IBM Power 755 server brings IBM POWER7 technology to the High Performance Computing marketplace

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At a glance

The Power® 755 server is a 3.3 GHz 32-core POWER7 processor-based server optimized for high performance computing. Up to sixty-four 32-core nodes can be clustered together, providing up to 2,048 cores. Each 755 server node features:

- Four 8-core POWER7 modules, each with 4 MB L3 cache/core and also 256 KB L2 cache/core
- Up to 256 GB of 1066 GHz DDR3 memory
- Five PCI slots (three PCIe and two PCI-X)
- One slot for a 12X InfiniBand adapter
- Eight SFF SAS bays in the CEC for disk or solid-state drives
- Up to 72 TB disk storage using CEC and EXP12S SAS I/O drawers
- Integrated 10/100/1000 Mb quad-port Virtual Ethernet or dual-port 10 Gb Virtual Ethernet
- EnergyScale™ technology
- Integrated DVD-RAM drive
- 4U rack-mount configuration

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

Overview

The IBM Power 755 compute node is designed for organizations that require a scalable system with extreme parallel processing performance and dense packaging. Ideal workloads for Power 755 include high performance computing (HPC) applications such as weather and climate modeling, computational chemistry,

physics, and petroleum reservoir modeling that require highly intense computations where the workload is aligned with parallel processing methodologies.

The Power 755 server (8236-E8C) is a 3.3 GHz 32-core POWER7 server that should be very popular in HPC environments such as weather and climate modeling, computational chemistry, physics, computer-aided engineering, computational fluid dynamics, and petroleum reservoir modeling. A single Power 755 provides four 64-bit, eight-core processor POWER7 modules with 4 MB of L3 cache/core and 256 KB of L2 cache/core. Each module is packaged on its own processor card, which has eight DDR3 DIMM slots offering a maximum of 256 GB memory when all 32 DIMM slots are filled with 8 GB DIMMs. The memory DIMMs run at 1066 MHz.

Using 12X InfiniBand adapters, up to 64 Power 755 nodes, each with 32 cores, can be clustered together, providing up to 2,048 POWER7 cores. The IBM HPC software stack provides the necessary development tools, libraries, and system management software necessary to manage a Power 755 server cluster.

The Power 755 system unit provides up to five PCI slots, one GX slot for a 12X adapter, eight SFF (small form factor) SAS bays, and a DVD-RAM. Three of the five PCI slots are PCIe 8x and two are PCI-X DDR. The GX slot can hold a 12X InfiniBand adapter supporting 4x connection to other Power 755s. The eight SAS bays contain a minimum of two and a maximum of eight disks or SSDs, providing up to 2.4 TB storage capacity. Up to an 156 additional SAS bays are available using the EXP12S SAS disk/SSD drawer (#5886), providing up to 70 TB of additional capacity. All drives are direct dock and hot pluggable.

The Power 755 system unit also provides a choice of quad gigabit or dual 10 Gb integrated host Ethernet adapters, which can be extensively virtualized. These ports are selected at the time of initial order and do not use a PCI slot.

The Power 755 server contains a minimum of two and a maximum of either eight SFF SAS disks or eight SFF SAS SSDs. The maximum internal disk storage available is 2400 GB. All DASD are direct dock and hot pluggable. A slim media bay is available for a mandatory SATA DVD-RAM.

Also available in the Power 755 system unit is a choice of quad gigabit or dual 10 Gb integrated host Ethernet adapters. These native ports can be selected at the time of initial order. Virtualization of these integrated Ethernet adapters is supported.

Other integrated features include:

- Service Processor
- Integrated SAS/SATA controller for disk/SSD/DVD in system unit
- EnergyScale technology
- Two system ports and three USB ports
- Two HMC ports and two SPCN ports
- Redundant and hot-swap power and cooling
- 4U 19-inch rack-mount packaging

Key prerequisites

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

- AIX Version 6.1 with the 6100-04 Technology Level and Service Pack 2, or later
- AIX Version 6.1 with the 6100-03 Technology Level and Service Pack 5, or later (planned availability: June 25, 2010)
- AIX Version 6.1 with the 6100-02 Technology Level and Service Pack 8, or later (planned availability: June 25, 2010)
- AIX Version 5.3 with the 5300-11 Technology Level and Service Pack 2, or later (planned availability: March 16, 2010)

- AIX Version 5.3 with the 5300-10 Technology Level and Service Pack 4, or later (planned availability: May 28, 2010)
- AIX Version 5.3 with the 5300-09 Technology Level and Service Pack 7, or later (planned availability: May 28, 2010)

Visit the IBM Prerequisite Web site for compatibility information for hardware features and the corresponding AIX Technology Levels

http://www-912.ibm.com/e_dir/eserverprereq.nsf

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

- SUSE Linux Enterprise Server 11 for the Power 755 Server, or later, with current maintenance updates available from Novell to enable all planned functionality
- SUSE Linux Enterprise Server 10 Service Pack 3 for the Power 755 Server, with current maintenance updates available from Novell to enable all planned functionality

Users should also update their systems with the latest Linux for Power service and productivity tools available at

http://www14.software.ibm.com/webapp/set2/sas/f/lopdiags/home.html

If installing VIOS:

- VIOS 2.1.2.11 with Fix Pack 22.1 and Service Pack 1, or later

Java™ 1.4.2 on POWER7

There are unique considerations when running Java 1.4.2 on POWER7. For best exploitation of the outstanding performance capabilities and most recent improvements of POWER7 technology, IBM recommends upgrading Java-based applications to Java 6 or Java 5 whenever possible.

For more information, visit

http://www.ibm.com/developerworks/java/jdk/aix/service.html

Planned availability date

February 19, 2010, except for feature 4526, which is planned to be available on March 16, 2010.

Description

Power 755

Summary of standard features:

- Rack-mount (4U) configuration
- 32-core design with four 3.3 GHz processor cards
- 128 GB of PC3-8500 1066 MHz ECC memory (error checking and correcting) memory, maximum of 64 GB per processor card (256 GB system maximum)
- 8 x 2.5-inch DASD/SSD/Media backplane with an external SAS port
  - 2 to 8 SFF DASD or SSDs (mixing allowed)
- Choice of two integrated virtual Ethernet daughter cards:
  - Quad-port 1 Gb IVE
  - Dual-port 10 Gb IVE
- One media bay:
  - Slim bay for a DVD-RAM (required)

- A maximum of five hot-swap slots:
  - Two PCIe x8 slots, short card length (slots 1 and 2)
  - One PCIe x8 slot, full card length (slot 3)
  - Two PCIX DDR slots, full card length (slots 4 and 5)
  - One GX++ slot (shares same space as PCIe x8 slot 1)
- Integrated:
  - Service Processor
  - Quad-port 10/100/1000 Mb Ethernet
  - EnergyScale technology
  - Hot-swap and redundant cooling
  - Three USB ports; two system ports
  - Two HMC ports; two SPCN ports
- Two Power Supplies, 1725 Watt AC, Hot-swap

The minimum Power 755 configuration must include four processor cards, 32 processor activations, memory, two power supplies and power cords, two DASD, a DASD/SSD/Media backplane, an operator panel cable, an Ethernet daughter card, a DVD-RAM, an operating system indicator, and a Language Group Specify.

The minimum defined configuration, if no choice is made, is:

Feature number	Description
4 x 8332	0/8 core 3.3 GHz POWER7 Processor -- 32-core system
32 x 2325	32 Zero-priced Processor Activations
16 x 4526	8 GB (2 x 4096 MB) Memory -- Total 128 GB memory
2 x 1883	Two 73.4 GB 15k SFF DASD
1878	Operator Panel Cable, Rack-mount drawer with 2.5-inch DASD Backplane
8340	DASD/Media Backplane for 2.5-inch DASD/SATA DVD/Tape with External SAS Port
5624	Quad-port 1 Gb Integrated Ethernet Daughter Card
2 x 7740	Two Power Supplies, 1725 Watt AC, Base
5762	SATA DVD-RAM
9300/97xx)	Language Group Specify
2146 or 2147	Primary Operating System Indicator - IBM AIX (2146) or Linux (2147)
2 x 6xxx	Two Power Cords

Notes:

- The 8 GB memory feature (#4526) is planned to be available on March 16, 2010. Eight of feature 4527 can replace 16 of feature 4526.
- The GX Dual-port 12X Channel Attach Adapter Card (#5609) will be defaulted on every 8236-E8C order but may be deselected.
- No internal DASD is required if feature 0837 (Boot from SAN) is selected. In this case, a Fibre Channel or Fibre Channel over Ethernet adapter must also be ordered.

I/O drawer availability

The EXP12S disk-only I/O drawers (#5886) are supported on the Power 755, providing large storage capacity and multiple partition support.

EXP 12S SAS Drawer (#5886)

The EXP 12S SAS drawer (#5886) is a 2 EIA drawer and mounts in a 19-inch rack. The drawer can hold either SAS disk drives or SSD. The EXP 12S SAS drawer has twelve 3.5-inch SAS disk bays with redundant data paths to each bay. The drawer supports redundant hot-plug power and cooling and redundant hot-swap SAS

expanders (Enclosure Services Manager-ESM). Each ESM has an independent SCSI Enclosure Services (SES) diagnostic processor.

The SAS disk drives or SSDs contained in the EXP12S are controlled by one or two PCIe or PCI-X SAS adapters connected to the EXP12S via SAS cables. The SAS cable will vary, depending upon the adapter being used, the operating system being used, and the protection desired.

- The large cache PCI-X (#5904/#5908) uses a SAS Y cable when a single port is running the EXP12S. A SAS X cable is used when a pair of adapters are used for controller redundancy.
- The medium cache PCI-X feature 5902 and PCIe feature 5903 adapters are always paired and use a SAS X cable to attach the feature 5886 I/O drawer.
- The zero cache PCI-X feature 5912 and PCIe feature 5901 use a SAS Y cable when a single port is running the EXP12S. A SAS X cable is used for AIX/Linux environments when a pair of adapters is used for controller redundancy.

In all of the above configurations, all 12 SAS bays are controlled by a single controller or a single pair of controllers.

A second EXP12S drawer can be attached to another drawer using two SAS EE cables, providing 24 SAS bays instead of 12 bays for the same SAS controller port. This is called *cascading* . In this configuration all 24 SAS bays are controlled by a single controller or a single pair of controllers.

Feature 5886 can also be directly attached to the SAS port on the rear of the Power 755, providing a very low-cost disk storage solution. When used this way, the imbedded SAS controllers augmented by the 175 MB write cache RAID enabler (#5679) in the system unit drive the disk drives in EXP12S. A second unit cannot be cascaded to a feature 5886 attached in this way.

Reliability, availability, and serviceability (RAS) features

Reliability, fault tolerance, and data correction

The reliability of systems starts with components, devices, and subsystems that are designed to be fault-tolerant. POWER7 uses lower voltage technology, improving reliability with stacked latches to reduce soft error (SER) susceptibility. During the design and development process, subsystems go through rigorous verification and integration testing processes. During system manufacturing, systems go through a thorough testing process to help ensure the highest level of product quality.

The system cache and memory offer ECC (error checking and correcting) fault-tolerant features. ECC is designed to correct environmentally induced, single-bit, intermittent memory failures and single-bit hard failures. With ECC, the likelihood of memory failures will be substantially reduced. ECC also provides double-bit memory error detection that helps protect data in the event of a double-bit memory failure.

The AIX operating system provides disk drive mirroring and disk drive controller duplexing. The Linux operating system supports disk drive mirroring (RAID 1) through software, while other RAID protection schemes are provided via hardware RAID adapters.

The Journaled File System, also known as JFS or JFS2, helps maintain file system consistency and reduces the likelihood of data loss when the system is abnormally halted due to a power failure. JFS, the recommended file system for 32-bit kernels, now supports extents on the Linux operating system. This feature is designed to substantially reduce or eliminate fragmentation. Its successor, JFS2, is the recommended file system for 64-bit kernels.

With 64-bit addressing, a maximum file system size of 32 TB, and maximum file size of 16 TB, JFS2 is highly recommended for systems running the AIX operating system.

Memory error correction extensions

The memory has single-bit-error correction and double-bit-error detection ECC circuitry. The ECC code is also designed such that the failure of any one specific memory module within an ECC word by itself can be corrected absent any other fault.

Memory protection features include scrubbing to detect errors, a means to call for the deallocation of memory pages for a pattern of correctable errors detected, and signaling deallocation of a logical memory block when an error occurs that cannot be corrected by the ECC code.

Redundancy for array self-healing

Although the most likely failure event in a processor is a soft single-bit error in one of its caches, other events can occur, and they need to be distinguished from one another. For caches and their directories, hardware and firmware keep track of whether errors are being corrected beyond a threshold. If exceeded, a deferred repair error log is created.

Caches and directories on the POWER7 chip are manufactured with spare bits in their arrays that can be accessed via programmable steering logic to replace faulty bits in the respective arrays. This is analogous to the redundant bit steering employed in main storage as a mechanism that is designed to help avoid physical repair, and is also implemented in POWER7 systems. The steering logic is activated during processor initialization and is initiated by the built-in system-test (BIST) at power-on time.

When correctable error cache exceeds a set threshold, systems using the POWER7 processor invoke a dynamic cache line delete function, which enables them to stop using bad cache and eliminates exposure to greater problems.

Fault monitoring functions

- When a POWER7-based system is powered on, BIST and POST (power-on self-test) check processor, cache, memory, and associated hardware required for proper booting of the operating system. If a noncritical error is detected or if the errors occur in resources that can be removed from the system configuration, the restarting process is designed to proceed to completion. The errors are logged in the system nonvolatile RAM (NVRAM).
- Disk drive fault tracking is designed to alert the system administrator of an impending disk drive failure before it impacts customer operation.

Mutual surveillance

The Service Processor monitors the operation of the firmware during the boot process, and also monitors the Hypervisor™ for termination. The Hypervisor monitors the Service Processor and will perform a reset/reload if it detects the loss of the Service Processor. If the reset/reload does not correct the problem with the Service Processor, the Hypervisor will notify the operating system and the operating system can take appropriate action, including calling for service.

Environmental monitoring functions

POWER7-based servers include a range of environmental monitoring functions:

- Temperature monitoring warns the system administrator of potential environmental-related problems by monitoring the air inlet temperature. When the inlet temperature rises above a warning threshold, the system initiates an orderly shutdown. When the temperature exceeds the critical level, or if the temperature remains above the warning level for too long, the system will shut down immediately.
- Fan speed is controlled by monitoring actual temperatures on critical components and adjusting accordingly. If internal component temperatures reach critical levels, the system will shut down immediately, regardless of fan speed. When a

redundant fan fails, the system calls out the failing fan and continues running. When a nonredundant fan fails, the system shuts down immediately.

Availability enhancement functions

The POWER7 family of systems continues to offer and introduce significant enhancements designed to increase system availability.

POWER7 processor functions

As in POWER6™, the POWER7 processor has the ability to do processor instruction retry and alternate processor recovery for a number of core-related faults. This significantly reduces exposure to both hard (logic) and soft (transient) errors in the processor core. Soft failures in the processor core are transient (intermittent) errors, often due to cosmic rays or other sources of radiation, and generally are not repeatable. With this function, when an error is encountered in the core, the POWER7 processor will first automatically retry the instruction. If the source of the error was truly transient, the instruction will succeed and the system will continue as before. On IBM systems prior to POWER6, this error would have caused a checkstop.

Hard failures are more difficult, being true logical errors that will be replicated each time the instruction is repeated. Retrying the instruction will not help in this situation because the instruction will continue to fail. As in POWER6, POWER7 processors have the ability to extract the failing instruction from the faulty core and retry it elsewhere in the system for a number of faults, after which the failing core is dynamically deconfigured and called out for replacement. The entire process is transparent to the partition owning the failing instruction. These systems are designed to avoid a full system outage.

POWER7 single processor checkstopping

As in POWER6, POWER7 provides single processor checkstopping. This significantly reduces the probability of any one processor affecting total system availability.

Partition availability priority

Also available is the ability to assign availability priorities to partitions. If an alternate processor recovery event requires spare processor resources in order to protect a workload, when no other means of obtaining the spare resources is available, the system will determine which partition has the lowest priority and attempt to claim the needed resource. On a properly configured POWER7 processor-based server, this allows that capacity to be first obtained from, for example, a test partition instead of a financial accounting system.

POWER7 cache availability

The POWER® processor-based line of servers continues to be at the forefront of cache availability enhancements. The L3 cache is now integrated on the POWER7 processor. The POWER7 processor provides both L2 and L3 cache line delete functions.

Special uncorrectable error handling

Uncorrectable errors are difficult for any system to tolerate, although there are some situations where they can be shown to be irrelevant. For example, if an uncorrectable error occurs in cached data that will never again be read or where a fresh write of the data is imminent, it would be unwise to "protect" the user by forcing an immediate reboot.

Special Uncorrectable Error (SUE) handling was an IBM innovation introduced for POWER5™ processors, where an uncorrectable error in memory or cache does not immediately cause the system to terminate. Rather, the system tags the data and determines whether it will ever be used again. If the error is irrelevant, it will not force a checkstop.

PCI extended error handling

PCI extended error handling (EEH) enabled adapters respond to a special data packet generated from the affected PCI slot hardware by calling system firmware, which will examine the affected bus, allow the device driver to reset it, and continue without a system reboot. For Linux, EEH support extends to the majority of frequently used devices, although some third-party PCI devices may not provide native EEH support.

Predictive failure and dynamic component deallocation

Servers with POWER processors have long had the capability to perform predictive failure analysis on certain critical components such as processors and memory. When these components exhibit symptoms that would indicate a failure is imminent, the system can dynamically deallocate and call home about the failing part before the error is propagated system-wide. In many cases, the system will first attempt to reallocate resources in such a way that will avoid unplanned outages. In the event that insufficient resources exist to maintain full system availability, these servers will attempt to maintain partition availability by user-defined priority.

Uncorrectable error recovery

When the auto-restart option is enabled, the system can automatically restart following an unrecoverable software error, hardware failure, or environmentally induced (ac power) failure.

Serviceability

The purpose of serviceability is to repair the system while attempting to minimize or eliminate service cost (within budget objectives), while maintaining high customer satisfaction. Serviceability includes system installation, MES (system upgrades/downgrades), and system maintenance/repair. Depending upon the system and warranty contract, service may be performed by the customer, an IBM representative, or an authorized warranty service provider.

The Serviceability features delivered in this system provide a highly efficient service environment by incorporating the following attributes:

- Design for Customer Set Up (CSU), Customer Installed Features (CIF), and Customer Replaceable Units (CRU)
- Error detection and Fault Isolation (ED/FI)
- First Failure Data Capture (FFDC)
- Converged service approach across multiple IBM server platforms

Service environments

The HMC is a dedicated server that provides functions for configuring and managing servers for either partitioned or full-system partition using a GUI or command-line interface (CLI). An HMC attached to the system allows support personnel (with client authorization) to remotely log in to review error logs and perform remote maintenance if required.

The POWER7 processor-based platforms support two main service environments:

- Attachment to one or more HMCs is a supported option by the system. This is the default configuration for servers supporting logical partitions with dedicated or virtual I/O. In this case, all servers have at least one logical partition.
- No HMC.
- Full system partition: A single partition owns all the server resources and only one operating system may be installed.

Service Interface

The Service Interface allows support personnel to communicate with the service support applications in a server using a console, interface, or terminal. Delivering a clear, concise view of available service applications, the Service Interface allows the support team to manage system resources and service information in an efficient and effective way. Applications available via the Service Interface are carefully configured and placed to give service providers access to important service functions.

Different service interfaces are used depending on the state of the system and its operating environment. The primary service interfaces are:

- LEDs
- Operator Panel
- Service Processor menu
- Operating system service menu
- Service Focal Point on the HMC

In the light path LED implementation, when a fault condition is detected on the POWER7 system, an amber FRU fault LED will be illuminated, which will be rolled up to the system fault LED. The light path system pinpoints the exact part by turning on the amber FRU fault LED associated with the part to be replaced.

The system can clearly identify components for replacement by using specific component-level LEDs, and can also guide the servicer directly to the component by signaling (turning on solid) the system fault LED, enclosure fault LED, and the component FRU fault LED. The servicer can also use the identify function to blink the FRU-level LED. When this function is activated, a roll-up to the blue enclosure locate and system locate LEDs will occur. These LEDs will turn on solid and can be used to follow the light path from the system to the enclosure and down to the specific FRU.

First Failure Data Capture and Error Data Analysis

First Failure Data Capture (FFDC) is a technique that helps ensure that when a fault is detected in a system, the root cause of the fault will be captured without the need to re-create the problem or run any sort of extending tracing or diagnostics program. For the vast majority of faults, a good FFDC design means that the root cause can also be detected automatically without servicer intervention.

FFDC information, error data analysis, and fault isolation are necessary to implement the advanced serviceability techniques that enable efficient service of the systems and to help determine the failing items.

In the rare absence of FFDC and Error Data Analysis, diagnostics are required to re-create the failure and determine the failing items.

Diagnostics

General diagnostic objectives are to detect and identify problems such that they can be resolved quickly. Elements of IBM's diagnostics strategy include:

- Provide a common error code format equivalent to a system reference code, system reference number, checkpoint, or firmware error code.
- Provide fault detection and problem isolation procedures.
- Support remote connection ability to be used by the IBM Remote Support Center or IBM Designated Service.
- Provide interactive intelligence within the diagnostics with detailed online failure information while connected to IBM's back-end system.

Automatic diagnostics

Because of the FFDC technology designed into IBM Servers, it is not necessary to perform re-create diagnostics for failures or require user intervention. Solid and

intermittent errors are designed to be correctly detected and isolated at the time the failure occurs. Runtime and boot-time diagnostics fall into this category.

Stand-alone diagnostics

As the name implies, stand-alone or user-initiated diagnostics require user intervention. The user must perform manual steps, including:

- Compact disk-based diagnostics
- Keying in commands
- Interactively selecting steps from a list of choices

Concurrent maintenance

The system will continue to support concurrent maintenance of power, cooling, PCI adapters, DASD, DVD, and firmware updates (when possible). The determination of whether a firmware release can be updated concurrently is identified in the readme information file released with the firmware.

Service labels

Service providers use these labels to assist them in performing maintenance actions. Service labels are found in various formats and positions, and are intended to transmit readily available information to the servicer during the repair process. Following are some of these service labels and their purpose:

Location diagrams

Location diagrams are strategically located on the system hardware, relating information regarding the placement of hardware components. Location diagrams may include location codes, drawings of physical locations, concurrent maintenance status, or other data pertinent to a repair. Location diagrams are especially useful when multiple components are installed such as DIMMs, CPUs, processor books, fans, adapter cards, LEDs, and power supplies.

Remove/replace procedures

Service labels that contain remove/replace procedures are often found on a cover of the system or in other spots accessible to the servicer. These labels provide systematic procedures, including diagrams, detailing how to remove/replace certain serviceable hardware components.

Arrows

Numbered arrows are used to indicate the order of operation and serviceability direction of components. Some serviceable parts such as latches, levers, and touch points need to be pulled or pushed in a certain direction and certain order for the mechanical mechanisms to engage or disengage. Arrows generally improve the ease of serviceability.

Packaging for service

The following service enhancements are included in the physical packaging of the systems to facilitate service:

- Color coding (touch points): Terracotta colored touch points indicate that a component (FRU/CRU) can be concurrently maintained. Blue colored touch points delineate components that are not concurrently maintained -- those that require the system to be turned off for removal or repair.
- Tool-less design: Selected IBM systems support tool-less or simple tool designs. These designs require no tools or simple tools such as flat head screwdrivers to service the hardware components.
- Positive retention: Positive retention mechanisms help to assure proper connections between hardware components such as cables to connectors, and between two cards that attach to each other. Without positive retention, hardware

components run the risk of becoming loose during shipping or installation, preventing a good electrical connection. Positive retention mechanisms like latches, levers, thumb-screws, pop Nylatches (U-clips), and cables are included to help prevent loose connections and aid in installing (seating) parts correctly. These positive retention items do not require tools.

Error Handling and Reporting

In the unlikely event of system hardware or environmentally induced failure, the system runtime error capture capability systematically analyzes the hardware error signature to determine the cause of failure. The analysis result will be stored in system NVRAM. When the system can be successfully restarted either manually or automatically, the error will be reported to the operating system. Error Log Analysis (ELA) can be used to display the failure cause and the physical location of the failing hardware.

With the integrated Service Processor, the system has the ability to automatically send out an alert via phone line to a pager or call for service in the event of a critical system failure. A hardware fault will also turn on the amber system fault LED located on the system unit to alert the user of an internal hardware problem. The indicator may also be set to blink by the operator as a tool to allow system identification. For identification, the blue locate LED on the enclosure and at the system level will turn on solid. The amber system fault LED will be on solid when an error condition occurs.

On POWER7 processor-based servers, hardware and software failures are recorded in the system log. When an HMC is attached, an ELA routine analyzes the error, forwards the event to the Service Focal Point (SFP) application running on the HMC, and notifies the system administrator that it has isolated a likely cause of the system problem. The Service Processor event log also records unrecoverable checkstop conditions, forwards them to the SFP application, and notifies the system administrator. Once the information is logged in the SFP application, if the system is properly configured, a call home service request will be initiated and the pertinent failure data with service parts information and part locations will be sent to an IBM Service organization. Customer contact information and specific system-related data such as the machine type, model, and serial number, along with error log data related to the failure are sent to IBM Service.

Service Processor

The Service Processor provides the capability to diagnose, check the status of, and sense the operational conditions of a system. It runs on its own power boundary and does not require resources from a system processor to be operational to perform its tasks.

The Service Processor supports surveillance of the connection to the HMC and to the system firmware (Hypervisor). It also provides several remote power control options, environmental monitoring, reset, restart, remote maintenance, and diagnostic functions, including console mirroring. The Service Processors menus (ASMI) can be accessed concurrently with system operation allowing nondisruptive abilities to change system default parameters.

Call Home

Call Home refers to an automatic or manual call from a customer location to IBM support structure with error log data, server status, or other service-related information. Call Home invokes the service organization in order for the appropriate service action to begin. Call Home can be done through HMC or non-HMC managed systems. While configuring Call Home is optional, clients are encouraged to implement this feature in order to obtain service enhancements such as reduced problem determination and faster and potentially more accurate transmittal of error information. In general, using the Call Home feature can result in increased system availability. The Electronic Service Agent™ application can be configured for automated call home. Refer to the next section for specific details on this application.

IBM Electronic Services

Electronic Service Agent and the IBM Electronic Services Web portal comprise the IBM Electronic Services solution -- dedicated to providing fast, exceptional support to IBM customers. IBM Electronic Service Agent is a no-charge tool that proactively monitors and reports hardware events such as system errors, performance issues, and inventory. Electronic Service Agent can help focus on the customer's company strategic business initiatives, save time, and spend less effort managing day-to-day IT maintenance issues.

Integrated in the operating system in addition to the HMC, Electronic Service Agent is designed to automatically and electronically report system failures and customer-perceived issues to IBM, which can result in faster problem resolution and increased availability. System configuration and inventory information collected by Electronic Service Agent also can be viewed on the secure Electronic Services Web portal and used to improve problem determination and resolution between the customer and the IBM support team. As part of an increased focus to provide even better service to IBM customers, Electronic Service Agent tool configuration and activation comes standard with the system. In support of this effort, a new HMC External Connectivity security whitepaper has been published, which describes data exchanges between the HMC and the IBM Service Delivery Center (SDC) and the methods and protocols for this exchange. To read the whitepaper and prepare for Electronic Service Agent installation, go to the "Reference Guide" section of

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

Select your country.

Click on "IBM Electronic Service Agent Connectivity Guide."

Benefits

Increased uptime: Electronic Service Agent is designed to enhance the warranty and maintenance service by providing faster hardware error reporting and uploading system information to IBM Support. This can optimize the time monitoring the symptoms, diagnosing the error, and manually calling IBM Support to open a problem record. And 24 x 7 monitoring and reporting means no more dependency on human intervention or off-hours customer personnel when errors are encountered in the middle of the night.

Security: Electronic Service Agent is secure in monitoring, reporting, and storing the data at IBM. Electronic Service Agent securely transmits via the Internet (HTTPS or VPN) and can be configured to communicate securely through gateways to provide customers a single point of exit from their site. Communication between the customer and IBM only flows one way; activating Service Agent does not enable IBM to call into a customer's system. System inventory information is stored in a secure database, which is protected behind IBM firewalls. The customer's business applications or business data is never transmitted to IBM.

More accurate reporting: Because system information and error logs are automatically uploaded to the IBM Support Center in conjunction with the service request, customers are not required to find and send system information, decreasing the risk of misreported or misdiagnosed errors. Once inside IBM, problem error data is run through a data knowledge management system and knowledge articles are appended to the problem record.

Customized support: Using the IBM ID entered during activation, customers can view system and support information in the "My Systems" and "Premium Search" sections of the Electronic Services Web site.

The Electronic Services Web portal is a single Internet entry point that replaces the multiple entry points traditionally used to access IBM Internet services and support. This Web portal enables you to gain easier access to IBM resources for assistance in resolving technical problems. The newly improved My Systems and Premium Search

functions make it even easier for Electronic Service Agent-enabled customers to track system inventory and find pertinent fixes.

My Systems provides valuable reports of installed hardware and software using information collected from the systems by IBM Electronic Service Agent. Reports are available for any system associated with the customer's IBM ID. Premium Search combines the function of search and the value of Electronic Service Agent information, providing advanced search of the technical support knowledgebase. Using Premium Search and the Service Agent information that has been collected from the system, customers are able to see search results that apply specifically to their systems.

For more information on how to utilize the power of IBM Electronic Services, visit the following Web site or contact an IBM Systems Services Representative

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Accessibility by people with disabilities

A U.S. Section 508 Voluntary Product Accessibility Template (VPAT) containing details on accessibility compliance can be requested at

http://www.ibm.com/able/product_accessibility/index.html

Section 508 of the U.S. Rehabilitation Act

IBM Power 755 server is capable as of February 19, 2010, when used in accordance with associated IBM documentation, of satisfying the applicable requirements of Section 508 of the Rehabilitation Act, provided that any assistive technology used with the product properly interoperates with it. A U.S. Section 508 Voluntary Product Accessibility Template (VPAT) can be requested at

http://www-03.ibm.com/able/product_accessibility/index.html

Statement of general direction

IBM is working with Red Hat on POWER7 support. Red Hat plans to support the Power 750, 755, 770, and 780 models in an upcoming release targeted for availability in first half 2010. For additional questions on the availability of this release, contact Red Hat.

All statements regarding IBM's future direction and intent are subject to change or withdrawal without notice, and represent goals and objectives only. Any reliance on these Statements of Direction is at the relying party's sole risk and will not create liability or obligation for IBM.

The information on the new product is intended to outline our general product direction and it should not be relied on in making a purchasing decision. The information on the new product is for informational purposes only and may not be incorporated into any contract. The information on the new product is not a commitment, promise, or legal obligation to deliver any material, code, or functionality. The development, release, and timing of any features or functionality described for our products remains at our sole discretion.

Product number

The following are newly announced features on the specific models of the IBM Power Systems 8236 machine type:

Description	MT	Model	Feature number
IBM Power 755	8236	E8C	
AIX Partition Specify	8236	E8C	0265
Linux Partition Specify	8236	E8C	0266
CSC Specify	8236	E8C	0275
V.24/EIA232 6.1m (20-Ft) PCI Cable	8236	E8C	0348
V.35 6.1m (20-Ft) PCI Cable	8236	E8C	0353
X.21 6.1m (20-Ft) PCI Cable	8236	E8C	0359
Customer Specified Placement	8236	E8C	0456
SSD Placement Indicator - CEC	8236	E8C	0462
SSD Placement Indicator - 5886	8236	E8C	0464
19 inch, 1.8 meter high rack	8236	E8C	0551
19 inch, 2.0 meter high rack	8236	E8C	0553
Rack Filler Panel Kit	8236	E8C	0599
SAN Load Source Specify	8236	E8C	0837
US TAA Compliance Indicator	8236	E8C	0983
1.5 Meter 12X to 4X Channel Conversion Cable	8236	E8C	1828
3 Meter 12X to 4X Channel Conversion Cable	8236	E8C	1841
10 Meter 12X to 4X Enhanced Channel Conversion Cable	8236	E8C	1854
0.6 Meter 12X DDR Cable	8236	E8C	1861
Op Panel Cable for Rack-mount Drawer w/2.5" DASD	8236	E8C	1878
146.8GB 10K RPM SAS SFF Disk Drive	8236	E8C	1882
73.4 GB 15K RPM SAS SFF Disk Drive	8236	E8C	1883
300GB 10K RPM SFF SAS Disk Drive	8236	E8C	1885
146GB 15K RPM SFF SAS Disk Drive	8236	E8C	1886
69GB SFF SAS Solid State Drive	8236	E8C	1890
Primary OS - AIX	8236	E8C	2146
Primary OS - Linux	8236	E8C	2147
Zero-priced Processor Activation for #8332	8236	E8C	2325
2M LC-SC 50 Micron Fiber Converter Cable	8236	E8C	2456
2M LC-SC 62.5 Micron Fiber Converter Cable	8236	E8C	2459
4 port USB PCIe Adapter	8236	E8C	2728
PCIe 2-Line WAN w/Modem	8236	E8C	2893
3M Asynchronous Terminal/Printer Cable EIA-232	8236	E8C	2934
Asynchronous Cable EIA-232/V.24 3M	8236	E8C	2936
Serial-to-Serial Port Cable for Drawer/Drawer-3.7M	8236	E8C	3124
Serial-to-Serial Port Cable for Rack/Rack- 8M	8236	E8C	3125
69GB 3.5" SAS Solid State Drive	8236	E8C	3586
Widescreen LCD Monitor	8236	E8C	3632
146GB 15K RPM SAS Disk Drive	8236	E8C	3647
300GB 15K RPM SAS Disk Drive	8236	E8C	3648
450GB 15K RPM SAS Disk Drive	8236	E8C	3649
SAS Cable (EE) Drawer to Drawer 1M	8236	E8C	3652
SAS Cable (EE) Drawer to Drawer 3M	8236	E8C	3653
SAS Cable (EE) Drawer to Drawer 6M	8236	E8C	3654
SAS Cable (X) Adapter to SAS Enclosure, Dual Controller/Dual Path 3M:	8236	E8C	3661
SAS Cable (X) Adapter to SAS Enclosure, Dual Controller/Dual Path 6M:	8236	E8C	3662
SAS Cable (X) Adapter to SAS Enclosure, Dual Controller/Dual Path 15M:	8236	E8C	3663
SAS Cable, DASD Backplane to Rear Bulkhead	8236	E8C	3668
SAS Cable (AI)- Adapter to Internal drive 1M	8236	E8C	3679
3M SAS CABLE, ADPTR TO ADPTR (AA)	8236	E8C	3681
6M SAS CABLE, ADPTR TO ADPTR (AA)	8236	E8C	3682
SAS Cable (AE) Adapter to Enclosure, single			

controller/single path 3M	8236	E8C	3684
SAS Cable (AE) Adapter to Enclosure, single controller/single path 6M	8236	E8C	3685
SAS Cable (YI) System to SAS Enclosure, Single Controller/Dual Path 1.5M	8236	E8C	3686
SAS Cable (YI) System to SAS Enclosure, Single Controller/Dual Path 3M	8236	E8C	3687
SAS Cable (YO) Adapter to SAS Enclosure, Single Controller/Dual Path 1.5 M	8236	E8C	3691
SAS Cable (YO) Adapter to SAS Enclosure, Single Controller/Dual Path 3 M	8236	E8C	3692
SAS Cable (YO) Adapter to SAS Enclosure, Single Controller/Dual Path 6 M	8236	E8C	3693
SAS Cable (YO) Adapter to SAS Enclosure, Single Controller/Dual Path 15 M	8236	E8C	3694
0.3M Serial Port Converter Cable, 9-Pin to 25-Pin	8236	E8C	3925
Asynch Printer/Terminal Cable, 9-pin to 25-pin, 4M	8236	E8C	3926
Serial Port Null Modem Cable, 9-pin to 9-pin, 3.7M	8236	E8C	3927
Serial Port Null Modem Cable, 9-pin to 9-pin, 10M	8236	E8C	3928
1.8 M (6-ft) Extender Cable for Displays (15-pin D-shell to 15-pin D-shell)	8236	E8C	4242
Extender Cable - USB Keyboards, 2M	8236	E8C	4256
VGA to DVI Connection Converter	8236	E8C	4276
8GB (2x4GB) Memory DIMMs, 1066 MHz, 2Gb DDR3 DRAM	8236	E8C	4526
16GB (2x8GB) Memory DIMMs, 1066 MHz, 2Gb DDR3 DRAM	8236	E8C	4527
Rack Indicator- Not Factory Integrated	8236	E8C	4650
Rack Indicator, Rack #1	8236	E8C	4651
Rack Indicator, Rack #2	8236	E8C	4652
Rack Indicator, Rack #3	8236	E8C	4653
Rack Indicator, Rack #4	8236	E8C	4654
Rack Indicator, Rack #5	8236	E8C	4655
Rack Indicator, Rack #6	8236	E8C	4656
Rack Indicator, Rack #7	8236	E8C	4657
Rack Indicator, Rack #8	8236	E8C	4658
Rack Indicator, Rack #9	8236	E8C	4659
Rack Indicator, Rack #10	8236	E8C	4660
Rack Indicator, Rack #11	8236	E8C	4661
Rack Indicator, Rack #12	8236	E8C	4662
Rack Indicator, Rack #13	8236	E8C	4663
Rack Indicator, Rack #14	8236	E8C	4664
Rack Indicator, Rack #15	8236	E8C	4665
Rack Indicator, Rack #16	8236	E8C	4666
PCI-X Cryptographic Coprocessor (FIPS 4)	8236	E8C	4764
RFID TAGS FOR SERVERS, BLADES, BLADECENTERS, RACKS, AND HMCS	8236	E8C	5524
GX Dual-port 12X Channel Attach	8236	E8C	5609
Dual Port (SR) Integrated Virtual Ethernet 10Gb Daughter Card	8236	E8C	5613
4-Port 1Gb Integrated Virtual Ethernet Daughter Card	8236	E8C	5624
Blind Swap Type III Cassette- PCIe, Short Slot	8236	E8C	5646
Blind Swap Type III Cassette- PCI-X or PCIe, Standard Slot	8236	E8C	5647
IBM 2-Port 10/100/1000 Base-TX Ethernet PCI-X Adapter	8236	E8C	5706
10Gb FCoE PCIe Dual Port Adapter	8236	E8C	5708
1 Gigabit iSCSI TOE PCI-X on Copper Media Adapter	8236	E8C	5713
4-Port 10/100/1000 Base-TX PCI Express Adapter	8236	E8C	5717
10 Gigabit Ethernet-CX4 PCI Express Adapter	8236	E8C	5732
8 Gigabit PCI Express Dual Port Fibre Channel Adapter	8236	E8C	5735
POWER GXT145 PCI Express Graphics Accelerator	8236	E8C	5748
4 Gb Dual-Port Fibre Channel PCI-X 2.0 DDR Adapter	8236	E8C	5759
SATA Slimline DVD-RAM Drive	8236	E8C	5762
2-Port 10/100/1000 Base-TX Ethernet PCI Express Adapter	8236	E8C	5767
2-Port Gigabit Ethernet-SX PCI Express Adapter	8236	E8C	5768
10 Gigabit Ethernet-SR PCI Express Adapter	8236	E8C	5769
10 Gigabit Ethernet-LR PCI Express Adapter	8236	E8C	5772
4 Gigabit PCI Express Dual Port Fibre Channel			

Adapter	8236	E8C	5774
4 Port Async EIA-232 PCIe Adapter	8236	E8C	5785
EXP 12S Expansion Drawer	8236	E8C	5886
PCIe Dual-x4 SAS Adapter	8236	E8C	5901
PCIe 380MB Cache Dual - x4 3Gb SAS RAID Adapter	8236	E8C	5903
Non-paired PCIe SAS RAID Indicator	8236	E8C	5923
Full Width Keyboard -- USB, US English, #103P	8236	E8C	5951
Full Width Keyboard -- USB, French, #189	8236	E8C	5952
Full Width Keyboard -- USB, Italian, #142	8236	E8C	5953
Full Width Keyboard -- USB, German/Austrian, #129	8236	E8C	5954
Full Width Keyboard -- USB, UK English, #166P	8236	E8C	5955
Full Width Keyboard -- USB, Spanish, #172	8236	E8C	5956
Full Width Keyboard -- USB, Japanese, #194	8236	E8C	5957
Full Width Keyboard -- USB, Brazilian Portuguese, #275	8236	E8C	5958
Full Width Keyboard -- USB, Hungarian, #208	8236	E8C	5959
Full Width Keyboard -- USB, Korean, #413	8236	E8C	5960
Full Width Keyboard -- USB, Chinese, #467	8236	E8C	5961
Full Width Keyboard -- USB, French Canadian, #445	8236	E8C	5962
Full Width Keyboard -- USB, Belgian/UK, #120	8236	E8C	5964
Full Width Keyboard -- USB, Swedish/Finnish, #153	8236	E8C	5965
Full Width Keyboard -- USB, Danish, #159	8236	E8C	5966
Full Width Keyboard -- USB, Bulgarian, #442	8236	E8C	5967
Full Width Keyboard -- USB, Swiss/French/German, #150	8236	E8C	5968
Full Width Keyboard -- USB, Norwegian,#155	8236	E8C	5969
Full Width Keyboard -- USB, Dutch, #143	8236	E8C	5970
Full Width Keyboard -- USB, Portuguese, #163	8236	E8C	5971
Full Width Keyboard -- USB, Greek, #319	8236	E8C	5972
Full Width Keyboard -- USB, Hebrew, #212	8236	E8C	5973
Full Width Keyboard -- USB, Polish, #214	8236	E8C	5974
Full Width Keyboard -- USB, Slovakian, #245	8236	E8C	5975
Full Width Keyboard -- USB, Czech, #243	8236	E8C	5976
Full Width Keyboard -- USB, Turkish, #179	8236	E8C	5977
Full Width Keyboard -- USB, LA Spanish, #171	8236	E8C	5978
Full Width Keyboard -- USB, Arabic, #253	8236	E8C	5979
Full Width Keyboard -- USB, Thai, #191	8236	E8C	5980
Full Width Keyboard -- USB, Russian, #443	8236	E8C	5981
Full Width Keyboard -- USB, Slovenian, #234	8236	E8C	5982
Full Width Keyboard -- USB, US English Euro, #103P	8236	E8C	5983
Opt Front Door for 1.8m Rack	8236	E8C	6068
Opt Front Door for 2.0m Rack	8236	E8C	6069
1.8m Rack Acoustic Doors	8236	E8C	6248
2.0m Rack Acoustic Doors	8236	E8C	6249
1.8m Rack Trim Kit	8236	E8C	6263
2.0m Rack Trim Kit	8236	E8C	6272
Power Cable -- Drawer to IBM PDU, 14-foot, 250V/ 10A	8236	E8C	6458
Power Cord 4.3m (14-ft), Drawer To OEM PDU (125V, 15A)	8236	E8C	6460
Power Cord 4.3m (14-foot), Drawer to OEM PDU, (250V, 15A), U. S.	8236	E8C	6469
Power Cord 1.8m(6-foot), To Wall (125V, 15A)	8236	E8C	6470
Power Cord 2.7m (9-foot), To Wall/OEM PDU, (125V, 15A)	8236	E8C	6471
Power Cord 2.7m (9-foot), To Wall/OEM PDU, (250V, 16A)	8236	E8C	6472
Power Cord 2.7m (9-foot), To Wall/OEM PDU, (250V, 10A)	8236	E8C	6473
Power Cord 2.7M (9-foot), To Wall/OEM PDU, (250V, 13A)	8236	E8C	6474
Power Cord 2.7M (9-foot), To Wall/OEM PDU, (250V, 16A)	8236	E8C	6475
Power Cord 2.7M (9-foot), To Wall/OEM PDU, (250V, 10A)	8236	E8C	6476
Power Cord 2.7M (9-foot), To Wall/OEM PDU, (250V, 16A)	8236	E8C	6477
Power Cord 2.7 M(9-foot), To Wall/OEM PDU, (250V, 16A)	8236	E8C	6478
Power Cord 1.8M (6-foot),To Wall, (250V, 15A), United States	8236	E8C	6487
Power Cord 2.7M (9-foot), To Wall/OEM PDU, (125V, 15A or 250V, 10A)	8236	E8C	6488

4.3m (14-Ft) 3PH/24A Power Cord	8236	E8C	6489
4.3m (14-Ft) 1PH/48A Pwr Cord	8236	E8C	6491
4.3m (14-Ft) 1PH/48-60A Pwr Cord	8236	E8C	6492
Power Cord 2.7M (9-foot), To Wall/OEM PDU, (250V, 10A)	8236	E8C	6493
Power Cord 2.7M (9-foot), To Wall/OEM PDU, (250V, 10A)	8236	E8C	6494
Power Cord 2.7M (9-foot), To Wall/OEM PDU, (250V, 10A)	8236	E8C	6496
Power Cable - Drawer to IBM PDU, 200-240V/10A	8236	E8C	6577
Optional Rack Security Kit	8236	E8C	6580
Modem Tray for 19-Inch Rack	8236	E8C	6586
Power Cord 2.7M (9-foot), To Wall/OEM PDU, (125V, 15A)	8236	E8C	6651
4.3m (14-Ft) 1PH/24-30A Pwr Cord	8236	E8C	6654
4.3m (14-Ft) 1PH/24-30A WR Pwr Cord	8236	E8C	6655
4.3m (14-Ft)1PH/24A Power Cord	8236	E8C	6656
Power Cord 2.7M (9-foot), To Wall/OEM PDU, (250V, 15A)	8236	E8C	6659
Power Cord (14-foot), Drawer To OEM PDU (125V, 15A)	8236	E8C	6660
Power Cord 3 M (10 ft), Drawer to IBM PDU, 250V/ 10A	8236	E8C	6665
Power Cord 4.3M (14-foot), Drawer to OEM PDU, (250V, 15A)	8236	E8C	6669
Power Cord 2.7M (9-foot), Drawer to IBM PDU, 250V/10A	8236	E8C	6671
Power Cord 1.5M (5-foot), Drawer to IBM PDU, 250V/10A	8236	E8C	6672
Power Cord 2.7M (9-foot), To Wall/OEM PDU, (250V, 10A)	8236	E8C	6680
PCI 4-Modem WAN IOA No IOP	8236	E8C	6808
Intelligent PDU+, 1 EIA Unit, Universal UTG0247 Connector	8236	E8C	7109
Environmental Monitoring Probe	8236	E8C	7118
Power Distribution Unit	8236	E8C	7188
Quantity 150 of #3586	8236	E8C	7535
Quantity 150 of #3647	8236	E8C	7549
Quantity 150 of #3648	8236	E8C	7564
Quantity 150 of #3649	8236	E8C	7565
Power Supply, 1725 Watt AC, Hot-swap, Base or Redundant	8236	E8C	7740
Ethernet Cable, 15m, Hardware Management Console to System Unit	8236	E8C	7802
PCI Blind Swap Cassette Kit, Double Wide Adapters, Type II	8236	E8C	7863
Linux Software Preinstall	8236	E8C	8143
Linux Software Preinstall (Business Partners)	8236	E8C	8144
8-core 3.3 GHz POWER7 Processor Card	8236	E8C	8332
Enhanced DASD/Media Backplane for 2.5" DASD/SATA DVD/Tape with External SAS Port	8236	E8C	8340
USB Mouse	8236	E8C	8845
Order Routing Indicator- System Plant	8236	E8C	9169
Language Group Specify - US English	8236	E8C	9300
New AIX License Core Counter	8236	E8C	9440
New Red Hat License Core Counter	8236	E8C	9442
New SUSE License Core Counter	8236	E8C	9443
Other AIX License Core Counter	8236	E8C	9444
Other Linux License Core Counter	8236	E8C	9445
3rd Party Linux License Core Counter	8236	E8C	9446
VIOS Core Counter	8236	E8C	9447
Month Indicator	8236	E8C	9461
Day Indicator	8236	E8C	9462
Hour Indicator	8236	E8C	9463
Minute Indicator	8236	E8C	9464
Qty Indicator	8236	E8C	9465
Countable Member Indicator	8236	E8C	9466
Language Group Specify - Dutch	8236	E8C	9700
Language Group Specify - French	8236	E8C	9703
Language Group Specify - German	8236	E8C	9704
Language Group Specify - Polish	8236	E8C	9705
Language Group Specify - Norwegian	8236	E8C	9706

Language Group Specify - Portuguese	8236	E8C	9707
Language Group Specify - Spanish	8236	E8C	9708
Language Group Specify - Italian	8236	E8C	9711
Language Group Specify - Canadian French	8236	E8C	9712
Language Group Specify - Japanese	8236	E8C	9714
Language Group Specify - Traditional Chinese (Taiwan)	8236	E8C	9715
Language Group Specify - Korean	8236	E8C	9716
Language Group Specify - Turkish	8236	E8C	9718
Language Group Specify - Hungarian	8236	E8C	9719
Language Group Specify - Slovakian	8236	E8C	9720
Language Group Specify - Russian	8236	E8C	9721
Language Group Specify - Simplified Chinese (PRC)	8236	E8C	9722
Language Group Specify - Czech	8236	E8C	9724
Language Group Specify -- Romanian	8236	E8C	9725
Language Group Specify - Croatian	8236	E8C	9726
Language Group Specify -- Slovenian	8236	E8C	9727
Language Group Specify - Brazilian Portuguese	8236	E8C	9728
Language Group Specify - Thai	8236	E8C	9729

Model conversions

Not applicable

Feature conversions

Not applicable

Business Partner information

If you are a Direct Reseller - System Reseller acquiring products from IBM, you may link directly to Business Partner information for this announcement. A PartnerWorld® ID and password are required (use IBM ID).

https://www.ibm.com/partnerworld/mem/sla.jsp?num=110-008

19-inch racks

The Model 8236-E8C and its I/O drawers are designed to mount in the 25U 7014-S25 (#0555), 36U 7014-T00 (#0551), or the 42U 7014-T42 (#0553) rack. These racks are built to the 19-inch EIA standard. When you order a new 8233 system, you can also order the appropriate 7014 rack model with the system hardware on the same initial order. IBM is making the racks available as features of the 8233-E8B when you order additional I/O drawer hardware for an existing system (MES order). The rack feature number should be used if you want IBM to integrate the newly ordered I/O drawer in a 19-inch rack before shipping the MES order.

1.8-Meter Rack (#0551)

The 1.8-Meter Rack (#0551) is a 36 EIA unit rack. The rack that is delivered as feature 0551 is the same rack delivered when you order the 7014-T00 rack; the included features may be different. Some features that are delivered as part of the 7014-T00 must be ordered separately with the feature 0551. Order the feature 0551 only when required to support rack integration of MES orders prior to shipment from IBM.

2.0-Meter Rack (#0553)

The 2.0-Meter Rack (#0553) is a 42 EIA unit tall rack. The rack that is delivered as feature 0553 is the same rack delivered when you order the 7014-T42 rack; the included features may be different. Some features that are delivered as part of the 7014-T42 must be ordered separately with the feature 0553. Order the feature 0553 only when required to support rack integration of MES orders prior to shipment from IBM.

Publications

IBM Power Systems hardware documentation provides you with the following topical information:

System overview
Planning for the system
Installing and configuring the system
Working with consoles, terminals, and interfaces
Managing system resources
Working with operating systems and software applications
Troubleshooting, service, and support

You can access the product documentation at

http://publib.boulder.ibm.com/infocenter/systems/scope/hw/index.jsp

Product documentation is also available on DVD, SK5T-7087.

The following information is shipped with the 8236-E8C:

```
8236-E8C  Service DVD          SK5T-7087-04
Installation Road Map
Safety Information
Statement of Warranty
```

Hardware documentation such as installation instructions, user's information, and service information is available to download or view at

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

AIX documentation can be found at the IBM AIX Information Center

http://publib.boulder.ibm.com/infocenter/pseries/index.jsp

Visit the IBM System Support Site, which contains the documentation for the hardware

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

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Services

Global Technology Services

IBM services include business consulting, outsourcing, hosting services, applications, and other technology management.

These services help you learn about, plan, install, manage, or optimize your IT infrastructure to be an On Demand Business. They can help you integrate your high-speed networks, storage systems, application servers, wireless protocols, and an array of platforms, middleware, and communications software for IBM and many non-IBM offerings. IBM is your one-stop shop for IT support needs.

For details on available services, contact your IBM representative or visit

http://www.ibm.com/services/

For details on available IBM Business Continuity and Recovery Services, contact your IBM representative or visit

http://www.ibm.com/services/continuity

For details on education offerings related to specific products, visit

http://www.ibm.com/services/learning/index.html

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

Technical information

Specified operating environment

Physical specifications

```
Rack-Mount:
  Width: 440 mm (17.3 in)
  Depth: 730 mm (28.7 in)
  Height: 173 mm (6.81 in)
  Weight: 48.7 kg (107.4 lb)
```

Operating environment

- Temperature: (nonoperating) 5°C to 45° C (41°F to 113°F); recommended temperature (operating) 18°C to 27°C (64°F to 80°F); allowable operating temperature 5°C to 35°C (41°F to 95°F)
- Relative humidity: Nonoperating 8% to 80%; recommended 5.5°C (42° F) dew point to 60% RH and 15°C (59°F) dew point
- Maximum dew point: 28°C (84°F)(operating)
- Operating voltage: 200 to 240 V ac
- Operating frequency: 47/63 Hz
- Maximum measured power consumption: 1950 watts (maximum)
- Power factor: 0.98
- Thermal output: 6,655 Btu/hour (maximum)
- Power-source loading
  - 2.0 kVa (maximum configuration)
  - Maximum altitude: 3,050 m (10,000 ft)

Noise level and sound power

- Two 3.3 GHz 6-core processors, sixteen 8 GB DIMMs, two power supplies, eight SFF disks, one DVD, three PCI adapters: 6.4 bels idle/6.2 bels operating
- Two 3.3 GHz 6-core processors, sixteen 8 GB DIMMs, two power supplies, eight SFF disks, one DVD, three PCI adapters with acoustical doors: 5.8 bels idle/5.6 bels operating
- Four 3.3 GHz 6-core processors, thirty-two 8 GB DIMMs, two power supplies, eight SFF disks, one DVD, three PCI adapters: 7.1 bels idle/7.1 bels operating
- Four 3.3 GHz 6-core processors, thirty-two 8 GB DIMMs, two power supplies, eight SFF disks, one DVD, three PCI adapters with acoustical doors: 6.5 bels idle/6.5 bels operating

EMC conformance classification: This equipment is subject to FCC rules and shall comply with the appropriate FCC rules before final delivery to the buyer or centers of distribution.

- U.S.: FCC Class A
- Europe: CISPR 22 Class A
- Japan: VCCI-A
- Korea: Korean Requirement Class A
- China: People's Republic of China commodity inspection law Class A

Homologation -- Telecom environmental testing (Safety and EMC): Homologation approval for specific countries has been initiated with the IBM Homologation and Type Approval (HT&A) organization in LaGaude, France. This Power Systems model and applicable features meet the environmental testing requirements of the country telecom and have been designed and tested in compliance with the Full Quality Assurance Approval (FQAA) process as delivered by the British Approval Board for Telecom (BABT), the U.K. Telecom regulatory authority.

Product safety/Country testing/Certification

- UL 60950 Underwriters Laboratory, Safety Information
- CSA C22.2 No. 60950-00, Canadian Standards Association
- EN60950 European Norm
- IEC 60950, Edition 1, International Electrotechnical Commission, Safety Information
- GS Mark (Safety, TUV, EN60950)- Germany, Europe
- Nordic deviations to IEC 60950-1 1st Edition

General requirements: The product is in compliance with IBM Corporate Bulletin C-B 0-2594-000 Statement of Conformity of IBM Product to External Standard (Suppliers Declaration).

Hardware requirements

Power 755 minimum system configuration: The Power 755 has four processor slots, each of which must contain an 8-core 3.3 GHz POWER7 processor card. The system can contain up to 256 GB of system memory (64 GB maximum per processor card), eight HDD or SDD DASD, five PCI adapters, and a mandatory DVD-RAM, as desired. This flexibility is made available through the many optional features for the Power 755.

Each Power 755 order must include a minimum of the following items:

- One system Central Electronics Complex (CEC) enclosure with the following items:
  - Two power cords (#6470-#6478, #6487-#6494, #6496, #6497, #6577, #6580, #6586, #6651, #6653-#6660, #6662, #6665, #6669, #6671, #6672, #6680)

  - One Language Group, Specify (#9300 or #97xx)
- Four 8-core 3.3 GHz POWER7 processor cards (#8332)
- Thirty-two zero-priced processor activations (#2325)
- Choose 128 GB minimum memory from:
  - 8 GB (2 x 4 GB) Memory DIMMs, 1066 MHz, 2 Gb (#4526)
  - 16 GB (2 x 8 GB) Memory DIMMs, 1066 MHz, 2 Gb (#4527)

  Note: The 8 GB memory feature (#4526) is planned to be available on March 16, 2010.
- DASD/Media Backplane with external SAS port, 8 x 2.5-inch DASD (#8340)
- Choose Ethernet daughter card from:
  - 4-port 1 Gb Integrated Virtual Ethernet Daughter Card (#5624)
  - Dual-port 10 Gb Integrated Virtual Ethernet Daughter Card (#5613)
- Choose two DASD from:
  - 73.4 GB SAS 2.5-inch 15,000 RPM (#1883) (AIX/Linux/VIOS)
  - 146.8 GB SAS 2.5-inch 10,000 RPM (#1882) (AIX/Linux/VIOS)
  - 146.8 GB SAS 2.5-inch 15,000 RPM (#1886) (AIX/Linux/VIOS)
  - 300 GB SAS 2.5-inch 15,000 RPM (#1885) (AIX/Linux/VIOS)
  - 69 GB SAS 2.5-inch Solid State Drive (#1890) (AIX/Linux/VIOS)

  Note: No internal DASD is required if feature 0837 (Boot from SAN) is selected. In this case, a Fibre Channel or Fibre Channel over Ethernet adapter must also be ordered.
- Cable for rack-mount drawer with 2.5-inch DASD Backplane (#1878)
- SATA DVD-RAM (#5762)
- 2 x 1725 Watt AC, Hot-swap Power Supply (2 x #7740)
- Choose Primary Operating System Indicator from:
  - AIX (#2146)
  - Linux (#2147)

  Note: The GX Dual-port 12X Channel Attach Adapter Card (#5609) will be defaulted on every 8236-E8C order but may be deselected.

RAID: Internal RAID is not available on the Power 755.

Software requirements

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

- AIX Version 6.1 with the 6100-04 Technology Level and Service Pack 2, or later
- AIX Version 6.1 with the 6100-03 Technology Level and Service Pack 5, or later (planned availability: June 25, 2010)
- AIX Version 6.1 with the 6100-02 Technology Level and Service Pack 8, or later (planned availability: June 25, 2010)
- AIX Version 5.3 with the 5300-11 Technology Level and Service Pack 2, or later (planned availability: March 16, 2010)
- AIX Version 5.3 with the 5300-10 Technology Level and Service Pack 4, or later (planned availability: May 28, 2010)
- AIX Version 5.3 with the 5300-09 Technology Level and Service Pack 7, or later (planned availability: May 28, 2010)

Visit the IBM Prerequisite Web site for compatibility information for hardware features and the corresponding AIX Technology Levels

http://www-912.ibm.com/e_dir/eserverprereq.nsf

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

- SUSE Linux Enterprise Server 11 for the Power 755 Server, or later, with current maintenance updates available from Novell to enable all planned functionality
- SUSE Linux Enterprise Server 10 Service Pack 3 for the Power 755 Server, with current maintenance updates available from Novell to enable all planned functionality

Users should also update their systems with the latest Linux for Power service and productivity tools available from IBM's Web site

http://www14.software.ibm.com/webapp/set2/sas/f/lopdiags/home.html

If installing VIOS:

- VIOS 2.1.2.11 with Fix Pack 22.1 and Service Pack 1, or later

Java 1.4.2 on POWER7

There are unique considerations when running Java 1.4.2 on POWER7. For best exploitation of the outstanding performance capabilities and most recent improvements of POWER7, IBM recommends upgrading Java-based applications to Java 6 or Java 5 whenever possible.

For more information, visit

http://www.ibm.com/developerworks/java/jdk/aix/service.html

Limitations

System

- When an HMC is connected to the system, the integrated system ports are rendered nonfunctional. In this case, the customer must install an asynchronous adapter for serial port usage.
- Integrated system ports are not supported under AIX or Linux when the HMC ports are connected to an HMC. Either the HMC ports or the integrated system ports can be used, but not both.
- The integrated system ports are supported for modem and async terminal connections. Any other application using serial ports requires a serial port adapter to be installed in a PCI slot. The integrated system ports do not support HACMP™ configurations.

Processor cards

- Four processor cards are required.
- All processors must be activated.
  - Because four processor cards are required in the 8236-E8C system, a minimum and maximum of 32 processor activations are required: 32 x #2325 must be on the order.

Power supply

- The base machine contains two ac power supplies (#7740).

Redundant fans

- Redundant fans standard

Power cords

Two power cords are required.

The Power 755 requires 200-240 V power cords for all configurations.

System memory

- A minimum 128 GB of memory is required on the Power 755 system.
- Eight memory DIMM slots are on a processor card. The maximum system memory is 256 GB with four processor cards.
- Different system memory feature numbers may not be mixed on the same processor card. However, a system with more than one processor card may use different memory feature numbers on the same system.
- Memory must be installed in groups of one feature (two DIMMs), two features (four DIMMs), or four features (eight DIMMs) per processor card. Installation of three features (six DIMMs) is not permitted.
- It is generally recommended that memory be installed evenly across all processor cards in the system. Balancing memory across the installed processor cards allows memory access in a consistent manner and typically results in the best possible performance for your configuration. However, balancing memory fairly evenly across multiple processor cards, compared to balancing memory exactly evenly typically has a very small performance difference.

Plans for future memory upgrades should be taken into account when deciding which memory feature size to use at the time of initial system order.

Figure 1. Memory features

Feature	Feature number	Minimum quantity	Maximum quantity
8 GB 1066 MHz (2 x 4 GB RDIMMs)	4526	0	16
16 GB 1066 MHz (2 x 8 GB RDIMMs)	4527	0	16

Note: The 8 GB memory feature (#4526) is planned to be available on March 16, 2010.

Drawer/tower attachment:

- EXP12S SAS DASD Expansion Drawer (#5886)
  - Feature number 8340 supports one feature number 5886 drawer directly off the system unit's SAS port. EXP12S drawers are attached to a PCI-X or PCIe SAS adapter via SAS cables.
  - A system maximum of 13 is allowed.

The following list shows I/O drawers that are supported or available on the 8236 machine type and the correct interface to use for each of the drawers.

Feature	Description	Order Status	Interface
5886	Exp 12S SAS Disk Drawer	Available	SAS

Maximum number of attached I/O drawers per system:

Feature	Power 755 (32-core)

	O/S	AIX	Linux
5886		13	13

PCI card slots

The Power 755 has a maximum of five hot-plug slots.

- Slot 1 is a PCIe x8 short-length slot. A GX++ slot shares this slot.
- Slot 2 is a PCIe x8 short-length slot.
- Slot 3 is a PCIe x8 full-length slot.
- Slots 4 and 5 are PCIX DDR 266 MHz full-length slots.
- All slots are hot pluggable except slot 1 when used as a GX slot.

Graphics adapters

- A graphics adapter, keyboard, and mouse are not required in the minimum configuration.
- The maximum number of graphics adapters supported in the Power 755 is three.

I/O adapters

- Integrated Virtual Ethernet feature (#5613, #5623, #5624), and the SAS RAID Enablement feature (#5679) are not plugged into a slot, leaving the slots available for PCI adapters or GX adapters.
- Refer to Figure 2 for additional I/O adapter information.
- The adapter installed in slot 1 or 2 must be short.

Figure 2. I/O adapter features

I/O Adapter	Orderable feature number	Supported feature number	CEC Max qty	Size
4-port USB PCIe	2728		3	Short
PCIe 2-Line WAN w/Modem	2893		3	Short
PCIe 2-Line WAN w/Modem CIM	2894		3	Short
PCI-X Cryptographic Coprocessor	4764		2	Long
GX Dual-port 12X Channel Attach	5609		1	GX++ slot
2-port 10 Gb IVE Daughter Card	5613		1	N/A
4-port 1 Gb IVE Daughter Card	5624		1	N/A
2-port 10/100/1000 Ethernet	5706		2	Short
10 Gigabit FCoE PCIe Dual Port	5708		3	Short
ISCI TOE Gb Ethernet (Copper)	5713		2	Short
4-port 1 Gb Ethernet PCI-e 4x	5717		3	Short
10 Gigabit Ethernet-CX4 PCI Exp.	5732		3	Short
8 Gb Dual-port Fibre Channel	5735		3	Short
GXT145 PCIe Graphics Accelerator	5748		3	Short
2-port 4 Gb Fibre Channel	5759		2	Short
2-port 1 Gb Ethernet (UTP) PCIe	5767		3	Short
2-port 1 Gb Ethernet (Fiber) PCIe	5768		3	Short
10 Gb Ethernet-SR	5769		3	Short
10 Gb Ethernet-LR	5772		3	Short
2-port 4 Gb Fibre Channel	5774		3	Short
4-port Asynch EIA-232 PCIe	5785		3	Short
PCIe Dual-x4 SAS	5901		3	Short
PCIe 380MB Cache Dual-x4 SAS RAID	5903		3	Short
PCI 4-Modem WAN IOA, no IOP	6808		2	Short
PCI 4-Modem WAN IOA, no IOP, CIM	6809		2	Short

Note: Maximums are for CEC only.

Storage devices/bays

- The Power 755 has a slim media bay that contains a mandatory DVD-RAM (#5762 or follow-on).
- Feature number 8340 must be selected and supports only SFF or SSD; 3.5-inch drives are not supported with feature 8340:
  - Feature number 1878 must be selected.
  - One of feature numbers 1882, 1883, 1885, 1886, or 1890 must be selected[1].
  - If connection of a feature 5886 EXP12S drawer is desired using the external SAS port on feature 8340, feature number 3668 is required.

[1] No internal DASD is required if feature 0837 (Boot from SAN) is selected. In this case, a Fibre Channel or Fibre Channel over Ethernet adapter must also be ordered.

- Split DASD is not supported on the 8236-E8C.
- SSDs (#1890 and #3586) support restrictions:
  - Feature 1890 is supported in the Power 755 CEC.
  - SFF feature 3586 is not supported in the Power 755 CEC.
  - SSDs and disk drives (HDDs) are not allowed to mirror each other.
  - SSDs are not supported by features 5900, 5901, and 5912.
  - A maximum of eight per feature 5886 EXP12S drawer is allowed. There can be no mixing of SSDs and HDDs in a feature 5886. A maximum of one feature 5886 containing SSDs attached to a single controller or pair of controllers is allowed. A feature 5886 containing SSD drives cannot be connected to other feature 5886s. A feature 5886 containing SSD drives cannot be attached to the CEC external SAS portion of the Power 755.

Figure 3. Storage device features

Device	Maximum quantity	Bay	Orderable feature number
DVD-RAM (SATA)	1	Slim	5762

Device	Maximum quantity		Bay	Orderable feature number
	AIX	Linux		
146.8 GB 15K, SAS, SFF,	8	8	DASD 1-8	1882
73.4 GB 15K, SAS, SFF,	8	8	DASD 1-8	1883
300 GB 10K, SAS, SFF,	8	8	DASD 1-8	1885
146.8 GB 15K, SAS, SFF,	8	8	DASD 1-8	1886
69 GB SAS, SFF, Solid-state	8	8	DASD 1-8	1890
69 GB SAS, SFF, Solid-state	24	24	24 in	3 x #5886

Notes:

- Eight disks or solid-state drives maximum can be installed internally.
- Feature 3586 cannot be installed internally.
- Eight of feature 3586 can be placed in each feature 5886.
- Only one feature 5886 can be attached to a feature 5903 when it contains solid-state drives.

- A feature 5886 cannot be attached to the CEC external SAS port when it contains solid-state drives.

Device	Maximum quantity		Bay	Orderable feature number	Supported feature number
	AIX	Linux			
146.8 GB 15K RPM, SAS	156	156		13 x #5886	3647
300 GB 15K RPM, SAS	156	156		13 x #5886	3648
450 GB 15K RPM, SAS	156	156		13 x #5886	3649

Note: 3.5-inch DASD is not supported in the 8236-E8C CEC.

Planning information

Cable orders

No cables required.

Security, auditability, and control

This product uses the security and auditability features of host software and application software.

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

IBM Electronic Services

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

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

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

To learn how Electronic Services can work for you, visit

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

Volume orders: Contact your IBM representative.

IBM Global Financing

Yes

Warranty period

One year

Alternative warranty options are available on a special bid basis from your IBM representative or Business Partner.

Warranty service

If required, IBM provides repair or exchange service depending on the types of warranty service specified for the machine. An IBM technician will attempt to resolve your problem over the telephone, or electronically via an IBM Web site. You must follow the problem determination and resolution procedures that IBM specifies. Scheduling of service will depend upon the time of your call and is subject to parts availability. If applicable to your product, parts considered Customer Replaceable Units (CRUs) will be provided as part of the machine's standard warranty service.

Service levels are response time objectives and are not guaranteed. The specified level of warranty service may not be available in all worldwide locations. Additional charges may apply outside IBM's normal service area. Contact your local IBM representative or your reseller for country- and location-specific information. This product is covered by the following types of service.

Customer Replaceable Unit Service and On-site for other selected parts.

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

Tier 1 CRU: Installation of Tier 1 CRUs is your responsibility. If IBM installs a Tier 1 CRU at your request, you will be charged for the installation. For machines with on-site same-day response service, IBM will replace a Tier 1 CRU at your request, at no additional charge.

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

Based upon availability, CRUs will be shipped for next-business-day delivery. IBM specifies, in the materials shipped with a replacement CRU, whether a defective CRU must be returned to IBM. When return is required, 1) return instructions and a container are shipped with the replacement CRU and 2) you may be charged for the replacement CRU if IBM does not receive the defective CRU within 15 days of your receipt of the replacement.

The following parts have been designated as Tier 1 CRU parts:

- DASD Drive
- DVD Drive
- Dedicated Ethernet
- Fan Air Baffle
- Fan
- All PCI Adapters

- Power Supply
- Thermal Card (TPMD)
- VPD card
- Line/power cord
- Keyboard
- Mouse
- External cables
- Display
- Operator Panel
- TOD Battery
- DIMMs

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.

- 9 hours per day, Monday through Friday, excluding holidays, next-business-day response

Calls must be received by 5 p.m. local time in order to qualify for Next-Business-Day Service.

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

During the warranty period, warranty service upgrades provide 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.

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 service selections are available as warranty upgrades for your machine.

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

Customer Replaceable Units (CRUs) may be provided as part of the machine's standard warranty CRU Service except that you may install a CRU yourself or request IBM installation, at no additional charge, under one of the On-site Service levels specified above. For additional information on the CRU Service, see the warranty information.

Maintenance Services:

If required, IBM provides repair or exchange service depending on the types of maintenance service specified for the machine. IBM will attempt to resolve your problem over the telephone or electronically, via an IBM Web site. You must follow the problem determination and resolution procedures that IBM specifies. Scheduling of service will depend upon the time of your call and is subject to parts availability. Service levels are response time objectives and are not guaranteed. The specified level of maintenance 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. The following service selections are available as maintenance options for your machine type.

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.

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

Customer Replaceable Unit Service:

If your problem can be resolved with a CRU (for example, keyboard, mouse, speaker, memory, or hard disk drive), and depending upon the maintenance service offerings in your geography, IBM will ship the CRU to you for you to install. CRU information and replacement instructions are shipped with your machine and are available from IBM upon your request.

Based upon availability, CRUs will be shipped for next-business-day delivery. IBM specifies, in the materials shipped with a replacement CRU, whether a defective CRU must be returned to IBM. When return is required, 1) return instructions and a container are shipped with the replacement CRU and 2) you may be charged for the replacement CRU if IBM does not receive the defective CRU within 15 days of your receipt of the replacement.

CRUs may be provided as part of the machine's standard maintenance service except that you may install a CRU yourself or request IBM installation, at no additional charge, under any of the On-site Service levels specified above.

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

Non-IBM parts support

Under certain conditions, IBM repairs selected non-IBM parts at no additional charge for machines that are covered under warranty service upgrades or maintenance services.

IBM Service provides hardware problem determination on non-IBM parts (for example, adapter cards, PCMCIA cards, disk drives, memory) installed within IBM machines covered under warranty service upgrades or maintenance services and provides the labor to replace the failing parts at no additional charge.

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

Warranty service upgrades

Usage plan machine

No

IBM hourly service rate classification

Two

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

Field-installable features

Yes

Model conversions

No

Machine installation

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

Graduated program license charges apply

Yes. The applicable processor tier is Small.

Licensed machine code

IBM Machine Code is licensed for use by a customer on the IBM machine for which it was provided by IBM under the terms and conditions of the IBM License Agreement for Machine Code, to enable the machine to function in accordance with its specifications, and only for the capacity authorized by IBM and acquired by the customer. You can obtain the agreement by contacting your IBM representative or visiting

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

Machine using LMC Type Model -xxx

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

http://www14.software.ibm.com/webapp/set2/firmware

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

Educational allowance

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

The educational allowance is 8% for the products in this announcement.

Prices

For additional information and current prices, contact your local IBM representative.

Description	Model number	Feature number
Widescreen LCD Monitor		
	E8C	3632

Note: This feature is subject to a $16.00 electronic waste recycling fee (15-inch to 34-inch video device.)

The following are newly announced features on the specific models of the IBM Power Systems 8236 machine type:

Description	Model Number	Feature Numbers	Purchase Price	Minimum Initial/ Monthly MES/ Maint. Charge	Both/ Support	CSU	RP MES
IBM Power 755							
	E8C					Yes	
AIX Partition Specify							
	E8C	0265			Both	Yes	No
Linux Partition Specify							
	E8C	0266			Both	Yes	No
CSC Specify							
	E8C	0275			Both	N/A	No
V.24/EIA232 6.1m (20-Ft) PCI Cable							
	E8C	0348			Both	Yes	No
V.35 6.1m (20-Ft) PCI Cable							
	E8C	0353			Both	Yes	No
X.21 6.1m (20-Ft) PCI Cable							
	E8C	0359			Both	Yes	No
Customer Specified Placement							
	E8C	0456			Initial	N/A	No
SSD Placement Indicator - CEC							
	E8C	0462			Both	N/A	No
SSD Placement Indicator - 5886							
	E8C	0464			Initial	N/A	No
19 inch, 1.8 meter high rack							
	E8C	0551			MES	Yes	No
19 inch, 2.0 meter high rack							
	E8C	0553			MES	Yes	No
Rack Filler Panel Kit							
	E8C	0599			Both	Yes	No
SAN Load Source Specify							
	E8C	0837			Both	Yes	No
US TAA Compliance Indicator							
	E8C	0983	NC		Initial	N/A	No
1.5 Meter 12X to 4X Channel Conversion Cable							
	E8C	1828			Both	Yes	No
3 Meter 12X to 4X Channel Conversion Cable							
	E8C	1841			Both	Yes	No
10 Meter 12X to 4X Enhanced Channel Conversion Cable							
	E8C	1854			Both	Yes	
0.6 Meter 12X DDR Cable							

```
                        E8C     1861                    Both     Yes No
Op Panel Cable for Rack-mount Drawer w/2.5" DASD
                        E8C     1878                    Initial  N/A No
146.8GB 10K RPM SAS SFF Disk Drive
                        E8C     1882                    Both     Yes No
73.4 GB 15K RPM SAS SFF Disk Drive
                        E8C     1883                    Both     Yes No
300GB 10K RPM SFF SAS Disk Drive
                        E8C     1885                    Both     Yes No
146GB 15K RPM SFF SAS Disk Drive
                        E8C     1886                    Both     Yes No
69GB SFF SAS Solid State Drive
                        E8C     1890                    Both     Yes No
Primary OS - AIX
                        E8C     2146                    Both     Yes No
Primary OS - Linux
                        E8C     2147                    Both     Yes No
Zero-priced Processor Activation for #8332
                        E8C     2325                    Both     Yes No
2M LC-SC 50 Micron Fiber Converter Cable
                        E8C     2456                    Both     Yes No
2M LC-SC 62.5 Micron Fiber Converter Cable
                        E8C     2459                    Both     Yes No
4 port USB PCIe Adapter
                        E8C     2728                    Both     Yes No
PCIe 2-Line WAN w/Modem
                        E8C     2893                    Both     Yes No
3M Asynchronous Terminal/Printer Cable EIA-232
                        E8C     2934                    Both     Yes No
Asynchronous Cable EIA-232/V.24 3M
                        E8C     2936                    Both     Yes No
Serial-to-Serial Port Cable for Drawer/Drawer- 3.7M
                        E8C     3124                    Both     Yes No
Serial-to-Serial Port Cable for Rack/Rack- 8M
                        E8C     3125                    Both     Yes No
69GB 3.5" SAS Solid State Drive
                        E8C     3586                    Both     Yes No
Widescreen LCD Monitor
                        E8C     3632                    Both     Yes No
146GB 15K RPM SAS Disk Drive
                        E8C     3647                    Both     Yes No
300GB 15K RPM SAS Disk Drive
                        E8C     3648                    Both     Yes No
450GB 15K RPM SAS Disk Drive
                        E8C     3649                    Both     Yes No
SAS Cable (EE) Drawer to Drawer 1M
                        E8C     3652                    Both     Yes No
SAS Cable (EE) Drawer to Drawer 3M
                        E8C     3653                    Both     Yes No
SAS Cable (EE) Drawer to Drawer 6M
                        E8C     3654                    Both     Yes No
SAS Cable (X) Adapter to SAS Enclosure, Dual Controller/Dual Path 3M:
                        E8C     3661                    Both     Yes No
SAS Cable (X) Adapter to SAS Enclosure, Dual Controller/Dual Path 6M:
                        E8C     3662                    Both     Yes No
SAS Cable (X) Adapter to SAS Enclosure, Dual Controller/Dual Path
15M:
                        E8C     3663                    Both     Yes No
SAS Cable, DASD Backplane to Rear Bulkhead
                        E8C     3668                    Both     Yes No
SAS Cable (AI)- Adapter to Internal drive 1M
                        E8C     3679                    Both     Yes No
3M SAS CABLE, ADPTR TO ADPTR (AA)
                        E8C     3681                    Both     Yes No
6M SAS CABLE, ADPTR TO ADPTR (AA)
                        E8C     3682                    Both     Yes No
SAS Cable (AE) Adapter to Enclosure, single controller/single path 3M
                        E8C     3684                    Both     Yes No
SAS Cable (AE) Adapter to Enclosure, single controller/single path 6M
                        E8C     3685                    Both     Yes No
SAS Cable (YI) System to SAS Enclosure, Single Controller/Dual Path
1.5M
                        E8C     3686                    Both     Yes No
SAS Cable (YI) System to SAS Enclosure, Single Controller/Dual Path
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3M
                        E8C     3687                    Both     Yes No
SAS Cable (YO) Adapter to SAS Enclosure, Single Controller/Dual Path
1.5 M
                        E8C     3691                    Both     Yes No
SAS Cable (YO) Adapter to SAS Enclosure, Single Controller/Dual Path
3 M
                        E8C     3692                    Both     Yes No
SAS Cable (YO) Adapter to SAS Enclosure, Single Controller/Dual Path
6 M
                        E8C     3693                    Both     Yes No
SAS Cable (YO) Adapter to SAS Enclosure, Single Controller/Dual Path
15 M
                        E8C     3694                    Both     Yes No
0.3M Serial Port Converter Cable, 9-Pin to 25-Pin
                        E8C     3925                    Both     Yes No
Asynch Printer/Terminal Cable, 9-pin to 25-pin, 4M
                        E8C     3926                    Both     Yes No
Serial Port Null Modem Cable, 9-pin to 9-pin, 3.7M
                        E8C     3927                    Both     Yes No
Serial Port Null Modem Cable, 9-pin to 9-pin, 10M
                        E8C     3928                    Both     Yes No
1.8 M (6-ft) Extender Cable for Displays (15-pin D-shell to 15-pin
D-shell)
                        E8C     4242                    Both     Yes No
Extender Cable - USB Keyboards, 2M
                        E8C     4256                    Both     Yes No
VGA to DVI Connection Converter
                        E8C     4276                    Both     Yes No
8GB (2x4GB) Memory DIMMs, 1066 MHz, 2Gb DDR3 DRAM
                        E8C     4526                    Both     Yes No
16GB (2x8GB) Memory DIMMs, 1066 MHz, 2Gb DDR3 DRAM
                        E8C     4527                    Both     Yes No
One and only one rack indicator features is required onall orders (#4650 to #4666).
Rack Indicator- Not Factory Integrated
                        E8C     4650                    Initial  N/A No
Rack Indicator, Rack #1
                        E8C     4651                    Initial  N/A No
Rack Indicator, Rack #2
                        E8C     4652                    Initial  N/A No
Rack Indicator, Rack #3
                        E8C     4653                    Initial  N/A No
Rack Indicator, Rack #4
                        E8C     4654                    Initial  N/A No
Rack Indicator, Rack #5
                        E8C     4655                    Initial  N/A No
Rack Indicator, Rack #6
                        E8C     4656                    Initial  N/A No
Rack Indicator, Rack #7
                        E8C     4657                    Initial  N/A No
Rack Indicator, Rack #8
                        E8C     4658                    Initial  N/A No
Rack Indicator, Rack #9
                        E8C     4659                    Initial  N/A No
Rack Indicator, Rack #10
                        E8C     4660                    Initial  N/A No
Rack Indicator, Rack #11
                        E8C     4661                    Initial  N/A No
Rack Indicator, Rack #12
                        E8C     4662                    Initial  N/A No
Rack Indicator, Rack #13
                        E8C     4663                    Initial  N/A No
Rack Indicator, Rack #14
                        E8C     4664                    Initial  N/A No
Rack Indicator, Rack #15
                        E8C     4665                    Initial  N/A No
Rack Indicator, Rack #16
                        E8C     4666                    Initial  N/A No
PCI-X Cryptographic Coprocessor (FIPS 4)
                        E8C     4764                    Both     Yes No
RFID TAGS FOR SERVERS, BLADES, BLADECENTERS, RACKS, AND HMCS
                        E8C     5524                    Initial  N/A No
GX Dual-port 12X Channel Attach
                        E8C     5609                    Both     Yes No
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Dual Port (SR) Integrated Virtual Ethernet 10Gb Daughter Card
                        E8C     5613                    Both     Yes No
4-Port 1Gb Integrated Virtual Ethernet Daughter Card
                        E8C     5624                    Both     Yes No
Blind Swap Type III Cassette- PCIe, Short Slot
                        E8C     5646                    MES      Yes No
Blind Swap Type III Cassette- PCI-X or PCIe, Standard Slot
                        E8C     5647                    MES      Yes No
IBM 2-Port 10/100/1000 Base-TX Ethernet PCI-X Adapter
                        E8C     5706                    Both     Yes No
10Gb FCoE PCIe Dual Port Adapter
                        E8C     5708                    Both     Yes No
1 Gigabit iSCSI TOE PCI-X on Copper Media Adapter
                        E8C     5713                    Both     Yes No
4-Port 10/100/1000 Base-TX PCI Express Adapter
                        E8C     5717                    Both     Yes No
10 Gigabit Ethernet-CX4 PCI Express Adapter
                        E8C     5732                    Both     Yes No
8 Gigabit PCI Express Dual Port Fibre Channel Adapter
                        E8C     5735                    Both     Yes No
POWER GXT145 PCI Express Graphics Accelerator
                        E8C     5748                    Both     Yes No
4 Gb Dual-Port Fibre Channel PCI-X 2.0 DDR Adapter
                        E8C     5759                    Both     Yes No
SATA Slimline DVD-RAM Drive
                        E8C     5762                    Both     Yes No
2-Port 10/100/1000 Base-TX Ethernet PCI Express Adapter
                        E8C     5767                    Both     Yes No
2-Port Gigabit Ethernet-SX PCI Express Adapter
                        E8C     5768                    Both     Yes No
10 Gigabit Ethernet-SR PCI Express Adapter
                        E8C     5769                    Both     Yes No
10 Gigabit Ethernet-LR PCI Express Adapter
                        E8C     5772                    Both     Yes No
4 Gigabit PCI Express Dual Port Fibre Channel Adapter
                        E8C     5774                    Both     Yes No
4 Port Async EIA-232 PCIe Adapter
                        E8C     5785                    Both     Yes No
EXP 12S Expansion Drawer
                        E8C     5886                    Both     Yes No
PCIe Dual-x4 SAS Adapter
                        E8C     5901                    Both     Yes No
PCIe 380MB Cache Dual - x4 3Gb SAS RAID Adapter
                        E8C     5903                    Both     Yes No
Non-paired PCIe SAS RAID Indicator
                        E8C     5923                    Both     Yes No
Full Width Keyboard -- USB, US English, #103P
                        E8C     5951                    Both     Yes No
Full Width Keyboard -- USB, French, #189
                        E8C     5952                    Both     Yes No
Full Width Keyboard -- USB, Italian, #142
                        E8C     5953                    Both     Yes No
Full Width Keyboard -- USB, German/Austrian, #129
                        E8C     5954                    Both     Yes No
Full Width Keyboard -- USB, UK English, #166P
                        E8C     5955                    Both     Yes No
Full Width Keyboard -- USB, Spanish, #172
                        E8C     5956                    Both     Yes No
Full Width Keyboard -- USB, Japanese, #194
                        E8C     5957                    Both     Yes No
Full Width Keyboard -- USB, Brazilian Portuguese, #275
                        E8C     5958                    Both     Yes No
Full Width Keyboard -- USB, Hungarian, #208
                        E8C     5959                    Both     Yes No
Full Width Keyboard -- USB, Korean, #413
                        E8C     5960                    Both     Yes No
Full Width Keyboard -- USB, Chinese, #467
                        E8C     5961                    Both     Yes No
Full Width Keyboard -- USB, French Canadian, #445
                        E8C     5962                    Both     Yes No
Full Width Keyboard -- USB, Belgian/UK, #120
                        E8C     5964                    Both     Yes No
Full Width Keyboard -- USB, Swedish/Finnish, #153
                        E8C     5965                    Both     Yes No
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Full Width Keyboard -- USB, Danish, #159
                      E8C     5966                  Both     Yes No
Full Width Keyboard -- USB, Bulgarian, #442
                      E8C     5967                  Both     Yes No
Full Width Keyboard -- USB, Swiss/French/German, #150
                      E8C     5968                  Both     Yes No
Full Width Keyboard -- USB, Norwegian,#155
                      E8C     5969                  Both     Yes No
Full Width Keyboard -- USB, Dutch, #143
                      E8C     5970                  Both     Yes No
Full Width Keyboard -- USB, Portuguese, #163
                      E8C     5971                  Both     Yes No
Full Width Keyboard -- USB, Greek, #319
                      E8C     5972                  Both     Yes No
Full Width Keyboard -- USB, Hebrew, #212
                      E8C     5973                  Both     Yes No
Full Width Keyboard -- USB, Polish, #214
                      E8C     5974                  Both     Yes No
Full Width Keyboard -- USB, Slovakian, #245
                      E8C     5975                  Both     Yes No
Full Width Keyboard -- USB, Czech, #243
                      E8C     5976                  Both     Yes No
Full Width Keyboard -- USB, Turkish, #179
                      E8C     5977                  Both     Yes No
Full Width Keyboard -- USB, LA Spanish, #171
                      E8C     5978                  Both     Yes No
Full Width Keyboard -- USB, Arabic, #253
                      E8C     5979                  Both     Yes No
Full Width Keyboard -- USB, Thai, #191
                      E8C     5980                  Both     Yes No
Full Width Keyboard -- USB, Russian, #443
                      E8C     5981                  Both     Yes No
Full Width Keyboard -- USB, Slovenian, #234
                      E8C     5982                  Both     Yes No
Full Width Keyboard -- USB, US English Euro, #103P
                      E8C     5983                  Both     Yes No
Opt Front Door for 1.8m Rack
                      E8C     6068                  MES      Yes No
Opt Front Door for 2.0m Rack
                      E8C     6069                  MES      Yes No
1.8m Rack Acoustic Doors
                      E8C     6248                  MES      Yes No
2.0m Rack Acoustic Doors
                      E8C     6249                  MES      Yes No
1.8m Rack Trim Kit
                      E8C     6263                  Both     Yes No
2.0m Rack Trim Kit
                      E8C     6272                  Both     Yes No
Power Cable -- Drawer to IBM PDU, 14-foot, 250V/10A
                      E8C     6458                  Both     Yes No
Power Cord 4.3m (14-ft), Drawer To OEM PDU (125V, 15A)
                      E8C     6460                  Both     Yes No
Power Cord 4.3m (14-foot), Drawer to OEM PDU, (250V, 15A), U. S.
                      E8C     6469                  Both     Yes No
Power Cord 1.8m(6-foot), To Wall (125V, 15A)
                      E8C     6470                  Both     Yes No
Power Cord 2.7m (9-foot), To Wall/OEM PDU, (125V, 15A)
                      E8C     6471                  Both     Yes No
Power Cord 2.7m (9-foot), To Wall/OEM PDU, (250V, 16A)
                      E8C     6472                  Both     Yes No
Power Cord 2.7m (9-foot), To Wall/OEM PDU, (250V, 10A)
                      E8C     6473                  Both     Yes No
Power Cord 2.7M (9-foot), To Wall/OEM PDU, (250V, 13A)
                      E8C     6474                  Both     Yes No
Power Cord 2.7M (9-foot), To Wall/OEM PDU, (250V, 16A)
                      E8C     6475                  Both     Yes No
Power Cord 2.7M (9-foot), To Wall/OEM PDU, (250V, 10A)
                      E8C     6476                  Both     Yes No
Power Cord 2.7M (9-foot), To Wall/OEM PDU, (250V, 16A)
                      E8C     6477                  Both     Yes No
Power Cord 2.7 M(9-foot), To Wall/OEM PDU, (250V, 16A)
                      E8C     6478                  Both     Yes No
Power Cord 1.8M (6-foot),To Wall, (250V, 15A), United States
                      E8C     6487                  Both     Yes No
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Power Cord 2.7M (9-foot), To Wall/OEM PDU, (125V, 15A or 250V, 10A )
                        E8C     6488                    Both     Yes No
4.3m (14-Ft) 3PH/24A Power Cord
                        E8C     6489                    MES      Yes No
4.3m (14-Ft) 1PH/48A Pwr Cord
                        E8C     6491                    MES      Yes No
4.3m (14-Ft) 1PH/48-60A Pwr Cord
                        E8C     6492                    MES      Yes No
Power Cord 2.7M (9-foot), To Wall/OEM PDU, (250V, 10A)
                        E8C     6493                    Both     Yes No
Power Cord 2.7M (9-foot), To Wall/OEM PDU, (250V, 10A)
                        E8C     6494                    Both     Yes No
Power Cord 2.7M (9-foot), To Wall/OEM PDU, (250V, 10A)
                        E8C     6496                    Both     Yes No
Power Cable - Drawer to IBM PDU, 200-240V/10A
                        E8C     6577                    Initial  N/A No
Optional Rack Security Kit
                        E8C     6580                    MES      Yes No
Modem Tray for 19-Inch Rack
                        E8C     6586                    MES      Yes No
Power Cord 2.7M (9-foot), To Wall/OEM PDU, (125V, 15A)
                        E8C     6651                    Both     Yes No
4.3m (14-Ft) 1PH/24-30A Pwr Cord
                        E8C     6654                    MES      Yes No
4.3m (14-Ft) 1PH/24-30A WR Pwr Cord
                        E8C     6655                    MES      Yes No
4.3m (14-Ft)1PH/24A Power Cord
                        E8C     6656                    MES      Yes No
Power Cord 2.7M (9-foot), To Wall/OEM PDU, (250V, 15A)
                        E8C     6659                    Both     Yes No
Power Cord (14-foot), Drawer To OEM PDU (125V, 15A)
                        E8C     6660                    Both     Yes No
Power Cord 3 M (10 ft), Drawer to IBM PDU, 250V/10A
                        E8C     6665                    Both     Yes No
Power Cord 4.3M (14-foot), Drawer to OEM PDU, (250V, 15A)
                        E8C     6669                    Both     Yes No
Power Cord 2.7M (9-foot), Drawer to IBM PDU, 250V/10A
                        E8C     6671                    Both     Yes No
Power Cord 1.5M (5-foot), Drawer to IBM PDU, 250V/10A
                        E8C     6672                    Both     Yes No
Power Cord 2.7M (9-foot), To Wall/OEM PDU, (250V, 10A)
                        E8C     6680                    Both     Yes No
PCI 4-Modem WAN IOA No IOP
                        E8C     6808                    Both     Yes No
Intelligent PDU+, 1 EIA Unit, Universal UTG0247 Connector
                        E8C     7109                    MES      Yes No
Environmental Monitoring Probe
                        E8C     7118                    Both     Yes No
Power Distribution Unit
                        E8C     7188                    MES      Yes No
Quantity 150 of #3586
                        E8C     7535                    Both     Yes No
Quantity 150 of #3647
                        E8C     7549                    Both     Yes No
Quantity 150 of #3648
                        E8C     7564                    Both     Yes No
Quantity 150 of #3649
                        E8C     7565                    Both     Yes No
Power Supply, 1725 Watt AC, Hot-swap, Base or Redundant
                        E8C     7740                    Initial  N/A No
Ethernet Cable, 15m, Hardware Management Console to System Unit
                        E8C     7802                    Both     Yes No
PCI Blind Swap Cassette Kit, Double Wide Adapters, Type II
                        E8C     7863                    MES      Yes No
Linux Software Preinstall
                        E8C     8143                    Initial  N/A No
Linux Software Preinstall (Business Partners)
                        E8C     8144                    Initial  N/A No
8-core 3.3 GHz POWER7 Processor Card
                        E8C     8332                    Both     Yes No
Enhanced DASD/Media Backplane for 2.5" DASD/SATA DVD/Tape with
External SAS Port
                        E8C     8340                    Initial  N/A No
USB Mouse
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                      E8C     8845                    Both     Yes No
Order Routing Indicator- System Plant
                      E8C     9169     NC             Initial  N/A No
Language Group Specify - US English
                      E8C     9300     NC             Initial  N/A No
New AIX License Core Counter
                      E8C     9440     NC             Initial  N/A No
New Red Hat License Core Counter
                      E8C     9442     NC             Initial  N/A No
New SUSE License Core Counter
                      E8C     9443     NC             Initial  N/A No
Other AIX License Core Counter
                      E8C     9444     NC             Initial  N/A No
Other Linux License Core Counter
                      E8C     9445     NC             Initial  N/A No
3rd Party Linux License Core Counter
                      E8C     9446     NC             Initial  N/A No
VIOS Core Counter
                      E8C     9447     NC             Initial  N/A No
Month Indicator
                      E8C     9461     NC             Initial  N/A No
Day Indicator
                      E8C     9462     NC             Initial  N/A No
Hour Indicator
                      E8C     9463     NC             Initial  N/A No
Minute Indicator
                      E8C     9464     NC             Initial  N/A No
Qty Indicator
                      E8C     9465     NC             Initial  N/A No
Countable Member Indicator
                      E8C     9466     NC             Initial  N/A No
Language Group Specify - Dutch
                      E8C     9700     NC             Initial  N/A No
Language Group Specify - French
                      E8C     9703     NC             Initial  N/A No
Language Group Specify - German
                      E8C     9704     NC             Initial  N/A No
Language Group Specify - Polish
                      E8C     9705     NC             Initial  N/A No
Language Group Specify - Norwegian
                      E8C     9706     NC             Initial  N/A No
Language Group Specify - Portuguese
                      E8C     9707     NC             Initial  N/A No
Language Group Specify - Spanish
                      E8C     9708     NC             Initial  N/A No
Language Group Specify - Italian
                      E8C     9711     NC             Initial  N/A No
Language Group Specify - Canadian French
                      E8C     9712     NC             Initial  N/A No
Language Group Specify - Japanese
                      E8C     9714     NC             Initial  N/A No
Language Group Specify - Traditional Chinese (Taiwan)
                      E8C     9715     NC             Initial  N/A No
Language Group Specify - Korean
                      E8C     9716     NC             Initial  N/A No
Language Group Specify - Turkish
                      E8C     9718     NC             Initial  N/A No
Language Group Specify - Hungarian
                      E8C     9719     NC             Initial  N/A No
Language Group Specify - Slovakian
                      E8C     9720     NC             Initial  N/A No
Language Group Specify - Russian
                      E8C     9721     NC             Initial  N/A No
Language Group Specify - Simplified Chinese (PRC)
                      E8C     9722     NC             Initial  N/A No
Language Group Specify - Czech
                      E8C     9724     NC             Initial  N/A No
Language Group Specify -- Romanian
                      E8C     9725     NC             Initial  N/A No
Language Group Specify - Croatian
                      E8C     9726     NC             Initial  N/A No
Language Group Specify -- Slovenian
                      E8C     9727     NC             Initial  N/A No
Language Group Specify - Brazilian Portuguese
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                    E8C     9728     NC          Initial  N/A No
Language Group Specify - Thai
                    E8C     9729     NC          Initial  N/A No
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Machine type	Model	Description	One-time charge
8236	E8C	BASE ATLAS HPC	$7,498

New features

Machine type	Model	Feature number	Description	One-time charge
8236	E8C	4526	8GB (2x4GB) Memory DIMMs, 1067 MHz, 1Gb DDR3 DRAM	$1,065
8236	E8C	4527	16GB (2x8GB) Memory DIMMs, 1067 MHz, 2Gb DDR3 DRAM	$2,130
8236	E8C	6263	1.8M Rack Trim Kit	$399
8236	E8C	6272	2.0M Rack Trim Kit	$399
8236	E8C	7118	Environmental Monitoring Probe	$280
8236	E8C	7740	Power Supply, 1725 Watt AC, Hot-swap, Base or Redundant	$699
8236	E8C	8332	8-core 3.3 GHz POWER7 Processor Card	$12,400
8236	E8C	8340	Enhanced DASD/Media Backplane for 2.5" DASD/ SATA DVD/Tape with External SAS Port	$799

Existing features

Machine type	Model	Feature number	Description	One-time charge
8236	E8C	0348	V.24/EIA232 6.1M 20FT PCI	$124
8236	E8C	0353	V.35 6.1M 20FT PCI CBL	$124
8236	E8C	0359	X.21 6.1M 20FT PCI CBL	$371
8236	E8C	0456	CUSTOMER SPECIFIED PLACEME	$400
8236	E8C	0551	19 INCH, 1.8 METER HIGH RA	$2,644
8236	E8C	0553	19 INCH, 2.0 METER HIGH RA	$3,585
8236	E8C	0599	RACK FILLER PANEL KIT	$74
8236	E8C	1828	1.5 M 12X TO 4X CHANNEL CO	$300
8236	E8C	1841	3 M 12X TO 4X CHANNEL CONV	$375
8236	E8C	1854		$600

			10 METER 12X TO 4X ENHANCE	
8236	E8C	1861	0.6 METER 12X DDR CABLE	$350
8236	E8C	1878	OP PANEL CBL RACK MOUNT SY	$6
8236	E8C	1882	146.8 GB 10K RPM SAS SFF D	$650
8236	E8C	1883	73.4 GB 15K RPM SAS SFF DI	$498
8236	E8C	1885	300GB 10K RPM SFF SAS DISK	$1,050
8236	E8C	1886	146GB 15K RPM SFF SAS DISK	$798
8236	E8C	1890	69GB SFF SAS SOLID STATE D	$5,200
8236	E8C	2456	MICRON FIBER CONVERTER CAB	$83
8236	E8C	2459	MICRON FIBER CONVERTER CAB	$83
8236	E8C	2728	4 PORT USB PCIE ADAPTER	$150
8236	E8C	2893	PCIE 2 LINE WAN W/ MODEM	$579
8236	E8C	2934	TERMINAL/ PRINTER CBL EIA 2	$37
8236	E8C	2936	ASYNCHRONOUS CBL. EIA 232/	$61
8236	E8C	3124	PORT CBL. FOR DRAWER/ DRAWE	$67
8236	E8C	3125	PORT CBL. FOR RACK/RACK	$67
8236	E8C	3586	69GB 3.5'' SAS SOLID STATE	$5,200
8236	E8C	3632	WIDESCREEN LCD MONITOR	$999
8236	E8C	3647	146 GB 15K RPM SAS DISK DR	$498
8236	E8C	3648	300 GB 15K RPM SAS DISK DR	$1,150
8236	E8C	3649	450GB 15K RPM SAS DISK DRI	$1,599
8236	E8C	3652	SAS CBL (EE) DRAWER TO DRA	$50
8236	E8C	3653	SAS CBL (EE) DRAWER TO DRA	$70
8236	E8C	3654	SAS CBL (EE) DRAWER TO DRA	$120
8236	E8C	3661	SAS CBL (X) ADP ENCLOSURE	$150

8236	E8C	3662	SAS CBL (X) ADP ENCLOSURE	$301
8236	E8C	3663	SAS CBL (X) ADP ENCLOSURE	$611
8236	E8C	3668	SAS CABLE, DASD BACKPLANE	$80
8236	E8C	3679	SAS CABLE (AI) 1 M	$53
8236	E8C	3681	3M SAS CABLE, ADPTR TO ADP	$75
8236	E8C	3682	6M SAS CABLE, ADPTR TO ADP	$150
8236	E8C	3684	SAS CBL (AE) ADP ENCLOSURE	$150
8236	E8C	3685	SAS CBL (AE) ADP ENCLOSURE	$301
8236	E8C	3686	SAS CABLE (YI) SYSTEM TO S	$90
8236	E8C	3687	SAS CABLE (YI) SYSTEM TO S	$110
8236	E8C	3691	SAS CBL (YO) ADP TO SAS	$90
8236	E8C	3692	SAS CBL (YO) ADP TO SAS	$110
8236	E8C	3693	SAS CBL (YO) ADP TO SAS	$150
8236	E8C	3694	SAS CBL (YO) ADP ENCLOSURE	$528
8236	E8C	3925	SERIAL PORT CONVERTER CABL	$21
8236	E8C	3926	ASYNCH PRINTER/ TERMINAL CB	$146
8236	E8C	3927	SERIAL PORT NULL MODEM CAB	$67
8236	E8C	3928	SERIAL PORT NULL MODEM CAB	$67
8236	E8C	4242	6 FOOT EXTENDER CABLE	$83
8236	E8C	4256	EXTENDER CBL. USB KEYBOARD	$42
8236	E8C	4276	VGA TO DVI CONNECT. CONVER	$8
8236	E8C	4764	CRYPTOGRAPHIC COPROCESSOR	$9,000
8236	E8C	5524	RFID TAGS FOR SERVERS BLAD	$20
8236	E8C	5609	GX DUALPORT 12X CHANNEL AT	$2,200
8236	E8C	5613	DUAL PORT (SR) INTEG VIRTU	$3,500

8236	E8C	5624	VIRTUAL ETHERNET DAUGHTER	$528
8236	E8C	5646	BLIND SWAP TYPE III CASSET	$38
8236	E8C	5647	BLIND SWAP TYPE III CASSET	$38
8236	E8C	5706	BASE TX ETHERNET PCI X ADP	$755
8236	E8C	5708	10GB FCOE PCIE DUAL PORT A	$4,154
8236	E8C	5713	TOE PCI X ON COPPER MEDIA	$900
8236	E8C	5717	4 PORT BASE TX PCI EXPRESS	$830
8236	E8C	5732	10 GB ETH CX4 PCI EXPRESS	$3,626
8236	E8C	5735	8GB PCI EXPRESS DUAL PRT F	$3,499
8236	E8C	5748	POWER GXT145 PCI EXPRESS	$378
8236	E8C	5759	4 GB DUAL PORT FIBRE CHANN	$2,499
8236	E8C	5762	SATA SLIMLINE DVD RAM DRIV	$299
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8236	E8C	6493	TO WALL/OEM PDU, (250V, 10	$14
8236	E8C	6494	TO WALL/OEM PDU, (250V, 10	$14

8236	E8C	6496	TO WALL/OEM PDU, (250V, 10	$14
8236	E8C	6580	OPTIONAL RACK SECURITY KIT	$136
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8236	E8C	6655	4.3M 14FT 1PH/24 30A WR PW	$400
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8236	E8C	6665	PWR CD 3M 10FT DRAWER PDU	$14
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8236	E8C	7565	QUANTITY 150 OF 3649	$239,850
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8236	E8C	7863	PCI BLIND SWAP CASSETTE KI	$50
8236	E8C	8143	LINUX SOFTWARE PREINSTALL	$60
8236	E8C	8144	LINUX SOFTWARE PREINSTALL	$60
8236	E8C	8845	USB MOUSE	$30

Machine type	Model/ Feature number	Description	MMMC
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8236	0551	19 inch, 1.8 meter high rack	$40
8236	0553	19 inch, 2.0 meter high rack	$47
8236	1890	69GB SS SFF Disk	$73
8236	3586	69 GB SS 3.5" Disk	$73
8236	8332	0/8W 3.3 GHz PROC CD, P7 SCM(8GC), 8XDIMMS, (KAPALUA)	$273
8236	5886	EXP 12S Expansion Drawer	$228
8236	7535	150 x 3586	$10,920

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