

IBM Storage Networking SAN192C-6

Highlights

- Provide up to 192 32-Gbps FC ports
 - Or up to 32 1/10-Gbps Fibre Channel over IP (FCIP) ports
 - Enable up to 12 Tbps FC, line rate, nonblocking switching capacity
 - Enable scalable deployment of SAN extension solutions
 - Support IBM z Systems FICON, FC protocol and Linux
 - Deliver capabilities with intelligent fabric services
 - Enable virtual SANs for consolidating physical SAN islands
 - Provide inter-VSAN routing (IVR) for sharing resources across VSANs
 - Provide smooth migration, common sparing and investment protection
 - Deliver redundancy on all major hardware components
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Consolidate data assets into fewer, larger, more manageable SANs to keep up with data growth

IBM Storage Networking SAN192C-6 is a director-class SAN switch designed for deployment in small to midsize storage networks that can support enterprise clouds and business transformation. It layers a comprehensive set of intelligent features onto a high-performance, protocol-independent switch fabric.

SAN192C-6 addresses the stringent requirements of large virtualized data center storage environments. It delivers uncompromising availability, security, scalability, ease of management and transparent integration of new technologies for extremely flexible data center SAN solutions. It shares the same operating system and management interface with other IBM Storage Networking c-type data center switches. SAN192C-6 lets you transparently deploy unified fabrics with Fibre Channel, FICON, and Fibre Channel over IP (FCIP) connectivity for low total cost of ownership (TCO).

For organizations that need efficient, cost-effective SANs to keep up with today's exponential data growth, SAN192C-6 is the answer. The switch lets you easily consolidate data assets into fewer, larger and more manageable SANs to reduce hardware footprint and associated capital and operational expenses—all with outstanding scalability.

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.

Scalable expansion with outstanding investment protection

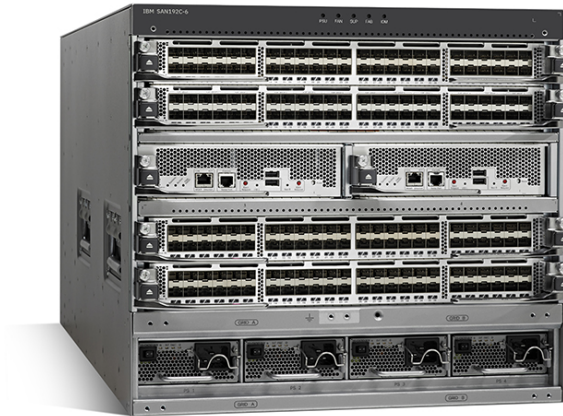
SAN192C-6 is designed to make optimal use of valuable data center floor space. It is 15.6 inches tall (9RU) and allows up to four SAN192C-6 Directors per standard 7-foot rack (42RU). A smaller footprint makes it an excellent candidate for deployment in smaller storage networks as well as pod-based converged data center infrastructure solutions for the cloud.

SAN192C-6 supports up to 192 ports in a 6-slot modular chassis, with up to 768 ports in a single rack. You can configure ports as 2/4/8 Gbps, 4/8/16 Gbps, or 8/16/32 Gbps Fibre Channel. SAN192C-6 supports the same Fibre Channel switching modules as IBM Storage Networking SAN768C-6 and IBM Storage Networking SAN384C-6 for a high degree of system commonality. Designed to grow with your storage environment, SAN192C-6 provides smooth migration, common sparing and outstanding investment protection.

Enterprise-class availability

SAN192C-6 is designed from the beginning for high availability. In addition to meeting the basic requirements of nondisruptive software upgrades and redundancy of all critical hardware components, SAN192C-6 software architecture offers outstanding availability.

SAN192C-6 provides redundancy on all major hardware components, including the supervisor and fabric modules as well as the power supplies. The Supervisor Module automatically restarts failed processes, making SAN192C-6 exceptionally robust. In the rare event that a supervisor module is reset, complete synchronization between the active and standby supervisor modules helps ensure stateful failover with no disruption of traffic.



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Business transformation with enterprise cloud deployment

Enterprise clouds provide organizations with elastic computing and network capabilities, enabling IT to scale resources up or down as needed in a quick and cost-efficient manner. SAN192C-6 provides industry-leading scalability and the following features for enterprise cloud deployments:

- Pay-as-you-grow flexibility to meet scalability needs in the cloud
- Robust security for multitenant cloud applications
- Predictable performance to meet stringent service level agreements (SLAs)
- Resilient connectivity for an always-on cloud infrastructure
- Advanced traffic management capabilities, such as quality of service (QoS), to rapidly and cost-efficiently allocate network capabilities to cloud applications

Furthermore, Data Center Network Manager provides resource monitoring and capacity planning on a per-virtual machine basis.¹

Integrated mainframe support

SAN192C-6 supports the FICON protocol in both cascaded and non-cascaded 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 IBM Family 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.

Comprehensive solution for robust security

SAN192C-6 offers an extensive security framework to protect highly sensitive data crossing today's enterprise storage networks. It 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. It also uses Fibre Channel Security Protocol (FC-SP) and TrustSec Fibre Channel link encryption mechanisms to provide comprehensive security for storage networks.

Investment protection with future readiness

The SAN192C-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.



¹ For more information, please refer to the [IBM Storage Networking SAN192C-6 Redbooks Product Guide](#)

SAN192C-6 Specifications

Model	8978-E04
Chassis slot configuration	<ul style="list-style-type: none"> • Line-card slots: 4 • Supervisor slots: 2 • Crossbar switching fabric slots: 6* • Fan trays: 3 fan trays at the back of the chassis • Power supply bays: 4
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
Dimensions (H x W x D)	<p>Chassis dimensions (9RU): 39.62 cm (15.6 in.) x 43.90 cm (17.3 in.) x 81.30 cm (32 in.)</p> <ul style="list-style-type: none"> • SAN192C-6 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.) • 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.) • Fan tray: 91.87 cm x 13.08 cm x 4.75 cm (36.17 in. x 5.15 in. x 1.87 in.) • SFP+: 1.25 cm x 1.36 cm x 5.65 cm (0.49 in. x 0.54 in. x 2.22 in.) • Chassis depth including cable management and chassis doors is 965.2 mm (38 in.) <p>Unit is rack mountable in a standard 482.6-mm (19-inch) EIA rack; unit is also 2-post rack mountable</p>
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), SAN192C-6 Fabric-1 Switching Module (#AJK9), Enterprise Package (#AJJ9), DCNM SAN Advanced Edition (#AJJA), Mainframe Package (#AJJB), small form-factor pluggables, fans*, AJN6 Supervisor-4 Module, AJN9 Fabric-3 Module
Weight	<ul style="list-style-type: none"> • Chassis only: 65.80 kg (145 lb) • Fully configured: 147.42 kg (325 lb) • 48-port 32-Gbps Fibre Channel line card: 7.94 kg (17.5 lb) • Fabric-1 module: 9.07 kg (20 lb) • Fan tray: 5.76 kg (12.7 lb) • Supervisor blank cover: 0.5 kg (1.1 lb) • Line-card blank cover: 2.04 kg (4.5 lb)
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 SAN192C-6 Redbooks Product Guide](#)



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 recognized industry leadership—are just a few of the reasons to consider storage solutions from IBM. In addition, IBM delivers some of the best storage products, technologies, services and solutions in the industry without the complexity of dealing with different hardware and software vendors.

For more information

To learn more about IBM Storage Networking SAN192C-6 Multilayer Director, please contact your IBM representative or IBM Business Partner, or visit:

ibm.com/systems/storage/san/ctype/9706/

To download the IBM Storage Networking SAN192C-6 Multilayer Director Redbooks Product Guide, please visit:

<http://www.redbooks.ibm.com/abstracts/tips1362.html?Open>

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