Innovative modular technology achieves outstanding performance density and affordable availability

IBM @server BladeCenter solutions

Highlights

- ***Intelligent management tools such as IBM Director help provide comprehensive systems management.***
- ***Innovative, flexible modular technology integrates both Intel® processor-based and IBM POWER processor-based blade servers into the IBM @server® BladeCenter™ architecture.***
- ***New BladeCenter Standby Capacity on Demand delivers extra power when you need it.***

Your priorities are clear: contain costs, deal with a critical shortage of skilled people and keep up with the demands of sustained e-business innovation. In short, manage the many components of your IT organization so that they contribute to business success in today's on demand world.

Take control of your infrastructure

Tackle your server management challenges with IBM @server BladeCenter. BladeCenter's modular design gathers computing resources into cost-effective, high-density enclosures that support hot-swappable, high-performance 2-way Intel processor-based and new 2-way POWER processor-based blade servers.

BladeCenter offers the high performance and manageability of IBM rack-optimized platforms. The result is an effectively managed infrastructure that helps maximize resource productivity and minimize IT administration costs. In an on demand world, BladeCenter gives control back to the IT manager.

On demand ready

BladeCenter helps businesses be responsive to customers, focused on core competencies, variable to adapt to cost structures flexibly and resilient to face any challenge. The new Standby Capacity on Demand offering[1] features a fully configured BladeCenter system with seven active blades and another seven blades in standby mode.

Pay for the standby blades only after they're activated[2]—helping deliver additional computing capacity when it's needed.

Visit

ibm.com to locate an IBM reseller or for more information.

Advanced manageability:
IBM Director

IBM Director unleashes the power of BladeCenter, giving you comprehensive remote management from a single graphical console. IBM Director, which ships with BladeCenter, automates and simplifies IT tasks, letting you deploy, configure, manage and maintain up to hundreds of blade servers.

Advanced management capabilities boost administrator productivity and reduce skill-level requirements, which can help reduce costs, improve overall productivity and make administration easier. IBM Director and BladeCenter deliver incredible control of 2-way Intel processor-based and 2-way POWER processor-based blade servers. Shared infrastructure means platform deployment is quicker and more cost-effective. Because installing a new blade server is fast and easy, expanding capacity for applications can be completed in as little as just a few minutes instead of hours.

Tools such as IBM Deployment Wizard, and functions such as Automatic Chassis Discovery and Event Action Plans, make infrastructure deployment easy. The Deployment Wizard allows you to save chassis configurations for easy replication. Another tool, Remote Deployment Manager (RDM), gives you the ability to create, maintain and deploy images from a single drag-and-drop user interface[3].

With the tight integration of storage, networking, servers and applications, and IBM Director's common interface for a rich portfolio of management tools, the BladeCenter design is both intelligent and simple. IBM has created an ideal environment to maintain your data center. Tools such as Light Path Diagnostics, Predictive Failure Analysis®, and calibrated vectored cooling can help reduce administration costs.

Powerful tools for advanced management

IBM Director delivers advanced, proactive management, providing rich and broad systems management capabilities. Some of the key optional enhancements in the IBM Director Server Plus Pack include:

- ***Capacity Manager***
  Helps predict future server bottlenecks and proactively alerts administrators, automating corrective actions to minimize downtime.

- ***Software Rejuvenation***
  Helps predict pending software failures that could lead to costly downtime and automatically refreshes the software to help ensure optimal operation.

- ***System Availability***
  Tracks and provides graphical views of system downtime or uptime for systems or groups of systems, helping save labor costs.

- ***Rack Manager***
  Provides a graphical drag-and-drop interface that simplifies rack hardware management.

Visit **ibm.com**/eserver/xseries/systems_management/xseries_sm.html for more information about the self-managing capabilities of IBM Director software.

Designed to solve real-world problems

The BladeCenter design addresses your most serious issues: space constraints, manageability, scalability, capacity, performance, cooling and power. BladeCenter servers are designed to take less time to install, fewer people to maintain and cost less than a traditional server solution, helping reduce IT infrastructure costs.

Integrating both Intel processor-based and POWER processor-based blade servers, BladeCenter collapses the data center by integrating functions such as Layer 2-7 Ethernet and your Storage Area Network (SAN) fabric into an efficient 7U enclosure that simplifies deployment and management.

Your enterprise will benefit from simplified management, fast installation and deployment, modular scalability and high availability. What's more, BladeCenter delivers improved space efficiency when compared to most of today's 1U solutions.

BladeCenter solutions make adding capacity simple and affordable. BladeCenter's technology features deliver an effective scale-out architecture that lets you add server modules quickly using a "pay as you grow" approach.

- ***Outstanding performance density***
  BladeCenter provides an efficient use of data center floor space with up to 84 2-way blades in an industry-standard (42U) rack. The efficient design features leading-edge cooling technology and the latest Intel Xeon™ and PowerPC® 970 processors.

- ***Affordable availability for your mission-critical applications***
  Chassis features, such as high-availability midplanes and redundant hot-swap cooling and power, help reduce single points of failure. This is part of the OnForever™ features–designed to deliver outstanding operation, helping to increase your productivity. Tight integration of key components such as networking services, centralized management and applications help to enable high availability.

Application flexibility

BladeCenter architecture is based on industry standards to better support the deployment of third-party software and hardware technologies. IBM works with industry-leading technology companies to support innovative solutions running on Linux, Windows® and Novell operating systems.

Customers using BladeCenter can take advantage of the flexibility provided by the Linux operating system. Linux offers power, functionality, high security and reliability for business and infrastructure applications, and is strongly supported on BladeCenter.

BladeCenter supports the Microsoft® Windows Server 2003 and Windows 2000 operating systems enabling customers to migrate existing or deploy new Windows environments on this platform. The unique advantages offered by BladeCenter combined with the broad array of applications supported on Windows deliver a valuable proposition for customers.

BladeCenter options

BladeCenter options provide choices so you can tune hardware to create customized solutions to match application needs.

Blade server options[4]

Myrinet® Cluster Expansion Card

This I/O expansion option provides a high-speed interconnect for high performance computing applications. It works in conjunction with the Optical Pass-thru Module.

Gigabit Ethernet Expansion Card

This I/O option allows for expansion of the Ethernet subsystem to enable additional bandwidth. It works in conjunction with the Optical Pass-thru Module, the Nortel Networks® Switch Module and the IBM 4-port Gigabit Ethernet Switch Module.

Fibre Channel (FC) Expansion Card

This I/O expansion option adds dual-port FC connectivity at up to 2Gbps to each blade server. It works in conjunction with the IBM BladeCenter 2-Port Fibre Channel Switch Module.

40GB[5] 5400rpm ATA-100 Hard Disk Drive (HDD)

Helping you achieve maximum density at a low cost, the ATA-100 HDD is a 2.5-inch, slim-high EIDE HDD. The HS20 and JS20 blade servers support two HDDs for up to 80GB of storage capacity.

SCSI Storage Expansion Unit

Enable the use of high-performance Ultra320 SCSI HDDs in your blades environment. This option provides integrated mirroring capabilities and uses standard IBM hot-swap HDDs.

Blade chassis options

Optical Pass-thru Module

This option features an unswitched, unblocked network connection to each blade server bay. It must be used in conjunction with the Gigabit Ethernet Expansion Card, the Myrinet Expansion Card, the FC Expansion Card or the integrated Gigabit Ethernet on the blade server.

4-port Gigabit Ethernet Switch Module

Featuring Layer 2 switching technology, this option provides high-speed Ethernet connections between each blade server and the outside network environment.

Nortel Networks Layer 2-7 Gigabit Ethernet Switch Module

Featuring Layer 2 through 7 switching technology, this module integrates advanced Ethernet functionality into the chassis, decreasing complexity and increasing manageability.

2-Port Fibre Channel Switch Module

Similar to the Ethernet switch, this option contains two FC uplinks capable of supporting transmissions up to 2Gbps[6].

Redundant KVM/Management Module

This option enables system management resiliency and provides remote management and connectivity to the BladeCenter chassis for the most critical applications[7].

1800W Power Supply Module

Bringing greater reliability to your BladeCenter solution and greater availability for applications, the 1800W Power Supply Module provides both power and redundancy to BladeCenter configurations.

Acoustic Attenuation Module

An ideal solution for sound-sensitive customers deploying multiple BladeCenters, this module is designed to minimize audio emissions.

BladeCenter options	Part number
Optical Pass-thru Module	02R9080
Optical Pass-thru Module SC Cable	73P5992
Optical Pass-thru Module LC Cable	73P6033
4-Port Gigabit Ethernet Switch Module	48P7054
Nortel Networks Layer 2-7 Gigabit Ethernet Switch Module	73P9057
2-Port Fibre Channel Switch Module	48P7062
Redundant KVM/Management Module	48P7055
1800W Power Supply Module	13N0570
Acoustic Attenuation Module	49P2694
Myrinet Cluster Expansion Card	73P6000
Gigabit Ethernet Expansion Card	73P9030
Fibre Channel Expansion Card	48P7061
40GB 5400rpm ATA-100 Hard Disk Drive	48P7063
SCSI Storage Expansion Unit	48P7058

For more information?

World Wide Web

U.S.	**ibm.com**/pc/us/eserver/xseries/bladecenter_family
Canada	**ibm.com**/pc/ca/eserver/xseries/bladecenter_family

Reseller locator and general information

U.S.	1 800 426-4968
Canada	1 800 426-2255
	ibm.com/pc/us/businesspartner

Support for IBM TotalStorage® solutions

Network Attached Storage (NAS)

NAS

NAS is a low-cost, remote storage solution giving you great flexibility and scalability for storage needs. Connecting the Gigabit Ethernet switch module to the IBM TotalStorage NAS family of products creates a solution that is easy to deploy and manage.

SAN

A SAN is a high-performance, highly flexible architecture for creating remote storage solutions, ideal for Microsoft Exchange configurations. The FC switch modules and FC expansion cards enable connectivity to each blade server. Connecting to the IBM TotalStorage FAStT family of products is an ideal solution.

Choose BladeCenter solutions

1. ***Innovative technology***
   - High-performance solution with high reliability targeted at business-critical application workloads
   - Integration reduces complexity
   - Bringing servers, storage and networking together in a single managed environment, BladeCenter simplifies IT management while helping reduce IT costs.
2. ***On demand world***
   - BladeCenter gives businesses the flexibility to architect application solutions that meet business objectives.
   - BladeCenter provides advanced systems management capabilities that help simplify operations and make your IT infrastructure more resilient.
3. ***BladeCenter ecosystem offers solution flexibility***
   - BladeCenter's comprehensive ecosystem gives you the ability to integrate BladeCenter into the existing environment—so you can standardize data centers around existing infrastructures.
4. ***A comprehensive solution***
   - IBM provides outstanding service and support
   - IBM features interoperability between series to make BladeCenter work with midrange, mainframe and existing Intel systems

IBM @server BladeCenter at a glance	
Form factor	Rack/7U, high-availability midplane
Blade bays	Up to 14
Standard media	CD-ROM and diskette drive accessible from each blade server
Switch modules	4 switch module bays
Power supply module	Up to 4 (hot-swap and redundant 1800W with load balancing and failover capabilities)
Cooling modules	2 hot-swap and redundant blowers standard
Systems management hardware	1 management module standard, add an optional second module for redundancy
I/O ports	Keyboard, video, mouse, Ethernet, USB

IBM @server BladeCenter HS20 at a glance	
Processor	Intel Xeon processor up to 2.8GHz
Number of processors (std/max)	1/2
Level 2 cache	512KB
Front side bus	Up to 533MHz
Memory	Up to 8GB[8] DDR ECC Chipkill™
Internal hard disk drives	Up to 2 IDE (or up to 2 hot-swap Ultra320 SCSI drives with optional SCSI Storage Expansion Unit)
Maximum internal storage	146.8GB[5] SCSI/80GB IDE
RAID support	Integrated IDE RAID standard on blade server, integrated RAID with SCSI Storage Expansion Unit option
Network	2 integrated Gigabit Ethernet controllers
I/O upgrade	1 expansion card connection
Systems management hardware	Integrated systems management processor
Systems management software	IBM Director with systems management and trial deployment tools, IBM Director Server Plus Pack optional
Predictive Failure Analysis	Hard disk drives, processors, blowers, memory
Light Path Diagnostics	Blade server, processor, memory, power supplies, blowers, switch module, management module, hard disk drives and expansion card
Limited warranty[9] and support	3-year onsite limited warranty
External storage	Support for IBM TotalStorage solutions (including FAStT and NAS family of products)
Operating systems supported	Microsoft Windows Server 2003, Microsoft Windows 2000 Server/Advanced Server, Red Hat Linux, SuSE Linux, Novell NetWare

High-performance processors

The JS20 delivers a new level of price/performance for the POWER technology customer. This blade server features a 64-bit PowerPC 970 processor, derived from POWER4™ technology. The processor is enhanced with 162 Single Instruction/Multiple Data (SIMD) instructions. If applications have independent data that use the same instruction stream, then the SIMD instructions will allow parallel execution. These applications will typically achieve 20-40% greater throughput by using this instruction set than the same applications run on the same system without employing these instructions.

Customers with applications in bioinformatics, seismic processing, crash analysis, digital signal processing and financial services will often be able to take advantage of the SIMD capability to achieve high levels of throughput and price/performance.

Binary compatibility with POWER processor-based systems

Applications written for POWER4 and PowerPC processor-based systems using the SuSE Linux Enterprise Server 8 (SLES 8) can be executed without recompilation on same and

IBM @server BladeCenter JS20 at a glance	
Processor	PowerPC® 970 at 1.6GHz (64-bit)
Number of processors	2
Level 2 cache	512KB
Memory bus	800MHz
Memory	Up to 4GB DDR ECC SDRAM
Internal hard disk drives	Up to 2 IDE
Maximum internal storage	80GB
Network	2 integrated Gigabit Ethernet controllers
I/O Upgrade	1 expansion card connection
Systems management hardware	Integrated system management processor
Systems management software	IBM Director with systems management and trial deployment tools, IBM Director Server Plus Pack optional
Predictive Failure Analysis	Hard disk drives, processors, blowers, memory
Light Path Diagnostics	Blade server, processor, memory, power supplies, blowers, switch module, management module, hard disk drives and expansion card
Limited warranty[10] and support	3-year CRU and onsite limited warranty
External storage	Support for IBM TotalStorage solutions (including FAStT and NAS family of products)
Operating systems supported	SuSE Linux Enterprise Server 8, Turbolinux Enterprise Server 8

newer models of that processor family with SLES 8. The exceptions include, but may not be limited to, applications compiled using POWER4 or PowerPC specific compiler options but executed on models other than POWER4 or PowerPC, respectively, or applications using:

- *Undocumented SLES 8 internal features; or*
- *SIMD instructions which are not available on POWER4 systems*

64-bit Linux support

The JS20 provides 64-bit Linux support. This can help customers with data-intensive applications, enabling them to simplify programming and improve application performance.

Target applications for the JS20 include:

- *Bioinformatics*
- *Seismic processing*
- *Digital signal processing*
- *Transactional Web serving*
- *Financial services*

[1] Available on select models of HS20 blade servers.

[2] The Standby Capacity on Demand offering requires agreement to purchase all standby blades within six months of delivery.

[3] The Remote Deployment Manager Tool is not supported on the JS20 blade.

[4] Options support varies by server platform.

[5] When referring to storage capacity, GB means 1,000,000,000 and TB means 1,000,000,000,000. Accessible capacity is less.

[6] Speed denotes maximum possible and is dependent on many factors. Actual speed may vary and be less than the maximum.

[7] KVM capability not available on JS20.

[8] Varies by model.

[9] Visit **ibm.com**/pc/safecomputing periodically for the latest information on safe and effective computing. For a copy of the IBM Statement of Limited Warranty, call 1 800 426-7378. Telephone support may be subject to additional charges. For onsite service, IBM sends a technician after attempting to diagnose and resolve the problem remotely.

[10] For a copy of the IBM Statement of Limited Warranty, call 1 800 426-7378. Telephone support may be subject to additional charges. For onsite service, IBM sends a technician after attempting to diagnose and resolve the problem remotely. If the problem can be resolved with customer replaceable unit (CRU), then IBM will ship CRU parts to you for your replacement.

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