



IBM BladeCenter QS20 blade with new Cell BE processor offers unique capabilities for graphic-intensive, numeric applications

Overview

The IBM BladeCenter® QS20 extends the IBM Power Architecture™-based blade portfolio by providing a new level of parallelism and performance to targeted workloads, including image processing, signal processing, and graphics rendering applications. The QS20 complements IBM's more mature rack-optimized and blade server product lines (based on Xeon, Opteron, and POWER™ processors) that are highly suited to production applications.

Based on the Power Architecture, the Cell Broadband Engine (Cell BE) processor was originally developed in collaboration with IBM, Sony Corporation, Sony Computer Entertainment Inc. (Sony and Sony Computer Entertainment collectively referred to as Sony Group), and Toshiba Corporation. The Cell BE processor is an advanced microprocessor optimized for compute-intensive workloads. Cell BE's breakthrough multicore architecture and ultra-high-speed communications capabilities deliver vastly improved, real-time response for entertainment and rich media applications. Effectively delivering supercomputer-like performance by incorporating advanced multiprocessing technologies used in IBM's sophisticated servers, Cell BE is especially suitable for high-performance workloads across a number of industries, including digital media, medical imaging, aerospace and defense, seismic computing, communications, and the high-performance computing industry.

The new QS20 Cell BE technology-based system is designed for businesses that need the dense computing power and unique capabilities of the Cell BE processor to tackle tasks involving graphic-intensive, numeric

applications. The system will rely on the Cell BE processor to help accelerate key algorithms like 3D rendering, compression, and encryption, to help enable companies to create and run highly visual, immersive, real-time applications.

Key prerequisites

The IBM BladeCenter QS20 requires:

- A BladeCenter chassis (8677-3XU)
- A Fedora Core5 (Linux™ operating system)

Note: The QS20 can only be ordered, supported, and fulfilled via the IBM System Cluster 1350.

Planned availability dates

- September 29, 2006: BladeCenter QS20 without InfiniBand Adapter feature
- October 27, 2006: Optional InfiniBand Adapter

At a glance

IBM BladeCenter QS20 blade features:

- Two 3.2 GHz Cell BE processors
- 1 GB XDRAM (512 MB per processor)
- 410 GFLOPS peak performance
- Blade-mounted 40 GB IDE hard disk drive
- Two 1 Gb Ethernet (GbE) controllers that provide connectivity to the BladeCenter chassis midplane and BladeCenter GbE switches
- BladeCenter interface that offers Blade Power System and Sense Logic Control
- Double-wide blade (uses two BladeCenter slots)
- InfiniBand (IB) option, supporting up to two Mellanox IB 4x Host Channel Adapters (External IB switches are required for the IB option.)
- Peak performance of 2.8 TFLOPS in a standard single-chassis configuration, and over 17 TFLOPS may be possible in a standard 42U rack (There is a maximum of seven blades per chassis. Each Cell BE blade requires two slots. Cell BE blades should not be intermixed with other blades within a chassis.)

For ordering, contact:

Your IBM representative or the Americas Call Centers at

800-IBM-CALL

Reference: YE001

This announcement is provided for your information only. For additional information, contact your IBM representative, call 800-IBM-4YOU, or visit the IBM home page at: <http://www.ibm.com>.

Description

The IBM BladeCenter QS20 blade represents the newest offering in the BladeCenter family of high-density, high-performance blades with multisolet processors. The model QS20 provides two-socket, multicore (one Power Processing Element plus eight Synergistic Processing Elements for a total of nine cores per processor), 3.2 GHz Cell BE processors directly mounted to the planar board.

The QS20 blade extends and deepens IBM's Power Architecture based blade portfolio by providing a new level of parallelism and performance to targeted workloads, including image processing, signal processing, and graphics rendering applications. As a new offering that has an emerging set of support tools and libraries, the Cell BE blade is suited for evaluation and experimentation by early adopters who are seeking to differentiate through technology capability. This complements IBM's more mature rack-optimized and blade server product lines (based on Xeon, Opteron, and POWER processors) that are highly suited to production applications and feature a rich software stack and extensive business partner support.

The QS20 blade offers advanced and differentiating features compared to blades and servers based on traditional processors. The Cell BE blade is quite unique with new features of the Cell BE processor, and it will complement (or accelerate) new applications which are not capable of their full potential running solely on available technology.

The Cell BE itself is derived from Power Architecture and can therefore leverage the significant investment in Power Architecture software, blades, and ecosystem IBM has created. However, due to its new multicore architecture and the new Synergistic Processing Element (SPE) cores that are part of the architecture, clients will have to port or optimize their software and likely develop new software to realize the inherent benefits of the Cell BE processor. The Cell BE processor-based blade uses the popular IBM BladeCenter form factor, thereby benefiting from the ease of deployment, manageability, and integration for which the BladeCenter is known. IT offers very fast, floating-point processing performances, broader bandwidth, and a fast interconnect, and can leverage the Power Architecture. Each BladeCenter chassis can be populated with seven QS20 blades. QS20 blades cannot be intermixed with other blades within a chassis; however, the QS20 can be networked with other blades within a rack or multirack system configuration.

InfiniBand is a connectivity option for QS20. You can purchase the blade without InfiniBand or optionally purchase either one or two InfiniBand Adapters for each blade that interfaces to the QS20 via the PCI Express connectors. When using InfiniBand, clients must add external InfiniBand switches to the system-level/rack configuration.

IBM has made the Cell SDK available on AlphaWorks® as a software foundation; however, clients will have to invest time and energy to develop, port, and optimize code to introduce complete solutions for themselves and their clients. The SDK provides a development toolchain that includes compilers, a debugger, performance tools, libraries, sample code, and a full system simulator. More information about the SDK can be referenced at

<http://www.alphaworks.ibm.com/topics/cell>

Standard QS20 blade configuration

System number	Processor	Memory	HDD Interface	Ethernet
020025x	Two 3.2 GHz Cell BE	1 GB XDRAM 512 MB/processor	40 GB IDE	Two 1 Gb controllers

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

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IBM United States Announcement Supplemental Information

September 12, 2006

Publications

The following publications are shipped with each QS20 blade:

- *Installation and User's Guide* (SC33-8284-02)
- *Problem Determination and Service Guide* (SC33-8297-00)
- Warranty and Support Information
- Safety Information (48P9741)

The following BladeCenter® and QS20 blade publications, in U.S. English version, are available from

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

- *Installation and User's Guide* (SC33-8284-02)
- *Software Development Toolkit Installation and User's Guide* (SC33-8323-00)
- *Problem Determination and Service Guide* (SC33-8297-00)
- Warranty and Support Information
- Safety Information (48P9741)

Services

IBM 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

	BladeCenter QS20
Processor	
External speed	3.2 GHz
Number standard	2
L2 cache (full speed)	512 KB per processor
Memory	1 GB XDRAM, 512 MB per processor
HDD controller	
Channels	
Connector external	
IDE controller	PATA
Channels	1
Connector external	1
HDD	40 GB IDE, 2.5-in
Total bays	
Bays available	None
Total slots	2 dual x4 InfiniBand
PCI	
Slots available	None
Ethernet controller	2 x 1 Gigabit

- Width: 245 mm (9.657 in)
- Depth: 436 mm (17.146 in)
- Height: 59 mm (2.323 in)
- Weight: 5 kg (11.023 lb)

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°C (50° to 95°F) at 0 to 914 m (0 to 3,000 ft)
 - 10° to 32°C (50° to 90°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)
- Electrical power: BladeCenter (8677) 200-240 V ac (nominal), 50 or 60 Hz
- Power consumption:
 - QS20: 315 watts maximum
 - QS20: 330 watts with 1 IB (#2945)
 - QS20: 345 watts with 2 IB (#2945)

EMC conformance

- U.S.: FCC, Title 47, Part 15 Class A
- Canada: ICES-003, Issue 4, 2004 Class A
- Japan: VCCI, 2006 Class A
- Taiwan: CNS 13438, 1997 Class A

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- Australia/New Zealand: AS/NZS CISPR 22: 2002, 2002 Class A; CISPR 22, 2003 Class A
- EMEA:
 - EN 55022, 1994 as amended by Amendment 1 (1995) and Amendment 2 (1997) Class A
 - EN 55024, 1998 as amended by Amendment 1 (2001) and Amendment 2 (2003)
 - EN 61000-3-2, 2000 as amended by Amendment 2 (2005)
 - EN 61000-3-3, 1995 as amended by Amendment 1 (2001)

InfiniBand Adapter: This equipment is subject to the FCC rules. The equipment will comply with the appropriate rules before delivery to the buyer or to centers of distribution.

Safety certifications

- U.S.: (UL Mark) UL 60950-1: 2003 First Edition
- CAN: (cUL Mark) CSA22.2 No.60950-1-03 First Edition April 1, 2003

Hardware requirements: The QS20 requires a BladeCenter chassis and appropriate network switches as part of the Cluster 1350 system offering.

QS20	Processor	L2 Cache	Memory	Ethernet	HDD
020025x	Two 3.2 GHz Cell BE	512 KB/processor	1 GB XDRAM 512 MB/processor	Two 1 Gigabit IDE controllers	40GB IDE

Software requirements: The QS20 requires the Linux™ operating system, Fedora Core5, which can be downloaded from

<http://www.bsc.es/projects/deepcomputing/linuxoncell/cbexdev.html>

For additional information support, certification, and version information on network operating systems, access

<http://www.ibm.com/pc/us/compat>

Limitations

- Cell BE blades should not be intermixed with other blades in a BladeCenter (8677-3xx) chassis. Only BladeCenter (8677) is supported.
- The BladeCenter (8677-3XU) USB DVD-ROM is not supported for the QS20.
- Two 2,000-watt power modules are in the 8677-3xx BladeCenter with support for two optional 2,000-watt power modules for redundancy and robust configurations. Blades 1 to 3 receive their power from power modules 1 and 2. Blades 4 to 7 receive their power from power modules 3 and 4. If a QS20 is being installed in the 8677-1xx/2xx BladeCenter, the IBM BladeCenter Power Module Upgrade Guidelines (59P6598) will contain a table identifying the power load factor of all possible blades.
- If your BladeCenter chassis was shipped before June 2003, check the following items:
 - To determine the part number of your existing media tray, from the management module Web interface, under the heading “Monitors” in the left-hand column, select Hardware VPD and then look at the Module Name “media tray.” If the FRU number of the media tray in your blade center is

59P6629, call your hardware support center and request a free replacement media tray.

- Power modules may need to be upgraded to handle the additional power requirements.

To prevent problems at installation, order any required upgrades along with the QS20. The level of the Ethernet switch module firmware must be at level 81, or higher. To determine the revision level of your existing firmware, from the management module Web interface, under the heading “Monitors” in the left-hand column, select Firmware VPD, then in the table for “I/O Module Firmware VPD” look for the revision number of the “Main Application 1” for the selected Ethernet switch module. If you need new firmware, the latest level is available for download from

<http://www-306.ibm.com/pc/support/site.wss/document.do?Indocid=MIGR-50457>

Note: The IBM System Cluster 1350 solution is the only order process that will result in fulfillment and service and support. Orders outside this process will not be supported by IBM Service and Support.

Planning information

Cable orders: No additional cables are required.

Packaging: The QS20 is shipped in a single package and includes:

- QS20 blade
- Adapter cable
- Publications on a CD-ROM
 - *Installation and User’s Guide* (SC33-8284-02)
 - *Problem Determination and Service Guide* (SC33-8297-00)
 - Warranty and Support Information
 - Safety Information (48P9741)

Security, auditability, and control

The BladeCenter and QS20 blades have no security-intrusion detection; therefore, they should be installed in a rack environment that provides security through lockable doors or other security measures. It is a customer’s responsibility to ensure that the server is secure to protect sensitive data.

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

Terms and conditions

IBM Global Financing: No

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

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

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

Warranty period

- System hardware — One year

- Optional features — One year

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

Warranty service: If required, IBM provides repair or exchange service depending on the type of warranty service specified below for the machine. IBM will attempt to resolve your problem over the telephone or electronically by access to an IBM 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. 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.

Customer replaceable unit (CRU) (for example, bezel) service and on-site service for other selected parts.

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 at any time on your request. CRUs are designated as being either a Tier 1 or a Tier 2 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. You may install a Tier 2 CRU yourself or request IBM to install it, at no additional charge under the type of warranty service specified below, on-site service.

Based upon availability, 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, and you may be charged for the replacement CRU if IBM does not receive the defective CRU within 30 days of your receipt of the replacement.

The following parts have been designated as Tier 1 CRUs:
None

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

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

International warranty service (IWS): IWS is available during the warranty period to customers who travel or relocate to countries where their computer is sold and serviced by IBM or IBM resellers authorized to perform

warranty service. Eligible IBM computers are identified by their four-digit machine type.

You can obtain IWS through the method of service, such as CRU, depot, carry-in or on-site, provided in the servicing country. Service methods and procedures vary by country, and some service or parts may not be available in all countries. Service centers in certain countries may not be able to service all models of a particular machine type. In addition, some countries may have fees and restrictions that apply at the time of service.

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

<http://www.ibm.com/pc/support/site.wss/warranty/warranty.vm>

For more information on IWS, refer to Services Announcement 601-034, dated September 25, 2001.

Note: Due to the earth's magnetic field, CRT monitors are manufactured to work in northern, southern, and equatorial regions of the earth and may not produce a satisfactory image when moved between them. Any required adjustment (if possible) is not covered under IWS and may be subject to a chargeable action. The magnetic field does not affect flat-panel LCD monitors.

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

Maintenance services

Warranty service upgrade: During the warranty period, 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.

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

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

The following warranty service upgrade options are available:

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

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.

CRU service: If your problem can be resolved with a CRU (for example, bezel), 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 30 days of your receipt of the replacement.

On-site service: IOR; 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 following on-site service options are available:

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

Maintenance service (ICA)

Maintenance services are available for ICA legacy contracts. The preferred go-to-market offerings are ServiceElect. However, ICA legacy contracts will still be available for current customers until they are withdrawn.

Alternative service (warranty service upgrades): During the warranty period, 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.

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 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.

The following warranty service upgrade option is available.

- IOR, 24 hours per day, 7 days a week, 4 hour average response.

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.

CRU service: If your problem can be resolved with a CRU (for example, bezel), 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 30 days of your receipt of the replacement.

On-site service: IOR; 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 following on-site service options are available:

- IOR, 9 hours per day, Monday through Friday excluding holidays, NBD response.
- IOR, 24 hours per day, 7 days a week, 4 hour average response.

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 (adapter cards, PCMCIA cards, disk drives, memory, and so forth) installed within IBM systems covered under warranty service upgrades or maintenance services and provides the labor to replace the failing parts at no additional charge.

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

IBM hourly service rate classification: Two

Field-installable features: Yes

Model conversions: No

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

Graduated program license charges apply: No

Licensed machine code: Machine code included with this product is licensed under the terms and conditions of the License Agreement that is shipped with the product.

To view the license agreement, visit

http://www.ibm.com/servers/support/machine_warranties/

To download the machine code, visit

<http://www.ibm.com/pc/support/site.wss/>

Educational allowance: None

Prices

The following are newly announced features on the specified model of the IBM BladeCenter QS20 0200 machine type:

Description	Model number	Feature Number	IBM list price(1)	Initial/MES/Both/Support
BladeCenter QS20	AC1		\$ 0	
Packaging -- 2U Blade WW	AC1	0756	NC	Initial
Custom Asset Tagging -- Standard	AC1	2200	10	Initial
	AC1	2201	20	Initial
Custom Labeling	AC1	2220	5	Initial
Custom Palletization	AC1	2221	5	Initial
Request for a new Vendor Logo Hardware	AC1	2247	NC	Initial
Request for an existing IBM Feature	AC1	2248	NC	Initial
Request for an existing Public RPQ	AC1	2249	NC	Initial
Dual Cell Based Blade	AC1	2684	18,995	Initial
InfiniBand Card Kit	AC1	2945	1,950	Initial
Install in Rack 01	AC1	3101	NC	Initial
Install in Rack 02	AC1	3102	NC	Initial
Install in Rack 03	AC1	3103	NC	Initial
Install in Rack 04	AC1	3104	NC	Initial
Install in Rack 05	AC1	3105	NC	Initial
Install in Rack 06	AC1	3106	NC	Initial
Install in Rack 07	AC1	3107	NC	Initial
Install in Rack 08	AC1	3108	NC	Initial
Install in Rack 09	AC1	3109	NC	Initial
Install in Rack 10	AC1	3110	NC	Initial

Install in Rack 11	AC1	3111	NC	Initial
Install in Rack 12	AC1	3112	NC	Initial
Install in Rack 13	AC1	3113	NC	Initial
Install in Rack 14	AC1	3114	NC	Initial
Install in Rack 15	AC1	3115	NC	Initial
Install in Rack 16	AC1	3116	NC	Initial
Install in Rack 17	AC1	3117	NC	Initial
Install in Rack 18	AC1	3118	NC	Initial
Install in Rack 19	AC1	3119	NC	Initial
Install in Rack 20	AC1	3120	NC	Initial
Install in Rack 21	AC1	3121	NC	Initial
Install in Rack 22	AC1	3122	NC	Initial
Install in Rack 23	AC1	3123	NC	Initial
Install in Rack 24	AC1	3124	NC	Initial
Install in Rack 25	AC1	3125	NC	Initial
Install in Rack 26	AC1	3126	NC	Initial
Install in Rack 27	AC1	3127	NC	Initial
Install in Rack 28	AC1	3128	NC	Initial
Install in Rack 29	AC1	3129	NC	Initial
Install in Rack 30	AC1	3130	NC	Initial
Install in Rack 31	AC1	3131	NC	Initial
Install in Rack 32	AC1	3132	NC	Initial
Install in Rack 33	AC1	3133	NC	Initial
Install in Rack 34	AC1	3134	NC	Initial
Install in Rack 35	AC1	3135	NC	Initial
Install in Rack 36	AC1	3136	NC	Initial
Install in Rack 37	AC1	3137	NC	Initial
Install in Rack 38	AC1	3138	NC	Initial
Install in Rack 39	AC1	3139	NC	Initial
Install in Rack 40	AC1	3140	NC	Initial
Install in Rack 41	AC1	3141	NC	Initial
Install in Rack 42	AC1	3142	NC	Initial
Install in Rack 43	AC1	3143	NC	Initial
Install in Rack 44	AC1	3144	NC	Initial
Install in Rack 45	AC1	3145	NC	Initial
Install in Rack 46	AC1	3146	NC	Initial
Install in Rack 47	AC1	3147	NC	Initial
Install in Rack 48	AC1	3148	NC	Initial
Install in Rack 49	AC1	3149	NC	Initial
Install in Rack 50	AC1	3150	NC	Initial
Install in Rack 51	AC1	3151	NC	Initial
Install in Rack 52	AC1	3152	NC	Initial
Install in Rack 53	AC1	3153	NC	Initial
Install in Rack 54	AC1	3154	NC	Initial
Install in Rack 55	AC1	3155	NC	Initial
Install in Rack 56	AC1	3156	NC	Initial
Install in Rack 57	AC1	3157	NC	Initial
Install in Rack 58	AC1	3158	NC	Initial
Install in Rack 59	AC1	3159	NC	Initial
Install in Rack 60	AC1	3160	NC	Initial
Install in Rack 61	AC1	3161	NC	Initial
Install in Rack 62	AC1	3162	NC	Initial
Install in Rack 63	AC1	3163	NC	Initial
Install in Rack 64	AC1	3164	NC	Initial

BladeCenter 01	AC1	3301	NC	Initial
BladeCenter 02	AC1	3302	NC	Initial
BladeCenter 03	AC1	3303	NC	Initial
BladeCenter 04	AC1	3304	NC	Initial
BladeCenter 05	AC1	3305	NC	Initial
BladeCenter 06	AC1	3306	NC	Initial
BladeCenter 07	AC1	3307	NC	Initial
BladeCenter 08	AC1	3308	NC	Initial
BladeCenter 09	AC1	3309	NC	Initial
BladeCenter 10	AC1	3310	NC	Initial
BladeCenter 11	AC1	3311	NC	Initial
BladeCenter 12	AC1	3312	NC	Initial
BladeCenter 13	AC1	3313	NC	Initial
BladeCenter 14	AC1	3314	NC	Initial
BladeCenter 15	AC1	3315	NC	Initial
BladeCenter 16	AC1	3316	NC	Initial
BladeCenter 17	AC1	3317	NC	Initial
BladeCenter 18	AC1	3318	NC	Initial
BladeCenter 19	AC1	3319	NC	Initial
BladeCenter 20	AC1	3320	NC	Initial
BladeCenter 21	AC1	3321	NC	Initial
BladeCenter 22	AC1	3322	NC	Initial
BladeCenter 23	AC1	3323	NC	Initial
BladeCenter 24	AC1	3324	NC	Initial
BladeCenter 25	AC1	3325	NC	Initial
BladeCenter 26	AC1	3326	NC	Initial
BladeCenter 27	AC1	3327	NC	Initial
BladeCenter 28	AC1	3328	NC	Initial
BladeCenter 29	AC1	3329	NC	Initial
BladeCenter 30	AC1	3330	NC	Initial
BladeCenter 31	AC1	3331	NC	Initial
BladeCenter 32	AC1	3332	NC	Initial
BladeCenter 33	AC1	3333	NC	Initial
BladeCenter 34	AC1	3334	NC	Initial
BladeCenter 35	AC1	3335	NC	Initial
BladeCenter 36	AC1	3336	NC	Initial

BladeCenter 37	AC1	3337	NC	Initial	2684	CCE/CCR	Dual Cell Based Blade	18,885
BladeCenter 38	AC1	3338	NC	Initial	2945	CCE/CCR	InfiniBand Card Kit	1,950
BladeCenter 39	AC1	3339	NC	Initial	3101	CCE/CCR	Install in Rack 01	NC
BladeCenter 40					3102	CCE/CCR	Install in Rack 02	NC
	AC1	3340	NC	Initial	3103	CCE/CCR	Install in Rack 03	NC
BladeCenter location 01	AC1	3401	NC	Initial	3104	CCE/CCR	Install in Rack 04	NC
BladeCenter location 02	AC1	3402	NC	Initial	3105	CCE/CCR	Install in Rack 05	NC
BladeCenter location 03	AC1	3403	NC	Initial	3106	CCE/CCR	Install in Rack 06	NC
BladeCenter location 04	AC1	3404	NC	Initial	3107	CCE/CCR	Install in Rack 07	NC
BladeCenter location 05	AC1	3405	NC	Initial	3108	CCE/CCR	Install in Rack 08	NC
BladeCenter location 06	AC1	3406	NC	Initial	3109	CCE/CCR	Install in Rack 09	NC
BladeCenter location 07	AC1	3407	NC	Initial	3110	CCE/CCR	Install in Rack 10	NC
BladeCenter location 08	AC1	3408	NC	Initial	3111	CCE/CCR	Install in Rack 11	NC
BladeCenter location 09	AC1	3409	NC	Initial	3112	CCE/CCR	Install in Rack 12	NC
BladeCenter location 10	AC1	3410	NC	Initial	3113	CCE/CCR	Install in Rack 13	NC
BladeCenter location 11	AC1	3411	NC	Initial	3114	CCE/CCR	Install in Rack 14	NC
BladeCenter location 12	AC1	3412	NC	Initial	3115	CCE/CCR	Install in Rack 15	NC
BladeCenter location 13	AC1	3413	NC	Initial	3116	CCE/CCR	Install in Rack 16	NC
BladeCenter location 14	AC1	3414	NC	Initial	3117	CCE/CCR	Install in Rack 17	NC
Consolidated Delivery	AC1	8031	NC	Initial	3118	CCE/CCR	Install in Rack 18	NC
					3119	CCE/CCR	Install in Rack 19	NC
e1350 Solution Component	AC1	8034	NC	Initial	3120	CCE/CCR	Install in Rack 20	NC
					3121	CCE/CCR	Install in Rack 21	NC
TAA Compliant Order	AC1	8067	NC	Initial	3122	CCE/CCR	Install in Rack 22	NC
					3123	CCE/CCR	Install in Rack 23	NC
General Racking Solution	AC1	8072	NC	Initial	3124	CCE/CCR	Install in Rack 24	NC
					3125	CCE/CCR	Install in Rack 25	NC
Integrate BladeCenter in Manufacturing	AC1	8077	NC	Initial	3126	CCE/CCR	Install in Rack 26	NC
					3127	CCE/CCR	Install in Rack 27	NC
No Publications Selected	AC1	8086	NC	Initial	3128	CCE/CCR	Install in Rack 28	NC
					3129	CCE/CCR	Install in Rack 29	NC
					3130	CCE/CCR	Install in Rack 30	NC
Storage Subsystem ID 01	AC1	9170	NC	Initial	3131	CCE/CCR	Install in Rack 31	NC
Storage Subsystem ID 02	AC1	9171	NC	Initial	3132	CCE/CCR	Install in Rack 32	NC
Storage Subsystem ID 03	AC1	9172	NC	Initial	3133	CCE/CCR	Install in Rack 33	NC
Storage Subsystem ID 04	AC1	9173	NC	Initial	3134	CCE/CCR	Install in Rack 34	NC
Storage Subsystem ID 05	AC1	9174	NC	Initial	3135	CCE/CCR	Install in Rack 35	NC
Storage Subsystem ID 06	AC1	9175	NC	Initial	3136	CCE/CCR	Install in Rack 36	NC
Storage Subsystem ID 07	AC1	9176	NC	Initial	3137	CCE/CCR	Install in Rack 37	NC
Storage Subsystem ID 08	AC1	9177	NC	Initial	3138	CCE/CCR	Install in Rack 38	NC
Storage Subsystem ID 09	AC1	9178	NC	Initial	3139	CCE/CCR	Install in Rack 39	NC
Storage Subsystem ID 10	AC1	9179	NC	Initial	3140	CCE/CCR	Install in Rack 40	NC
Storage Subsystem ID 11	AC1	9180	NC	Initial	3141	CCE/CCR	Install in Rack 41	NC
Storage Subsystem ID 12	AC1	9181	NC	Initial	3142	CCE/CCR	Install in Rack 42	NC
Storage Subsystem ID 13	AC1	9182	NC	Initial	3143	CCE/CCR	Install in Rack 43	NC
Storage Subsystem ID 14	AC1	9183	NC	Initial	3144	CCE/CCR	Install in Rack 44	NC
Storage Subsystem ID 15	AC1	9184	NC	Initial	3145	CCE/CCR	Install in Rack 45	NC
Storage Subsystem ID 16	AC1	9185	NC	Initial	3146	CCE/CCR	Install in Rack 46	NC
Storage Subsystem ID 17	AC1	9186	NC	Initial	3147	CCE/CCR	Install in Rack 47	NC
Storage Subsystem ID 18	AC1	9187	NC	Initial	3148	CCE/CCR	Install in Rack 48	NC
Storage Subsystem ID 19	AC1	9188	NC	Initial	3149	CCE/CCR	Install in Rack 49	NC
Storage Subsystem ID 20	AC1	9189	NC	Initial	3150	CCE/CCR	Install in Rack 50	NC
					3151	CCE/CCR	Install in Rack 51	NC
No Preload Specify	AC1	9206	NC	Initial	3152	CCE/CCR	Install in Rack 52	NC
					3153	CCE/CCR	Install in Rack 53	NC
(1) List price does not include tax or shipping and is subject to change without notice. Reseller prices may vary.					3154	CCE/CCR	Install in Rack 54	NC
					3155	CCE/CCR	Install in Rack 55	NC
					3156	CCE/CCR	Install in Rack 56	NC
					3157	CCE/CCR	Install in Rack 57	NC
					3158	CCE/CCR	Install in Rack 58	NC
The following Single Entity Offering (SEO) option is newly announced for the IBM BladeCenter QS20 (MT 0200):					3159	CCE/CCR	Install in Rack 59	NC
					3160	CCE/CCR	Install in Rack 60	NC
					3161	CCE/CCR	Install in Rack 61	NC
					3162	CCE/CCR	Install in Rack 62	NC
					3163	CCE/CCR	Install in Rack 63	NC
					3164	CCE/CCR	Install in Rack 64	NC
Description	Model number	SEO number	IBM list price	Initial/MES/Both/Support				
IBM BladeCenter QS20	AC1	020025U	\$18,995	Initial	3301	CCE/CCR	BladeCenter 01	NC
					3302	CCE/CCR	BladeCenter 02	NC
					3303	CCE/CCR	BladeCenter 03	NC
					3304	CCE/CCR	BladeCenter 04	NC
					3305	CCE/CCR	BladeCenter 05	NC
					3306	CCE/CCR	BladeCenter 06	NC
					3307	CCE/CCR	BladeCenter 07	NC
					3308	CCE/CCR	BladeCenter 08	NC
					3309	CCE/CCR	BladeCenter 09	NC
					3310	CCE/CCR	BladeCenter 10	NC
					3311	CCE/CCR	BladeCenter 11	NC
					3312	CCE/CCR	BladeCenter 12	NC
					3313	CCE/CCR	BladeCenter 13	NC
					3314	CCE/CCR	BladeCenter 14	NC
					3315	CCE/CCR	BladeCenter 15	NC
					3316	CCE/CCR	BladeCenter 16	NC
					3317	CCE/CCR	BladeCenter 17	NC
					3318	CCE/CCR	BladeCenter 18	NC
0756	CCE/CCR	Packaging -- 2U Blade WW		NC	3319	CCE/CCR	BladeCenter 19	NC
2200	CCE/CCR	Custom Asset Tagging -- Standard		\$ 10	3320	CCE/CCR	BladeCenter 20	NC
2201	CCE/CCR	Custom Asset Tagging -- Standard		20	3321	CCE/CCR	BladeCenter 21	NC
2220	CCE/CCR	Custom Labeling		5	3322	CCE/CCR	BladeCenter 22	NC
2221	CCE/CCR	Custom Palletization		5	3323	CCE/CCR	BladeCenter 23	NC
2247	CCE/CCR	Request for a new Vendor Logo Hardware		NC	3324	CCE/CCR	BladeCenter 24	NC
2248	CCE/CCR	Request for an existing IBM Feature		NC	3325	CCE/CCR	BladeCenter 25	NC
2249	CCE/CCR	Request for an existing Public RPO		NC				

3326	CCE/CCR	BladeCenter	26	NC
3327	CCE/CCR	BladeCenter	27	NC
3328	CCE/CCR	BladeCenter	28	NC
3329	CCE/CCR	BladeCenter	29	NC
3330	CCE/CCR	BladeCenter	30	NC
3331	CCE/CCR	BladeCenter	31	NC
3332	CCE/CCR	BladeCenter	32	NC
3333	CCE/CCR	BladeCenter	33	NC
3334	CCE/CCR	BladeCenter	34	NC
3335	CCE/CCR	BladeCenter	35	NC
3336	CCE/CCR	BladeCenter	36	NC
3337	CCE/CCR	BladeCenter	37	NC
3338	CCE/CCR	BladeCenter	38	NC
3339	CCE/CCR	BladeCenter	39	NC
3340	CCE/CCR	BladeCenter	40	NC
3401	CCE/CCR	BladeCenter	location 01	NC
3402	CCE/CCR	BladeCenter	location 02	NC
3403	CCE/CCR	BladeCenter	location 03	NC
3404	CCE/CCR	BladeCenter	location 04	NC
3405	CCE/CCR	BladeCenter	location 05	NC
3406	CCE/CCR	BladeCenter	location 06	NC
3407	CCE/CCR	BladeCenter	location 07	NC
3408	CCE/CCR	BladeCenter	location 08	NC
3409	CCE/CCR	BladeCenter	location 09	NC
3410	CCE/CCR	BladeCenter	location 10	NC
3411	CCE/CCR	BladeCenter	location 11	NC
3412	CCE/CCR	BladeCenter	location 12	NC
3413	CCE/CCR	BladeCenter	location 13	NC
3414	CCE/CCR	BladeCenter	location 14	NC
8031	CCE/CCR	Consolidated Delivery		NC
8034	CCE/CCR	e1350 Solution Component		NC
8067	CCE/CCR	TAA Compliant Order		NC
8072	CCE/CCR	General Racking Solution		NC
8077	CCE/CCR	Integrate BladeCenter in Manufacturing		NC
8086	CCE/CCR	No Publications Selected		NC
9170	CCE/CCR	Storage Subsystem ID 01		NC
9171	CCE/CCR	Storage Subsystem ID 02		NC
9172	CCE/CCR	Storage Subsystem ID 03		NC
9173	CCE/CCR	Storage Subsystem ID 04		NC
9174	CCE/CCR	Storage Subsystem ID 05		NC
9175	CCE/CCR	Storage Subsystem ID 06		NC
9176	CCE/CCR	Storage Subsystem ID 07		NC
9177	CCE/CCR	Storage Subsystem ID 08		NC
9178	CCE/CCR	Storage Subsystem ID 09		NC
9179	CCE/CCR	Storage Subsystem ID 10		NC
9180	CCE/CCR	Storage Subsystem ID 11		NC
9181	CCE/CCR	Storage Subsystem ID 12		NC
9182	CCE/CCR	Storage Subsystem ID 13		NC
9183	CCE/CCR	Storage Subsystem ID 14		NC
9184	CCE/CCR	Storage Subsystem ID 15		NC
9185	CCE/CCR	Storage Subsystem ID 16		NC
9186	CCE/CCR	Storage Subsystem ID 17		NC
9187	CCE/CCR	Storage Subsystem ID 18		NC
9188	CCE/CCR	Storage Subsystem ID 19		NC
9189	CCE/CCR	Storage Subsystem ID 20		NC
9206	CCE/CCR	No Preload Specify		NC

Maintenance service

Description	Machine type/model	IOR 9 x 5	IOR 24 x 7
QS20	0200-AC1	\$1,200	\$1,800

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

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Warranty service upgrades

Description	Machine type/model	IOR 9 x 5 4-hour	IOR 24 x 7 4-hour	IOR 24 x 7 2-hour
QS20	1 yr 0200-AC1	\$ 350	\$ 500	\$1,250
QS20	3 yr 0200-AC1	1,800	3,200	

Maintenance services

Description	Machine type/model	IOR 9 x 5 NBD	IOR 9 x 5 4-hour	IOR 24 x 7 4-hour	IOR 24 x 7 2-hour
QS20	1 yr 0200-AC1	\$1,000	\$1,350	\$1,500	\$2,250

Maintenance service charges (legacy)

Alternative service (warranty service upgrades)

Description	Machine type/model	IOR 24 x 7
QS20	0200-AC1	\$500