-5 switch is designed to provide outstanding price and performance value, combining flexibility, simplicity, 16 Gbps Fibre Channel technology and enterprise-class functionality in an entry-level switch. The SAN24B-5 is configurable in 12 or 24 ports and supports 2, 4, 8 or 16 Gbps speeds in an efficiently designed 1U form factor. Base unit includes one (249824G/2498-X24) or two (2498-F24) integrated power supplies and fans. A second power supply provides additional redundancy for increased resiliency.

Enterprise-class features in an entry-level switch
The SAN24B-5 features advanced monitoring, diagnostics, reliability, availability, serviceability and redundancy capabilities in an entry-level switch to maximize availability, optimize performance and simplify administration. Enterprise-class features include:

- Critical diagnostic and monitoring capabilities to help ensure early problem detection and recovery
- Non-intrusive and non-disruptive monitoring on every port to provide a comprehensive end-to-end view of the entire fabric
- Forward error correction to recover from bit errors in inter-switch links (ISLs), enhancing transmission reliability and performance
- Additional buffers to overcome performance degradation and congestion due to buffer credit loss
- Real-time bandwidth consumption by hosts and applications on ISLs to easily identify hot spots and potential network congestion
- A second power supply to enable dual power redundancy and enhance availability

**Building block for virtualized, private cloud storage**
The SAN24B-5 provides a critical building block for today’s highly virtualized, private cloud storage environments. It simplifies server virtualization and virtual desktop infrastructure management while meeting the high-throughput demands of solid state disks. The SAN24B-5 also supports multi-tenancy in cloud environments through quality of service and fabric-based zoning features.

**Flexible, simple and easy-to-use industry-leading technology**
The SAN24B-5 delivers industry-leading SAN technology within a flexible, simple and easy-to-use solution. The base configuration includes 12 activated ports, with up to 24 ports on demand. In addition to providing best-in-class scalability, the SAN24B-5 is easy to deploy with the EZSwitchSetup wizard and the diagnostic ports (D_Ports) feature, which simplifies setup.

**Accelerating fabric deployment with diagnostic ports**
D_Ports enable administrators to quickly identify and isolate optics and cable problems, reducing fabric deployment and diagnostic times. Organizations can also use D_Ports to run a variety of tests through the IBM Network Advisor or command line interface (CLI) to test ports, small form-factor pluggables and cables for faults, latency and distance.

**Simplifying server deployment with dynamic fabric provisioning**
Dynamic fabric provisioning enables organizations to eliminate fabric reconfiguration when adding or replacing servers through the virtualization of host worldwide names (WWNs). It also reduces or eliminates the need to modify zoning or logical unit number masking, as well as enabling pre-provisioning of virtual WWNs, helping organizations eliminate time-consuming steps when deploying new equipment or moving devices within a switch.

**Leveraging Access Gateway Mode**
The SAN24B-5 can be deployed as a full-fabric switch or as an access gateway, which simplifies fabric topologies and heterogeneous fabric connectivity (the default mode setting is a switch). Access Gateway Mode utilizes NPIV switch standards to present physical and virtual servers directly to the core of SAN fabrics. This makes access gateway transparent to the SAN fabric, greatly reducing management of the network edge. In Access Gateway Mode, the SAN24B-5 can connect servers to NPIV-enabled b-type, m-type and other SAN fabrics.
Organizations can easily enable Access Gateway Mode via the IBM Network Advisor or a CLI. Key benefits of Access Gateway Mode include:

- Improved scalability for large or rapidly growing server and virtual server environments
- Reduced management of the network edge, since access gateway does not have a domain identity and appears transparent to the core fabric
- Support for heterogeneous SAN configurations without reduced functionality for server connectivity

**Fabric operating system and management software**

Fabric operating system (FOS), which is included with each SAN24B-5, contains all the functions necessary to operate a base system. The 16 Gbps base systems require FOS v7.0.1 or later. The D-port type supported in FOS v7.0 or later is designed to debug the components associated with the link, such as transceivers and cables. This feature is only supported on the 16 Gbps ports.

Advanced Web Tools, Advanced Zoning, Full Fabric and Enhanced Group Management are part of the base FOS and do not require a license:

- **Advanced Web Tools** software enables graphical user interface (GUI)-based administration, configuration and maintenance of fabric switches and SANs.
- **Advanced Zoning** software segments a fabric into virtual private SANs to restrict device communication and apply certain policies only to members within the same zone.
- **Full Fabric** software allows switches to be connected, and is required to enable E_Ports.
- **Enhanced Group Management** enables additional device-level management functionality for IBM b-type SAN products when added to the element management, and allows large consolidated operations to groups of devices (such as firmware downloads and configuration uploads and downloads).

The following are offered as optional licenses:

- **Adaptive networking** service is a set of features that provide users with tools and capabilities for incorporating network policies to ensure optimal behavior of a large SAN. The FOS v7.0 release supports two types of quality-of-service features with the 16 Gbps fabric backbones: ingress rate limiting and SID/DID-based prioritization.
- **Advanced Performance Monitor** helps identify end-to-end bandwidth used by host/target pairs and is designed to provide for capacity planning.
- **Fabric Watch** is designed to constantly monitor mission-critical switch operations for potential faults and automatically alert administrators to problems before they become costly failures. Fabric Watch includes the Port Fencing capability.
- **Inter Switch Link (ISL) Trunking** enables efficient Fibre Channel packet distribution across multiple ISLs between two IBM b-type SAN fabric switches and directors while preserving in-order delivery. Both b-type SAN devices must have trunking activated. The SAN24B-5 adds enhanced ISL Trunking support uses 16 Gbps ports and enables Fibre Channel packets to be distributed across up to eight 16 Gbps-capable ISLs for a combined bandwidth of up to 128 Gbps.
- **Extended Fabrics** extend SAN fabrics beyond the Fibre Channel standard of 10 km by optimizing internal switch buffers to maintain performance on ISLs connected at extended distances.
- **Server Application Optimization** optimizes overall application performance for physical servers and virtual machines by extending virtual channels to the server infrastructure. Application-specific traffic flows can be configured, prioritized and optimized throughout the entire data center infrastructure.
- **12-port Activation** enables the SAN24B-5 switch with one additional increment of 12 ports that can be enabled on demand. The SAN24B-5 switch ships with the first 12 ports activated in the base product.
• **Enterprise Package** offers a convenient method with which to order a set of optional features bundled into one feature number. It includes one license for each of the following: Trunking Activation, Fabric Watch, Advanced Performance Monitor, Adaptive Networking, Server Application Optimization and one 12-port Activation.

**Management software supports 16 Gbps technology**

IBM Network Advisor v11.1 (or later) is the base management software for the SAN24B-5, capable of providing end-to-end data center fabric management, from storage ports on networked storage systems to host bus adapters attached to physical or virtualized servers.

**Outstanding price and performance for growing SAN workloads**

The IBM System Networking SAN24B-5 combines market-leading throughput with an affordable switch form factor, making it ideal for growing SAN workloads. The 24 ports produce an aggregate 384 Gbps full-duplex throughput; any eight ports can be trunked for 128 Gbps ISLs. Exchange-based dynamic path selection optimizes fabric-wide performance and load balancing by automatically routing data to the most efficient and available path in the fabric, as shown in Figure 1. It augments ISL Trunking to provide more effective load balancing in certain configurations.

In addition, the SAN24B-5 provides a low total cost of ownership (TCO) due to its 12-port base configuration, easy administration, 1U footprint and low-energy consumption—0.22 watts per Gbps and 3.3 watts per port.

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**Frame-based trunking**

Application specific integrated circuit (ASIC) preserves in-order delivery

**Dynamic Path Selection (DPS)**

Balancing data flow between multiple trunk groups

*Figure 1: Exchange-based dynamic path selection optimizes fabric-wide performance and load balancing by automatically routing data to the most efficient and available path in the fabric.*
The SAN24B-5 can be deployed as a full-fabric switch or as an access gateway, which simplifies fabric topologies and heterogeneous fabric connectivity (the default mode setting is a switch). Access Gateway Mode utilizes NPIV switch standards to present physical and virtual servers directly to the core of SAN fabrics. This makes access gateway transparent to the SAN fabric, greatly reducing management of the network edge. In Access Gateway Mode, the SAN24B-5 can connect servers to NPIV-enabled b-type, m-type and other SAN fabrics.

**Why IBM?**
To stay competitive in the global marketplace, your employees need to have access to the right information at the right time, to help them be effective, creative and highly innovative.

For today’s smarter planet, where organizations and networks are more instrumented, interconnected and intelligent than ever before, IBM provides flexible, scalable and open standards-based, business-class and global enterprise-class storage networking solutions.

The IBM System Networking SAN24B-5 SAN switch is designed to provide outstanding price and performance, combining flexibility, simplicity and enterprise-class functionality in a 24-port, 1U form factor entry-level switch.

<table>
<thead>
<tr>
<th>Feature</th>
<th>Benefits</th>
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<tbody>
<tr>
<td>16 Gbps performance in an energy-efficient, 1U form factor</td>
<td>Entry-level SAN switch with market-leading throughput</td>
</tr>
<tr>
<td>Ports-on-demand capabilities</td>
<td>Fast, easy, cost-effective scaling from 12 to 24 ports; aggregate 384 Gbps full-duplex throughput at 24 ports</td>
</tr>
<tr>
<td>Diagnostic ports</td>
<td>Quick identification and isolation of optics and cable problems; reduction in fabric deployment and diagnostic times</td>
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<tr>
<td>Dynamic fabric provisioning</td>
<td>Elimination of fabric reconfiguration when adding or replacing servers through virtualization of host WWNs</td>
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<tr>
<td>Nondisruptive software upgrades</td>
<td>Increased resiliency</td>
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## IBM System Networking SAN24B-5 at a glance

### Product numbers
- 2498-F24 (AAS)
- 2498-X24 (Xccellerator)
- 249824G (HVEC)

### Base machine
**Base switch includes the following components:**
- Power distribution unit (PDU) jumpers, fixed rack mount rail kit, install guide hardcopy, EZSwitchSetup CD, CD-ROM (with manuals), service tools, RJ-45 wrap tools, wrist strap and small form factor pluggable (SFP) extraction tool
- **AAS:** dual integrated power supplies and fans (replaceable)
- **HVEC/XCC:** one integrated power supply and fan (replaceable)

**Base switch includes the following functions:**
- Advanced Web Tools, Advanced Zoning, Full Fabric, Enhanced Group Management, Fabric Operating System v7.0.1 or later

### Fibre Channel interfaces
- Auto-sensing of 2, 4, 8 and 16 Gbps port speeds
- D_Prot (diagnostic port), E_Prot, EX_Prot, F_Prot, M_Prot (mirror port); self-discovery based on switch type (U_Prot); optional port type control
- Access Gateway Mode: F_Prot and NPIV-enabled N_Prot

### Transceivers
- 16 Gbps: hot pluggable SFP+, LC connector; 16 Gbps short-wavelength laser (SWL), long-wavelength laser (LWL)
- 8 Gbps: hot-pluggable SFP+, LC connector; 8 Gbps SWL, LWL

### Hot-swap components
- Power supplies, fan modules, SFPs

### Non-rack support
- Non-rack installation support; requires country-specific power cords which must be ordered

### Management software
- HTTP, SNMP v1/v3 (FE MIB, Fibre Channel Management MIB), SSH; Auditing, Syslog; Advanced Web Tools, Advanced Performance Monitoring, Fabric Watch; IBM Network Advisor v11.1 or later; CLI

### Servers supported*
- IBM Power Systems™
- IBM System p®
- IBM System i®
- IBM System x®
- Other Intel processor-based servers with Linux, Microsoft Windows 2003 and Windows 2008
- Selected Sun and HP servers

### Operating systems supported*
- Red Hat Linux, Red Hat Linux Advanced Server
- SUSE Linux, SUSE Linux Enterprise Server (SLES)
- IBM AIX®
- Other selected operating systems

### Storage products supported*
- IBM XIV® storage system
- IBM System Storage® DS8000® storage servers
- System Storage SAN Volume Controller
- IBM Storwize® V7000 Unified Storage
- System Storage DS5000 and DS3500
- System Storage TS1040 and TS1050 tape drives
- System Storage TS1130 and TS1140 tape drives
- System Storage TS3100, TS3200, TS3310 and TS3500 tape libraries
- Other selected storage systems
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<tr>
<th>Feature</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>Fiber Channel switches supported</td>
<td>System Storage and TotalStorage b-type and m-type SAN directors, switches and routers; other directors, switches and routers manufactured by Brocade</td>
</tr>
<tr>
<td>Fibre optic cable</td>
<td>Fiber optic cables with LC connectors are required and available in various lengths in single-mode and multimode formats</td>
</tr>
<tr>
<td>Power cords</td>
<td>Jumper cables are included for installation; country-specific power cords must be ordered for desktop/standalone installation</td>
</tr>
<tr>
<td>Warranty</td>
<td>One year; customer replaceable unit (CRU) and onsite; 9×5 next-business-day response, warranty service upgrades are available</td>
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<tr>
<td>Optional features</td>
<td>Licenses: 12-port Activation, Adaptive Networking, Advanced Performance Monitor, Fabric Watch, Enterprise Package†, Extended Fabrics, Trunking Activation, Server Application Optimization Other: SFPs; fiber optic cables; upgrade power supplies</td>
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### Physical Characteristics

<table>
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<tr>
<th>Feature</th>
<th>Description</th>
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<tbody>
<tr>
<td>Size Width</td>
<td>43.8 cm (17.24 in.)</td>
</tr>
<tr>
<td>Depth</td>
<td>4.3 cm (1.7 in.)</td>
</tr>
<tr>
<td>Height</td>
<td>44.3 cm (17.44 in.)</td>
</tr>
<tr>
<td>Weight</td>
<td>7.82 kg (17.25 lb) with one power supply, without transceivers</td>
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<tr>
<td></td>
<td>9.16 kg (20.2 lb) with two power supplies, without transceivers</td>
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### Operating environment

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<tr>
<th>Feature</th>
<th>Description</th>
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<tbody>
<tr>
<td>Temperature (operating)</td>
<td>0 to 40°C (32 to 104°F)</td>
</tr>
<tr>
<td>Humidity (operating)</td>
<td>10% to 85% noncondensing at 40°C (104°F)</td>
</tr>
<tr>
<td>Altitude (operating)</td>
<td>Up to 3,000 m (9,842 ft)</td>
</tr>
<tr>
<td>Airflow</td>
<td>Rear panel-to-door airflow</td>
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### Electrical requirement

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<tr>
<th>Feature</th>
<th>Description</th>
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<tbody>
<tr>
<td>Nominal input voltage</td>
<td>85 - 264 V ac, universal</td>
</tr>
<tr>
<td>Input line frequency</td>
<td>47 - 63 Hz</td>
</tr>
<tr>
<td>Power consumption</td>
<td>80 W with 24 ports populated with 16 Gbps SWL optics</td>
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<tr>
<td>Heat dissipation</td>
<td>338 BTU/hr</td>
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<tr>
<td>Inrush current</td>
<td>Maximum of 35 amps</td>
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For more information
To learn more about the IBM System Networking SAN24B-5 switch, contact your IBM representative or IBM Business Partner, or visit: ibm.com/systems/networking/switches/san/b-type/san24b-5

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