



IBM BladeCenter S Product Guide

September 2008

You need to make IT decisions that will drive business success. You face management challenges and technological complexity such as space constraints, power and cooling limitations, heterogeneous environments and I/O connectivity issues. IBM brings together the widest choice of blade servers and storage and networking offerings and solution providers in the industry to help you build an open and flexible IT environment. And regardless of the size of your business, you want to be up and running 24/7. With built-in redundancy, innovative power and cooling and the latest I/O and management tools, IBM BladeCenter is easy to own—so you can focus on your business demands and stay ahead of the competition.

The **RIGHT** choice, tailored to fit your diverse needs.

- It's flexible and modular. As needs evolve, a one-size-fits-all solution doesn't work.
 - Meet your needs with BladeCenter S: for a small office with limited IT skills—IBM has you covered
 - Get flexibility with 5 blade types supporting multiple I/O fabrics, all managed from a common point
- It's robust and reliable, providing redundancy throughout and the information you need to keep your business up and running.
 - Provide redundancy for no single point of failure with IBM BladeCenter
 - Preserve application uptime with IBM Predictive Failure Analysis[®] and light path diagnostics
 - Make decisions based on accurate data for quick problem diagnosis with First Failure Data Capture

OPEN and innovative, for a flexible business foundation.

- It's comprehensive, providing broad, fast, and reliable networking and storage I/O with BladeCenter Open Fabric.
 - Match your data center needs and the appropriate interconnect using a common management point, and 5 I/O fabrics to choose from
 - Extract the most from your third-party management solutions by utilizing the BladeCenter Open Fabric Manager
- It's collaborative, enabling you to harness the power of the industry to deliver innovation that matters.
 - Get flexibility from a myriad of solutions created by Blade.org members and industry leaders that have downloaded our open specification

EASY to deploy, integrate and manage.

- It enables efficient integrated management, which allows you to minimize costs with the tools you need for effective management.
 - Automate OS installation and BIOS updates remotely with IBM Director tools
 - Administer your blades at the chassis or rack level with the Advanced Management Module
 - Plug into your enterprise management software
 - Use Service Advisor to make operation easy for remote sites and beginning BladeCenter users
- It enable deployment simplicity without tradeoffs by speeding the deployment of new hardware in minutes rather than days, using BladeCenter Open Fabric Manager
 - Get significantly faster deployment of servers and I/O than from rack solutions
 - Reduce costly downtime with integrated failover capability
 - Manage from a single point of control via the Advanced Management Module

GREEN today for a better tomorrow.

- It offers control via powerful tools that help you optimize your data center infrastructure so you can be responsive.
 - Understand your power requirements with IBM Power Configurator
 - Monitor, control and virtualize your power with IBM Systems Director Active Energy Manager for x86
- Our eco-friendly servers and services can help you be environmentally responsible.
 - Become more energy efficient with IBM expertise

IBM BladeCenter S

Product Overview

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Today's server environment is tougher than ever. You are looking to reduce IT cost, complexity, space requirements, power consumption, heat output and noise, while increasing flexibility, utilization and manageability. Moving to innovative **IBM® BladeCenter®** as your IT foundation can help you accomplish all of these goals.

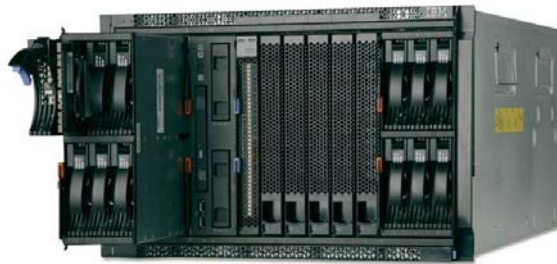
The IBM BladeCenter S enables your IT strategy. It tightly integrates servers, SAN storage, networking, I/O and applications, allowing you to build a flexible IT infrastructure that is robust, integrated and virtualized using common building blocks. This modular technology integrates **Intel®** and **AMD®**, as well as **IBM POWER™** processor-based blade servers, supporting many operating systems. Consolidating servers, switches and cables reduces complexity and helps lower costs and allows clients to manage everything in one solution.

Designed specifically for small offices and remote branch locations, its features include:

- Configurable **"business in a box"** foundation combines sharable integrated storage with blades and switches
- Comes standard with the BladeCenter **Start Now Advisor**, which enables easy set up, with "select and click" configurability
- Up to **6 blade servers**, 7U design (convertible to floor-standing configuration using the BladeCenter Office Enablement Kit with optional dust filter)
- Up to **12 hot-swap SAS, SATA, or Nearline SAS** 3.5-inch HDDs, for an all-in-one chassis containing up to **3.6TB** of SAS or **12TB** of SATA enterprise-class storage
- Up to **4 switches**
- Auto sensing 110V or 220V power so the BladeCenter can be **plugged into a regular wall outlet**
- **Lowest IT staff requirements** of the BladeCenter Chassis
- **Quiet operation**

The BladeCenter S chassis is designed to monitor environmental conditions in the chassis and each blade and send alerts to the administrator. Advanced standard features help maintain system availability with increased uptime. These features include **Service Advisor, Predictive Failure Analysis™**, **light path diagnostics**, **hot-swap redundant power supplies and blower/fan modules with Calibrated Vecteded Cooling™**; **IPMI 2.0** support with **highly secure remote power control**; **text-console redirect over LAN**, and an **Advanced Management Module** (upgradeable with a redundant AMM).

If you need a highly manageable, easy to use, power-efficient, highly compatible server solution, BladeCenter S is the ideal choice.



Product Description



- **A choice of installation methods** — Designed for either **rack** or **deskside** use with the optional **Office Enablement Kit**, it's ideal for offices or remote/branch locations.
- **Integrated compute blades, SAN storage, and switches in one chassis** — In addition to **six blade servers**, the BladeCenter S also supports **12 shared hot-swap 3.5-inch SAS, SATA, or Nearline SAS HDDs**, and **four** integrated switches (**two** Ethernet, plus **two** Ethernet, Fibre Channel, SAS, or RAID SAS Controllers, which can enable true shared storage).
- **Six 30mm blade slots** — These **hot-swap** slots are capable of supporting any combination of **6 HC10/HS12/HS20/HS21/HS21 XM** (Intel Xeon), **LS20/LS21/LS22** (AMD Opteron®), and **JS12/JS21/JS22** (IBM PowerPC® 970FX/MP) blade servers, or **3** double-wide (**60mm**) **LS41/LS42** blade servers or a **mixture** of 30mm and 60mm blades. It also supports multiple optional 30mm **Expansion Units** in combination with the blade servers, using the same blade slots. Up to **six** chassis can be installed in an industry-standard **42U** rack, for a total of up to **36** 30mm blade servers and **72** HDDs per rack, plus switches, *with full power redundancy*.
- **Standard office 110V power or 220V power** — Don't have a data center, but still want to consolidate many servers into a few? No problem. BladeCenter S runs on standard office power (as well as 220V), using an auto-sensing power supply.
- **Simplified setup and configuration** — BladeCenter S's configurable "business in a box" foundation offers the BladeCenter Start Now Advisor, a wizard-based installation tool on a DVD that is shipped standard with every chassis. You can be up and running in minutes. A user can literally plug the blade servers into the system, plug the system into a power outlet, and launch a management tool that enables easy select-and-click configuration via an "express" install. For businesses operating branch offices—such as retailers or financial institutions—IT administrators at headquarters can easily pre-configure hundreds of blade systems to operate in the same manner and ship them out the door knowing an office employee will be able to simply plug a system in and power it up.
- **Forward and backward compatibility** — *Most blades, and every switch and passthru module released by IBM for BladeCenter E since 2002, are supported. Many new blades and 1X fabric switches released for IBM BladeCenter E, BladeCenter H, BladeCenter T, or BladeCenter HT are also supported in the BladeCenter S chassis.*
- **One module bay for hot-swap Advanced Management Module** — The management module provides advanced **systems management and KVM** capabilities for not only the chassis itself, but for all of the blades and other modules installed in the chassis. The management module provides capabilities similar to the IBM **Remote Supervisor Adapter II** used in stand-alone IBM System x™ or IBM eServer™ xSeries™ rack and tower servers. The features of the management module can be accessed either **locally** or **remotely** across a network. One module comes standard.
- **One module bay for hot-swap Serial Passthru Module** — This module provides six RJ45 serial ports (one per blade). The ports are numbered 1 through 6, and correspond to blade slots 1 through six.
- **Two bays for hot-swap Storage Modules** — Each module supports up to **6 hot-swap SAS, SATA, or Nearline SAS** drives (12 total), for an internal capacity of up to **3.6TB** (using 300GB SAS HDDs) or **12TB** (using 1TB SATA drives). The drives *can* be mixed within a Storage Module. The drives can be shared by one or more blades. If any drives are installed, one or two (for redundancy) **SAS Connectivity Modules or the SAS RAID Controller Modules** must be installed in switch bays 3 and/or 4. (In addition, if you have **BladeCenter Storage and I/O Expansion Unit** blades, which attach to the HS and LS blades, these are supported as well.)
- **Four module bays for hot-swap communication and I/O switches** — The modules interface with all of the blade servers in the chassis and eliminate the need for external switches or expensive, cumbersome, and error-prone cabling. All connections are done internally via the midplane. All modules, when installed in pairs, offer **load balancing and failover** support. *Integrated* switch modules mean that **no extra "U space"** is required in the rack. The first two bays support Ethernet switches only (one comes standard). The other two bays support Ethernet, Fibre Channel, or SAS switches. Either one or two of a kind is required in Bays 3 and 4. (No mixing and matching between the pair.)
- **Four module bays for Fan Modules** — Four **hot-swap/redundant** blower modules come standard with the chassis. (Each module contains two fans.) They are capable of providing efficient cooling for all **blades, switches and storage devices**. These modules replace the need for each blade to contain its own fans. The four fan modules are more energy efficient than dozens or hundreds of smaller fans would be, and they offer many fewer points of potential failure.
- **Four module bays for hot-swap Power Modules** — BladeCenter S ships with two 950W / **1400W high-efficiency hot-swap/redundant** power modules (upgradeable to four), capable of handling the power needs of the entire chassis. Many servers use power

supplies with an efficiency level of approximately 65-75%. Because BladeCenter S uses power supplies that are at least **90% efficient**, much less power is wasted as heat. Not only is more power available for chassis use, there is less power wasted as excess heat output. Two *additional* power modules must be installed when the second Storage Module is used.

- **Redundant midplane connections** — Each chassis contains a midplane that connects all blades and modules together internally. The midplane provides *two* physical connections to each blade; therefore, a failure of one connector alone cannot bring down the server.
- **A hot-swappable Media Tray** containing a DVD-RW/CD-RW drive, **two USB 2.0** port, **two BBU module bays**, and a **light path diagnostic panel**—the media tray is *shared by all the blades* in the server. This eliminates unnecessary parts (and reduces the number of parts than can fail). In the event of a failure of the Media Tray the tray can be swapped for another. While the tray is offline, the servers in the chassis can remotely access the Media Tray in another chassis. The diagnostic LEDs indicate chassis status.

It is extremely important to include *all* infrastructure costs when comparing a BladeCenter S solution to a competitor's offering, not just the cost of the chassis and the blades. The high density and level of integration of the BladeCenter chassis greatly reduces the cost of the overall solution. For example, because up to six chassis will fit in a rack, this means that up to 24 switches can be installed per rack *without* having to reserve any "U" space for the switches, unlike the competition. (And the integrated switches may be less expensive than external, self-powered switches.) Plus, the number of power distribution units (PDUs) needed per rack may be reduced, because there are fewer discrete devices to have to plug in. In addition, because all the blades are connected to all the switches inside the chassis, there is no need for external Ethernet or other communication cables to connect the blades and switches. (Only the few cables needed to connect the switches to the external world are required.) This not only saves the cost of numerous cables per rack, but also the clutter and bother of routing that many cables. An added bonus is potentially much freer airflow behind the rack, due to fewer cables.

Selling Features

Price/Performance

- The **extremely high degree of integration** in the BladeCenter S chassis reduces the need for server components, replacing numerous fans, KVM and Ethernet cables, power supplies, external switches and other components with fewer *shared* hot-swap/redundant components in the BladeCenter chassis itself. This integration also can greatly **reduce** the amount of **power consumed** and **heat produced**, relative to an equivalent number of 1U servers—or competitive blade systems. This can significantly reduce the power bill. The **reduced footprint** can also save on infrastructure cost.
- IBM Cool Blue technology's web-based **Power Configurator** accurately predicts the power and cooling required for specific configurations, thereby enabling realistic planning of the correct power and cooling infrastructure. The IBM **Systems Director Active Energy Manager for x86** (formerly known as PowerExecutive) tool tracks actual power usage, temperatures and heat emitted, and plots trends over time so you can actively manage power and cooling with real information. Active Energy Manager also will manage through power incidents (e.g., brownouts or supply failures.) to help users avoid outages due to power and cooling issues. Cool Blue's Active Energy Manager also provides an industry-unique capability to virtualize power (capping) and move it from one server to another, as required. This capability helps maximize server usage within a restricted power envelope.
- BladeCenter S provides real-time hardware event monitoring with **IBM Service Manager**. Service Manager simplifies operations for remote branch users and beginner BladeCenter users by automating notification of service and support so that users will be contacted with resolutions to problems when they occur.
- BladeCenter also **reduces the number of parts required** to run the system. Sharing fans, systems management, floppy devices and media means fewer parts to buy and maintain, and fewer items that can fail and bring the solution down.

Flexibility/Durability

- *Every HS/LS/JS blade server ever released by IBM is supported in BladeCenter S.* Almost every switch module released by IBM is equally compatible. (Ask HP and Dell how far back *their* compatibility goes.) Future blades and fabric switches are expected to continue to be compatible with previous chassis for the foreseeable future.
- A blade server has access to as many as **4 communication switches/bridges** in a **BladeCenter S** chassis. And the switches can be **SAS, Ethernet, Fibre Channel**, or anything else designed and ServerProven for BladeCenter use. Switches, bridges and interface cards are currently available from such vendors as Brocade, Cisco, Intel[®],



Nortel/Blade Network Technologies, QLogic, Cisco and others, in addition to IBM.

- The optional SAS RAID Controller module provides BladeCenter S with **RAID 5** and **SAN capabilities**.
 - Nearly **100 vendors** are offering options for the BladeCenter family.
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Manageability

- **IBM Systems Director** provides powerful, intelligent solutions management for the BladeCenter family, for rock-solid reliability. Systems Director exploits the hardware's capabilities by "surfacing" pertinent information about your blade server. The easy-to-use **Deployment Wizard** also provides step-by-step installation instructions and offers automated deployment capabilities.
 - Each BladeCenter chassis includes an **Advanced Management Module (AMM)** with **IBM Service Advisor**. The AMM boosts administrator productivity and reduces skill level requirements, which can help reduce costs, improve overall productivity and make administration easier. Unlike traditional servers and some competitive blades with a myriad of separate management tools, this management module provides a single point of control for the solution and supports many industry-standard, open protocols. The AMM provides systems management capabilities, including *Web-based out-of-band control; virtual floppy and CD-ROM support; Windows "blue screen" error capture; LDAP and SSL support; and remote redirection of video, text, keyboard and mouse* for the chassis and the components installed in the chassis.
 - **IBM Systems Director Active Energy Manager for x86**, an IBM-exclusive, is designed to take advantage of new system power management features, by monitoring *actual* power usage and providing power consumption capping features. More accurate power usage data helps with data center construction planning and the sizing of power and cooling needs, as well as allowing you to use available power more efficiently.
 - **IBM Systems Director** is included for proactive systems management and works with both the blade's internal BMC and the chassis' management module. It comes with a portfolio of tools, including *IBM Systems Director Active Energy Manager for x86, Management Processor Assistant, RAID Manager, Update Assistant, and Software Distribution*. In addition, IBM Blade Director offers extended systems management tools for additional server management and increased availability. When a problem is encountered, IBM Blade Director can issue administrator alerts via e-mail, pager, and other methods.
 - BladeCenter S comes standard with **IBM Service Manager** to simplify operations for remote branch users and beginner BladeCenter users.
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Availability and Serviceability

- BladeCenter chassis are designed for operation with **greatly reduced potential for single points of failure**. Most aspects of operation, from blade servers to communication modules, to management modules, to power and blower/fan modules, are **hot-swappable and redundant**. The midplane connections are **redundant** and other features can be made so, when used in pairs.
 - **Environmentally tuned blower/fan modules** in the chassis adjust to compensate for changing thermal characteristics. At the lower speeds they draw less power and suffer less wear. Equally important in a crowded data center, temperature-controlled blowers/fans produce less ambient noise in the data center than if they were constantly running at full speed.
 - A **standard three-year (parts and labor) limited onsite warranty¹** affords you peace of mind and greater potential investment protection.
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Key Features

Management Modules

Each BladeCenter chassis includes an **Advanced Management Module (AMM)** to provide a high level of systems management capabilities that are well-suited to blade environments. The AMM boosts administrator productivity and reduces skill level requirements, which can help reduce costs, improve overall productivity and make administration easier. Unlike traditional servers and some competitive blades with a myriad of separate management tools, this management module provides a single point of control for the solution and supports many industry-standard, open protocols.

The AMM, in combination with the blade server's Baseboard Management Controller (**BMC**), provides industry-standard **Intelligent Platform Management Interface (IPMI)**

¹ For terms and conditions or copies of the IBM Statement of Limited Warranty, call 800-772-2227 in the U.S. In Canada call 800-426-2255. Telephone support may be subject to additional charges. For warranties including onsite labor, a technician is sent after IBM attempts to resolve the problem remotely. International warranty service is available in any country in which this product is sold.

2.0-compliant systems management. It provides a number of important system functions, including:

- Monitoring of system and battery voltage, system temperature, fans, power supplies, processor and DIMM status
- Fan speed control
- Product ID and Family ID detection
- Highly secure remote power on/off
- System reset control
- NMI/SMI detection and generation
- System diagnostic LED control (power, HDD, activity, alerts, heartbeat)
- IPMI over LAN
- Serial Over LAN
- Proxy server support
- LAN messaging and alerting
- Text console redirection over LAN
- VLAN support
- Enhanced authentication and encryption algorithms (RMCP+, SHA-1, AES)
- Local update of BMC firmware
- Firmware firewall
- Support for IPMI v2.0 compliant management software (e.g., xCAT)
- Other mandatory and optional IPMI BMC functions

Other systems management features offered for the combination of blade server and chassis include:

- Predictive Failure Analysis for system processors, memory and HDDs, as well as chassis switch modules, blower/fan modules and power modules
- Web-based out-of-band control
- Windows “blue screen” capture
- Remote virtual media
- High-speed remote redirection of PCI video, keyboard and mouse
- SSL (Secure Socket Layer) and LDAP (Lightweight Directory Access Protocol) support

Predictive Failure Analysis (PFA) enables the MM/AMM and the server’s Baseboard Management Controller (BMC) to detect impending failure of supported components (processors; memory; expansion cards; switch, blower/fan and power supplies; and hard disk drives) before actual failure, and alert the administrator through IBM Director. This gives you the ability to replace the failing component *before* it fails, resulting in increased uptime.

Power Modules

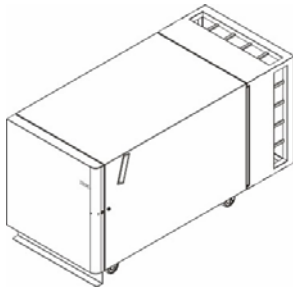
The various BladeCenter chassis require only **two** to **four** high-efficiency power supply modules to provide redundant power for every device in the chassis. This means fewer parts to fail and less power consumed than if each blade server had its own power supplies. The power modules are **hot-swap/redundant**, so you don’t have to shut down the BladeCenter chassis to replace a power supply.

Blower/Fan Modules

Instead of having hundreds of tiny fans per rack—using power, subject to failure, and creating ambient noise—BladeCenter requires only **two** (BladeCenter/BladeCenter H) or **four** (BladeCenter S, BladeCenter T or BladeCenter HT) **hot-swap/redundant fan** (BladeCenter S or HT) or **blower** (other chassis) **modules** to cool all the blades and other devices in the chassis. In normal operation, fan modules share the cooling in the BladeCenter system. If one fan module fails, the others handle the entire load. You can replace a fan module without shutting down the BladeCenter system. These modules draw only **60W** between them (**100W** in the BladeCenter HT chassis). By contrast, some competing blade designs require *dozens* of *non-hot-swappable* fans per chassis, consuming *hundreds* of watts of power and generating lots of noise. Fewer points of failure and less power consumed can mean greater uptime and lower costs.

Key Options

You can rely on BladeCenter options to supply a comprehensive solution for your



business needs. Options help create an optimized system to meet your space, data protection, storage and availability needs. Every IBM option is designed and tested for peak performance and flexibility, helping to maximize your return on investment. The combination of BladeCenter chassis, blade servers and options lets you keep your fingers on the pulse of your e-business.

Office Enablement Kit — The Office Enablement Kit is an **11U-high rack cabinet** designed to enable the use of the BladeCenter S chassis in a retail or office environment. The rear door of the Office Enablement Kit is an acoustical module that helps to ensure that the BladeCenter chassis is **quiet enough for office environments** while providing easy access to chassis components. It comes with **front and rear locking doors** and lockable wheels so it can be moved where it is needed. The Office Enablement Kit includes 4U of additional space besides the BladeCenter S chassis to leave room for storage, KVM, and future growth.

Dust Filter — Specially designed filter to protect your hardware from the airborne particles found in the retail and office environment.

Communication Modules — The various BladeCenter chassis support integrated communication and I/O switches and/or bridges for Gigabit Ethernet, Fibre Channel and others. Expansion adapters for individual blade servers are available to interface with these modules.

Redundant features — Optional power supply modules, blower/fan modules, management modules, switches and bridges provide redundancy for the various BladeCenter chassis.

Storage — Clients deploying blades are building enterprise infrastructures and/or virtual infrastructures that require end-to-end reliability. Moving to external, shared RAID storage can help increase your data and application availability and make management easier. IBM delivers a wide range of easy-to-install, storage products to meet your demanding business needs:

- **Network attached storage (NAS)** — Provides a large capacity, highly available and secure environment for storing mission-critical data. The System Storage™ N series attaches to IBM BladeCenter using integrated Ethernet switch modules.
- **Storage area network (SAN)** — Offers SAS, iSCSI and Fibre Channel SANs for high-performance, block-level storage solutions. With the new BladeCenter S SAS RAID Controller Module, IBM can help you create an easy-to-deploy storage solution for your needs.

For clients seeking local hard disk drives, IBM offers integrated storage as well as hot-swap options:

- **Internal Solid State Drives** — For OS boot images or primarily random-read-heavy storage (such as Web serving). Provides up to *three times* the availability of traditional spinning disk drives. (Available in HS12, HS21, HS21 XM, LS21, and LS41 blade servers.)
- **Internal SAS drives** — For I/O-intensive workloads.
- **Internal USB Flash** — For OS/boot images.
- **Hot-swap SAS** — For RAID-5 and additional I/O with the BladeCenter Storage and I/O Expansion Unit blade.
- **Hot-swap SATA** — For price/performance-optimized workloads. Available on BladeCenter S.

Additionally, external LAN-attached tape storage is available.

Extensive System Support Features

The IBM services and technical support portfolio provides world-class, consistent, high-quality service and support. From the start, IBM programs make it easier for you to plan for, configure and purchase BladeCenter servers, get them running and keep them running long-term. These features include IBM Express Portfolio, IBM ServerProven®, the IBM Standalone Solutions Configuration Tool, IBM Electronic Service Agent™, Product Customization Services and extensive technical support offerings.



The IBM **ServerProven** program provides the confidence that specific options and operating systems have been tested on the blade servers and chassis and are officially supported to work together. It is updated frequently to keep the latest compatibility information at your fingertips.

The IBM **Standalone Solutions Configuration Tool** (SSCT) is a downloadable tool that simplifies the often complex chore of configuring a full rack of servers (including blade servers) and confirming that you have all the cables, power distribution units, KVM (keyboard, video and mouse) switch boxes and other components you need, as well as the proper airflow clearances, electrical circuits and other environmental conditions.

IBM **Electronic Service Agent**[™] is an innovative “call home” feature that allows System x and BladeCenter servers to automatically report hardware problems to IBM support, which can even dispatch onsite service if necessary to those customers entitled to onsite support under the terms of their warranty or an IBM Maintenance Agreement. Electronic Service Agent resides on a server and provides electronic support and problem management capabilities through a highly secure electronic dialogue between your systems and IBM. It monitors networked servers for hardware errors and it can perform hardware and software inventories and report inventory changes to IBM. All information sent to IBM is stored in a highly secure database and used for improved problem determination.

Additional services include hardware warranty upgrades and factory-installed **Product Customization Services** (PCS), such as asset tagging, hardware integration, software imaging and operating systems personalization.

IBM offers extensive **technical support** by phone and via the Web. Support options include links to forums/newsgroups, problem submission, online shopping support, service offerings, device drivers for all IBM product lines, software downloads and even upcoming technical seminar worldwide schedules and registration. Also available are remote installation, configuration and usage support for both System x and BladeCenter hardware and software, as well as onsite custom services to provide the level of expertise you require.

BladeCenter S I/O Modules

Ethernet



Nortel Layer 2/3 Copper Gigabit Ethernet Switch Module for IBM BladeCenter

Offers **6 six copper uplinks** and strongest price/performance benefits. Delivers complete Layer 2 and 3 functionality: routing, filtering, and traffic queueing. Better serves the processing demands of bandwidth-intensive applications. Provides port flexibility and traffic management to improve maintenance.



Server Connectivity Module for IBM BladeCenter

Serves the needs of Small and Medium Business customers. Easy to install, configure and manage through an easy-to-use browser based interface. Ideal for environments where a separation between the server and networking domains is preferred.



Cisco Catalyst Switch Module 3012 for IBM BladeCenter

The Cisco Catalyst Switch Module 3012 provides four external 1Gb ports and fourteen internal 1Gb ports, and operates in standard I/O module bay. It supports Layer 2 and basic Layer 3 switching (static routing and RIP) and employs common management with external Cisco switches via IOS Command Line Interface and CiscoWorks LAN Management Solution.



Nortel 1/10Gb Uplink Ethernet Switch Module for IBM BladeCenter

Perfect investment protection for Clients who require 1Gb today and 10Gb for future growth. It is easy to configure, use and manage via a web-based interface. It provides full Layer 2/3 support and uses next-generation SFP+ modules to migrate to 10Gb on the same switch. It also supports 6 1Gb and 3 10Gb Uplink ports.

SAS



SAS Connectivity Module

This high-performance, 3Gbps, SAS-based pass-thru module enables broad storage functionality. It enables up to 12 3.5 in. SAS or SATA disks using the Disk Storage Module. It also enables use of entry storage products such as IBM System Storage DS3200. Provides 4 external 3Gb ports. Easy to use IBM Storage Configuration Manager (SCM) or industry standard CLI.



BladeCenter S SAS RAID Controller Module

Enables a fully redundant SAN within the BladeCenter S chassis. Provides high-performance, fully duplex 3 Gbps speeds. Supports two disk storage modules with up to 12 x 3.5 in. SAS or Nearline SAS drives. Provides 4 external 3Gb ports. Easy to use IBM Storage Configuration Manager (SCM) or industry standard CLI.

Fibre Channel



Brocade 10- and 20-Port SAN Switch Modules

Enables high-performance end-to-end **1, 2 and 4Gbps SAN** solutions for the data center. Affordable 10-port and 20-port offerings available for Small, Medium and Large Enterprise business needs. Easy-to-use **non-disruptive upgrade doubles the 10-port switch connectivity to 20-ports** when your business needs change. Integrates the Brocade SAN fabric to simplify deployment/management and reduce infrastructure complexity and total cost of ownership. Utilizes Brocades proven Silkworm technology and fully backward compatible and interoperable with Silkworm and IBM TotalStorage b-type SAN switches.



Cisco 4Gb 10-Port Fibre Channel Switch Module for IBM BladeCenter

Enables high-performance end-to-end **1, 2 and 4Gbps SAN** solutions for the data center. Affordable 10-port offering available for Small, Medium and Large Enterprise business needs. Exciting addition to the Cisco Ethernet and MDS family of products. Includes Tivoli SAN manager enhancements to better manage MDS9000 with integrated IBM SAN Volume Controller. Cisco SFPs are required: Long-wave, short-wave, or short-wave 4-pack.

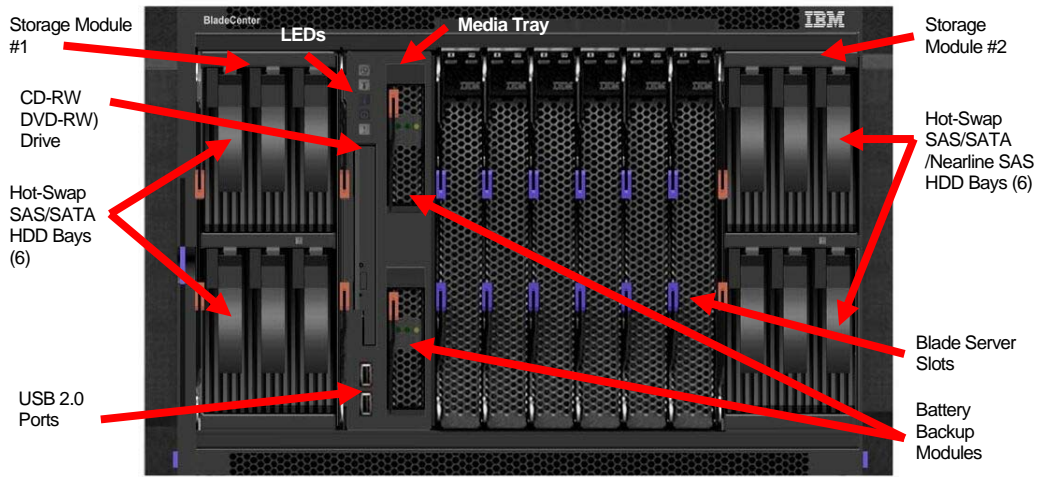


QLogic 10-Port 4Gb Fibre Channel Switch Module

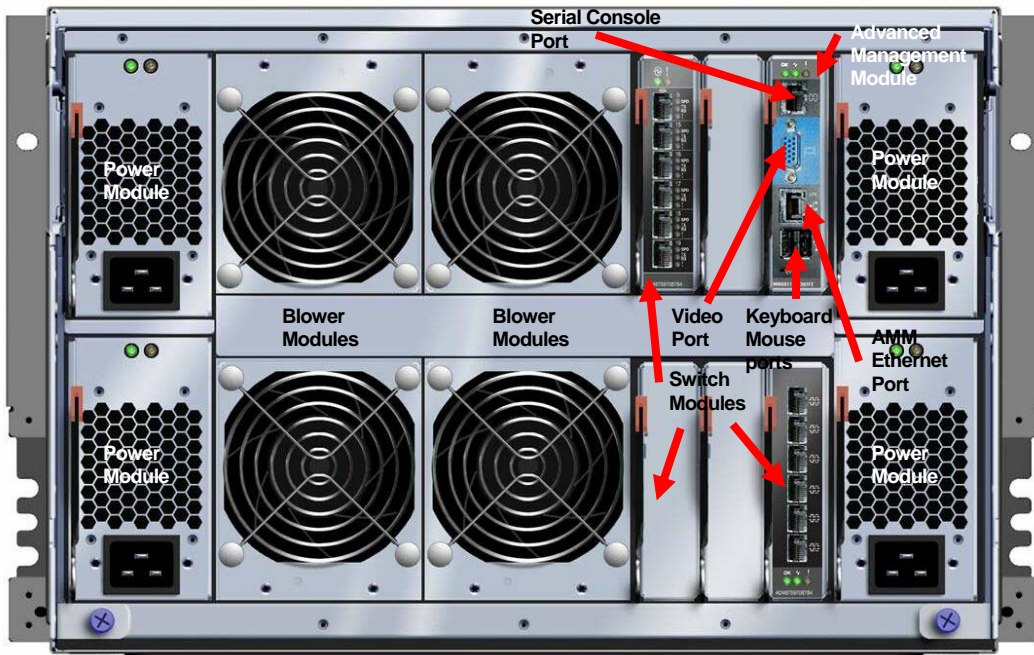
Enables high-performance end-to-end **1, 2 and 4Gbps SAN** solutions. Provides interoperability in open mode leveraging standards-compliant (FC-SW2 & FC-SW3) SANs. Affordable 10-port offering available—ideal for Small, Medium and Enterprise business needs. Included with every switch, QLogic's SANsurfer Management Suite eases installation, configuration and management of your SAN infrastructure—all from one GUI.

BladeCenter S Chassis Images

Front View



Rear View



BladeCenter S Chassis Specifications

Machine type	8886-1Ex/Y, 1Mx/1MY, AC1
Rack form factor	7U
# of DVD/CD drives standard	1 DVD-RW/CD-RW (in Media Tray)
# of diskette drives standard	None (USB-attached)
# of internal (chassis-based) H/S SAS	12 (3.5-inch)

HDDs supported		
# of Media Tray module bays	2	
Internal tape drives supported	None (SAN-attached)	
Internal hot-swap disk drive support	12 hot-swap SAS/SATA/Nearline SAS (mix-and-match)	
Internal disk storage capacity	3.6TB (using 12 300GB SAS drives)	12TB (using 12 1TB SATA drives)
Storage Type support	NAS / SAN	
# of video ports	1 (on Advanced Management Module)	
# of blade slots / orientation	6 x 30mm or 3 x 60mm (or combinations thereof) / vertical	
Blade types supported	HC10, HS12, HS20, HS21, HS21 XM, JS12, JS21, JS22, LS20, LS21, LS22, LS42	
# of switch module bays	4 hot-swap/redundant	
Switch modules standard	None	
Fabric bandwidth	1Gbps Ethernet / 3Gbps SAS / 4Gbps Fibre Channel	
# of management modules (std / max)	1 / 1	
Systems management controller	Advanced Management Module	
# of RS485 ports	None	
# of serial breakout ports	None standard (6 using optional Serial Passthru Module)	
# of parallel ports	None	
# of mouse ports	None (USB-attached)	
# of keyboard ports	None (USB-attached)	
# of USB ports	4 (2 in Media Tray, front, 2 in Advanced Management Module, rear)	
Light path diagnostic panel	Yes (on Media Tray)	
Predictive Failure Analysis support	Blades, fan modules	
Power supply size standard	950W/1450W AC (110V/220V)	
Input voltage	110V / 220V autoswitching	
# of power supplies standard / maximum	2 / 4 hot-swap/redundant (110V = N+1, 220V = N+N)	
Heat output	1365 BTUs/hr (400W) min.; 11,942 BTUs/hr. (3500W) max.	
# of fan modules standard / max.	4 / 4 hot-swap/redundant (two fans per module)	
Fan module airflow (front-to-back)	200 CFM (per module) at 25°C; 400 CFM (per module) at 32°C or greater	
Dimensions (HWD) / weight	12.0" (306.3mm) H 17.5" (444mm) W 28.9" (733.4mm) D	90-240 lbs 40.8-108.9 kg
Length of limited warranty	3 years (parts and labor) onsite	
Tape backup options	8765 1UX Tape Drive Enclosure w/ 43W8478 IBM HH LTO Gen 3 SAS Tape Drive, 8767HHX HH Tape Drive Enclosure w/ 43W8478 HH LTO Gen 3 SAS Tape Drive, TS2230, TS2240, TS3100	

For the latest compatibility data, refer to the [BladeCenter Compatibility Guide](#), found on [Systems Sales](#).



For More Information

IBM System x Servers

Electronic Service Agent

IBM System x and BladeCenter Power Configurator

Standalone Solutions Configuration Tool

Configuration and Options Guide

ServerProven Program

Technical Support

Other Technical Support Resources

<http://www.ibm.com/systems/x>

<http://www.ibm.com/support/electronic>

<http://www.ibm.com/systems/bladecenter/powerconfig>

<http://www.ibm.com/servers/eserver/xseries/library/configtools.html>

<http://www.ibm.com/servers/eserver/xseries/cog>

<http://www.ibm.com/servers/eserver/serverproven/compat/us>

<http://www.ibm.com/server/support>

<http://www.ibm.com/servers/eserver/techsupport.html>

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Some machines are designed with a power management capability to provide customers with the maximum uptime possible for their systems. In extended thermal conditions, rather than shutdown completely, or fail, these machines automatically reduce the processor frequency to maintain acceptable thermal levels.

MB, GB and TB = 1,000,000, 1,000,000,000 and 1,000,000,000,000 bytes, respectively, when referring to storage capacity. Accessible capacity is less; up to 3GB is used in service partition. Actual storage capacity will vary based upon many factors and may be less than stated.

Performance is in Internal Throughput Rate (ITR) ratio based on measurements and projections using standard IBM benchmarks in a controlled environment. The actual throughput that any user will experience will depend on considerations such as the amount of multiprogramming in the user's job stream, the I/O configuration, the storage configuration and the workload processed. Therefore, no assurance can be given that an individual user will achieve throughput improvements equivalent to the performance ratios stated here.

Maximum internal hard disk and memory capacities may require the replacement of any standard hard drives and/or memory and the population of all hard disk bays and memory slots with the largest currently supported drives available. When referring to variable speed CD-ROMs, CD-Rs, CD-RWs and DVDs, actual playback speed will vary and is often less than the maximum possible.

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