



IBM BladeCenter JS23 and JS43 Express servers combine excellent processing power with the scalability, reliability, and configuration flexibility of the IBM BladeCenter architecture

Table of contents

1 At a glance	12 Services
1 Overview	12 Technical information
2 Key prerequisites	17 IBM Electronic Services
3 Planned availability dates	18 Terms and conditions
3 Description	23 Pricing
6 Product number	30 Order now
12 Publications	31 Corrections

At a glance

The IBM® BladeCenter® JS23 and JS43 Express feature:

- Innovation with proven sixth-generation POWER™ technology for enhanced performance, efficiency, and reliability features
- Leadership PowerVM™ virtualization technology to help cut costs and consolidate workloads
- Innovative EnergyScale™ technology to help save energy costs
- Up to 64 GB memory on a 4-core JS23 or 128 GB memory on an 8-core JS43
- One (JS23) or two (JS43) 73 GB, 146 GB, or 300 GB 2.5-inch SAS or 69 GB solid state disk drives
- Integrated:
 - Dual Gigabit Ethernet
 - SAS Controller
 - FSP1 Service Processor
 - Four USB ports and one Serial over LAN (SOL) via FSP
 - One PCI-E CIOv expansion card slot and one PCI-E CFFh high-speed expansion card slot on the JS23; two PCI-E CIOv expansion card slots and two PCI-E CFFh high-speed expansion card slots on the JS43
- Optional preinstall for IBM AIX/VIOS, IBM i, and SUSE Linux® Enterprise Server 10 Service Pack 2 for POWER operating systems

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

Overview

Built on the promise of the IBM BladeCenter family of products -- easy-to-use, integrated platforms with a high degree of deployment flexibility, scalability, and manageability -- the new BladeCenter JS23 and JS43 Express are the premier blades for 64-bit applications. They represent one of the most flexible and cost-efficient solutions for UNIX®, IBM i, and Linux deployments available in the market.

Further enhanced by their ability to be installed in the same chassis with other BladeCenter servers, the JS23 and JS43 are designed to deliver the rapid return on investment that small businesses demand. Delivering on the promise of a truly dynamic Infrastructure, the BladeCenter JS23 and JS43 help in delivering superior business and IT services with agility and speed -- all in a simple-to-manage, highly efficient way.

The 4.2 GHz BladeCenter JS23 and JS43 use the POWER6+™ version of the POWER6™ processor.

The JS23 and JS43 Express blades have been preconfigured and tested by IBM and are based on proven technology. Utilizing a 4.2 GHz 64-bit POWER6 processor and available in a 4-core or 8-core configuration including a new 32 MB Level 3 cache for each core pair, and simultaneous multi-threading, they are designed to deliver outstanding performance and capabilities at compelling prices. With faster and more reliable double data rate 2 (DDR2) memory options and support for eight to sixteen memory DIMM slots along with a Serial Attached SCSI (SAS) disk subsystem, the BladeCenter JS23 and JS43 Express blades are designed for increased uptime and enhanced performance. Exploiting the newest in high-performance and energy-efficient solutions like solid state disk technology, the JS23 and JS43 offer remarkable performance for I/O-intensive applications. And for those that require fast and frequent data access, the JS23 and JS43 offer the utmost in easy-to-manage, tough-to-break solutions. Along with built-in support for PowerVM Editions for advanced virtualization features such as Live Partition Mobility and Active Memory™ Sharing, the JS23 and JS43 Express offer an ideal blade server solution for driving your most demanding performance- and memory-intensive workloads, such as virtualization, databases, and high performance computing (HPC) applications. By consolidating and virtualizing on BladeCenter with the JS23 and JS43, you can increase the utilization of your hardware and decrease the number of physical assets you need to watch over. This translates into real dollar savings through better energy conservation and IT resource usage across the data center.

Meeting today's cost challenges while planning for tomorrow's growth can be difficult. When you demand more performance, these blade servers are ready to scale to four processors with the addition of a multi-processor expansion unit (MPE). Simply snap the MPE to the original blade and it becomes a four-processor, eight-core, 60-mm blade server with additional performance, additional memory, and twice the I/O expansion to deliver a flexible, resilient, and highly scalable IT infrastructure. Best of all, this expansion capability won't break the bank and provides the opportunity to standardize on a single blade platform for all your needs.

With IBM BladeCenter and IBM i, you can realize innovation with proven sixth-generation POWER technology for enhanced performance, efficiency, and reliability features; help cut costs and consolidate workloads with leadership virtualization as a built-in feature; go green with better energy management by using EnergyScale technology; and manage growth, complexity, and risk with the flexibility of IBM BladeCenter technology. With i support, small and medium clients can consolidate their IBM System i® and Intel® processor-based servers into a single chassis, leveraging the management, space, and power savings provided by IBM BladeCenter solutions. Large or small enterprises can now consolidate their IBM i applications into a centralized BladeCenter environment with a choice of BladeCenter chassis and blade configurations to fit their needs.

Key prerequisites

- A BladeCenter chassis
- When used with Serial over LAN Console support, a network switch module
- A rack (7014-B42 recommended)
- An operating system (IBM AIX®, IBM i operating system, Red Hat Linux, or Novell SUSE Linux)

Planned availability dates

- June 5, 2009 for feature numbers 8240 and 8242
- May 22, 2009 for all other features

Description

IBM BladeCenter JS23 and JS43

The IBM BladeCenter JS23 and JS43 Express are the latest high-density blade servers with POWER6 and EnergyScale technology.

The IBM BladeCenter JS23 is a one-wide BladeCenter with a 4-core 64-bit 4.2 GHz processor, eight DIMM slots which can contain up to a maximum of 64 GB of memory, and a bay for an optional single 73/146/300 GB SAS Small Form Factor (SFF) 2.5-inch or 69 GB solid-state drive.

By adding feature number 8446, the BladeCenter JS23 is converted into a two-wide BladeCenter JS43. Feature number 8446 delivers a second 4-core 64-bit 4.2 GHz processor, a second set of eight DIMM slots which increases the maximum memory to 128 GB, and a bay for an optional second 73/146/300 GB SAS SFF or 69 GB solid-state drive.

Integrated features common to both the JS23 and JS43 include:

- Dual Gigabit Ethernet
- SAS Controller
- FSP1 Service Processor
- Four USB ports and one Serial over LAN (SOL) via FSP
- One PCI-E CIOv daughter card slot and one PCI-E high-speed daughter card slot on the JS23; two PCI-E CIOv daughter card slots and two PCI-E high-speed daughter card slots on the JS43

As a heterogeneous infrastructure consolidation platform, the BladeCenter H, HT, and S Chassis also support running the JS23 and JS43 alongside your Intel processor-based HS blades, AMD Opteron processor-based LS blades, and Cell/B.E.[™] processor-based QS21 blades in the same chassis with independent monitoring, security, power, and systems management. With several Gigabit Ethernet, Fibre Channel, iSCSI, and InfiniBand high-performance expansion cards to choose from, the JS23 and JS43 can be tailored to the demands of your datacenter network and application workloads.

The BladeCenter S Chassis supports a maximum of six JS23 blades, or a mix of JS23 blades and other blades. For the BladeCenter H Chassis, the maximum number of JS23 blades is 14; for the BladeCenter HT Chassis, the maximum number of JS23 blades is 12.

IBM i supports the BladeCenter S chassis and BladeCenter H chassis only.

IBM i does not support the BladeCenter HT chassis.

The JS23 and JS43 have autonomic power and thermal controls designed to maintain operation in out-of-specification situations. If thermal or power conditions become unacceptable, it may reduce the processor or memory performance capability to maintain acceptable conditions. When the conditions are restored to an acceptable value, the blade will again automatically resume normal operation. Some applications may be sensitive to these capability changes. Contact your application vendors to determine any possible impacts.

Full keyboard, video, and mouse support can be used at installation instead of Serial over LAN (SOL), which requires a network switch module in the chassis.

Multiple console connections are also supported by simultaneously using the BladeCenter keyboard, video, and mouse, and a SOL connection. The USB bus on the BladeCenter chassis is used for keyboard support on the JS23 and JS43. The Advanced Management Module (aMM) on the chassis controls the routing of keyboard inputs to one of up to 14 blade servers. An embedded video controller is used to support 2D graphics on an SVGA video display. The JS23 and JS43 have four USB ports; two interface with keyboard and mouse through the aMM and two with a removable media tray also through the aMM.

As a robust blade solution for 64-bit UNIX applications, the JS23 and JS43 also deliver leadership single-instruction, multiple-data (SMID) capabilities with the Linux operating system for scientific research and HPC.

JS23 and JS43 features and benefits:

- Highly efficient and flexible design of IBM blade
 - Densely pack more servers into a smaller space
 - Tailor the system to meet varied business requirements with a choice of BladeCenter chassis
 - Lower acquisition cost and energy consumption versus traditional 1U or 2U rack servers
 - Integrate networking switch infrastructure for improved cabling and data center maintenance
 - Deploy in virtually any office environment for quiet, highly secure, and contaminant-protected operation
- Pioneering IBM EnergyScale technology and Systems Director Active Energy Manager software
 - Generate less heat by managing application utilization and server energy consumption
 - Use less energy to cool the system
- Industry-leading PowerVM virtualization technology
 - Reduce infrastructure costs by doing more with fewer servers
 - Simplify IT operations to leverage storage, network, and computing resources to control costs and be more responsive
- Innovative reliability features and systems management
 - Expedite hardware repairs and reduce service time
 - Enable scheduled maintenance with proactive monitoring of critical system components to help reduce unplanned failures
- Choice of IBM AIX, IBM i, or Linux operating environment
 - Standardize on a single platform that runs the large and varied portfolio of applications that support your business

PowerVM Editions (Advanced Power Virtualization) (Optional)

The JS23 and JS43 have support for PowerVM technology built into the microprocessor. The JS23 and JS43 are designed to make it more affordable to consolidate multiple independent applications on a single blade using the same proven virtualization technologies offered on IBM Power servers.

The JS23 and JS43 support two leading-edge virtualization technologies: PowerVM Standard Edition (#5429) and PowerVM Enterprise Edition (#5607):

- PowerVM Standard Edition makes the JS23 and JS43 an ideal platform for consolidation of AIX, Linux, and IBM i operating system applications, helping clients reduce infrastructure complexity and cost. Offering an intuitive, Web-based interface for managing virtualization within a single blade, the Integrated Virtualization Manager (IVM) component of Virtual I/O Server (VIOS) allows the small business IT manager to quickly and easily set up and manage logical partitions (LPARs). It also enables Virtual I/O and Virtual Ethernet so that storage and communications adapters can be shared among all the LPARs running on

the JS23 and JS43. Ultimately, IBM Micro-Partitioning[™] technology allows each processor core to be subdivided into as many as 10 virtual servers. And since the JS23 and JS43 are built with POWER6 technology, other advanced virtualization functions such as Shared Dedicated Capacity may be exploited.

- PowerVM Enterprise Edition includes all the features of PowerVM Standard Edition plus a new capability called Live Partition Mobility. Live Partition Mobility allows for the movement of a running AIX or Linux partition from one POWER6 processor-based server to another with no application downtime, resulting in better system utilization, improved application availability, and potential energy savings. With Live Partition Mobility, planned application downtime due to regular server maintenance can be a thing of the past. Software Maintenance for Virtual I/O Server (577x-PVE) must be purchased with VIOS (5765-PVE). PowerVM Enterprise Edition must be purchased separately.

Note:PowerVM Standard Edition and PowerVM Enterprise Edition are optional when running AIX or Linux. Power VM Standard or Enterprise Edition is required when running IBM i operating system on the JS23 and JS43.

Systems Management and Administrative Tools

Integrated diagnostic and administrative tools like IBM Predictive Failure Analysis® and light path diagnostics are designed to simplify administration to help lower costs and improve control of the IT environment. Remote management capabilities allow automating IT networking tasks. Proven technology like VIOS allows the sharing of disk drives, communications, and Fibre Channel adapters.

Systems management tools for the JS23 and JS43:

- AIX 5.3 or AIX 6: IBM Director V5.2 and Cluster Systems Management (CSM) for AIX, V1.7
- SUSE Linux Enterprise Server 10 Service Pack 2 for POWER, or later, or SUSE Linux Enterprise Server for POWER, or later: IBM Director V5.2 and CSM for Linux on POWER, V1.7
- Red Hat Enterprise Linux 4.6, for POWER, or later, or Red Hat Enterprise Linux 4.7, for POWER, or later: IBM Director V5.2 and CSM for Linux on POWER, V1.7
- Red Hat Enterprise Linux 5.1, for POWER, or later, or Red Hat Enterprise Linux 5.2, for POWER, or later, or Red Hat Enterprise Linux 5.3, for POWER, or later: IBM Director V5.2 and CSM for Linux on POWER, V1.7
- IBM i 6.1, or later: IBM Director V5.2

IBM Director V5.1 must be downloaded from

<http://www.ibm.com/systems/management/director/downloads.html>

CSM for Linux on POWER, V1.7 (5765-G16) and CSM for AIX, V1.7 (5765-F67) provide a full suite of systems management software for the JS23 and JS43, including:

- Hardware control
- Installation and updating of software on nodes
- Distributed command execution
- File synchronization across a cluster
- Monitoring and automated response
- Automatic security configuration
- Management of node groups (static and dynamic)
- Diagnostics tools

More information on CSM can be found at

<http://www.ibm.com/systems/clusters/software/>

CSM/IBM Director Positioning

CSM is recommended for managing Linux or AIX clusters if you prefer a scripting interface to perform cluster management tasks. CSM provides full installation for Linux and a flexible command-line interface.

Product number

The following are newly announced features on the specific models of the IBM BladeCenter 7778 machine type:

Description	MT	Model	Feature
IBM 7778-23X	7778	23X	
AIX Partition Specify	7778	23X	0265
Linux Partition Specify	7778	23X	0266
IBM i Operating System Partition Specify	7778	23X	0267
IBM i 6.1 Specify Code	7778	23X	0534
US TAA Compliance Indicator	7778	23X	0983
Primary OS - IBM i	7778	23X	2145
Primary OS - AIX	7778	23X	2146
Primary OS - Linux	7778	23X	2147
Integrate Blade Server in Chassis (BP)	7778	23X	4645
Integrate Blade Server in Chassis	7778	23X	4646
Rack Indicator- Not Factory Integrated	7778	23X	4650
Rack Indicator, Rack #1	7778	23X	4651
Rack Indicator, Rack #2	7778	23X	4652
Rack Indicator, Rack #3	7778	23X	4653
Rack Indicator, Rack #4	7778	23X	4654
Rack Indicator, Rack #5	7778	23X	4655
Rack Indicator, Rack #6	7778	23X	4656
Rack Indicator, Rack #7	7778	23X	4657
Rack Indicator, Rack #8	7778	23X	4658
Rack Indicator, Rack #9	7778	23X	4659
Rack Indicator, Rack #10	7778	23X	4660
Rack Indicator, Rack #11	7778	23X	4661
Rack Indicator, Rack #12	7778	23X	4662
Rack Indicator, Rack #13	7778	23X	4663
Rack Indicator, Rack #14	7778	23X	4664
Rack Indicator, Rack #15	7778	23X	4665
Rack Indicator, Rack #16	7778	23X	4666
Chassis indicator-Not Factory Integrated	7778	23X	4680
BladeCenter chassis specify, Chassis #1	7778	23X	4681
BladeCenter chassis specify, Chassis #2	7778	23X	4682
BladeCenter chassis specify, Chassis #3	7778	23X	4683
BladeCenter chassis specify, Chassis #4	7778	23X	4684
BladeCenter chassis specify, Chassis #5	7778	23X	4685
BladeCenter chassis specify, Chassis #6	7778	23X	4686
BladeCenter chassis specify, Chassis #7	7778	23X	4687
BladeCenter chassis specify, Chassis #8	7778	23X	4688
BladeCenter chassis specify, Chassis #9	7778	23X	4689
Custom Service Specify, Off-Site	7778	23X	5001
Software Preinstall	7778	23X	5005
Custom Service Specify, On-Site	7778	23X	5039
PowerVM Standard Edition	7778	23X	5429
PowerVM Enterprise Edition	7778	23X	5607
SDI Software Pre-Install Indicator	7778	23X	7305
IBM i Software Preinstall	7778	23X	8141
Linux Software Preinstall	7778	23X	8143
Linux Software Preinstall (SDIs)	7778	23X	8144
Software Preinstall	7778	23X	8146
4GB (2 x 2 GB) DDR2 667MHz DIMMs	7778	23X	8229
IBM 146GB SAS 10K SFF HDD	7778	23X	8236
IBM 73GB SAS 10K SFF HDD	7778	23X	8237
8GB (2 x 4 GB) DDR2 667MHz DIMMs	7778	23X	8239
Emulex 8Gb Fibre Channel Expansion Card (CIOV)			

for IBM BladeCenter	7778	23X	8240
QLogic 4 Gb Fibre Channel Expansion Card (CIOv) for IBM BladeCenter	7778	23X	8241
QLogic 8Gb Fibre Channel Expansion Card (CIOv) for IBM BladeCenter	7778	23X	8242
16GB (2 x 8 GB) DDR2 400 MHz DIMMs	7778	23X	8245
3 Gb SAS Passthrough Expansion Card (CIOv) for IBM BladeCenter	7778	23X	8246
QLogic Ethernet and 4 Gb Fibre Channel Expansion Card (CFFh)	7778	23X	8252
4X InfiniBand DDR Expansion Card (CFFh) for IBM BladeCenter	7778	23X	8258
QLogic 8 Gb Fibre Channel Expansion Card (CFFh)	7778	23X	8271
69GB SFF SAS Solid State Drive-Power Blade	7778	23X	8273
IBM 300GB SAS 10K RPM SAS HDD	7778	23X	8274
Voltaire 4x InfiniBand DDR Expansion Card (CFFh) for IBM BladeCenter	7778	23X	8298
Zero-priced Processor Entitlement for IBM BladeCenter JS23/JS43	7778	23X	8393
One Processor Entitlement for the IBM BladeCenter JS23/JS43	7778	23X	8395
1-wide Add-on SMP Chassis	7778	23X	8446
IBM BladeCenter JS23/JS43 Installation/Users Guide (Brazilian Portuguese)	7778	23X	8766
IBM BladeCenter JS23/JS43 Installation/Users Guide (English)	7778	23X	8767
IBM BladeCenter JS23/JS43 Installation/Users Guide (French)	7778	23X	8768
IBM BladeCenter JS23/JS43 Installation/Users Guide (German)	7778	23X	8769
IBM BladeCenter JS23/JS43 Installation/Users Guide (Italian)	7778	23X	8770
IBM BladeCenter JS23/JS43 Installation/Users Guide (Japanese English)	7778	23X	8771
IBM BladeCenter JS23/JS43 Installation/Users Guide (Japanese)	7778	23X	8772
IBM BladeCenter JS23/JS43 Installation/Users Guide (Korean)	7778	23X	8773
IBM BladeCenter JS23/JS43 Installation/Users Guide (Simplified Chinese)	7778	23X	8774
IBM BladeCenter JS23/JS43 Installation/Users Guide (Spanish)	7778	23X	8775
IBM BladeCenter JS23/JS43 Installation/Users Guide (Traditional Chinese)	7778	23X	8776
IBM BladeCenter JS23/JS43 Installation/Users Guide (UK English)	7778	23X	8777
IBM BladeCenter JS23/JS43 Service/Warranty CDs (Multi-language)	7778	23X	8778
Order Routing Indicator- System Plant	7778	23X	9169
Month Indicator	7778	23X	9461
Day Indicator	7778	23X	9462
Hour Indicator	7778	23X	9463
Minute Indicator	7778	23X	9464
Qty Indicator	7778	23X	9465
Countable Member Indicator	7778	23X	9466

The following are newly announced features on the specific models of the IBM BladeCenter 7779, 7989, and 7998 machine types:

Description	MT	Model	Feature
BladeCenter Chassis content specify - 7778-23X	7779	BCS	0312
	7989	BCH	
BladeCenter Chassis content specify - 7778-23X with Feature #8446	7779	BCS	0313
	7989	BCH	
Widescreen LCD Monitor	7779	BCS	3632
	7989	BCH	
SAS RAID Controller Switch Module and BBU	7779	BCS	3734
Linux Software Preinstall	7998	60X	8143
		61X	
Linux Software Preinstall (SDIs)	7998	60X	8144
		61X	
4GB (2 x 2 GB) DDR2 667MHz, 1GB DIMMs	7998	61X	8270

QLogic 8 Gb Fibre Channel Expansion Card (CFFh)	7998	60X 61X	8271
IBM 300GB SAS 10K RPM SAS HDD	7998	60X 61X	8274

Feature conversions

The existing components being replaced during a model or feature conversion become the property of IBM and must be returned.

Feature conversions are always implemented on a "quantity of one for quantity of one" basis. Multiple existing features may not be converted to a single new feature. Single existing features may not be converted to multiple new features.

The following conversions are available to customers:

Feature conversions for 7778-23X virtualization engine features:

From FC:	To FC:	Return parts
5429 - PowerVM Standard Edition	5607 - PowerVM Enterprise Edition	No

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=109-231>

IBM BladeCenter JS23 and JS43 Express System At a Glance

- Form factor
The JS23 is a one-wide blade server and the JS43 is a two-wide blade server for BladeCenter S, BladeCenter H, or BladeCenter HT Chassis.
- Processor cores
The JS23 contains two 2-core 64-bit 4.2 GHz POWER6 processors and the JS43 contains four 2-core 64-bit 4.2 GHz processors. Processors are not features. Processors contain AltiVec SIMD and Hardware Decimal Floating-Point acceleration.
- Level 2 (L2) cache
4 MB per processor core; 4-way set associative.
- Level 3 (L3) cache
32 MB per processor socket.
- Memory (standard and maximum)
Base offering: 4 GB (2 x 2 GB); Express offering: 4 GB (2 x 2 GB). Up to 64 GB maximum per JS23 in 8 DIMM slots and up to 128 GB maximum per JS43 blade in 16 DIMM slots. ECC and Chipkill™, redundant bit steering DDR2 SDRAM memory running at 667 MHz (2, 4 GB DIMMs) or 400 MHz (8 GB DIMMs).
- Internal SAS drive storage
One optional 73, 146, or 300 GB 2.5-inch Serial Attached SCSI (SAS) 10,000 RPM non-hot-swappable disk drive or 69 GB 2.5-inch solid-state disk on the JS23 with an additional optional 73, 146, or 300 GB 2.5-inch SAS 10,000 RPM non-hot-swappable disk drive or 69 GB 2.5-inch solid-state disk with the JS43. Integrated RAID-0 or RAID-1 standard on blade server with support for disk mirroring.
- Networking

Integrated Virtual Ethernet adapter (IVE) Dual-Gigabit and support for optional dual gigabit Ethernet daughter card.

- I/O upgrade

JS23 has one PCI-E CIOv daughter card slot and one PCI-E high-speed daughter card slot. The JS43 has two PCI-E CIOv daughter card slots and two PCI-E high-speed daughter card slots.

- Optional connectivity

1 Gbps Ethernet, 4 and 8 Gbps Fibre Channel, 4X InfiniBand SAS Expansion.

- PowerVM Standard Edition

Virtual LAN, POWER Hypervisor[™], Micro-partitioning, Virtual I/O Server with Integrated Virtualization Manager, Shared Dedicated Capacity, PowerVM Lx86.

- PowerVM Enterprise Edition

All the features of PowerVM Standard Edition plus Live Partition Mobility and Active Memory Sharing.

- Systems management

Integrated systems management processor, IBM Systems Director Active Energy Manager[™], light path diagnostics, Predictive Failure Analysis, Cluster Systems Management (CSM), Serial Over LAN, IPMI-compliant.

- RAS features

- IBM Chipkill ECC, bit-steering memory and cache Processor Instruction Retry
- Service processor with fault monitoring
- Hot-swappable disk bays (in BladeCenter S Chassis)
- Hot-plug power supplies and cooling fans (on chassis)
- Dynamic processor deallocation
- Dynamic deallocation of logical partitions and PCI bus slots
- Extended error handling on PCI-E slots
- Redundant power supplies and cooling fans (on chassis)

- Operating environments:

- AIX V5.3, or later
- AIX V6.1, or later
- IBM i 6.1, or later
- Novell SUSE Linux Enterprise Server 10 Service Pack 2 for POWER, or later
- Red Hat Enterprise Linux 4.6, for POWER, or later
- Red Hat Enterprise Linux 5.1, for POWER, or later

Note: Some of the IBM BladeCenter functions may not be supported by the IBM i operating system. These are identified at

<http://www.ibm.com/systems/power/hardware/blades/ibmi.html>

- High availability

IBM PowerHA family

Enhancements for IBM i 6.1

Enhanced support for BladeCenter

Support for BladeCenter JS23 and JS43 Express blades

IBM i 6.1 supports the scalable BladeCenter JS23 and BladeCenter JS43 Express blades. The BladeCenter JS23 blade is a 4-core, 4.2 GHz POWER6 processor-based blade with L3 cache which can be upgraded to the 8-core BladeCenter JS43. The JS23 blade supports up to 64 GB of memory and one disk drive and the BladeCenter JS43 supports up to 128 GB of memory and two disk drives. For IBM i, the BladeCenter JS23 and JS43 blades are supported in the BladeCenter S and BladeCenter H Chassis. These blades also support AIX and Linux operating systems.

IBM i uses the PowerVM VIOS partition for access to BladeCenter resources and storage devices. PowerVM Standard Edition is included with the BladeCenter JS23 and JS43 for no additional charge. The VIOS partition owns adapters on the blade and virtualizes the resources to the IBM i partition.

The BladeCenter JS23 and JS43 Express blades include:

- Dual Gigabit Ethernet
- SAS Controller
- FSP1 Service Processor
- Four USB ports and one Serial over LAN (SOL) via FSP
- One PCI-E CIOv daughter card slot and one PCI-E high-speed daughter card slot on the JS23
- Two PCI-E CIOv daughter card slots and two PCI-E high-speed daughter card slots on the JS43

IBM i supports the following I/O adapters and storage options on the BladeCenter JS23 and JS43:

- QLogic 8 Gb Fibre Channel Expansion Card (CIOv) for IBM BladeCenter (#8242)
- Emulex 8 Gb Fibre Channel Expansion Card (CIOv) for IBM BladeCenter (#8240)
- QLogic 4 Gb Fibre Channel Expansion Card (CIOv) for IBM BladeCenter (#8241)
- 3 Gb SAS Passthrough Expansion Card (CIOv) for IBM BladeCenter (#8246)
- QLogic Ethernet and 4 Gb Fibre Channel Expansion Card (CFFh) (#8252)
- 69 GB SFF SAS Solid State Drive-Blade P6+ (#8273)
- IBM 300 GB SAS 10K SFF HDD (#8274)
- IBM 146 GB SAS 10K SFF HDD (#8236)
- IBM 73 GB SAS 10K SFF HDD (#8237)

For use with IBM i, the blade can be deployed with one VIOS partition and one IBM i partition, with one VIOS partition and multiple IBM i partitions, or with one VIOS partition and a combination of IBM i, AIX, and Linux partitions. Integrated Virtualization Manager (IVM), a function of VIOS, is used to set up and manage the partitions.

IBM i 6.1 (5761-SS1) includes per processor core and per user entitlements for blade servers. When you select IBM i on a BladeCenter JS23 and JS43 blade, you must purchase at least one processor core entitlement and at least 10 user entitlements. You may purchase additional IBM i processor core entitlements up to a maximum of four on the JS23 and up to eight on the JS43 blade. Additional IBM i user entitlements can also be purchased in blocks of 10 users. You may also purchase unlimited user, external user, and unlimited collaboration user options. The BladeCenter JS23 and JS43 have a P10 Processor Group.

Support for virtual tape

IBM i 6.1 partitions on BladeCenter JS12, JS22, JS23, and JS43 blades support virtual tape, which simplifies backup and restore processing. IBM i can use native save/restore commands and BRMS to directly back up to a PowerVM VIOS attached LTO-4 tape drive, saving hardware costs and management time. This virtual tape support provides an effective backup solution for BladeCenter S configurations. It can also be used with BladeCenter H implementations. It simplifies migration to blades from tower/rack servers because an LTO-4 drive can read backup tapes

from LTO-2, 3, and 4 drives. Virtual tape can be used with VIOS and IBM i on POWER6 processor-based servers. The virtual tape function supports the IBM Systems Storage SAS LTO-4 drive, specifically, the TS2240 for BladeCenter and Power Servers, 7214 Model 1U2 with #1404, and #5720 DVD/Tape SAS External Storage Unit with #5746 for Power servers.

Support for BladeCenter S SAS RAID Controller Module

The BladeCenter S SAS RAID Controller Module is supported with POWER6 processor-based blades in addition to x86 processor-based blades with the BladeCenter S Chassis. This controller module provides additional protection options for BladeCenter S storage, providing:

- Support for RAID 0, 1, 10, and 5
- Support for two disk storage modules with up to 12 SAS drives
- Support for an external SAS tape drive
- Support for #8250 CFFV SAS adapter for JS22 and JS12 blades and #8246 3 GB SAS
- Passthrough Expansion Card, CIOv, for JS23 and JS43 blades
- 1 GB of battery-backed write cache between the two modules

Two SAS RAID Controller Modules are required with the BladeCenter S. For environments with high performance demands, separate RAID sets are recommended for each IBM i partition and for x86 blades. The controller is supported with BladeCenter JS12, JS22, JS23, and JS43 blades running AIX, Linux, and VIOS partitions, including a VIOS partition that virtualizes I/O resources for IBM i 6.1 partitions.

Enhanced i Edition Express for BladeCenter S

The i Edition Express for BladeCenter S configuration has been updated to increase the minimum memory from 2 GB to 4 GB on the BladeCenter JS12 Express blade and to include a new Intelligent Copper Pass-Thru Module (feature #5452). IBM i and VIOS are pre-installed with the i Edition solution along with built-in support for virtual tape. Available as optional is the newly supported BladeCenter S SAS RAID Controller Module (feature #3734) along with large capacity hot swappable disks for the BladeCenter S (300 GB or 450 GB).

For more information see

<http://www-03.ibm.com/systems/power/hardware/blades/index.html>

Virtualization enhancements

PowerVM Active Memory Sharing

IBM i 6.1 supports PowerVM Active Memory Sharing. PowerVM Active Memory Sharing is an advanced memory virtualization technology which intelligently flows memory from one partition to another for increased utilization and flexibility of memory usage. With this memory virtualization enhancement for POWER6 processor-based servers, IBM i, AIX, and Linux partitions can share a pool of memory and have PowerVM dynamically allocate the memory based on each partition's workload demands. PowerVM Active Memory Sharing is designed for partitions with variable memory requirements, for partitions that serve workloads that peak at different times across the partitions, and for active/inactive environments.

PowerVM Active Memory Sharing is available with PowerVM Enterprise Edition. It supports AIX 6.1, i 6.1, and SUSE Linux Enterprise Server 11 operating systems. The partitions must use PowerVM VIOS to virtualize all the I/O adapter and they must use shared processors. For more information see

<http://www-03.ibm.com/systems/power/software/virtualization/index.html>

Publications

No publications are shipped with the announced product.

With the IBM Systems Information Center, users can use a single information center to access product documentation for IBM Systems hardware, operating systems, and server software. Through a consistent framework, users can efficiently find information and personalize their access to that information. The IBM Systems Information Center is at

<http://publib14.boulder.ibm.com/infocenter/systems>

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.

Technical information

Specified operating environment

Physical specifications

- JS23
 - Height: 9.65 in (245 mm)
 - Width: 1.14 in (29 mm)
 - Depth: 17.55 in (445 mm)
 - Weight: 9.6 lb (4.35 kg)
- JS43
 - Height: 9.65 in (245 mm)
 - Width: 2.32 in (59 mm)
 - Depth: 17.55 in (445 mm)
 - Weight: 19.2 lb (8.7 kg)
- BladeCenter H chassis
 - Height: 15.75 in (400 mm)

- Width: 17.5 in (444 mm)
- Depth: 28.0 in (711 mm)
- Weight: 350 lb (159 kg)
- BladeCenter S chassis
 - Height: 12.0 in (306 mm)
 - Width: 17.5 in (444 mm)
 - Depth: 28.3 in (733 mm)
 - Weight: 240 lb (108.9 kg)

To assure installability and serviceability in non-IBM industry-standard racks, review the installation planning information for any product-specific installation requirements.

Operating environment

- Temperature:
 - 10 to 35 degrees C (50 to 95 degrees F) at 0 to 914 m (0 to 3,000 ft)
 - 10 to 32 degrees C (50 to 90 degrees F) at 914 to 2,133 m (3,000 to 7,000 ft)
- Relative humidity: 8% to 80%
- Maximum altitude: 2,133 m (7,000 ft)
- Power consumption (@ +12 V supplied by BladeCenter chassis): 350 watts maximum

EMC conformance

- U.S.: FCC - Verified to comply with Part 15 of the FCC Rules Class A
- Canada: ICES-004, issue 3 Class A
- EMEA: EN55022: 2006 Class A
- Australia and New Zealand: CISPR 22, Class A

Safety certifications

- U.S.: (UL Mark) UL 60950-1 1st Edition
- CAN: (cUL Mark) CAN/CSA22.2 No.60950-1 1st Edition
- Europe: (CE Mark) EN60950-1, 1st Edition
- CB: IEC60950-1, 1st Edition
- Russia: (GOST Mark) IEC60950-1

Hardware requirements

Standard JS23/JS43 blade configuration:

7778-23X	Processor	L2 Cache	Memory	Ethernet	HDD
Base (JS23)	Dual core, dual socket.	4 MB/ core	4 GB- 64 GB	Dual Gigabit	One optional SFF or SSD drive
With #8446 (JS43)	Dual core, 4 sockets	4 MB/ core	4 GB- 128 GB	Dual Gigabit	Two optional SFF or SSD drive
	Both 4.2 GHz POWER6				

Serial over LAN (SOL) function routes the console data stream over the standard two, 1 Gb Ethernet ports to the chassis aMM.

Minimum system configuration

Each 7778-23X configuration must contain a minimum of:

- One - Memory DIMMs (at least one of these):
 - 4 GB (2 x 2 GB DIMMs) DDR2 667 MHz (#8229)
 - 8 GB (2 x 4 GB DIMMs) DDR2 667 MHz (#8239)
 - 16 GB (2 x 8 GB DIMMs) DDR2 400 MHz (#8245)
- Four or eight Processor Entitlements (one of these):
 - 4 x #8395, or 2 x #8395 and 2 x #8393 for the JS23
 - 8 x #8395, or 4 x #8395 and 4 x #8393 with #8446 for the JS43

Note: Feature #8393 is part of Express Product Offerings.

Note: The following PowerVM features will be included in the base configuration but may be removed from the order:

- 4 x #5429 (Standard Edition) or 4 x #5607 (Enterprise Edition) for the JS23
- 8 x #5429 (Standard Edition) or 8 x #5607 (Enterprise Edition) with #8446 for the JS43

Note: For IBM i operating system on the JS23/JS43, one SAS Expansion Card (#8246) is required.

Note: A minimum of one copy of the *Service Warranty Publications* (#8737) and one copy of the *JS23/JS43 Installation and User's Guide* (#8766-8778) is required at each customer installation.

Express Product Offerings

If you order a JS23 or JS43 server Express Product Offering, as defined here, you may qualify for a processor entitlement at no additional charge. A minimum of 4 GB of memory and one SAS 10 K SFF disk drive or one solid-state drive on the JS23 and a minimum of 8 GB of memory and one SAS 10 K SFF disk drive or one solid state drive on the JS43 is required to determine if you are entitled to a processor entitlement at no additional charge.

You can make changes to the standard features as needed and still qualify for processor entitlements at no additional charge. However, selection of total memory smaller than the totals defined as the minimums disqualifies the order as an Express Product Offering.

You must purchase PowerVM Standard Edition (#5429) or PowerVM Enterprise Edition (#5407) for each Express Product Offering.

BladeCenter JS23

- Minimum 4 GB memory -- one of these:
 - One - 4 GB (2 x 2 GB DIMMs) DDR2 667 MHz (#8229)
 - One - 8 GB (2 x 4 GB DIMMs) DDR2 667 MHz (#8239)
 - One - 16 GB (2 x 8 GB DIMMs) DDR2 400 MHz (#8245)
- **Note:** Additional memory DIMMs of any size may be added.
- One of these:
 - Four - PowerVM Standard Edition (#5429)
 - Four - PowerVM Enterprise Edition (#5407)
- One of these:
 - One - 73 GB SAS 10K SFF HDD (#8237)
 - One - 146 GB SAS 10K SFF HDD (#8236)
 - One - 300 GB SAS 10K SFF HDD (#8274)
 - One - 69 GB SFF SSD (#8273)

- Two - Processor Entitlement (#8395)
- Two - Zero-priced Processor Entitlement (#8393); receive two processor entitlements (#8393) at no additional charge. Four processors are entitled.

BladeCenter JS43

- Minimum 8 GB memory -- one of these:
 - One - 8 GB (2 x 4 GB DIMMs) DDR2 667 MHz (#8239)
 - One - 16 GB (2 x 8 GB DIMMs) DDR2 400 MHz (#8245)

Note: Additional memory DIMMs of any size may be added.
- One of these:
 - Eight - PowerVM Standard Edition (#5429)
 - Eight - PowerVM Enterprise Edition (#5407)
- One of these:
 - One - 73 GB SAS 10K SFF HDD (#8237)
 - One - 146 GB SAS 10K SFF HDD (#8236)
 - One - 300 GB SAS 10K SFF HDD (#8274)
 - One - 69 GB SFF SSD (#8273)
- Four - Processor Entitlement (#8395)
- Four - Zero-priced Processor Entitlement (#8393); receive four processor entitlements (#8393) at no additional charge. Eight processors are entitled.

Note: A minimum of one copy of the *Service Warranty Publications* (#8778) and one copy of the *JS23/JS43 Installation and User's Guide* (#8766-8777) is required at each customer installation.

Optional and additional features

- Up to 64 GB of system memory on the JS23; up to 128 GB of system memory on the JS43
 - The JS23 system board contains eight RDIMM memory connections and the JS43 system board contains an additional eight RDIMM memory connections.
 - Memory must be installed in matched pairs with a minimum of 4 GB and maximum of 64 GB on the JS23 and 128 GB on the JS43.
 - Memory sizes can be mixed.
 - JS23/JS43 supports Memory Scrubbing, ECC, Chipkill, and Bit Steering.
 - 4 GB (2 x 2 GB DIMMs) and 8 GB (2 x 4 GB DIMMs) memory features operate at 667 MHz while the 16 GB (2 x 8 GB DIMMs) memory feature operates at 400 MHz.
- SAS Controller, supporting up to 146 GB
 - Internal disk drive, SFF (2.5-inch) 73 GB SAS (#8237) integrated on JS23 planar
 - Second internal disk drive, SFF (2.5-inch) 73 GB SAS (#8237) integrated on JS43 planar

Expansion cards

The JS23 has one PCI-e CIOv daughter card slot and one PCI-e high-speed daughter card slot (SFFh, CFFh). The JS43 has two PCI-e CIOv daughter card slots and two PCI-e high-speed daughter card slots (SFFh, CFFh).

CFFh expansion cards include:

- QLogic Ethernet and 4 GB Fibre Channel Expansion Card (CFFh) (#8252)

Note: Not supported in the BladeCenter S Chassis (7779-BCS)
- 4X InfiniBand DDR Expansion Card (CFFh) for IBM BladeCenter (#8258)

- QLogic Ethernet and 8 Gb Fibre Channel Expansion Card (CFFh) (#8271)
- Voltaire 4X InfiniBand DDR Expansion Card (CFFh) for IBM BladeCenter (#8298)

CIOv expansion cards include:

- Emulex 8Gb Fibre Channel Expansion Card (CIOv) (#8240)
- QLogic 4Gb Fibre Channel Expansion Card (CIOv) for IBM BladeCenter (#8241)
- QLogic 8Gb Fibre Channel Expansion Card (CIOv) (#8242)
- 3 Gb SAS Passthrough Expansion Card (CIOv) for IBM BladeCenter (#8246)

Note: 4X IB Dual Port DDR CFF/PCIe daughter card is not supported on AIX V5.3 with the 5300-07 Technology Level.

Note: IBM i does not support Fibre Channel adapters (feature numbers 8252, 8240, 8241, and 8242) when used in the BladeCenter S chassis.

Software requirements

The JS23 and JS43 servers support the AIX, Linux, and IBM i operating systems, providing the flexibility of using applications written for any one of the three. IBM has qualified two popular Linux distributions for use with the JS23 and JS43 servers:

- Red Hat Enterprise Linux for POWER
- Novell SUSE Linux Enterprise Server for POWER Systems

One or more of the following operating systems is required for an operational JS23/JS43:

If installing the AIX operating system (one of these):

- The following AIX Technology Levels are available on hardware availability date:
 - AIX 5.3 with the 5300-10 Technology Level, or later
 - AIX 6.1 with the 6100-03 Technology Level, or later
- The following AIX Technology Levels are available within 90 days of this announcement:
 - AIX 5.3 with the 5300-07 Technology Level and Service Pack 9, or later
 - AIX 5.3 with the 5300-08 Technology Level and Service Pack 7, or later
 - AIX 5.3 with the 5300-09 Technology Level and Service Pack 4, or later
 - AIX 6.1 with the 6100-00 Technology Level and Service Pack 9, or later
 - AIX 6.1 with the 6100-01 Technology Level and Service Pack 5, or later
 - AIX 6.1 with the 6100-02 Technology Level and Service Pack 4, or later

If installing the Linux operating system (one of these):

- SUSE Linux Enterprise Server 10 Service Pack 2 for POWER Systems, or later
- SUSE Linux Enterprise Server 11 for POWER Systems, or later
- Red Hat Enterprise Linux 4.6 for POWER
- Red Hat Enterprise Linux 4.7 for POWER, or later
- Red Hat Enterprise Linux 5.1 for POWER
- Red Hat Enterprise Linux 5.2 for POWER
- Red Hat Enterprise Linux 5.3 for POWER, or later

If installing the IBM i operating system:

- IBM i 6.1, or later

Note: IBM i 6.1 support for feature numbers 8236, 8237, 8240, 8241, 8242, 8246, 8252, 8273 and 8274 is via VIOS 2.1.1, or later.

Note: For systems ordered with the Linux operating system, IBM ships the most current versions available from the distributor. If your hardware requires a different version of a Linux OS than that shipped by IBM, you must obtain it via download from the Linux distributor's Web site. Information concerning access to a distributor's Web site is located on the product registration card delivered to you as part of your Linux OS order.

Disclaimer: Some information in this announcement addresses anticipated future capabilities and may be subject to change.

Planning information

Cable orders

No cables are required.

Security, auditability, and control

Security and auditability features include:

- A power-on password function provides control of who has access to the data and server setup program on the server.
- A selectable boot sequence can be used to prevent unauthorized installation of software or removal of data from the diskette drive.

Limitations: The BladeCenter and JS23 and JS43 blades blade have no security-intrusion detection.

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

IBM Electronic Services

IBM has transformed its delivery of hardware and software support services to help you achieve higher system availability. Electronic Services is a Web-enabled solution that offers an exclusive, no-additional-charge enhancement to the service and support available for IBM servers. These services are designed to provide the opportunity for greater system availability with faster problem resolution and preemptive monitoring. Electronic Services comprises two separate, but complementary, elements: Electronic Services news page and Electronic Services Agent.

The Electronic Services news page is a single Internet entry point that replaces the multiple entry points traditionally used to access IBM Internet services and support. The news page enables you to gain easier access to IBM resources for assistance in resolving technical problems.

The Electronic Service Agent[™] is no-additional-charge software that resides on your server. It monitors events and transmits system inventory information to IBM on a periodic, client-defined timetable. The Electronic Service Agent automatically reports hardware problems to IBM. Early knowledge about potential problems enables IBM to deliver proactive service that may result in higher system availability and performance. In addition, information collected through the Service Agent is made available to IBM service support representatives when they help answer your questions or diagnose problems. Installation and use of IBM Electronic Service Agent for problem reporting enables IBM to provide better support and service for your IBM server.

To learn how Electronic Services can work for you, visit

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

Terms and conditions

Volume orders: Contact your IBM representative.

IBM Global Financing

Yes

Warranty period

Three years

Warranty service

If required, IBM provides repair or exchange service depending on the types of warranty service specified for the machine. IBM will attempt to resolve your problem over the telephone, or electronically via an IBM Web site. 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. If applicable to your product, parts considered Customer Replaceable Units (CRUs) will be provided as part of the machine's standard warranty service.

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.

CRU Service

IBM provides replacement CRUs to you for you to install. CRU information and replacement instructions are shipped with your machine and are available from IBM upon your request. CRUs are designated as being either a Tier 1 or a Tier 2 CRU.

Tier 1 CRU

Installation of Tier 1 CRUs is your responsibility. If IBM installs a Tier 1 CRU at your request, you will be charged for the installation.

Tier 2 CRU

You may install a Tier 2 CRU yourself or request IBM to install it, at no additional charge.

Based upon availability, CRUs 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, 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 parts have been designated as Tier 1 CRUs:

- Hard disk drive
- Optical drive
- Fan
- I/O adapters
- Operator panel

- PCI adapters
- Power cord
- Power supply
- Processor power regulator
- Service processor

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.

The service level is

- 9 hours per day, Monday through Friday, excluding holidays, next business day response. Calls must be received by 5:00 p.m. local time in order to qualify for next business day response.

Machine Exchange Service

IBM will initiate shipment of a replacement machine to your location. You are responsible for its installation and verification of operation. You must pack the failed machine into the shipping container that contained the replacement machine and return the failed machine to IBM. Transportation charges, both ways, are paid by IBM. You may be charged for the replacement machine if IBM does not receive the failed machine within 15 days of your receipt of the replacement.

Non-IBM parts service

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.

International Warranty Service

International Warranty Service (IWS) is available in selected countries or regions.

The warranty service type and the service level provided in the servicing country may be different from that provided in the country in which the machine was purchased.

Under IWS, warranty service will be provided with the prevailing warranty service type and service level available for the IWS-eligible machine type in the servicing country, and the warranty period observed will be that of the country in which the machine was purchased.

To determine the eligibility of your machine and to view a list of countries where service is available, visit

<http://www-304.ibm.com/jct01004c/systems/support/supportsite.wss/warrantyform?brandind=5000008>

For more information on IWS, refer to Services Announcement [601-034](#), dated September 25, 2001.

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

Warranty service upgrades and maintenance service options

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. See the Warranty services section for additional details.

IBM will attempt to resolve your problem over the telephone or electronically by access to an IBM Web site. 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.

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.

The service level is

- 9 hours per day, Monday through Friday, excluding holidays, 4-hour average response, same-business-day response
- 24 hours per day, 7 days a week, 4-hour average response
- 24 hours per day, 7 days a week, 2-hour average response

Maintenance services

If required, IBM provides repair or exchange service depending on the types of maintenance service specified for the machine. IBM will attempt to resolve your problem over the telephone or electronically, via an IBM Web site. 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.

The service level is

- 9 hours per day, Monday through Friday, excluding holidays, next-business-day response
- 9 hours per day, Monday through Friday, excluding holidays, 4-hour average response
- 24 hours per day, 7 days a week, 4-hour average response
- 24 hours per day, 7 days a week, 2-hour average response

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 Web site. 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 Web site. 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.

Customer Replaceable Unit (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 upon your request.

Based upon availability, CRUs will be shipped for next business day delivery. IBM specifies, in the materials shipped with a replacement CRU, whether a defective CRU must be returned to IBM. When return is required, 1) return instructions and a container are shipped with the replacement CRU and 2) 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.

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.

Usage plan machine

No

IBM hourly service rate classification

One

When a type of service involves the exchange of a machine part, the replacement may not be new, but will be in good working order.

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

Yes

The applicable processor group is C5.

Licensed machine code

IBM Machine Code is licensed for use by a customer on the IBM machine for which it was provided by IBM under the terms and conditions of the IBM License Agreement for Machine Code, to enable the 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 or by contacting your IBM representative or visiting

http://www-1.ibm.com/servers/support/machine_warranties/machine_code.html

Machine using LMC Type Model 7778-23X

IBM may release changes to the Machine Code. IBM plans to make the Machine Code changes available for download from the IBM technical support Web site

<http://www-304.ibm.com/jct01004c/systems/support/supportsite.wss/docdisplay?Indocid=MIGR-5069766&brandind=5000020>

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

Educational allowance

A reduced charge is available to qualified education customers. The educational allowance may not be added to any other discount or allowance.

The educational allowance is 5% for the products in this announcement.

Pricing

The following are newly announced features on the specific models of the IBM BladeCenter 7778 machine type:

Description	Model number	Feature number	Initial/MES/Both support	RP CSU	MES
IBM 7778-23X					
AIX Partition Specify	23X			Yes	
Linux Partition Specify	23X	0265	Both	Yes	No
IBM i Operating System Partition Specify	23X	0266	Both	Yes	No
IBM i 6.1 Specify Code	23X	0267	Both	Yes	No
US TAA Compliance Indicator	23X	0534	Initial	N/A	No
Primary OS - IBM i	23X	0983	Initial	N/A	No
Primary OS - AIX	23X	2145	Both	Yes	No
Primary OS - Linux	23X	2146	Both	Yes	No
Integrate Blade Server in Chassis (BP)	23X	2147	Both	Yes	No
Integrate Blade Server in Chassis	23X	4645	Initial	N/A	No
Integrate Blade Server in Chassis	23X	4646	Initial	N/A	No

One and only one rack indicator feature is required on all orders (#4650 to #4666).

Rack Indicator- Not Factory Integrated	23X	4650	Initial	N/A	No
Rack Indicator, Rack #1	23X	4651	Initial	N/A	No
Rack Indicator, Rack #2	23X	4652	Initial	N/A	No
Rack Indicator, Rack #3					

	23X	4653	Initial	N/A	No
Rack Indicator, Rack #4	23X	4654	Initial	N/A	No
Rack Indicator, Rack #5	23X	4655	Initial	N/A	No
Rack Indicator, Rack #6	23X	4656	Initial	N/A	No
Rack Indicator, Rack #7	23X	4657	Initial	N/A	No
Rack Indicator, Rack #8	23X	4658	Initial	N/A	No
Rack Indicator, Rack #9	23X	4659	Initial	N/A	No
Rack Indicator, Rack #10	23X	4660	Initial	N/A	No
Rack Indicator, Rack #11	23X	4661	Initial	N/A	No
Rack Indicator, Rack #12	23X	4662	Initial	N/A	No
Rack Indicator, Rack #13	23X	4663	Initial	N/A	No
Rack Indicator, Rack #14	23X	4664	Initial	N/A	No
Rack Indicator, Rack #15	23X	4665	Initial	N/A	No
Rack Indicator, Rack #16	23X	4666	Initial	N/A	No
Chassis indicator-Not Factory Integrated	23X	4680	Initial	N/A	No
BladeCenter chassis specify, Chassis #1	23X	4681	Initial	N/A	No
BladeCenter chassis specify, Chassis #2	23X	4682	Initial	N/A	No
BladeCenter chassis specify, Chassis #3	23X	4683	Initial	N/A	No
BladeCenter chassis specify, Chassis #4	23X	4684	Initial	N/A	No
BladeCenter chassis specify, Chassis #5	23X	4685	Initial	N/A	No
BladeCenter chassis specify, Chassis #6	23X	4686	Initial	N/A	No
BladeCenter chassis specify, Chassis #7	23X	4687	Initial	N/A	No
BladeCenter chassis specify, Chassis #8	23X	4688	Initial	N/A	No
BladeCenter chassis specify, Chassis #9	23X	4689	Initial	N/A	No
Custom Service Specify, Off-Site	23X	5001	Both	Yes	No
Software Preinstall	23X	5005	Initial	N/A	No
Custom Service Specify, On-Site	23X	5039	Both	Yes	No
PowerVM Standard Edition	23X	5429	Both	Yes	No
PowerVM Enterprise Edition	23X	5607	Both	Yes	No
SDI Software Pre-Install Indicator	23X	7305	Initial	N/A	No
IBM i Software Preinstall	23X	8141	Initial	N/A	No
Linux Software Preinstall	23X	8143	Initial	N/A	No
Linux Software Preinstall (SDIs)	23X	8144	Initial	N/A	No
Software Preinstall	23X	8146	Initial	N/A	No
4GB (2 x 2 GB) DDR2 667MHZ DIMMs	23X	8229	Both	Yes	No
IBM 146GB SAS 10K SFF HDD	23X	8236	Both	Yes	No
IBM 73GB SAS 10K SFF HDD	23X	8237	Both	Yes	No

8GB (2 x 4 GB) DDR2 667MHz DIMMs	23X	8239	Both	Yes	No
Emulex 8Gb Fibre Channel Expansion Card (CIOv) for IBM BladeCenter	23X	8240	Both	Yes	No
QLogic 4 Gb Fibre Channel Expansion Card (CIOv) for IBM BladeCenter	23X	8241	Both	Yes	No
QLogic 8Gb Fibre Channel Expansion Card (CIOv) for IBM BladeCenter	23X	8242	Both	Yes	No
16GB (2 x 8 GB) DDR2 400 MHz DIMMs	23X	8245	Both	Yes	No
3 Gb SAS Passthrough Expansion Card (CIOv) for IBM BladeCenter	23X	8246	Both	Yes	No
QLogic Ethernet and 4 Gb Fibre Channel Expansion Card (CFFh)	23X	8252	Both	Yes	No
4X InfiniBand DDR Expansion Card (CFFh) for IBM BladeCenter	23X	8258	Both	Yes	No
QLogic 8 Gb Fibre Channel Expansion Card (CFFh)	23X	8271	Both	Yes	No
69GB SFF SAS Solid State Drive-Power Blade	23X	8273	Both	Yes	No
IBM 300GB SAS 10K RPM SAS HDD	23X	8274	Both	Yes	No
Voltaire 4x InfiniBand DDR Expansion Card (CFFh) for IBM BladeCenter	23X	8298	Both	Yes	No
Zero-priced Processor Entitlement for IBM BladeCenter JS23/JS43	23X	8393	Both	Yes	No
One Processor Entitlement for the IBM BladeCenter JS23/JS43	23X	8395	Both	Yes	No
1-Wide Add-on SMP Chassis	23X	8446	Both	Yes	No
IBM BladeCenter JS23/JS43 Installation/Users Guide (Brazilian Portuguese)	23X	8766	Both	Yes	No
IBM BladeCenter JS23/JS43 Installation/Users Guide (English)	23X	8767	Both	Yes	No
IBM BladeCenter JS23/JS43 Installation/Users Guide (French)	23X	8768	Both	Yes	No
IBM BladeCenter JS23/JS43 Installation/Users Guide (German)	23X	8769	Both	Yes	No
IBM BladeCenter JS23/JS43 Installation/Users Guide (Italian)	23X	8770	Both	Yes	No
IBM BladeCenter JS23/JS43 Installation/Users Guide (Japanese English)	23X	8771	Both	Yes	No
IBM BladeCenter JS23/JS43 Installation/Users Guide (Japanese)	23X	8772	Both	Yes	No
IBM BladeCenter JS23/JS43 Installation/Users Guide (Korean)	23X	8773	Both	Yes	No
IBM BladeCenter JS23/JS43 Installation/Users Guide (Simplified Chinese)	23X	8774	Both	Yes	No
IBM BladeCenter JS23/JS43 Installation/Users Guide (Spanish)	23X	8775	Both	Yes	No
IBM BladeCenter JS23/JS43 Installation/Users Guide (Traditional Chinese)	23X	8776	Both	Yes	No
IBM BladeCenter JS23/JS43 Installation/Users Guide (UK English)	23X	8777	Both	Yes	No
IBM BladeCenter JS23/JS43 Service/Warranty CDS (Multi-language)	23X	8778	Both	Yes	No
Order Routing Indicator- System Plant	23X	9169	Initial	N/A	No
Month Indicator	23X	9461	Initial	N/A	No
Day Indicator	23X	9462	Initial	N/A	No
Hour Indicator	23X	9463	Initial	N/A	No
Minute Indicator	23X	9464	Initial	N/A	No
Qty Indicator	23X	9465	Initial	N/A	No
Countable Member Indicator	23X	9466	Initial	N/A	No

The following are newly announced features on the specific models of the IBM System p® 7779, 7989, and 7998 machine types:

Description	Model number	Feature number	Initial/MES/Both support	RP CSU	MES
BladeCenter Chassis content specify - 7778-23X	BCS	0312	Initial	N/A	No
BladeCenter Chassis content specify - 7778-23X with Feature #8446	BCS	0313	Initial	N/A	No
Widescreen LCD Monitor	BCS	3632	Both	Yes	No
SAS RAID Controller Switch Module and BBU	BCS	3734	Both	Yes	

Description	Model number	Feature number	Initial/MES/Both support	RP CSU	MES
BladeCenter Chassis content specify - 7778-23X	BCH	0312	Initial	N/A	No
BladeCenter Chassis content specify - 7778-23X with Feature #8446	BCH	0313	Initial	N/A	No
Widescreen LCD Monitor	BCH	3632	Both	Yes	No

Description	Model number	Feature number	Initial/MES/Both support	RP CSU	MES
Linux Software Preinstall	60X	8143	Initial	N/A	
	61X		Initial	N/A	
Linux Software Preinstall (SDIs)	60X	8144	Initial	N/A	
	61X		Initial	N/A	
4GB (2 x 2 GB) DDR2 667MHZ, 1GB DIMMs	61X	8270	Both	Yes	No
QLogic 8 Gb Fibre Channel Expansion Card (CFFh)	60X	8271	Both	Yes	No
	61X		Both	Yes	No
IBM 300GB SAS 10K RPM SAS HDD	60X	8274	Both	Yes	
	61X		Both	Yes	

New Machine Type Model

Type	Model	Description	Direct	
7778	23X	IBM 7778-23X	\$	8,181

Feature Codes

Type	Model	Feature	Description	Direct	
7778	23X	0265	AIX Partition Specify	\$	-
7778	23X	0266	Linux Partition Specify	\$	-
7778	23X	0267	IBM i Op Sys Partition Spec	\$	-
7778	23X	0534	IBM i 6.1 Specify Code	\$	-
7778	23X	2145	Primary OS - IBM i	\$	-
7778	23X	2146	Primary OS - AIX	\$	-
7778	23X	2147	Primary OS - Linux	\$	-

7778	23X	4645	Int Blade Svr in Chassis (BP)	\$	20
7778	23X	4646	Int Blade Svr in Chassis	\$	25
7778	23X	4650	Rack Ind - Not Factory Integ	\$	-
7778	23X	4651	Rack Indicator, Rack #1	\$	-
7778	23X	4652	Rack Indicator, Rack #2	\$	-
7778	23X	4653	Rack Indicator, Rack #3	\$	-
7778	23X	4654	Rack Indicator, Rack #4	\$	-
7778	23X	4655	Rack Indicator, Rack #5	\$	-
7778	23X	4656	Rack Indicator, Rack #6	\$	-
7778	23X	4657	Rack Indicator, Rack #7	\$	-
7778	23X	4658	Rack Indicator, Rack #8	\$	-
7778	23X	4659	Rack Indicator, Rack #9	\$	-
7778	23X	4660	Rack Indicator, Rack #10	\$	-
7778	23X	4661	Rack Indicator, Rack #11	\$	-
7778	23X	4662	Rack Indicator, Rack #12	\$	-
7778	23X	4663	Rack Indicator, Rack #13	\$	-
7778	23X	4664	Rack Indicator, Rack #14	\$	-
7778	23X	4665	Rack Indicator, Rack #15	\$	-
7778	23X	4666	Rack Indicator, Rack #16	\$	-
7778	23X	4680	Chassis ind-Not Fact Int	\$	-
7778	23X	4681	BladeCtr chassis specify, #1	\$	-
7778	23X	4682	BladeCtr chassis specify, #2	\$	-
7778	23X	4683	BladeCtr chassis specify, #3	\$	-
7778	23X	4684	BladeCtr chassis specify, #4	\$	-
7778	23X	4685	BladeCtr chassis specify, #5	\$	-
7778	23X	4686	BladeCtr chassis specify, #6	\$	-
7778	23X	4687	BladeCtr chassis specify, #7	\$	-
7778	23X	4688	BladeCtr chassis specify, #8	\$	-
7778	23X	4689	BladeCtr chassis specify, #9	\$	-

7778	23X	5001	Custom Svc Specify, Off- Site	\$	-
7778	23X	5005	Software Preinstall	\$	-
7778	23X	5039	Custom Svc Specify, On- Site	\$	-
7778	23X	5429	PowerVM Standard Edition	\$	-
7778	23X	5607	PowerVM Enterprise Edition	\$	-
7778	23X	8141	IBM i Software Preinstall	\$	60
7778	23X	8143	Linux SW Preinstall	\$	60
7778	23X	8144	Linux SW Preinstall (SDIs)	\$	60
7778	23X	8146	Software Preinstall	\$	60
7778	23X	8229	4GB (2x2GB) DDR2 667MHz	\$	209
7778	23X	8236	IBM 146GB SAS 10K HDD	\$	429
7778	23X	8237	IBM 73GB SAS 10K HDD	\$	329
7778	23X	8239	8GB (2x4GB) DDR2 667MHz	\$	459
7778	23X	8240	Emulex 8gb Fbr Chnl Exp	\$	1,099
7778	23X	8241	QLogic 4 Gb Fbr Chnl Exp	\$	749
7778	23X	8242	QLogic 8Gb Fbr Chnl Exp	\$	1,099
7778	23X	8245	16GB (2x8GB) DDR2 400MHz	\$	3,599
7778	23X	8246	3Gb SAS Passthru Exp	\$	249
7778	23X	8252	QLogic Ether 4GB Fbr Chnl	\$	999
7778	23X	8258	4X InfiniBand DDR Exp	\$	1,199
7778	23X	8271	QLogic 8gb Fibre Chnl	\$	1,099
7778	23X	8273	69GB SFF SAS SS Dr	\$	10,000
7778	23X	8274	IBM 300GB SAS 10K HDD	\$	689
7778	23X	8298	Voltaire 4x IB DDR Exp Cd	\$	1,399
7778	23X	8393	Zero-priced Proc Ent for IBM	\$	-
7778	23X	8395	One Proc Ent for the IBM	\$	100
7778	23X	8446	1-Wide Add-on SMP Chassis	\$	8,182
7778	23X	8766	Inst/Users Guide (Braz Port)	\$	-
7778	23X	8767	Inst/Users Guide (English)	\$	-
7778	23X	8768	Inst/Users Guide (French)	\$	-

7778	23X	8769	Inst/Users Guide (German)	\$	-
7778	23X	8770	Inst/Users Guide (Italian)	\$	-
7778	23X	8771	Inst/Users Guide (Jap Eng)	\$	-
7778	23X	8772	Inst/Users Guide (Japanese)	\$	-
7778	23X	8773	Inst/Users Guide (Korean)	\$	-
7778	23X	8774	Inst/Users Guide (Simpl Chin)	\$	-
7778	23X	8775	Inst/Users Guide (Spanish)	\$	-
7778	23X	8776	Inst/Users Guide (Trad Chin)	\$	-
7778	23X	8777	Inst/Users Guide (UK English)	\$	-
7778	23X	8778	Svc/War CDs (Multi-language)	\$	-
7779	23X	3632	Widescreen LCD Monitor	\$	999
7779	23X	3734	SAS Raid Cont Swtch Mod	\$	3,499
7989	23X	3632	Widescreen LCD Monitor	\$	999
7998	60X	8143	Linux SW Preinstall	\$	60
7998	61X	8143	Linux SW Preinstall	\$	60
7998	60X	8144	Linux SW Preinstall (SDI's)	\$	60
7998	61X	8144	Linux SW Preinstall (SDI's)	\$	60
7998	61X	8270	4GB (2x2GB) DDR2 667MHz	\$	359
7998	60X	8271	QLogic 8 Gb Fbr Chnl(CFFh)	\$	1,099
7998	61X	8271	QLogic 8 Gb Fbr Chnl(CFFh)	\$	1,099
7998	60X	8274	IBM 300GB SAS 10K HDD	\$	689
7998	61X	8274	IBM 300GB SAS 10K HDD	\$	689

Feature conversions

Feature conversions for 7778-23X virtualization engine features

From FC:	To FC:	Parts returned
5429 - PowerVM Standard Edition	5607 - PowerVM Enterprise Edition	No

IBM Global Financing

IBM Global Financing offers competitive financing to credit-qualified customers to assist them in acquiring IT solutions. Offerings include financing for IT acquisition,

including hardware, software, and services, from both IBM and other manufacturers or vendors. Offerings (for all customer segments: small, medium, and large enterprise), rates, terms, and availability can vary by country. Contact your local IBM Global Financing organization or visit

<http://www.ibm.com/financing>

IBM Global Financing offerings are provided through IBM Credit LLC in the United States, and other IBM subsidiaries and divisions worldwide to qualified commercial and government customers. Rates are based on a customer's credit rating, financing terms, offering type, equipment type, and options, and may vary by country. Other restrictions may apply. Rates and offerings are subject to change, extension, or withdrawal without notice.

Financing solutions from IBM Global Financing can help you stretch your budget and affordably acquire the new product. But beyond the initial acquisition, our end-to-end approach to IT management can also help keep your technologies current, reduce costs, minimize risk, and preserve your ability to make flexible equipment decisions throughout the entire technology life cycle.

Order now

To order, contact the Americas Call Centers or your local IBM representative, or your IBM Business Partner.

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

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

Reference: YE001

The Americas Call Centers, our national direct marketing organization, can add your name to the mailing list for catalogs of IBM products.

Note: Shipments will begin after the planned availability date.

Trademarks

POWER, PowerVM, EnergyScale, POWER6+, POWER6, Active Memory, Micro-Partitioning, Chipkill, POWER Hypervisor, IBM Systems Director Active Energy Manager and Electronic Service Agent are trademarks of IBM Corporation in the United States, other countries, or both.

IBM, BladeCenter, System i, AIX, Predictive Failure Analysis, PartnerWorld, System p and ibm.com are registered trademarks of IBM Corporation in the United States, other countries, or both.

Linux is a registered trademark of Linus Torvalds in the United States, other countries, or both.

UNIX is a registered trademark of The Open Group in the United States and other countries.

Intel is a registered trademark of Intel Corporation or its subsidiaries in the United States and other countries.

Other company, product, and service names may be trademarks or service marks of others.

Terms of use

IBM products and services which are announced and available in your country can be ordered under the applicable standard agreements, terms, conditions, and prices in effect at the time. IBM reserves the right to modify or withdraw this announcement at any time without notice. This announcement is provided for your information only. Additional terms of use are located at

<http://www.ibm.com/legal/us/en/>

For the most current information regarding IBM products, consult your IBM representative or reseller, or visit the IBM worldwide contacts page

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

Corrections

(Corrected on April 30, 2009)

Information on International Warranty Service (IWS) was added.

(Corrected on May 13, 2009)

The software requirements were revised.