IBM System Networking SAN24B-5 delivers a 16 Gbps next generation Fibre Channel Switch for private cloud storage

Table of contents

At a glance

IBM® System Networking SAN24B-5 16 Gbps optimized cloud storage networking Fibre Channel (FC) switch offers the following capabilities:

- Twenty-four 16 Gbps FC ports supporting 2, 4, 8, and 16 Gbps speeds
- Scalable Ports on Demand (PoD) configuration from 12 to 24 ports to accommodate various sizes of SAN fabric environments
- Small footprint and low energy consumption in 1U
- Easy to use three-step deployment with EZSwitchSetup
- Integrated management with the IBM Network Advisor Version 11

For ordering, contact your IBM representative, an IBM Business Partner, or IBM Americas Call Centers at 800-IBM-CALL (Reference: YE001).

Overview

The SAN24B-5 is designed to meet the demands of highly virtualized, private cloud storage environments by delivering an entry-level switch with 16 Gbps FC technology and enterprise-class functionality. The following SAN24B-5 features enable maximum flexibility and investment protection:

- Up to twenty-four 16 Gbps ports in an energy-efficient, 1U form factor
- PoD capability for scaling from 12 to 24 ports in 12-port increments
- 2, 4, 8, or 16 Gbps on all ports producing an aggregate up to 384 Gbps full-duplex throughput
- 16 Gbps optimized Inter-Switch Links (ISLs) with trunking of any eight ports for 128 Gbps ISL

- Exchange-based Dynamic Path Selection (DPS) optimizes fabric-wide performance and load balancing by automatically routing data to the most efficient and available path in the fabric
- Server connectivity and SAN scalability by offering dual functionality as either a full-fabric SAN switch or an NPIV-enabled Brocade Access Gateway

SAN24B-5 delivers SAN technology within a flexible, simple, and easy-to-use solution. In addition to providing scalability, SAN24B-5 can address demanding reliability, availability, and serviceability requirements to help minimize downtime to support mission-critical cloud environments with:

- Simple configuration through EZSwitchSetup wizard
- Diagnostic Port (D-Port) feature for physical media diagnostic, troubleshooting, and verification services
- Resiliency with nondisruptive software upgrades and an optional redundant power supply
- Streamlined deployment and troubleshooting time with dynamic fabric provisioning, critical monitoring, and advanced diagnostic features

Key prerequisites

The IBM System Networking SAN b-type switch family supports FC connectivity for servers and storage. SAN24B-5 supports all features and functions as indicated in this announcement and require Fabric OS level 7.0.1, and later.

For a list of supported servers and storage systems, refer to the Hardware requirements section.

Planned availability date

May 25, 2012.

Description

IBM System Networking SAN24B-5 is a 24-port auto-sensing 2, 4, 8, or 16 Gbps FC switch delivering the next generation of single-chip architecture for storage area networks (SANs). With flexible PoD capability, the SAN24B-5 provides an entry-level switch as the foundation of a SAN with the ability to grow with an organization's SAN needs.

The SAN24B-5 is 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 (SSDs). The SAN24B-5 also supports multi-tenancy in cloud environments through Quality of Service (QoS) and fabric-based zoning features.

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 N_Port ID Virtualization (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. The SAN24B-5 in Access Gateway mode, supported only in 24-port configurations, can connect servers to NPIV-enabled IBM SAN b-type switches and other SAN fabrics.

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

- Critical diagnostic and monitoring capabilities to help ensure early problem detection and recovery
- Non-intrusive and nondisruptive monitoring on every port to provide a comprehensive end-to-end view of the entire fabric
- Forward error correction (FEC) to recover from bit errors in 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
- An optional second power supply to enable dual power redundancy enhances availability

Based on seventh-generation ASIC technology, IBM System Networking SAN24B-5 is designed with the following attributes:

- Up to 24 ports 16 Gbps Fibre Channel technology with PoD scaling from 12 to 24 ports
- Twenty-four nonblocking FC ports that may be used to connect to external N_ports (as an F_port), Mirror Ports (as an M_port), or to other FC switches as an E_port
- Each port can operate at 2, 4, 8, or 16 Gbps link speed
- Port-to-port latency is minimized down to 700 nanoseconds through the use of cut-through frame routing at 16 Gbps
- ISL trunking allows up to eight ports (at 2, 4, 8, or 16 Gbps speeds) between a pair of switches to be combined to form a single, logical ISL with a speed of up to 128 Gbps (256 Gbps full duplex) for optimal bandwidth utilization and load balancing
- Dynamic path selection optimizes fabric-wide performance and load balancing by automatically routing data to the most efficient path available in the fabric
- Access Gateway mode enables seamless connectivity into heterogeneous SAN environments, enhances scalability, and simplifies manageability to provide a single platform for all SAN connectivity
- New Diagnostic port (D-port) type in FOS v7.0 to quickly identify and isolate problems associated with the link, such as transceivers and cables

  Note: This feature is only supported on 16 Gbps ports with a 16 Gbps Transceiver. The D-port is statically configured by the user with the intention to run diagnostic tests. A D-port does not carry any control or data traffic and is purely used for link diagnostics purposes and to isolate link level faults.
- Enhanced RAS with extensive diagnostics and system monitoring capabilities
- An RJ45 Ethernet management port, in conjunction with EZSwitchSetup, supports switch IP address discovery and configuration, eliminating the need to attach a serial cable to configure the switch IP address and greatly increasing the ease of use

The SAN24B-5 (2499-X24) base system requires Fabric OS v7.0.1, and later. It is always enabled with the following features:

- Advanced web tools: Enables administration, configuration, and maintenance of fabric switches and SANs
- Zoning: Segments a fabric into virtual private SANs
- Enhanced Group Management (EGM): Enables additional device-level management functionality for IBM b-type products (for example, firmware download, configuration upload, and download)
- Full fabric: Enables E_Ports; the switch cannot be connected to another switch until Full Fabric is installed

Optional features

The SAN24B-5 switch is designed to be easily upgradeable with a low incremental cost by using its PoD capability of 12 to 24 ports and optional features. Advanced capabilities can be enabled with the following optional activation features:

Fabric Watch (#7202, #45W0504): Monitors mission-critical switch operations.

Extended Fabric (#7203, #45W0505): Extended Fabric Activation extends SAN fabrics beyond the FC standard 10 km by optimizing the internal switch buffers to help maintain performance on ISLs at distances up to 500 km.

Advanced Performance Monitor (#7204, #45W0508): Performance monitoring activation provides performance monitoring capabilities to help identify end-to-end bandwidth usage by host and target pairs, delivering information for capacity planning.

Trunking Activation (#7205, #45W0509): ISL Trunking Activation is designed to enable FC packets to be efficiently distributed across multiple Inter-Switch connections (links) between two SAN b-type fabric switches, while preserving in-order delivery. Both SAN b-type fabric switches must have ISL Trunking activated. ISL Trunking allows up to 8 ports (at 2, 4, 8, or 16 Gbps) between each pair of switches to be combined to form a single, logical ISL with a speed of up to 128 Gbps ISL trunks. The trunking groups are based on the user port number, with the contiguous eight ports as one group. When connecting the 16 Gbps-capable models to legacy 2, 4, or 8 Gbps-capable b-type fabric switch models, ISL trunking is supported with link speeds operational at the lowest speed and FC packets distributed across ISLs for a combined bandwidth of up to 8, 64, or 128 Gbps.

Adaptive Networking (#7206, #45W0510): Adaptive Networking provides a set of capabilities allowing high-priority connections to obtain the bandwidth necessary for optimum performance, even in congested environments. Ingress rate limiting limits the throughput on the ingress side of the port by delaying the return of buffer to buffer credits to the external device features, and are components of this license option available on all 16 Gbps platforms.

Server Application Optimization (SAO) (#7210, #45W7553): The SAO feature is designed to enhance overall performance and virtual machine scalability by extending b-type data center fabric technologies to the server infrastructure. SAO enables individual traffic flows to be specifically configured, prioritized, and optimized from end-to-end throughout the data center. The solution offered with IBM b-type 8 and 16 Gbps capable switches and directors support three QoS levels (low, medium, and high) to deliver end-to-end service levels. The bandwidth allocation from application and HBA port through the b-type fabric uses VC technology, creating logical links from the physical or virtual HBA port (NPIV) to the corresponding switch port. SAO and Adaptive Networking features must be both activated on the SAN switches.

12-port activation (#7212, #98Y2203): The SAN24B-5 switch ships with the first 12 ports activated in the base product, with an additional increment of 12 ports that can be enabled on demand. Additional port activation is available with this optional feature to enable additional 12 to 24 ports. The port activation feature does not include fiber optic transceivers; however, all activated ports must be populated with transceivers.

SAN24B-5 Enterprise package (#7211, #98Y2199): The SAN24B-5 Enterprise Package offers a convenient method to order a set of optional features bundled into one orderable feature number. Feature #7211 consists of one of each Fabric Watch (#7202), Advanced Performance Monitor (#7204), Trunking Activation (#7205), Adaptive Networking (#7206), SAO (#7210), and 12-port Activations (#7212).

SAN24B-5 Firmware upgrade renewal, one year (#7722, #98Y2208): The initial purchase of an IBM System Networking SAN24B-5 includes one year of firmware upgrade entitlement. This feature provides one additional year of renewal for upgrades included in future releases of the FOS firmware. You are not eligible to access new features and functions without the purchase of this feature.

SAN24B-5 Firmware upgrade renewal, two years (#7723, #98Y2212): The initial purchase of an IBM System Networking SAN24B-5 includes one year of firmware upgrade entitlement. This feature provides two additional years of renewal

for upgrades included in future releases of the FOS firmware. You are not eligible to access new features and functions without the purchase of this feature.

Mid-mount TELCO rack kit (#5911, #98Y2189): Enables installation of a SAN24B-5 in a Telco rack.

SAN24B-5 Power Supply / Fan Kit (#5998, #98Y2193): One AC power supply ships with the SAN24B-5 switch. The system accommodates two power supplies; one required and one redundant.

Accessibility by people with disabilities

A US Section 508 Voluntary Product Accessibility Template (VPAT) containing details on accessibility compliance can be requested at

http://www.ibm.com/able/product_accessibility/index.html

Product number

The following are the newly announced model and features of the IBM System Networking SAN24B-5:

Description	Machine type	Model	Feature
IBM System Networking SAN24B-5	2498	X24	
TMF Routing Code SJ	2498	X24	0991
SEO Routing Code SJ	2498	X24	0992
SEO Routing Code	2498	X24	0996
TAA Compliant Order	2498	X24	8067
IBM Smart Analytics 5700	2498	X24	A2VZ
SFP+ 16 Gbps SW	2498	X24	2601
SFP+ 16 Gbps SW 8-Pack	2498	X24	2608
SFP+ 16 Gbps 10 km LW	2498	X24	2611
SFP+ 16 Gbps 10 Km LW 8-Pack	2498	X24	2618
SFP+ 8 Gbps SW	2498	X24	2802
SFP+ 8 Gbps SW 8-Pack	2498	X24	2809
SFP 8 Gbps 10 km LW	2498	X24	2821
SFP 8 Gbps 10 km LW 8-Pack	2498	X24	2828
SFP 8 Gbps 25 km ELW	2498	X24	2881
LC/LC 5 m 50U	2498	X24	5605
LC/LC 25 m 50U	2498	X24	5625
LC/LC 31 m 9U	2498	X24	5721
OM3 Cable LC/LC 10 m	2498	X24	5810
Mid-mount Telco Rack Kit	2498	X24	5911
SAN24B-5 Power Supply/Fan Kit	2498	X24	5998
Fabric Watch	2498	X24	7202
Extended Fabric	2498	X24	7203
Advanced Performance Monitor	2498	X24	7204
Trunking Activation	2498	X24	7205
Adaptive Networking	2498	X24	7206
Server App Optimization	2498	X24	7210
SAN24B-5 Enterprise Package	2498	X24	7211
12 Port Activation	2498	X24	7212
SAN24B-5 FW Upgr Renewal, 1Yr	2498	X24	7722
SAN24B-5 FW Upgr Renewal, 2Yr	2498	X24	7723
Desktop Install Power Cord	2498	X24	9205
Linecord, US, Canada,	2498	X24	9800
Linecord, France	2498	X24	9820
Linecord, Denmark	2498	X24	9821
Linecord, UK	2498	X24	9825
Linecord, Israel	2498	X24	9827
Linecord, Switzerland	2498	X24	9828
Linecord, South Africa	2498	X24	9829
Linecord, Italy	2498	X24	9830
Linecord, Australia, NZ	2498	X24	9831
Linecord, Uruguay	2498	X24	9834

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Linecord, China                             2498      X24   9840
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Single Entity Offerings (SEOs)

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                                       Machine          SEO
Description                            type     Model   number

IBM System Networking SAN24B-5         2498     X24     249824G

IBM Smart Analytics 5700               2498     X24     00W0001 *
SFP+ 16 Gbps SW                        2498     X24     98Y2176
SFP+ 16 Gbps SW 8-Pack                 2498     X24     98Y2177
SFP+ 16 Gbps 10 km LW                  2498     X24     98Y2178
SFP+ 16 Gbps 10 Km LW 8-Pack           2498     X24     98Y2179
SFP+ 8 Gbps SW                         2498     X24     98Y2182
SFP+ 8 Gbps SW 8-Pack                  2498     X24     98Y2183
SFP 8 Gbps 10 km LW                    2498     X24     45W1216 *
SFP 8 Gbps 10 km LW 8-Pack             2498     X24     45W1218 *
SFP 8 Gbps 25 km ELW                   2498     X24     45W2283 *
LC/LC 5 m 50U                          2498     X24     39M5697 *
LC/LC 25 m 50U                         2498     X24     39M5698 *
LC/LC 31 m 9U                          2498     X24     22R0488 *
OM3 Cable LC/LC 10 m                   2498     X24     45W2282 *
Mid-mount Telco Rack Kit               2498     X24     98Y2189
SAN24B-5 Power Supply/Fan Kit          2498     X24     98Y2193
Fabric Watch                           2498     X24     45W0504 *
Extended Fabric                        2498     X24     45W0505 *
Advanced Performance Monitor           2498     X24     45W0508 *
Trunking Activation                    2498     X24     45W0509 *
Adaptive Networking                    2498     X24     45W0510 *
Server App Optimization                2498     X24     45W7553 *
SAN24B-5 Enterprise Package            2498     X24     98Y2199
12 Port Activation                     2498     X24     98Y2203
SAN24B-5 FW Upgr Renewal, 1Yr          2498     X24     98Y2208
SAN24B-5 FW Upgr Renewal, 2Yr          2498     X24     98Y2212
Linecord, US, Canada,                  2498     X24     39Y7931 *
Linecord, France                       2498     X24     39Y7917 *
Linecord, Denmark                      2498     X24     39Y7918 *
Linecord, UK                           2498     X24     39Y7923 *
Linecord, Israel                       2498     X24     39Y7920 *
Linecord, Switzerland                  2498     X24     39Y7919 *
Linecord, South Africa                 2498     X24     39Y7922 *
Linecord, Australia, NZ                2498     X24     39Y7924 *
Linecord, Brazil                       2498     X24     39Y7929 *
Linecord, Uruguay                      2498     X24     39Y7930 *
Linecord, China                        2498     X24     39Y7928 *
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* Note: These SEOs have been previously announced on other
machine-type models
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Business Partner information

If you are a Direct Reseller - System Reseller acquiring products from IBM, you may link directly to Business Partner information for this announcement. A PartnerWorld ID and password are required (use IBM ID).

https://www.ibm.com/partnerworld/mem/sla.jsp?num=112-062

Publications

The following publications are shipped with the product.

Additional copies of individual publications are available at

http://www.ibm.com/systems/storage/san

Title	Order number	Availability date
IBM System Networking SAN24B-5 Installation, Service, and User Guide	GA32-2213	04/24/12
IBM System Networking SAN24B-5 Quick Start Guide	GA32-2214	04/24/12

Services

Global Technology Services

IBM services include business consulting, outsourcing, hosting services, applications, and other technology management.

These services help you learn about, plan, install, manage, or optimize your IT infrastructure to be an On Demand Business. They can help you integrate your high-speed networks, storage systems, application servers, wireless protocols, and an array of platforms, middleware, and communications software for IBM and many non-IBM offerings. IBM is your one-stop shop for IT support needs.

For details on available services, contact your IBM representative or visit

http://www.ibm.com/services/

For details on available IBM Business Continuity and Recovery Services, contact your IBM representative or visit

http://www.ibm.com/services/continuity

For details on education offerings related to specific products, visit

http://www.ibm.com/services/learning/index.html

Select your country, and then select the product as the category.

System x and BladeCenter support services

Recommended core technical support

When you buy IBM System x® technology, include the support services you need - to help keep both your hardware and software working for you, day after day, at peak performance. It's your first step toward helping to protect your investment and sustain high levels of system availability. We offer service-level and response-time options to fit your business needs. And we'll help you get started with a core support package that includes:

- **Continuous system monitoring**

  Electronic monitoring that helps speed up problem-solving with automated, early detection of potential problems and system errors.

- **Hardware maintenance**

  World-class remote and on-site hardware problem determination and repair services.

- **Software technical support**

  Access to help line calls for fast, accurate answers to your questions during installation and throughout ongoing operations.

For more information, visit

http://www.ibm.com/servers/eserver/xseries/services.html

Technical information

Specified operating environment

Physical specifications

- Width: 43.8 cm (17.24 in)
- Depth: 4.3 cm (1.7 in)
- Height 44.3 cm (17.44 in)
- Weight: 9.16 kg (20.2 lb)

For information about technical specifications of IBM SAN b-type products, including operating environment, physical specifications, and recommended installation procedures, refer to

  http://www.ibm.com/systems/storage/san/b-type

Operating environment

249824G

- Temperature
  - Operating: 0° to 40° C (32° to 104° F)
  - Non-operating: -25° to 70° C (-13° to 158° F)
- Humidity operating: 10% to 85%, noncondensing at 40° C (104° F)
- Humidity non-operating: 10% to 90%, noncondensing at 70° C (158° F)
- Operating altitude: 0 to 3,000 m (0 to 10,000 ft)
- Storage altitude: Up to 12 km (40,000 ft)
- Operating shock: 20 G, 6 ms half-sine
- Non-operating shock: 33 G, 11 ms half-sine
- Vibration operating: 0.5 g sine, 5 to 500 Hz
- Non-operating vibration: 2 g sine, 5 to 500 Hz
- Airflow high-speed: 350 cu ft/min (.00059 cu m/hr)
- Input voltage: 85 to 264 V ac, single phase
- Frequency: 47 to 63 Hz
- Power consumption: 80 W with all 24 ports populated with 16 Gbps SWL optics

EMC conformance

- ANSI C63.4 (United States)
- ICES-003 Class A (Canada)
- CISPR22 and JEIDA (Japan)
- EN55022, EN55024 (European Community)
- EN55022, or CISPR22, or AS/NZS CISPR22 (Australia/New Zealand)
- KN22 and KN24 (Korea)
- 51318.22-99, and 51318.24.99 or latest (Russian Federation)
- GB17625.1-2003, or latest (China, PS only)
- CNS 13438(95) or latest (Taiwan, PS only)

Product Safety, country testing, and certification

- Bi-Nat UL/CSA 60950-1 1st Edition or latest (United States, Canada)
- CSA Certification to CSA 60950-1-03 (Canadian Standards Association)
- IEC60950-1 or latest (Argentina and Russian Federation)

- GB4943-2001 and GB9254-1998 or latest (China)
- CNS 14336(99) or latest (Taiwan)
- cCSAus (United States and Canada)
- TUV-GS (European Union)
- "S" Mark (Argentina)
- GOST mark (Russia)
- CCC logo (China)
- BSMI mark (Taiwan)
- KC mark (Korea)

Hardware requirements

Supported servers and storage systems

IBM System Networking SAN24B-5 is designed to support FC connectivity for the following:

Servers

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

Storage software

- IBM TotalStorage SAN Volume Controller (SVC)

Storage systems

- IBM System Storage® DS8000®
- IBM XIV® Storage System
- IBM System Storage DS5000
- IBM System Storage DS3500
- IBM Storwize® V7000 Unified Storage
- 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

For specific support dates, configuration options, server models, operating systems levels, attachment capabilities, and throughput connectivity speeds, visit

   http://www.ibm.com/systems/storage/san/b-type

Software requirements

Specific details on supported operating system releases are available at

   http://www.ibm.com/systems/storage/san/b-type

Compatibility

The IBM System Networking SAN24B-5 switch is compatible with the following options:

Description	Machine type	Model	Part number
IBM System Networking SAN24B-5	2498	24G	249824G
IBM Smart Analytics 5700			00W0001
SFP+ 16 Gbps SW			98Y2176
SFP+ 16 Gbps SW 8-Pack			98Y2177
SFP+ 16 Gbps 10 km LW			98Y2178
SFP+ 16 Gbps 10 Km LW 8-Pack			98Y2179
SFP+ 8 Gbps SW			98Y2182
SFP+ 8 Gbps SW 8-Pack			98Y2183
SFP 8 Gbps 10 km LW			45W1216
SFP 8 Gbps 10 km LW 8-Pack			45W1218
SFP 8 Gbps 25 km ELW			45W2283
LC/LC 5 m 50U			39M5697
LC/LC 25 m 50U			39M5698
LC/LC 31 m 9U			22R0488
OM3 Cable LC/LC 10 m			45W2282
Mid-mount Telco Rack Kit			98Y2189
SAN24B-5 Power Supply/Fan Kit			98Y2193
Fabric Watch			45W0504
Extended Fabric			45W0505
Advanced Performance Monitor			45W0508
Trunking Activation			45W0509
Adaptive Networking			45W0510
Server App Optimization			45W7553
SAN24B-5 Enterprise Package			98Y2199
12 Port Activation			98Y2203
SAN24B-5 FW Upgr Renewal, 1Yr			98Y2208
SAN24B-5 FW Upgr Renewal, 2Yr			98Y2212
Linecord, US, Canada,			39Y7931
Linecord, France			39Y7917
Linecord, Denmark			39Y7918
Linecord, UK			39Y7923
Linecord, Israel			39Y7920
Linecord, Switzerland			39Y7919
Linecord, South Africa			39Y7922
Linecord, Australia, NZ			39Y7924
Linecord, Brazil			39Y7929
Linecord, Uruguay			39Y7930
Linecord, Korea			39Y7925
Linecord, Japan			39Y7926
Linecord, India			39Y7927
Linecord, China			39Y7928

Planning information

Customer responsibilities

Planning information, including customer responsibilities, physical planning, and installability is available in the specific product planning manuals at

http://www.ibm.com/systems/storage/san/b-type

You are responsible for downloading or obtaining from IBM , and installing designated Machine Code (microcode, basic input/output system code (called BIOS), utility programs, device drivers, and diagnostics delivered with an IBM machine) and other software updates in a timely manner from an IBM Internet website or from other electronic media, and following the instructions that IBM provides. You may request IBM to install Machine Code changes; however, you may be charged for that service.

Cable orders

Fiber optic cable: A fiber optic cable is required for attaching the SAN248B-5 to the host system adapter or other storage area FC components. The cable can be customer supplied or ordered with the 2498-X24 system in the lengths available. The attaching fiber cable must be 62.5/125 micron (OM1) for distances up to

150 meters at 2 Gbps speed, 70 meters at 4 Gbps, 21 meters at 8 Gbps, 33 m at 10 Gbps, or 15 m at 16 Gbps. The attaching fiber cable must be 50.0/125 micron (OM2) for distances up to 300 meters at 2 Gbps speed, 150 meters at 4 Gbps, 50 meters at 8 Gbps, or 35 m at 16 Gbps. The attaching fiber cable must be 50.0 micron (OM3) for distances up to 150 meters at 8 Gbps, or 100 m at 16 Gbps. Longwave transceivers require 9 micron single-mode fiber optic cables. The connection is an LC connector type.

In many situations, the lengths and installation of fiber optic cables required will be unique to each customer's configuration and facility specifications. Product support services offered by IBM Global Services' Site and Connectivity Solutions can provide assistance for these unique cabling and installation requirements.

Packaging

Product	Shipment group	Number of boxes
249824G	IBM System Networking SAN24B-5	1
00W0001	IBM Smart Analytics 5700	1
98Y2176	SFP+ 16 Gbps SW	1
98Y2177	SFP+ 16 Gbps SW 8-Pack	1
98Y2178	SFP+ 16 Gbps 10 km LW	1
98Y2179	SFP+ 16 Gbps 10 Km LW 8-Pack	1
98Y2182	SFP+ 8 Gbps SW	1
98Y2183	SFP+ 8 Gbps SW 8-Pack	1
45W1216	SFP 8 Gbps 10 km LW	1
45W1218	SFP 8 Gbps 10 km LW 8-Pack	1
45W2283	SFP 8 Gbps 25 km ELW	1
39M5697	LC/LC 5 m 50U	1
39M5698	LC/LC 25 m 50U	1
22R0488	LC/LC 31 m 9U	1
45W2282	OM3 Cable LC/LC 10 m	1
98Y2189	Mid-mount Telco Rack Kit	1
98Y2193	SAN24B-5 Power Supply/Fan Kit	1
45W0504	Fabric Watch	1
45W0505	Extended Fabric	1
45W0508	Advanced Performance Monitor	1
45W0509	Trunking Activation	1
45W0510	Adaptive Networking	1
45W7553	Server App Optimization	1
98Y2199	SAN24B-5 Enterprise Package	1
98Y2203	12 Port Activation	1
98Y2208	SAN24B-5 FW Upgr Renewal, 1Yr	1
98Y2212	SAN24B-5 FW Upgr Renewal, 2Yr	1
39Y7931	Linecord, US, Canada,	1
39Y7917	Linecord, France	1
39Y7918	Linecord, Denmark	1
39Y7923	Linecord, UK	1
39Y7920	Linecord, Israel	1
39Y7919	Linecord, Switzerland	1
39Y7922	Linecord, South Africa	1
39Y7924	Linecord, Australia, NZ	1
39Y7929	Linecord, Brazil	1
39Y7930	Linecord, Uruguay	1
39Y7925	Linecord, Korea	1
39Y7926	Linecord, Japan	1
39Y7927	Linecord, India	1
39Y7928	Linecord, China	1

Security, auditability, and control

The customer is responsible for evaluation, selection, and implementation of security features, administrative procedures, and appropriate controls in application systems and communications facilities.

Terms and conditions

Volume orders: Contact your IBM representative.

IBM Global Financing

Yes

To obtain copies of the IBM Statement of Limited Warranty, contact your reseller or IBM .

In the United States, call 800-IBM-SERV (426-7378), or write to:

Warranty Information
P.O. Box 12195
Research Triangle Park, NC 27709
Attn: Dept JDJA/B203

Warranty period

- One year
- Optional features - One year

Optional IBM features initially installed in an IBM machine carry the same warranty period as the machine. If installed after the initial machine installation, they carry the balance of the machine warranty or the optional feature warranty, whichever is greater.

Warranty service

If required, IBM provides repair or exchange service depending on the type of warranty service specified below for the machine. IBM will attempt to resolve your problem over the telephone or electronically by access to an IBM website. You must follow the problem determination and resolution procedures that IBM specifies. Scheduling of service will depend upon the time of your call and is subject to parts availability. Service levels are response-time objectives and are not guaranteed. The specified level of warranty service may not be available in all worldwide locations. Additional charges may apply outside IBM's normal service area. Contact your local IBM representative or your reseller for country- and location-specific information.

The type of service is Customer Replaceable Unit (for example, keyboard, mouse, speaker, memory, or hard disk drive) Service and On-site Service.

CRU and On-site Service

Customer Replaceable Unit (CRU) Service

IBM provides a replacement CRU to you for you to install. CRU information and replacement instructions are shipped with your machine and are available from IBM at any time on your request. A CRU is designated as being either a Tier 1 or a Tier 2 CRU. Installation of a Tier 1 CRU is your responsibility. If IBM installs a Tier 1 CRU, at your request, you will be charged for the installation. You may install a Tier 2 CRU yourself or request IBM to install it, at no additional charge, under the type of warranty service specified below, On-site Service.

Based upon availability, a CRU will be shipped for next business day (NBD) delivery. IBM specifies in the materials shipped with a replacement CRU whether a defective CRU must be returned to IBM . When return is required, return instructions and a container are shipped with the replacement CRU, and you may be charged for the replacement CRU if IBM does not receive the defective CRU within 15 days of your receipt of the replacement.

The following have been designated as a Tier 1 CRU:

- Fiber optic cables
- SFPs
- Service kit
- Slide mounting kit
- PDU cord, jumper, 2.8 m
- Power supply/fan assembly

On-site Service

This provides On-site Repair, 9 hours per day, Monday through Friday excluding holidays, NBD response. IBM or your reseller will repair the failing machine at your location and verify its operation. You must provide a suitable working area to allow disassembly and reassembly of the IBM machine. The area must be clean, well-lit, and suitable for the purpose. On-site Service is not available in all countries, and some countries have kilometer or mileage limitations from an IBM service center. In those locations where On-site Service is not available, the normal in-county service delivery is used.

Call IBM at 1-800-IBM-SERV (426-7378) to assist with problem isolation for hardware to determine if warranty service is required. Telephone support may be subject to additional charges, even during the limited warranty period.

Calls must be received by 5:00 p.m. local time in order to qualify for NBD service.

Licensing

Programs included with this product are licensed under the terms and conditions of the License Agreements that are shipped with the system.

Maintenance services

ServicePac , ServiceSuite , ServiceElect, and ServiceElite

ServicePac® , ServiceSuite® , ServiceElect, and ServiceElite provide hardware warranty service upgrades, maintenance, and selected support services in one agreement.

Warranty service upgrade

During the warranty period, a warranty service upgrade provides an enhanced level of On-site Service for an additional charge. A warranty service upgrade must be purchased during the warranty period and is for a fixed term (duration). It is not refundable or transferable and may not be prorated. If required, IBM will provide the warranty service upgrade enhanced level of On-site Service acquired by the customer. Service levels are response-time objectives and are not guaranteed.

IBM will attempt to resolve your problem over the telephone or electronically by access to an IBM website. You must follow the problem determination and resolution procedures that IBM specifies. Scheduling of service will depend upon the time of your call and is subject to parts availability.

CRUs will be provided as part of the machine's standard warranty CRU Service except that you may install a Tier 1 CRU yourself or request IBM installation, at no additional charge, under one of the On-site Service levels specified below.

IBM will repair the failing machine at your location and verify its operation. You must provide a suitable working area to allow disassembly and reassembly of the IBM machine. The area must be clean, well-lit, and suitable for the purpose.

See the Pricing section for specific offerings.

Maintenance service

If required, IBM provides repair or exchange service depending on the type of maintenance service specified below for the machine. IBM will attempt to resolve your problem over the telephone or electronically by access to an IBM website. You must follow the problem determination and resolution procedures that IBM specifies. Scheduling of service will depend upon the time of your call and is subject to parts availability. Service levels are response-time objectives and are not guaranteed.

CRU Service

If your problem can be resolved with a CRU (for example, keyboard, mouse, speaker, memory, or hard disk drive), IBM will ship the CRU to you for you to install. CRU information and replacement instructions are shipped with your machine and are available from IBM at any time on your request.

IBM specifies in the materials shipped with a replacement CRU whether a defective CRU must be returned to IBM . When return is required, return instructions and a container are shipped with the replacement CRU, and you may be charged for the replacement CRU if IBM does not receive the defective CRU within 15 days of your receipt of the replacement.

On-site Service

IBM will repair the failing machine at your location and verify its operation. You must provide a suitable working area to allow disassembly and reassembly of the IBM machine. The area must be clean, well-lit, and suitable for the purpose.

See the Pricing section for specific offerings.

Maintenance service (ICA)

Maintenance services are available for ICA legacy contracts.

Alternative service (warranty service upgrades)

During the warranty period, a warranty service upgrade provides an enhanced level of On-site Service for an additional charge. A warranty service upgrade must be purchased during the warranty period and is for a fixed term (duration). It is not refundable or transferable and may not be prorated. If required, IBM will provide the warranty service upgrade enhanced level of On-site Service acquired by the customer. Service levels are response-time objectives and are not guaranteed.

IBM will attempt to resolve your problem over the telephone or electronically by access to an IBM website. You must follow the problem determination and resolution procedures that IBM specifies. Scheduling of service will depend upon the time of your call and is subject to parts availability.

A CRU will be provided as part of the machine's standard warranty CRU Service except that you may install a Tier 1 CRU yourself or request IBM to install it, at no additional charge, under the type of warranty service specified below, On-site Service.

IBM will repair the failing machine at your location and verify its operation. You must provide a suitable working area to allow disassembly and reassembly of the IBM machine. The area must be clean, well-lit, and suitable for the purpose.

See the Pricing section for specific offerings.

Maintenance service

If required, IBM provides repair or exchange service depending on the type of maintenance service specified below for the machine. IBM will attempt to resolve your problem over the telephone or electronically by access to an IBM website. You must follow the problem determination and resolution procedures that IBM specifies.

Scheduling of service will depend upon the time of your call and is subject to parts availability. Service levels are response-time objectives and are not guaranteed.

CRU Service

If your problem can be resolved with a CRU (for example, keyboard, mouse, speaker, memory, or hard disk drive), IBM will ship the CRU to you for you to install. CRU information and replacement instructions are shipped with your machine and are available from IBM at any time on your request.

IBM specifies in the materials shipped with a replacement CRU whether a defective CRU must be returned to IBM . When return is required, return instructions and a container are shipped with the replacement CRU, and you may be charged for the replacement CRU if IBM does not receive the defective CRU within 15 days of your receipt of the replacement.

On-site Service

IBM will repair the failing machine at your location and verify its operation. You must provide a suitable working area to allow disassembly and reassembly of the IBM machine. The area must be clean, well-lit, and suitable for the purpose.

See the Pricing section for specific offerings.

Non-IBM parts support

Warranty service

IBM is now shipping machines with selected non-IBM parts that contain an IBM field replaceable unit (FRU) part number label. These parts are to be serviced during the IBM machine warranty period. IBM is covering the service on these selected non-IBM parts as an accommodation to their customers, and normal warranty service procedures for the IBM machine apply.

Warranty service upgrades and maintenance services

Under certain conditions, IBM Integrated Technology Services repairs selected non-IBM parts at no additional charge for machines that are covered under warranty service upgrades or maintenance services.

IBM Service provides hardware problem determination on non-IBM parts (for example, adapter cards, PCMCIA cards, disk drives, or memory) installed within IBM machines covered under warranty service upgrades or maintenance services and provides the labor to replace the failing parts at no additional charge.

If IBM has a Technical Service Agreement with the manufacturer of the failing part, or if the failing part is an accommodations part (a part with an IBM FRU label), IBM may also source and replace the failing part at no additional charge. For all other non-IBM parts, customers are responsible for sourcing the parts. Installation labor is provided at no additional charge, if the machine is covered under a warranty service upgrade or a maintenance service.

IBM Hourly Service Rate Classification

Two

Warranty service upgrades

IBM hourly service rate classification

Two

Field-installable features

Yes

Model conversions

No

Machine installation

Customer setup. Customers are responsible for installation according to the instructions IBM provides with the machine.

Graduated program license charges apply

No

Licensed machine code

IBM System Networking SAN b-type (Brocade) family of products are licensed for use by a customer on IBM machine for which it was provided by Brocade under the terms and conditions of the Brocade user License Agreement, to enable a specific machine to function in accordance with its specifications, and only for the capacity authorized by IBM and acquired by the customer. You can obtain the agreement by contacting your IBM representative.

IBM may release changes to the licensed machine code. IBM plans to make the licensed machine code changes available for download from IBM technical support at

   http://www.ibm.com/servers/storage/san/b_type/library.html

If the machine does not function as warranted and your problem can be resolved through your application of downloadable licensed machine code, you are responsible for downloading and installing these designated licensed machine code changes as IBM specifies. If you would prefer, you may request IBM to install the downloadable licensed Machine code changes; however, you may be charged for that service.

Educational allowance

None

Pricing

Product charges

Description	Machine type	Model	Feature	Fld inst only	Plt inst only
IBM System Networking SAN24B-5	2498	X24			
TMF Routing Code SJ	2498	X24	0991	N	Y
SEO Routing Code SJ	2498	X24	0992	N	Y
SEO Routing Code	2498	X24	0996	N	Y
TAA Compliant Order	2498	X24	8067	N	Y
IBM Smart Analytics 5700	2498	X24	A2VZ	N	Y
SFP+ 16 Gbps SW	2498	X24	2601	N	N
SFP+ 16 Gbps SW 8-Pack	2498	X24	2608	N	N
SFP+ 16 Gbps 10 km LW	2498	X24	2611	N	N
SFP+ 16 Gbps 10 Km LW 8-Pack	2498	X24	2618	N	N
SFP+ 8 Gbps SW	2498	X24	2802	N	N
SFP+ 8 Gbps SW 8-Pack	2498	X24	2809	N	N
SFP 8 Gbps 10 km LW	2498	X24	2821	N	N
SFP 8 Gbps 10 km LW 8-Pack	2498	X24	2828	N	N

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SFP 8 Gbps 25 km ELW          2498   X24   2881      N    N
LC/LC 5 m 50U                 2498   X24   5605      N    N
LC/LC 25 m 50U                2498   X24   5625      N    N
LC/LC 31 m 9U                 2498   X24   5721      N    N
OM3 Cable LC/LC 10 m          2498   X24   5810      N    N
Mid-mount Telco Rack Kit      2498   X24   5911      N    N
SAN24B-5 Power Supply/Fan Kit 2498   X24   5998      N    N
Fabric Watch                  2498   X24   7202      N    N
Extended Fabric               2498   X24   7203      N    N
Advanced Performance Monitor  2498   X24   7204      N    N
Trunking Activation           2498   X24   7205      N    N
Adaptive Networking           2498   X24   7206      N    N
Server App Optimization       2498   X24   7210      N    N
SAN24B-5 Enterprise Package   2498   X24   7211      N    N
12 Port Activation            2498   X24   7212      N    N
SAN24B-5 FW Upgr Renewal, 1Yr 2498   X24   7722      N    N
SAN24B-5 FW Upgr Renewal, 2Yr 2498   X24   7723      N    N
Desktop Install Power Cord    2498   X24   9205      N    Y
Linecord, US, Canada,         2498   X24   9800      N    Y
Linecord, France              2498   X24   9820      N    Y
Linecord, Denmark             2498   X24   9821      N    Y
Linecord, UK                  2498   X24   9825      N    Y
Linecord, Israel              2498   X24   9827      N    Y
Linecord, Switzerland         2498   X24   9828      N    Y
Linecord, South Africa        2498   X24   9829      N    Y
Linecord, Italy               2498   X24   9830      N    Y
Linecord, Australia, NZ       2498   X24   9831      N    Y
Linecord, Uruguay             2498   X24   9834      N    Y
Linecord, China               2498   X24   9840      N    Y
```

The Single Entity Offerings (SEO)

```
                                              SEO        Install
Description                                   number     type

SAN24B-5                      2498 X24   249824G  Plant
IBM Smart Analytics 5700      2498 X24   00W0001  Plant*
SFP+ 16 Gbps SW               2498 X24   98Y2176  Both
SFP+ 16 Gbps SW 8-Pack        2498 X24   98Y2177  Both
SFP+ 16 Gbps 10 km LW         2498 X24   98Y2178  Both
SFP+ 16 Gbps 10 Km LW 8-Pack  2498 X24   98Y2179  Both
SFP+ 8 Gbps SW                2498 X24   98Y2182  Both
SFP+ 8 Gbps SW 8-Pack         2498 X24   98Y2183  Both
SFP 8 Gbps 10 km LW           2498 X24   45W1216  Both *
SFP 8 Gbps 10 km LW 8-Pack    2498 X24   45W1218  Both *
SFP 8 Gbps 25 km ELW          2498 X24   45W2283  Both *
LC/LC 5 m 50U                 2498 X24   39M5697  Both *
LC/LC 25 m 50U                2498 X24   39M5698  Both *
LC/LC 31 m 9U                 2498 X24   22R0488  Both *
OM3 Cable LC/LC 10 m          2498 X24   45W2282  Both *
Mid-mount Telco Rack Kit      2498 X24   98Y2189  Both
SAN24B-5 Power Supply/Fan Kit 2498 X24   98Y2193  Both
Fabric Watch                  2498 X24   45W0504  Both *
Extended Fabric               2498 X24   45W0505  Both *
Advanced Performance Monitor  2498 X24   45W0508  Both *
Trunking Activation           2498 X24   45W0509  Both *
Adaptive Networking           2498 X24   45W0510  Both *
Server App Optimization       2498 X24   45W7553  Both *
SAN24B-5 Enterprise Package   2498 X24   98Y2199  Both
12 Port Activation            2498 X24   98Y2203  Both
SAN24B-5 FW Upgr Renewal, 1Yr 2498 X24   98Y2208  Both
SAN24B-5 FW Upgr Renewal, 2Yr 2498 X24   98Y2212  Both
Linecord, US, Canada,         2498 X24   39Y7931  Plant *
Linecord, France              2498 X24   39Y7917  Plant *
Linecord, Denmark             2498 X24   39Y7918  Plant *
Linecord, UK                  2498 X24   39Y7923  Plant *
Linecord, Israel              2498 X24   39Y7920  Plant *
Linecord, Switzerland         2498 X24   39Y7919  Plant *
Linecord, South Africa        2498 X24   39Y7922  Plant *
Linecord, Australia, NZ       2498 X24   39Y7924  Plant *
Linecord, Brazil              2498 X24   39Y7929  Plant *
Linecord, Uruguay             2498 X24   39Y7930  Plant *
Linecord, China               2498 X24   39Y7928  Plant *
```

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* Note: These SEOs have been previously announced on
other machine-type models.

Y = Yes
N = No
```

Pricing terms

Prices in the following PDF prices link are suggested list prices on day of announcement for the U.S. only. They are provided for your information only. Dealer prices may vary, and prices may also vary by country. IBM list price does not include tax or shipping and is subject to change without notice.

ENUS-112-062-LIST_PRICES_2012_04_24.PDF

ServicePac for warranty and maintenance

```
Machine
type/            ServicePac ServicePac
model            SEO        PN          Description

Warranty Option Upgrades:

 2498-X24        00X8646    675680J     3 yr IOR 9x5 NBD
 2498-X24        00X8647    675680K     3 yr IOR 24x7 4 hour
 2498-X24        00X8648    675680M     3 yr IOR 24x7 2 hour
 2498-X24        00X8649    675680N     5 yr IOR 24x7 4 hour
 2498-X24        00X8650    675680P     5 yr IOR 24x7 2 hour

Maintenance Options:

 2498-X24        00X8651    6756MYC     1 yr MA IOR 9x5 NBD
 2498-X24        00X8652    6756MYD     1 yr MA IOR 24x7 4 hour
 2498-X24        00X8653    6756MYF     1 yr MA IOR 24x7 2 hour
 2498-X24        00X8654    6756MYG     2 yr MA IOR 9x5 NBD
 2498-X24        00X8655    6756MYH     2 yr MA IOR 24x7 4 hour
 2498-X24        00X8656    6756MYJ     2 yr MA IOR 24x7 2 hour
```

ServicePac prices

For ServiceElect (ESA) maintenance service charges, contact IBM Global Services at 888-IBM-4343 (426-4343).

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Order now

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To identify your local IBM representative or IBM Business Partner, call 800-IBM-4YOU (426-4968).

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Phone:      800-IBM-CALL (426-2255)
Fax:        800-2IBM-FAX (242-6329)
Internet:   callserv@ca.ibm.com
Mail:       IBM Teleweb Customer Support
            ibm.com® Sales Execution Center, Americas North
            3500 Steeles Ave. East, Tower 3/4
            Markham, Ontario
            Canada
            L3R 2Z1
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Reference: YE001

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Note: Shipments will begin after the planned availability date.

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http://www.ibm.com/planetwide/us/

Corrections

(Corrected on December 6, 2012)
ServicePac information has been added to the Pricing section