2.2 GHz Dual Core Processor Model for AMD Opteron LS20 for IBM @server® BladeCenter packs high density into less space

Overview

Extend the capabilities of your high-density BladeCenter™ with the AMD Opteron LS20 for IBM @server® BladeCenter blade server Model 65x that includes an AMD Opteron 32-/64-bit Dual Core processor running at a speed of 2.2 GHz— with 1 MB L2 cache per core.

This processor is a low-power, full-performance Opteron processor. With customers concerned with power consumption and heat output, this unique low-power processor can help to reduce the operational cost in deploying these blades.

This Opteron processor supports 64-bit operating systems from Red Hat Linux™, SUSE LINUX, and Microsoft® Windows™.

This processor can also run a 32-bit application under a 64-bit operating system and remain fully compatible with 32-bit applications and operating systems.

High density: Up to 14 AMD Opteron LS20 for BladeCenter Model 65x blade servers can be installed in a new BladeCenter chassis (8677-3XX). Also, they may be installed in an existing BladeCenter chassis (8677-1XX or 8677-2XX) at full density after an upgrade with the new 2,000-watt power supply option (26K4816). In addition, up to eight of these new LS20 blade servers may be installed in the BladeCenter T chassis (8720-1RX and 8730-1RX) with appropriate firmware.

Powerful blade-thin computing: The BladeCenter chassis and AMD Opteron LS20 for BladeCenter blade servers are the key components to building your blade configuration. Optionally available Ethernet, Fibre Channel, and InfiniBand switches and adapters, redundant keyboard video mouse (KVM) management, and power modules support advanced configurations.

Service and support perfected for On Demand Business

- IBM Director and Remote Deployment Manager™
- ServerProven® compatibility testing and Web support
- Three-year, on-site⁴ limited warranty⁵

Key prerequisites

- BladeCenter or BladeCenter T chassis
- Monitor, keyboard, and mouse for setup
- Network switch module
- Boot device such as on-board HDDs or network storage device
- Management module with latest level firmware
- Rack with appropriate PDUs and main power distribution

Planned availability dates

- July 15, 2005:
  - AMD Opteron LS20 for BladeCenter Model 65x
  - Low Power AMD Opteron Processor Model 275

- July 22, 2005:
  - McDATA Mode Firmware Upgrade for BladeCenter
  - McDATA SANtegrity Activation for BladeCenter

- July 29, 2005, InfiniBand 8 Meter Cables

At a glance

Revolutionizing the economics of application server deployment with power, scalability, control, and serviceability.

The new server includes:

- 2.2 GHz¹ Dual Core AMD Opteron processors, including 1 MB L2 cache per core and full 64-bit support
- Two-way SMP processing with a 1 GHz HyperTransport processor link
- The Model 65x includes high-speed 1 GB (2 x 512 MB kit) PC3200 CL3 ECC double data rate (DDR) VLP SDRAM RDIMM memory
- Maximum system memory is 8 GB²
- Dual Broadcom 5704S Gigabit Ethernet connections with failover support
- Support for Small Form Factor (SFF) or legacy Ethernet or Fibre Channel I/O cards, and Myrinet or InfiniBand expansion cards
- Integrated systems management processor
- Integrated SCSI controller and connectors for two 2.5-inch small form factor (SFF) Non Hot-Swap SCSI HDDs

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.
The AMD Opteron LS20 for BladeCenter Model 65x blade server, coupled with the BladeCenter chassis, advances application serving with performance, density, and scalability.

At your command are:

- Powerful, two-way SMP-capable Opteron processors
- High-speed memory with error checking and correction (ECC)
- Dual Gigabit Ethernet connections
- SCSI RAID-1 (mirroring) supported in 32-bit application operation mode
- Advanced high availability and systems management features

These features offer a new economic approach to the deployment of large numbers of powerful servers that require less space and fewer power resources.

This next-generation processors uses one 1 GHz interprocessor HyperTransport bus.

**AMD Opteron LS20 for BladeCenter**

**High-performance, blade-server subsystems:** The LS20 Model 65x blade server is a high-throughput, two-socket, SMP-capable, AMD Opteron-based blade server, highly scalable when you add memory. AMD Opteron processor cores support a 64 KB two-way set associative L1 Instruction Cache and a 64 KB two-way set associative L1 Data Cache. In addition, each core supports a 1MB L2 Cache that is 16-way set associative for both instruction and data and that is per core so on a Dual core each processing core contains an independent set of L1 and L2 caches.

The processor used in this LS20 blade is a low-power, full-performance Opteron processor. The standard AMD Opteron processors available at these speeds draw a maximum of 95W. This specially manufactured processor operates at 68-watts capacity or less with little or no performance trade-offs. This savings in power at the processor level combined with the smarter power solution that BladeCenter delivers make these blades attractive to customers dealing with limited power and cooling resources.

One AMD Opteron processor with 64-bit capability is standard on the blade server. High-speed, PC-3200 DDR1 SDRAM is synchronized for up to 400 MHz processor-to-memory subsystem performance.

The AMD Opteron LS20 for BladeCenter uses the AMD system chipset that includes:

- AMD 8131 HyperTransport PCI-X Bus Controller
- AMD 8111 HyperTransport I/O Hub (SouthBridge)

The Opteron processor includes an integrated Main Memory controller:

- Integrated high-performance main memory subsystem
- Maximum throughput between processors and main memory
- Processor interconnect fabric
  - 1 GHz HyperTransport links between processor sockets for the 2.2 GHz Dual core processors

**Standard AMD Opteron LS20 for BladeCenter Configuration**

<table>
<thead>
<tr>
<th>Model</th>
<th>Processor</th>
<th>L2 Cache</th>
<th>Memory</th>
<th>Ethernet</th>
<th>HDD</th>
</tr>
</thead>
<tbody>
<tr>
<td>B850-65x</td>
<td>2.2 GHz Opteron per Core</td>
<td>1 MB</td>
<td>1 GB ECC</td>
<td>Dual Gb</td>
<td>Open</td>
</tr>
</tbody>
</table>

**Additional features**

- AMD Opteron LS20 for BladeCenter system board containing four DIMM connectors, supporting 512 MB, 1 GB, or 2 GB DIMMs
  - Up to 8 GB of system memory is supported with 2 GB DIMMs.
  - Memory is two-way interleaved.
  - Memory sizes can be mixed (must be installed in matched pairs).
  - The Chipkill™ function is supported for 1 GB and 2 GB DIMMs.
- SCSI controller, supporting SCSI data storage up to 146 GB (two 73 GB HDDs) and RAID-1
- Two full-duplex, dual Gigabit Ethernet PCI-X connections, high-speed network communications to LAN clients

AMD Opteron LS20 for BladeCenter blade servers are designed for high throughput from processor, to memory, and to bus I/O.

These features, combined with SMP capability and blade-thin density, make it an excellent choice for space-constrained environments used for:
• Web caching
• Collaboration
• Terminal serving
• Dynamic Web serving
• Firewall
• Telecommunications
• Active directory services
• Scientific and technical computing
• Linux clustering

High availability and serviceability features

• Hot-swap blades enable easy access to each blade server.
• The management module interfaces with each blade server for single systems management control.

The AMD Opteron LS20 for BladeCenter blade servers deliver on reliability and serviceability.

Features include:

• ECC DIMMs, combined with an integrated ECC memory controller, correcting many soft and hard single-bit memory errors, while minimizing disruption of service to LAN clients
• Chipkill memory — correction for up to four bits per DIMM to help keep your blade server up and running
• Memory hardware scrubbing, designed to correct soft memory errors automatically without software intervention
• ECC L2 cache processors help improve data reliability and reduce downtime
• CPU failure recovery in SMP configurations:
  - Automatically reboots server
  - Generates alerts
• PFA on memory and processors alert the system administrator of an imminent component failure
• Dual Gigabit Ethernet connections support:
  - Failover, adapter fault tolerance
  - PXE 2.0 Boot Agent
  - Wake on LAN®
  - Load balancing or teaming
• An integrated management processor that supports diagnostic, reset, POST, and auto recovery functions and monitors temperature and voltage; alerts generated when thresholds are exceeded (refer to the Limitations section for restrictions)

High density

Using the 8677 BladeCenter Chassis: Up to 14 AMD Opteron LS20 for BladeCenter blade servers can be installed in a new BladeCenter chassis (8677-3XX). Also, they can be installed in an existing BladeCenter chassis (8677-1XX or 8677-2XX) at full density after an upgrade with the new 2000-watt power supply option (26K4816).

Power considerations: The 8677 BladeCenter Chassis with 1200-, 1400-, or 1800-watt power supply does not provide enough power to maintain redundancy at full density. Customers with the 8677-1XX and 2XX chassis who want full density must upgrade to the 2,000-watt power supplies (26K4816).

Using the 8720 or 8730 BladeCenter T Chassis:

IBM supports the installation of up to eight AMD Opteron LS20 blades in the BladeCenter T chassis with the latest management module firmware which includes Fuel Gauge. This feature allows for power throttling to occur in the unlikely event of a power supply failure. The fuel gauge feature will reduce power consumption per blade during a power crisis- keeping all eight blades installed in the chassis up and running but at a possibly lower performance level. Users that are not willing to accept any power/performance throttling should limit the number of blades they install in a BCT to seven blades. At this power requirement, the LS20 will not require any throttling in the BCT environment.

Related options

IBM Processor Upgrade with Low Power AMD Opteron Processor Model 275 2.2 GHz Dual Core with 1 MB L2 Cache per Core (25R8895).

Systems management

IBM Director

AMD Opteron LS20 for BladeCenter blade servers include IBM Director. This powerful, highly integrated systems management software solution is built on industry standards and designed for ease of use.

Exploit your existing enterprise or workgroup management environments and use rich security features to access and manage physically dispersed IT assets more efficiently over the Internet.

It can help reduce costs through potentially:

• Reduced downtime
• Increased productivity of IT personnel and end users
• Reduced service and support costs

IT administrators can view the hardware configuration of remote systems in detail and monitor the usage and performance of critical components such as processors, HDDs, and memory. IBM Director can be extended with optional add-ons for advanced server management, deployment, and software distribution. All of these tools smoothly integrate into IBM Director for consistent look-and-feel and single point of management while taking advantage of the IBM Director monitoring, scheduling, alerting, event management, and group management capabilities.

Optional add-ons

• The IBM Director Server Plus Pack is a collection of five tools with predictive and autonomic capabilities that help deliver optimal server performance and high availability. The five tools include Capacity Manager, Software Rejuvenation, Active PCI Manager, System Availability, and Rack Manager.
• Application Workload Manager extends IBM Director to enable the control of how multiple applications use server resources and help protect against unexpected resource contention.
• Remote Deployment Manager (RDM) is an effective tool for the initial deployment phase of a system’s lifecycle with its ability to remotely send out complete software images for installation in a preboot environment.
• Software Distribution Premium Edition enables you to create and distribute software packages to systems on your network, helping save travel and labor costs.

IBM Director also enables integration into leading workgroup and enterprise systems management environments via its Upward Integration Modules. This
enables the advanced management capabilities built into xSeries® servers to be accessed from:

- Tivoli® Enterprise and Tivoli NetView®
- Computer Associates CA Unicenter TNG
- HP OpenView
- Microsoft SMS
- BMC Patrol
- NetIQ

For more information about IBM Director, refer to Software Announcement 202-246, dated September 24, 2002.

**RDM for BladeCenter**

BladeCenter can use RDM, which enables the configuration and deployment of AMD Opteron LS20 for BladeCenter blade servers within a single BladeCenter. This highly flexible and powerful tool enables you to deploy system images that include the operating system and configuration detail to one or more blade servers at one time from an IBM Director console on the network.

With RDM you can:

- Add instructions for loading firmware or specific operating systems
- Deploy multiple blade servers in a BladeCenter at one time
- Store various images on the RDM server for target server installations
- Restore initial or incremental disk image locally with a keystroke
- Use the drop-and-drag capability to deploy images

**BladeCenter management module**

Use the management module in the BladeCenter to manage the BladeCenter and obtain vital system information about your installed AMD Opteron LS20 for BladeCenter servers. The management module communicates with the blade servers within the BladeCenter through an RS-485 intermanagement network. This network relays vital information about individual blade servers such as:

- Temperature
- Voltages
- Power supply status
- Memory status
- Fan status
- HDD status
- Error and status log

You receive status and control all blade servers within the BladeCenter. You can shut down and restart any blade server from anywhere on the network to help save time and costs associated with travel to the actual installation.

These manageability functions are provided through a self-contained Web page, creating an easy and familiar way for administrators to monitor, control, and maintain high availability.

**McDATA Software Activation Keys**

When IBM announced the McDATA 6-port Fibre Channel Switch Module for BladeCenter, these items were previewed and are now announced:

- McDATA Mode Firmware Upgrade for BladeCenter QLogic Switch Modules (32R1795) provides a license key to upgrade existing QLogic 6-port Fibre Channel Switch Modules to the capabilities of the McDATA switch module. This upgrade provides investment protection for customers who purchased the QLogic 6-port switch and now want to integrate them into existing McDATA fabrics.

- McDATA SANtegrity Enhanced Activation for BladeCenter is a license upgrade key, which includes both McDATA SANtegrity Binding and McDATA SANtegrity Authentication activation. Binding will help prevent problems due to accidental misconfigurations. Authentication helps provide protection from WWN spoofing or malicious users. The use of the McDATA SANtegrity Enhanced Activation key allows the BladeCenter switch module to configure fabric and port bindings within a Storage Area Network (SAN) where SANtegrity binding is already active.

**Product positioning**

The BladeCenter server blade offerings are positioned as the highest density servers of the IBM® xSeries® line. These server blades represent a new approach to the deployment of application servers where two-way, SMP-capable processing, high availability design, systems management, and easy setup features are combined in an extremely dense package.

The BladeCenter can require less space and power resources because of their high-density design, reduced power requirements, and single environment systems management. This is an extremely important consideration for:

- Large enterprises
- Application service providers
- Scientific and technical computing businesses

They are an excellent fit for applications such as:

- HPC Life Sciences
- Linux clusters

**Reference information**

1 GHz and MHz denote the internal and/or external clock speed of the microprocessor only, not application performance. Many factors affect application performance.

2 Using 2 GB DIMMs.

3 When referring to HDD or tape backup capacity, GB stands for one billion bytes. Total user capacity may vary depending on operating environments.

4 IBM sends a technician after attempting to diagnose and resolve the problem remotely.


Alternatively, this information is also available by contacting your IBM representative or reseller. Copies are available upon request.

**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)

BP Attachment for Announcement Letter 105-239
Trademarks

BladeCenter and Chipkill are trademarks of International Business Machines Corporation in the United States or other countries or both.
The e-business logo, ServerProven, Wake on LAN, xSeries, NetView, Tivoli, and eServer are registered trademarks of International Business Machines Corporation in the United States or other countries or both.
Microsoft and Windows are trademarks of Microsoft Corporation.
Linux is a trademark of Linus Torvalds in the United States, other countries or both.
Remote Deployment Manager is a trademark of Lenovo in the United States, other countries, or both.
Other company, product, and service names may be trademarks or service marks of others.
Publications

An installation and user’s guide, and safety and warranty publications are shipped with each AMD Opteron LS20 for BladeCenter™ blade.

The publication BladeCenter Solutions (GM13-0127) is available immediately.

The publication AMD Opteron LS20 for IBM eServer® BladeCenter Installation and User’s Guide and Hardware Maintenance Manual, in U.S. English versions, are available from

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

Technical information

Physical specifications

| AMD Opteron LS20 for BladeCenter |
|---------------------|-----------------------------|
| Processor           | Opteron                     |
| Internal speed      | 2.2 GHz                     |
| External speed      | 1 GHz                       |
| Number standard     | 1                           |
| Maximum             | 2                           |
| L2 cache (full speed)| 1 MB per core               |
| L3 cache            | 0                           |
| Memory (PC-3200 DDR1)| 1 GB ECC                    |
| DIMMs               | 2x 512 MB                   |
| DIMM sockets        | 4                           |
| Capacity            | 8 GB6                       |
| Video               | SVGA                        |
| Memory              | 16 MB                       |
| SCSI controller     | Ultra320                     |
| Channels            | 1                           |
| Connector internal  | 2                           |
| Connector external  | 0                           |
| RAID 1              | Yes                         |
| HDD                 | 1                           |
| Connectors          | 2                           |
| Internal capacity   | 146 GB                      |
| Total HDD bays      | 2                           |
| PCI Slots           | 0                           |
| Management processor| Standard                    |
| Ethernet controller| Dual GB                     |
| FC card             | Optional                    |
| DVD-ROM (IDE)       | 0                           |
| Diskette drive      | 0                           |
| Power supply        | 0                           |

6 Total system memory capacity is based on using 2 GB memory DIMMs.

Video subsystem

- ATI Mobility Radeon 7000M Video controller
- Integrated on the blade
- 16 MB embedded video memory

Services

Integrated 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


Select your country, and then select the product as the category.

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.
**Supported LS20 blade video resolutions**

<table>
<thead>
<tr>
<th>Resolution</th>
<th>Maximum refresh rate supported</th>
<th>CRT support</th>
<th>CRT ISO 9241.3 compliance</th>
<th>Flat panel support</th>
</tr>
</thead>
<tbody>
<tr>
<td>640 x 480</td>
<td>85 Hz</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>800 x 600</td>
<td>85 Hz</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>1024 x 768</td>
<td>75 Hz</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>1280 x 1024</td>
<td>40 Hz</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>1600 x 1200</td>
<td>28 Hz</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

**Note:** For resolutions supported by different operating systems, refer to the operating system documentation.

**Dimensions — LS20 blade Model 65x**
- Height: 24.5 cm (9.7 in)
- Depth: 44.6 cm (17.6 in)
- Width: 2.9 cm (1.14 in)
- Maximum weight: 5.0 kg (11 lb) (depends on the configuration when options are added)

**Electrical**
- BladeCenter chassis: 200 to 240 (nominal) V ac; 50 Hz or 60 Hz;
- BladeCenter LS20: 12.2 (nominal) V dc

**Standards:** This system supports or complies with the following standards:
- Multiprocessor Specification (MPS) 1.4
- Hardware-enabled to meet the International Organization for Standardization (ISO) 9241, Part 3

**Equipment approvals and safety**
- FCC — Verified to comply with Part 15 of the FCC Rules, Class A
- Canada ICES-003, issue 3, Class A
- UL 60950 Safety of Information Technology Equipment
- CSA C22.2 No.60950 Safety of Information Technology Equipment 60950
- NOM-019 Seguridad de Equipo de Procesamiento de Datos

**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)

**Hardware requirements:** For attended installation of an operating system, this server requires a compatible:
- Keyboard
- Mouse
- Display

Unattended or remote installation may be performed without requiring some or all of these components. Review your unattended software installation program information for specific hardware configuration requirements.

For service, the server requires a compatible:
- Keyboard
- Mouse
- Display

When having the unit serviced, plan to have these components attached to your server either directly or indirectly via a console switch.

**Software requirements:** The following network operating systems have been tested for compatibility with the AMD Opteron LS20 for BladeCenter:
- Microsoft™:
  - Windows™ Server 2003, Standard Edition®
  - Windows Server 2003, Enterprise Edition®
  - Windows XP Professional — 32-bit only
  - Windows 2000 Advanced Server
  - Windows 2000 Server
- Linux™:
  - Red Hat Enterprise Linux v.4 Update 1 (AS, ES, WS) for 32-bit x86
  - Red Hat Enterprise Linux v.4 Update 1 (AS, ES, WS) for 64-bit AMD64/Intel™ EM64T
  - Red Hat Enterprise Linux v.3 Update 5 (AS, ES, WS) for x86
  - Red Hat Enterprise Linux v.3 Update 5 (AS, ES, WS) for AMD64/Intel EM64T
  - SUSE LINUX Enterprise Server 9 Service Pack 1 for x86
  - SUSE LINUX Enterprise Server 9 Service pack 1 for AMD64 and Intel EM64T

For additional information about support, certification, and versions of network operating systems, access [http://www.ibm.com/pc/us/compat](http://www.ibm.com/pc/us/compat)

**Compatibility:** The AMD Opteron LS20 for BladeCenter contains licensed system programs that include set configuration, set features, and test programs. IBM system BIOS is loaded from a “flash” EEPROM into system memory. This BIOS provides instructions and interfaces designed to support the standard features of the AMD Opteron LS20 for BladeCenter and to maintain compatibility with many current software programs.

For detailed information about IBM and non-IBM devices, adapters, software, and network operating systems supported with xSeries® servers, visit [http://www.ibm.com/us/pc/compat](http://www.ibm.com/us/pc/compat)

Contact your IBM representative, IBM Business Partner, or refer to the IBM Sales Manual for information on the compatibility of hardware and software for xSeries servers. The Sales Manual is updated periodically as new features and options are announced that support these servers.

**Limitations**
- The AMD Opteron LS20 for BladeCenter blades contain four DIMM sockets. A maximum of 8 GB of system memory is supported by using 2 GB DIMMs of PC-3200 CL3 ECC DDR1 memory in each of the 4 DIMM sockets. All supported system memory is addressable through direct memory access. The AMD Opteron LS20 for BladeCenter supports currently available 512 MB,
1 GB, and 2 GB DIMMs. Supported DIMMs can coexist in the same server; however, memory DIMMs of the same capacity must be installed in matched pairs. Refer to the Planning information section or the IBM eServer xSeries server Page web page memory options.

- Microprocessors must be of the same type and clock speed on each AMD Opteron LS20 for BladeCenter. Mixing microprocessors of different speeds or cache size or upgrading the base processors is not supported.
- IBM supports the installation of eight AMD Opteron LS20 blades in the BladeCenter T chassis with the latest management module firmware which includes Fuel Gauge. This feature allows for power throttling to occur in the unlikely event of a power supply failure. The fuel gauge feature will reduce power consumption per blade during a power crisis-keeping all eight blades installed in the chassis up and running but a possibly lower performance level. Users that are not willing to accept any power/performance throttling should limit the number of blades they install in a BCT to seven blades. At this power requirement LS20 never will require any throttling in the BCT environment.

Refer to the Software requirements section for operating system limitations.

User group requirements

Limitations

- IBM Director is supported in 32-bit legacy mode only.
- ASR is supported in 32-bit legacy mode only.
- RDM:
  - Supports 32-bit legacy Windows Native Install and Windows Clone Install
  - Supports RH EL (Advanced Server) 3.0 32-bit installs via a white paper
  - Supports RH EL (Advanced Server) 3.0 64-bit installs via a white paper
  - Updates BIOS, performs CMOS updates, and configures RAID controller
  - Supports Windows Clone Install
  - Does not support SLES 9
- ServerGuide and Scripting Toolkit — Supports unattended installation of the legacy 32-bit Windows network operating systems only (Windows 2000 and Windows 2003) and no support for the installation of 64-bit operating systems
- Update Express — Supports in 32-bit legacy mode only
- May require 2000W PS as determined by the BladeCenter power module upgrade guideline (document part number 25K8424 shipped with HS20 blades)

Planning information

Customer responsibilities

AMD Opteron LS20 for BladeCenter blade and related options

This product is designated as customer setup. Customer setup instructions are shipped with the product.

Integrated RAID-1 configuration: Manufacturing instructions (MI) publication enables you to set up a RAID-1 integrated mirroring configuration. This instruction enables configuration via Odyssey (ibm.com). The MI is Integrated Mirroring SCSI HDD (59P5605).

Configuration information

AMD Opteron LS20 for BladeCenter blades must be installed in a BladeCenter.

BladeCenter 8677-3XU configuration

The BladeCenter contains 14 blade server bays supporting up to 14 hot-swap AMD Opteron LS20 for BladeCenter blades. A control panel, located at the top left of the unit, contains the following LEDs:

- Power good
- Blade location
- Over temperature
- Information
- General fault

Two bays at the top to the right of the control panel contain the standard DVD-ROM and 1.44 MB diskette drives.

The rear housing contains:

- Two hot-swap, redundant blower assemblies in the center, mounted one on top of the other
- Two standard 2,000-watt power supply modules and module bays for two optional power supply modules on each side of the blower assemblies
- One standard management module for KVM/Management
- Four hot-swap module bays on the left rear chassis, stacked in pairs, support one or two BladeCenter four-port Gigabit Ethernet Modules and one or two BladeCenter six-port Fibre Channel Switch Modules

Processor upgrades

The system comes standard with one AMD Opteron processor. An additional processor may be added by purchasing a supported processor option.

The Low Power AMD Opteron Processor Model 275 (25R8895) processor option is supported with AMD Opteron LS20 for BladeCenter Model 65x.

Memory support

The following memory options are supported with AMD Opteron LS20 for BladeCenter:

- 2 GB (2x1GB Kit) PC3200 CL3 ECC DDR VLP SDRAM RDIMM (73P5121)
- 4 GB (2x2GB Kit) PC3200 CL3 ECC DDR VLP SDRAM RDIMM (73P5122)

Power considerations

BladeCenter enclosure contains two 2,000-watt 220 V ac power modules. These modules must be attached to a supported high-voltage PDU. These standard power modules support blade bays 1 through 6 with power redundancy. When adding additional blade servers in bays 7 through 14, a BladeCenter 2,000-Watt Power Supply Module option must be installed. This option provides both power and redundancy to these blade bays.

Cable orders: Each AMD Opteron LS20 for IBM eServer BladeCenter blade contains two Gigabit Ethernet connections. An optional BladeCenter four-port Gigabit Ethernet Switch Module must be installed in the BladeCenter to support additional Ethernet connections. This Ethernet switch contain four ports with RJ-45 connectors. The RJ-45 connectors provide a 10/100/1000 Base-T interface (either at half- or full-duplex) for connecting twisted-pair cable to the Ethernet network. Cabling is not included with the server. To connect the Ethernet controller to a repeater or switch, use an
unshielded twisted pair (UTP) cable with RJ-45 connectors at both ends. For 100 Mbps, or higher operation, Category 5 cabling must be used. For 10 Mbps operation, Category 3, or better, cabling must be used.

Installations using the BladeCenter 2-port Fibre Channel Switch Module require short- or long-wave small form factor pluggable (SFP) options and appropriate Fibre Channel cabling.

Installability: Each AMD Opteron LS20 for BladeCenter requires approximately 10 minutes for installation. Installation includes unpacking, setting up, and powering on the system. Additional time is required to install an operating system, additional options, or features.

Packaging
- BladeCenter LS20 Carton
  - LS20 Blade
  - Publications/CD Package
- Publications package
  - Installation and User’s Guide
  - Documentation CD-ROM (softcopy of publications)
  - Broadcom CD-ROM
  - Safety flyer
  - Blade ID labels

The AMD Opteron LS20 for BladeCenter blades are shipped in a single package.

- Approximate shipping dimensions and weight:
  - Single pack dimensions: L 23.75 x W 13.13 x H 6.13 in
  - Single pack weight: 13.8 lbs

Related options
Processor Upgrades
- Opteron processor
- Heat sink
- Installation publications/warranty

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 set unattended boot mode allows the system keyboard to be locked to all entries except the password and at the same time allows other computers on the network to access the system disk drive.
- A selectable boot sequence can be used to prevent unauthorized installation of software or removal of data from the diskette drive.

The AMD Opteron LS20 for BladeCenter 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.

IBM Electronic Services

IBM Global Services has transformed its delivery of hardware and software support services to put you on the road to higher systems availability. IBM Electronic Services is a Web-enabled solution that provides you with an exclusive, no-additional-charge enhancement to the service and support on the IBM eServer. You should benefit from greater system availability due to faster problem resolution and preemptive monitoring. IBM Electronic Services is comprised of two separate, but complementary, elements: IBM Electronic Services news page and IBM Electronic Service Agent™.

IBM Electronic Services news page provides you with a single Internet entry point that replaces the multiple entry points traditionally used by customers 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 IBM Electronic Service Agent is a no-additional-charge software that resides on your IBM eServer system. It is designed to proactively monitor events and transmit system inventory information to IBM on a periodic, customer-defined timetable. The IBM Electronic Service Agent tracks system inventory, hardware error logs, and performance information. If the server is under a current IBM maintenance service agreement or within the IBM warranty period, the Service Agent automatically reports hardware problems to IBM.

Early knowledge about potential problems enables IBM to provide proactive service that maintains higher system availability and performance. In addition, information collected through the Service Agent will be made available to IBM service support representatives when they are helping answer your questions or diagnosing problems.

To learn how IBM Electronic Services can work for you, visit

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

Terms and conditions

IBM Global Financing: Yes

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 — Three years
- 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
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-3.ibm.com/computer/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**

*ServicePac®, ServiceSuite™ and ServiceElect:* ServicePac, ServiceSuite and ServiceElect provide hardware warranty service upgrades, maintenance, and selected support services in one agreement.

**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.

**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.

**On-site service:** IBM on-site repair (IOR), 9 hours per day, Monday through Friday excluding holidays, next-business-day (NBD) response. 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.

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.

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:

- 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 30 days of your receipt of the replacement.

The following parts have been designated as Tier 1 CRUs:

- Memory
- HDD
- System Bezel
- System Labels
- Battery
- HDD
- Top cover

**On-site service:** IBM on-site repair (IOR), 9 hours per day, Monday through Friday excluding holidays, next-business-day (NBD) response. 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.

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.

**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.

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 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 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 (keyboard, mouse, speaker, memory, HDD), 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.
- 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 IOR, 24 hours per day, 7 days a week, 4-hour average response warranty service upgrade option is available.

**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 (keyboard, mouse, speaker, memory, HDD), 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.
- 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:** One

**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. This product does not contain licensed internal code or licensed machine code.

### Prices

<table>
<thead>
<tr>
<th>Description</th>
<th>Machine type/model</th>
<th>Part number</th>
<th>IBM List price</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMD Opteron LS20 for BladeCenter</td>
<td>8850-65U</td>
<td>885065U</td>
<td>$4,299</td>
</tr>
</tbody>
</table>

9 Price does not include tax or shipping and is subject to change without notice. Reseller prices may vary.

<table>
<thead>
<tr>
<th>Description</th>
<th>Part number</th>
<th>IBM List price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Power AMD Opteron Processor Model 275</td>
<td>25R8895</td>
<td>$2,949</td>
</tr>
<tr>
<td>InfiniBand 8M Cables:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>InfiniBand 8 meter 4x Cable for BladeCenter</td>
<td>26R0847</td>
<td>339</td>
</tr>
<tr>
<td>InfiniBand 8 meter 12x to (3) 4x Cable for BladeCenter</td>
<td>26R0849</td>
<td>799</td>
</tr>
<tr>
<td>McDATA Software Activation Keys</td>
<td></td>
<td></td>
</tr>
<tr>
<td>McDATA Mode Firmware Upgrade for BladeCenter QLogic Switch Modules</td>
<td>32R1795</td>
<td>2,499</td>
</tr>
<tr>
<td>McDATA SANtegrity Activation for BladeCenter</td>
<td>32R1797</td>
<td>3,499</td>
</tr>
</tbody>
</table>

### ServicePac for warranty service upgrade (WSU) and maintenance charges

<table>
<thead>
<tr>
<th>Description</th>
<th>Part number</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-year WSU, IOR 24 x 7 2-hour average response</td>
<td>69P9519</td>
</tr>
<tr>
<td>3-year WSU, IOR 24 x 7 4-hour average response</td>
<td>69P9518</td>
</tr>
<tr>
<td>3-year WSU, IOR 9 x 5 4-hour average response</td>
<td>69P9517</td>
</tr>
<tr>
<td>1-year IOR 24 x 7 2-hour average response</td>
<td>69P9516</td>
</tr>
<tr>
<td>2-year IOR 24 x 7 2-hour average response</td>
<td>96P2132</td>
</tr>
<tr>
<td>4-year IOR 24 x 7 2-hour average response</td>
<td>69P9523</td>
</tr>
<tr>
<td>5-year IOR 24 x 7 2-hour average response</td>
<td>69P9527</td>
</tr>
<tr>
<td>1-year IOR 24 x 7 4-hour average response</td>
<td>69P9515</td>
</tr>
<tr>
<td>2-year IOR 24 x 7 4-hour average response</td>
<td>96P2131</td>
</tr>
<tr>
<td>4-year IOR 24 x 7 4-hour average response</td>
<td>69P9522</td>
</tr>
<tr>
<td>5-year IOR 24 x 7 4-hour average response</td>
<td>69P9526</td>
</tr>
<tr>
<td>1-year IOR 9 x 5 4-hour average response</td>
<td>69P9514</td>
</tr>
<tr>
<td>2-year IOR 9 x 5 4-hour average response</td>
<td>96P2130</td>
</tr>
<tr>
<td>4-year IOR 9 x 5 4-hour average response</td>
<td>69P9521</td>
</tr>
<tr>
<td>5-year IOR 9 x 5 4-hour average response</td>
<td>69P9525</td>
</tr>
<tr>
<td>1-year IOR 9 x 5 NBD response</td>
<td>69P9513</td>
</tr>
<tr>
<td>2-year IOR 9 x 5 NBD response</td>
<td>96P2129</td>
</tr>
<tr>
<td>4-year IOR 9 x 5 NBD response</td>
<td>69P9520</td>
</tr>
<tr>
<td>5-year IOR 9 x 5 NBD response</td>
<td>69P9524</td>
</tr>
</tbody>
</table>

To order direct, call IBM at 877-999-7115 and select option 4.

For the name of the nearest IBM representative or Business Partner, call 800-IBM-4YOU (426-4968).

Order Now

-7-
For ServicePac prices, visit

http://www-1.ibm.com/services/its/
us/spwarmain.html

Maintenance service charges (Legacy)(IOR)

Alternative service (Warranty service upgrades)

IOR
24 x 7
$400

Maintenance Service

IOR
24 x 7
$400

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

IBM Global Financing: IBM Global Financing offers competitive financing to credit-qualified customers to assist them in acquiring IT solutions. Our offerings include financing for IT acquisition, including hardware, software, and services, both from 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.

Trademarks

BladeCenter, ServerGuide, Electronic Service Agent, and ServiceSuite are trademarks of International Business Machines Corporation in the United States or other countries or both.
The e-business logo, eServer, xSeries, and ServicePac are registered trademarks of International Business Machines Corporation in the United States or other countries or both.
Intel is a trademark of Intel Corporation.
Microsoft and Windows are trademarks of Microsoft Corporation.
Linux is a trademark of Linus Torvalds in the United States, other countries or both.
Other company, product, and service names may be trademarks or service marks of others.