

# IBM Storage Networking SAN384C-6

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## Highlights

- Help future-proof the data center for cloud and big data
  - Scale up to 384 32-Gbps FC ports
  - Enable large, scalable deployment of SAN extension solutions
  - Support IBM z Systems FICON and Fibre Channel protocol environments
  - Combine large-scale storage networks and multiple storage protocols
  - Attain high availability with fully redundant components
  - Achieve outstanding SAN performance
  - Utilize 48-port 32-Gbps FC switching modules
  - Benefit from virtual SAN technology, access control lists
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## Addressing the stringent needs and requirements of large, virtualized data environments

IBM Storage Networking SAN384C-6 is a director-class SAN switch designed for deployment in large-scale storage networks, that enables not only enterprise clouds, but business transformation. By adding enterprise connectivity options that support FICON, SAN384C-6 delivers a high-performing and reliable FICON infrastructure designed to support fast and scalable z Systems servers. The SAN384C-6 platform also provides multi-protocol flexibility for SANs delivering 32-Gbps Fibre Channel and 1/10 Fibre Channel over IP (FCIP) capabilities.<sup>1</sup>

Layering a comprehensive set of intelligent features over a high-performance, protocol-independent switch fabric, SAN384C-6 addresses the rigorous requirements of large, virtualized data-center storage environments with features such as high availability, extreme scalability, flexibility, security and ease of management. Importantly, it enables the transparent integration of new technologies into the data center to provide highly flexible SAN solutions.

For mission-critical enterprise storage networks that require secure, robust, cost-effective business-continuance services, the FCIP extension module is designed to deliver outstanding SAN extension performance, reducing latency for disk and tape operations with FCIP acceleration features, including FCIP write acceleration and FCIP tape write and read acceleration.

## Lowering TCO with SAN consolidation

With the exponential growth of data in today's smarter business environments, organizations must deploy large-scale SANs in the most efficient and cost-effective way possible. To meet scalability requirements while managing total cost of ownership (TCO), SAN384C-6 and its components offer:

- High port densities of up to 384 32-Gbps Fibre Channel ports
- 1.5 Tbps performance per slot
- Up to 24 Tbps Fibre Channel backplane bandwidth
- Input/output (I/O) consolidation
- Non-blocking system-level switching
- Front-to-back airflow
- Outstanding functionality with intelligent fabric services
- Virtual SANs (VSANs) for consolidating individual physical SAN islands while maintaining logical boundaries
- Inter-VSAN routing (IVR) for sharing resources across VSANs

These capabilities enable organizations to consolidate their data assets into fewer, larger and more manageable SANs, thus reducing the data-center hardware footprint and associated capital and operational expenses.

## Leveraging IBM Storage Networking SAN384C-6 components

Also contributing to lower TCO, SAN384C-6 shares the same operating system and management interface as other data-center switches, which enables seamless fabric deployment with high-performance Fibre Channel, FICON and FCIP connectivity.

*SAN384C-6 48-port 32-Gbps Fibre Channel Switching Module* delivers predictable performance, scale, and innovative capabilities to enable private and virtualized data centers. These switching modules feature up to 384 line-rate 32-Gbps Fibre Channel ports per chassis and intelligent fabric services such as integrated VSANs, IVR and port channels.

The 48-port 32-Gbps Fibre Channel Switching Modules enable users to consolidate SAN deployments with fewer hardware components, consolidate workloads from hundreds of high-performance virtual machines, and scale with incremental updates as their SAN grows—while

protecting existing investments. It also offers VMpath technology, which enables advanced virtual machine-aware SAN provisioning and monitoring for virtualized data centers. Other features include predictable performance and high availability; advanced traffic-management capabilities; integrated VSAN and IVR; resilient, high-performance Inter-Switch Links (ISLs); hardware-assisted slow-drain support; comprehensive security frameworks; fault detection and isolation of errored packets; and sophisticated diagnostics.

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*IBM Storage Networking SAN384C-6*

## **Providing enterprise-class availability**

Beyond meeting the basic requirements of nondisruptive software upgrades and redundancy of critical hardware components, the SAN384C-6 software architecture offers an outstanding level of availability. SAN384C-6 provides redundancy on all major hardware components, including supervisor modules, fabric modules, power supplies and fan trays. SAN384C-6 is designed to exceed 99.999 percent uptime.

## **Transforming business with enterprise cloud deployment**

SAN384C-6 is designed to provide outstanding scalability and pay-as-you-grow flexibility, robust security for multi-tenancy cloud applications, the predictable high performance required to meet strict service level agreements (SLAs), the resilient connectivity required for no-downtime cloud infrastructures, and the advanced traffic management capabilities—such as quality of service (QoS)—needed to quickly and cost-efficiently allocate elastic network capabilities to cloud applications.

Furthermore, Data Center Network Manager (DCNM) for SAN provides resource monitoring and capacity planning on a per-virtual-machine basis, enabling efficient, consolidated enterprise cloud deployments, federation of up to 10 DCNM servers for easy management of large-scale clouds, and resource usage information through Storage Management Initiative Specification (SMI-S)-based developer application programming interfaces (APIs) to deliver IT as a service.

## Easing management

To meet the needs of virtually any user, SAN384C-6 provides three principal management modes: the command-line interface (CLI), DCNM and integration with third-party storage-management tools.

*SAN384C-6* leverages an easy-to-learn CLI to deliver broad management capabilities. This extremely efficient and direct interface is designed to provide consistent, logical, optimal capabilities to administrators in enterprise environments.

Another option is to use DCNM SAN, a user-friendly application that simplifies management across multiple switches and converged fabrics. It provides robust features to meet the routing, switching and storage administration needs of present and future virtualized data centers; streamlines provisioning of the unified fabric; and proactively monitors SAN components. DCNM SAN can be used independently or in conjunction with third-party management applications.

## Integrated mainframe support

*SAN384C-6* supports the FICON protocol in both cascaded and noncascaded fabrics, as well as an intermix of FICON and open-systems Fibre Channel Protocol traffic on the same switch. IBM control unit port (CUP) support enables in-band management of *SAN384C-6* switches from mainframe management applications and supports a fabric-binding feature that helps ensure that Inter-Switch Links (ISLs) are enabled only between specified switches in the fabric-binding configuration.

## Enabling robust security

Addressing the need for foolproof security in storage networks, *SAN384C-6* and the 48-port 32-Gbps line card offers an extensive security framework to protect the highly sensitive data crossing today's enterprise networks. *SAN384C-6* employs intelligent packet inspection at the port level, including the application of access control lists (ACLs) for hardware enforcement of zones, VSANs and advanced port security features.

## Offering advanced diagnostics and troubleshooting tools

Managing large-scale storage networks requires proactive diagnostics tools to verify connectivity and route latency, as well as mechanisms to capture and analyze network traffic. SAN384C-6 provides comprehensive port-based and flow-based statistics that enable sophisticated performance analysis and SLA accounting. Plus, an integrated *Call Home* capability can add reliability, speed problem resolution and help reduce service costs.

## Investment protection with future readiness

The SAN384C-6 switch can be used with either Fabric Switch module-1 and Fabric switch module-3. Switches currently running Fabric-1 can be upgraded online and in-place to Fabric-3. Each Fabric-3 module provides double the bandwidth of Fabric-1. Thus three Fabric-3 can support 192 Fibre Channel ports running at 32-Gbps line-rate. With the new Fabric-3 modules, the switch can be upgraded to additionally support 64-Gbps modules when available.



<sup>1</sup> For more information, please refer to the [IBM Storage Networking SAN384C-6 Redbooks Product Guide](#)

**SAN384C-6 Specifications**

<b>Model</b>	8978-E08
Chassis slot configuration	<ul style="list-style-type: none"> <li>• Line-card slots: 8</li> <li>• Supervisor slots: 2</li> <li>• Crossbar switching fabric slots: 6*</li> <li>• Fan trays: 3 fan trays at the back of the chassis</li> <li>• Power supply bays: 8</li> <li>• Hot-swappable components</li> </ul>
Hot-swappable components	Power supplies, fan modules, small form-factor pluggables, supervisor modules, fabric modules
Warranty	One year, IBM On-Site Limited, 24x7 same-day maintenance; service options available.
Optional features	48-port 32Gbps FC Module and 16G SW Bundle (#AJL2), 48-port 32Gbps FC Switching Module (#AJL4), 24/10-port SAN Extension Module (#AJL5), SAN384C-6 Fabric-1 Switching Module (#AJKE), Enterprise Package (#AJJ9), DCNM SAN Advanced Edition (#AJJA), Mainframe Package (#AJJB), 3000W AC power supply (#AJKF), small form-factor pluggables, fans*, AJN6 Supervisor-4 Module, AJNB Fabric-3 Module
Dimensions (H x W x D)	<p>Chassis dimensions (14RU): 61.9 cm (24.35 in.) x 43.9 cm (17.3 in.) x 86.4 cm (34 in.)</p> <ul style="list-style-type: none"> <li>• IBM 48-Port 32-Gbps Fibre Channel Switching Module: 4.4 cm x 40.39 cm x 55.37 cm (1.75 in. x 15.9 in. x 21.8 in.)</li> <li>• Power supply (3,000 W AC): 55.98 cm x 10.03 cm x 4.06 cm (22.04 in. x 3.95 in. x 1.6 in.)</li> <li>• Fabric-1 module: 82.3 cm x 5.13 cm x 25.96 cm (32.40 in. x 2.02 in. x 10.22 in.)</li> <li>• Supervisor-1E module: 5.18 cm x 20.17 cm x 55.5 cm (2.04 in. x 7.94 in. x 21.85 in.)</li> <li>• Fan tray: 91.87 cm x 13.08 cm x 4.75 cm (36.17 in. x 5.15 in. x 1.87 in.)</li> <li>• SFP+: 1.25 cm x 1.36 cm x 5.65 cm (0.49 in. x 0.54 in. x 2.22 in.)</li> <li>• Chassis (includes fans): 84.2 kg (185.5 lb)</li> <li>• 48-port 32-Gbps Fibre Channel line card: 7.94 kg (17.5 lb)</li> </ul>
Weight	<ul style="list-style-type: none"> <li>• Power supply (3,000W AC): 2.7 kg (6 lb)</li> <li>• Fabric module: 5.0 kg (11 lb)</li> <li>• Supervisor-1 module: 3.2 kg (7 lb)</li> </ul>
Recycling Parts	IBM does not recommend the removal of its product batteries due to safety reasons. Please utilize the IBM Product Collection and Recycling Take Back Programs.

For more information, please refer to the [IBM Storage Networking SAN384C-6 Redbooks Product Guide](#)





## Why IBM

IBM offers a vast portfolio of hardware, software and services that can help organizations of all sizes address their IT infrastructure requirements in a comprehensive and integrated way. With IBM, organizations can create a more flexible, robust and resilient infrastructure to support critical business operations.

## For more information

To learn more about IBM Storage Networking SAN384C-6, please contact your IBM representative or IBM Business Partner, or visit:

[ibm.com/systems/storage/san/ctype/](https://ibm.com/systems/storage/san/ctype/)

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