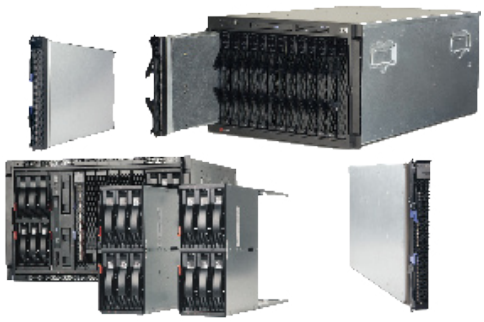
IBM BladeCenter

Truly unique blade server solutions that maximize compute density and simplicity, while reducing energy costs, cabling, and redundant components



- **Consolidate a variety of computing environments with Intel® Xeon®, AMD Opteron™, POWER6™, and Cell Broadband Engine™ CPUs in a single chassis**
- **Better performance/watt than blade servers from other manufacturers like Dell, HP & Sun**
- **Custom-built blade architecture reduces cabling, complexity, and operating costs, while using less floor space**

NORTH AMERICAN SYSTEMS INTERNATIONAL

IBM BladeCenter chassis share the power, cooling, Ethernet, storage, switching and management across blade servers

Leverage the experience North American Systems has gained from designing, configuring, installing and implementing IBM BladeCenter solutions. We offer:

- » assessments of existing IT infrastructure
- » translations of existing architecture and future requirements into a blade solution design
- » configuration and planning guidance
- » server migration and consolidation services
- » data conversion
- » proof-of-concept, live demos, and network diagrams of your architecture before and after
- » non-disruptive rollouts and implementation
- » onsite installation
- » SAN module installation
- » IBM Director solutions
- » IBM Remote Deployment Manager options
- » training on new, powerful Advanced Management Module and Open Fabric Manager

Reduce Costs

The IBM BladeCenter® provides many features that make it more attractive than many of today's 1U servers. The BladeCenter architecture eliminates the need for extra components, while providing redundancy and the stability of the IBM X-Architecture®, which delivers enterprise-class reliability

In addition, IBM's integrated CoolBlue™ technology helps reduce and control energy costs, allowing you to "go green".

Built for everywhere

The BladeCenter Chassis is available in a variety of configurations to fit any number of IT requirements.

For data centers short on space who need to converse energy, the BladeCenter E is ideal, while those who have compute-intensive applications and I/O requirements can use the BladeCenter H.

Branch offices can use standard office plugs with the BladeCenter S to bring a "business-in-a-box" approach to blade computing, while the BladeCenter T is NEBS-/ETSI- compliant, and ideal for ruggedized environments like telco.

With the new BladeCenter HT model, you can even get high-performance capabilities without sacrificing a ruggedized form factor.

High Performance Capabilities

The IBM BladeCenter comes with integrated storage connectivity and integrated ethernet to maximize throughput. All BladeCenter Chassis comes with external ports for KVM, ethernet, USB and serial connections. In addition, the IBM BladeCenter includes options for 10Gbps Ethernet, 4X InfiniBand, 10Gbps FC, and Myrinet Clustering for HPC.

Reliability, Availability, Serviceability

- » Redundant I/O and power for all blade servers
- » Predictive Failure Analysis for disk drives, processors, cooling blowers, and memory
- » Light Path Diagnostics for servers, processors, memory, power supplies, blowers, switch modules, management modules, disk drives, and expansion cards

Open Fabric & Open Fabric Manager

IBM's Open Fabric is an integrated I/O portfolio that enables IT departments to choose interconnects based on their business requirements, and simplify SAN interoperability and scalability.

The IBM Open Fabric Manager streamlines the management of your IBM BladeCenter solutions, allowing new blade servers to be deployed via a simple GUI, and automates the connections between the blade and storage networks. In addition, this management software also reduces downtime with integrated failover.

BladeCenter Chassis	BladeCenter HT	BladeCenter T	BladeCenter E	BladeCenter H	BladeCenter S
Server bays	12	8	14	14	6, w/2 x storage module bays and up to 12 x 3.5" HDD bays
Form Factor	12U	8U	7U	9U	7U
Power Module	3160W AC/DC	1300W AC/DC	2000W AC	2900W AC	950W / 1450W AC
I/O Modules	Up to 4 legacy, 4 high-speed, 4 bridge	Up to 4 legacy	Up to 4 legacy	Up to 4 legacy, 4 high-speed, 4 bridge	Up to 4 legacy
Features	Combination of high performance and ruggedized design	NEBS-/ETSI- for rugged environments, telecom, military	Maximum compute density and energy-efficiency	High-performance for demanding applications and simulations	Built for small offices, retail, and other distributed environments

IBM blade servers contain the necessary processors, memory, I/O and storage to run a variety of applications

IBM Blade Servers	HS21 XM	HS21	HS12	LS41	LS21	JS22	JS12	JS21	QS21	HC10
CPUs	1 - 2 dual- or quad-core Intel Xeon 3.0GHz	1 - 2 dual-core Xeon 3.0GHz or quad-core 3..6GHz	1 single- or dual-core Xeon 2.13GHz or quad-core 2..83GHz	1 - 4 AMD Opteron	1 - 2 AMD Opteron	4 x POWER6 up to 4.0GHz	2 x POWER6 up to 3.8GHz	2 single- or dual-core PowerPC 970MP up to 2.7GHz	Up to 2 x 3.2GHz Cell Broadband Engine processor with 1 x PPE and 8 x SPE	1 Intel Core2 Duo up to 2.66GHz
Max cache	12MB shared L2 w/quad-core, 6MB w/dual-core	12MB shared L2 w/quad-core, 6MB w/dual-core	12MB shared L2 w/quad-core, 4MB w/dual-core	1MB L2 cache per processor core	1MB L2 cache per processor core	4MB L2 cache per processor core	4MB L2 cache per processor core	1MB L2 cache per processor core	512KB per Cell CPU, plus 256KB/each SPE	Up to 4GB L2
Internal Memory	32 GB	16 GB	24 GB	64 GB	32 GB	32 GB	16 GB	64 GB	2 GB	8GB
Internal Storage	587.2 GB	734 GB	293.6 GB	734 GB	587.2 GB	146.8 GB	293.6 GB	293.6 GB	None	60 GB
Network	Dual GbE and 12 optional ports	Dual GbE and 8 optional ports	Dual GbE and 8 optional ports	2 or 4 integrated GbE	Dual integrated GbE	Integrated controller with 2 host ethernet	Dual GbE & optional GbE daughter card	Dual integrated GbE	Dual GbE	Solo GbE

Storage and I/O expansion blade	» Enables each blade server to support up to 5 disk drives » Embedded RAID 0, RAID 1 » Enables each blade server to support up to 3 I/O expansion cards
Memory and I/O expansion blade	» Provides additional memory DIMMs for each blade server » Up to 32GB additional memory per blade » Supported by HS21 server only » Two additional NICs and two addition I/O ports per blade
PCI-X I/O expansion blade	» Extends blade to house 2 100-133MHz PCI-X adapters » NEBS3/ETSI-certified » Supported on HS21 and HS20 servers
PCI-Express Expansion blade	» Extends blade to house 2 full-height or half-height PCI-Express cards » PCI-Express 8 lanes electrical and 16 lanes mechanical for each slot
I/O Module	» Doubles amount of simultaneous interconnects between HS21, LS21, LS41 and JS21 blade servers when used with CFF expansion cards » Multi-Switch Interconnect Module leverages full system of SFF Ethernet and FC switch modules » Allows standard switch modules to be used in horizontally-oriented high speed bays in BladeCenter H chassis
Boot Disk System	» 2U enclosure provides OS initialization functionality » Supports up to 2 x fully-loaded BladeCenter E or BladeCenter H chassis

Enhanced Virtualization

The IBM BladeCenter is an ideal virtualization solution for IT infrastructures that want to consolidate a variety of Linux®, UNIX™, IBM i™, and Windows® workloads onto a single physical system. With a wide variety of processor choice and interoperability, forwards- and backwards-compatibility, and advanced management, you can virtualize with the BladeCenter to reduce costs and redundancies, maximize resiliency, and increase IT agility to respond to rapidly-changing business requirements.

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