

IBM Power 750 Express server offers IBM POWER7 technology and large enterprise compute capability in small form factor

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At a glance



The Power® 750 Express server is a powerful 1- to 4-socket server that supports up to 32 cores with the configuration flexibility to meet today's growth and tomorrow's processing needs. The server features:

- Powerful POWER7 processors that offer 6-core to 32-core configuration options
 - 6-, 12-, 18-, and 24-core 3.3 GHz configurations (6-core processor card)
 - 8-, 16-, 24-, and 32-core 3.0 or 3.3 GHz configurations (8-core processor card)
 - 32-core 3.55 GHz configuration
- Up to 512 GB of memory with four processor cards installed, optionally augmented with Active Memory™ Expansion
- Up to four optional PCIe I/O drawers or up to eight optional PCI-X I/O drawers, with up to 41 PCIe slots or up to 50 PCI-X slots
- Rich I/O options in the system unit
 - Five PCI slots in the system unit
 - Eight disk/solid-state disk (SSD) SAS SFF (small form factor) bays -- up to 2.4 TB
 - Slimline DVD-RAM
 - Half-high bay for tape or removable drive
 - Integrated SAS/SATA controller for disk/SSD/DVD
 - Optional 175 MB RAID write cache for disk/SSD
 - Integrated Virtual Ethernet ports (four 1 Gb or two 10 Gb)
- Rack-mount configuration
- EnergyScale™ technology

Overview

The Power 750 Express server (8233-E8B) supports up to four 3.3 GHz 6-core or four 8-core 3.0, 3.3, and 3.55 GHz POWER7 processor cards in a rack-mount drawer configuration. The POWER7 processors in this server are 64-bit, 6-core and 8-core modules packaged on dedicated processor cards with 4 MB of L3 cache/core and 256 KB of L2 cache/core.

The Power 750 Express server supports a maximum of 32 DDR3 DIMM slots, eight per processor card. Memory features (two memory DIMMs per feature) supported are 8 GB, 16 GB, and 32 GB and run at speeds of 1066 MHz. A system with four processor cards installed has a maximum memory of 512 GB. Also, the optional Active Memory Expansion can allow the effective maximum memory capacity to be much larger than the true physical memory. Innovative compression/decompression of memory content using processor cycles can allow memory expansion up to 100%. A server with a maximum of 512 GB can effectively be expanded up to 1 TB. This can enhance virtualization and server consolidation by allowing a partition to do significantly more work with the same physical amount of memory or a server to run more partitions and do more work with the same physical amount of memory.

The Power 750 Express server provides great I/O expandability. For example, with 12X-attached I/O drawers, you can have up to 50 PCI-X slots or up to 41 PCIe slots. This combination can provide over 100 LAN ports or over 72 WAN ports, or up to 576 disk drives (over 240 TB disk storage). Extensive quantities of externally attached storage and tape drives and libraries can also be attached.

The Power 750 Express system unit without I/O drawers can contain a maximum of either eight SFF SAS disks or eight SFF SAS SSDs, providing up to 2.4 TB. All disks and SSDs are direct dock and hot pluggable. The eight SAS bays can be split into two sets of four bays for additional AIX/Linux configuration flexibility. The system unit also contains a slimline DVD-RAM, plus a half-high media bay for an optional tape drive or removable disk drive.

Also available in the Power 750 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:

- Five expansion slots
 - Three PCIe x8 (two short-length, one full-length)
 - Two PCI-X DDR (full length)
 - Two GX slots for 12X I/O loop or 4X connections
- Service Processor
- Integrated SAS/SATA controller for disk/SSD/DVD in system unit
 - Optional 175 MB RAID write cache to augment disk/SSD performance and function
- EnergyScale technology
- Two system ports and three USB ports
- Two hardware management console (HMC) ports and two SPCN ports
- Redundant and hot-swap power
- Redundant and hot-swap cooling

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)

If installing the IBM i operating system:

- IBM i 6.1 with i 6.1.1 machine code, or later (planned availability: March 16, 2010)

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

- SUSE Linux Enterprise Server 11 for the Power 750 Express 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 750 Express 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 750

Summary of standard features:

- Rack-mount (4U) configuration
- 6-, 12-, 18-, and 24-core design with one, two, three, or four 3.3 GHz processor cards; 8-, 16-, 24-, and 32-core design with one, two, three or four 3.0 or 3.3 GHz processor cards; or 32-core design with four 3.55 GHz processor cards
- 8 GB of PC3-8500 1066 MHz ECC memory (error checking and correcting) memory, expandable to 128 GB per processor card (512 GB system maximum)

Note: The 8 GB memory feature (#4526) is planned to be available on March 15, 2010.

- 8 x 2.5-inch DASD/SSD/Media backplane with an external SAS port
 - 1 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
- Two media bays:
 - One slim bay for a DVD-RAM (required)
 - One half-high bay for an optional tape drive or removable disk
- 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 2)
 - 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 750 configuration must include a processor, processor activations, memory, two power supplies and power cords, one or two DASD, a DASD/SSD/Media backplanes, 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, when AIX or Linux is the primary operating system is:

Feature number	Description
8335	0/6 core 3.3 GHz POWER7 Processor
6 x 7717	6 Processor Activations
4526	8 GB (2 x 4096 MB) Memory
1883	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.
- No internal DASD is required if feature 0837 (Boot from SAN) is selected. A Fibre Channel adapter must be ordered if feature 0837 is selected.

The minimum defined configuration, if no choice is made, when IBM i is the primary operating system is:

Feature number	Description
8335	0/6 core 3.3 GHz POWER7 Processor
6 x 7717	6 Processor Activations
4526	8 GB (2 x 4096 MB) Memory
2 x 1884	69.7 GB 15K RPM SAS SFF Disk Drive
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	Power Supply, 1725 Watt AC, Base
5762	SATA DVD-RAM
9300/97xx)	Language Group Specify
2145	Primary Operating System Indicator - IBM i
0040	Mirrored System Disk Level Specify Code
0566	IBM i 6.1 with 6.1.1 Machine Code Specify Code
2 x 6xxx	Two Power Cords

Notes:

- The 8 GB memory feature (#4526) is planned to be available on March 16, 2010.
- No internal DASD is required if feature 0837 (Boot from SAN) is selected. A Fibre Channel adapter must be ordered if feature 0837 is selected.

IBM Editions

IBM Editions are available only as initial order.

If you order a Power 750 Express server IBM Edition as defined below, you can qualify for half the initial configuration's processor core activations at no addition charge.

The total memory (based on the number of cores) and the quantity/size of disk, SSD, Fibre Channel adapters, or Fibre Channel over Ethernet (FCoE) adapters shipped with the server are the only features that determine if a customer is entitled to a processor activation at no additional charge.

Specifically, with an IBM Edition, processor activations for the processor card options are:

- 3.3 GHz 6-core processor cards
 - 3 x #7717 (chargeable) and 3 x #2327 (no-charge) with 6-core (1 x #8335) configuration
 - 6 x #7717 (chargeable) and 6 x #2327 (no-charge) with 12-core (2 x #8335) configuration

- 9 x #7717 (chargeable) and 9 x #2327 (no-charge) with 18-core (3 x #8335) configuration
- 12 x #7717 (chargeable) and 12 x #2327 (no-charge) with 24-core (4 x #8335) configuration
- 3.0 GHz 8-core processor cards
 - 4 x #7714 (chargeable) and 4 x #2324 (no-charge) with 8-core (1 x #8334) configuration
 - 8 x #7714 (chargeable) and 8 x #2324 (no-charge) with 16-core (2 x #8334) configuration
 - 12 x #7714 (chargeable) and 12 x #2324 (no-charge) with 24-core (3 x #8334) configuration
 - 16 x #7714 (chargeable) and 16 x #2324 (no-charge) with 32-core (4 x #8334) configuration
- 3.3 GHz 8-core processor cards
 - 4 x #7715 (chargeable) and 4 x #2325 (no-charge) with 8-core (1 x #8332) configuration
 - 8 x #7715 (chargeable) and 8 x #2325 (no-charge) with 16-core (2 x #8332) configuration
 - 12 x #7715 (chargeable) and 12 x #2325 (no-charge) with 24-core (3 x #8332) configuration
 - 16 x #7715 (chargeable) and 16 x #2325 (no-charge) with 32-core (4 x #8332) configuration
- 3.55 GHz 8-core processor cards
 - 16 x #7716 (chargeable) and 16 x #2326 (no-charge) with 32-core (4 x #8336) configuration

When you purchase an IBM Edition, you can purchase an AIX, IBM i, or Linux operating system license, or you may choose to purchase the system with no operating system. The AIX, IBM i, or Linux operating system is processed via a feature number on AIX 5.4 or 6.1, IBM i 6.1.1, and SUSE Linux Enterprise Server. If you choose AIX 5.4 or 6.1 for your primary operating system, you can also order IBM i 6.1.1 and SUSE Linux Enterprise Server. The converse is true if you choose an IBM i or Linux subscription as your primary operating system.

These sample configurations can be changed as needed and still qualify for processor entitlements at no additional charge. However, selection of total memory or DASD/SSD/Fibre Channel/FCoE adapter quantities smaller than the totals defined as the minimums disqualifies the order as an IBM Edition and the no-charge processor activations are then removed.

Processor activations are only available to Solution Delivery Integration (SDIs) as MES orders.

Processor cards ordered separately after the initial order are not eligible for no-charge processor activations.

Edition minimum memory definition details:

A minimum of 4 GB memory per core is needed to qualify for the IBM Edition, except on the 6-core IBM Edition where there is a 32 GB minimum memory requirement. For example, a 6-core minimum is 32 GB, an 8-core minimum is 32 GB, and a 12-core minimum is 48 GB. There can be many different valid memory configurations that meet the minimum 4 GB per core requirement. For example:

- 6-core (32 GB minimum) -- 4 x 8 GB (2 x 4 GB DIMMs) Memory (#4526)
 - Also, 2 x 16 GB (2 x 8 GB DIMMs) Memory (#4527)
 - Also, 1 x 32 GB (2 x 16 GB DIMMs) Memory (#4528)
- 8-core (32 GB minimum) -- 4 x 8 GB (2 x 4 GB DIMMs) Memory (#4526)
 - Also, 2 x 16 GB (2 x 8 GB DIMMs) Memory (#4527)
 - Also, 1 x 32 GB (2 x 16 GB DIMMs) Memory (#4528)
- 12-core (48 GB minimum) -- 6 x 8 GB (2 x 4 GB DIMMs) Memory (#4526)

- Also, 3 x 16 GB (2 x 8 GB DIMMs) Memory (#4527)
- Also, 2 x 32 GB (2 x 16 GB DIMMs) Memory (#4528)
- 16-core (64 GB minimum) -- 8 x 8 GB (2 x 4 GB DIMMs) Memory (#4526)
 - Also, 4 x 16 GB (2 x 8 GB DIMMs) Memory (#4527)
 - Also, 2 x 32 GB (2 x 16 GB DIMMs) Memory (#4528)
- 18-core (72 GB minimum) -- 9 x 8 GB (2 x 4 GB DIMMs) Memory (#4526)
 - Also, 5 x 16 GB (2 x 8 GB DIMMs) Memory (#4527)
 - Also, 3 x 32 GB (2 x 16 GB DIMMs) Memory (#4528)
- 24-core (96 GB minimum) -- 12 x 8 GB (2 x 4 GB DIMMs) Memory (#4526)
 - Also, 6 x 16 GB (2 x 8 GB DIMMs) Memory (#4527)
 - Also, 3 x 32 GB (2 x 16 GB DIMMs) Memory (#4528)
- 32-core (128 GB minimum) -- 16 x 8 GB (2 x 4 GB DIMMs) Memory (#4526)
 - Also, 8 x 16 GB (2 x 8 GB DIMMs) Memory (#4527)
 - Also, 4 x 32 GB (2 x 16 GB DIMMs) Memory (#4528)

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

Note: You can also mix different size memory features on the same server and meet the minimum memory requirements for the IBM Edition benefit as long as at least 4 GB per core is attained. For example, the 1 x 16 GB memory feature (#4527) can replace the 2 x 8 GB feature (#4526). However, all memory features on an individual processor card must be identical.

Edition minimum Disk/SSD/Fibre Channel/FCoE definition details:

- Minimum of: Two DASD, or two SSD, or two Fibre Channel adapters, or two FCoE adapters. You only need to meet one of this disk/SSD/FC/FCoE criteria. Partial criteria cannot be combined.
 - Two SAS disk drives -- Any capacity drives located in the system unit, feature 5802 I/O drawer, or feature 5886 disk drawer qualify.
 - Two SAS SSDs -- Drives located in the system unit, feature 5802 I/O drawer, or feature 5886 disk drawer qualify.
 - Two Fibre Channel adapters -- Either PCI-X or PCI-E adapters located in the system unit or 12X-attached I/O drawer.
 - Two Fibre Channel over Ethernet adapters -- Either PCI-X or PCI-E adapters located in the system unit or 12X-attached I/O drawer.

Multiple sample POWER7 IBM Edition configurations are provided in the IBM internal configurator tool, including:

- Four 3.3 GHz 6-core processor card configurations (6-core, 12-core, 18-core, and 24-core)
- Four 3.0 GHz 8-core processor card configurations (8-core, 16-core, 24-core, and 32-core)
- Four 3.3 GHz 8-core processor card configurations (8-core, 16-core, 24-core, and 32-core)
- Four 3.5 GHz 8-core processor card configurations (32-core)

Dynamic logical partitioning

The dynamic logical partitioning (LPAR) function provides enhanced resource management for the Power 750 Express server. Dynamic LPAR allows available system resources to be quickly and easily configured across multiple logical partitions to meet the rapidly changing needs of your business.

Dynamic LPAR also allows you to add new system resources such as new hot-plug PCI adapters into your system's configuration without requiring a reboot. Without the optional PowerVM™ Standard Edition (#7794) or PowerVM Enterprise Edition

(#7795) feature, as many as 32 LPARs are supported in a 32-core Power 750. If the PowerVM Standard or Enterprise Edition feature is installed in the system, a maximum of 10 dynamic LPARs for each physical processor can be defined, with a system maximum of 160 dynamic LPARs.

An HMC or IVM is required to manage POWER7 processor-based servers implementing partitioning. Multiple POWER7 processor-based servers can be supported by a single HMC.

If an HMC is used to manage any POWER7 processor-based server, the HMC must be a CR3, or later, model rack-mount HMC or C05, or later, desktide HMC.

When IBM Systems Director is used to manage an HMC or if the HMC manages more than 254 partitions, the HMC should have 3 GB of RAM minimum and be CR3 model, or later, rack-mount or C06, or later, desktide.

PowerVM Editions (optional)

Three optional PowerVM Edition features are now available on the Power 750: PowerVM Express Edition, PowerVM Standard Edition, and PowerVM Enterprise Edition. These are managed using built-in Integrated Virtualization Manager (IVM) software or optionally through use of an HMC.

PowerVM Standard Edition (#7794) and PowerVM Enterprise Edition (#7795) allow customers to create partitions in units of less than 1 CPU (sub-CPU LPARs) and allow the same system I/O to be virtually added to these partitions. The optional features, available for a fee, also include a software component that provides cross-partition workload management.

PowerVM Standard and Enterprise Editions offer:

- Micro-Partitioning™ (up to 10 partitions per processor, 160 per system)
- Virtualized disk and optical devices (VIOS)
- Automated CPU reconfiguration
- Real-time partition configuration and load statistics
- Support for dedicated and shared processor LPAR groups
- Support for manual provisioning of resources

At initial order entry, selecting feature number 7994 or 7995 will result in Micro-Partitioning to be enabled during manufacture and the enabling software media and publications to be shipped to the customer. When ordering feature number 7994 or 7995 as an MES, an activation key will be posted on an IBM Web site, and the customer must retrieve it and install it on the system.

The IBM Web site is

<http://www-912.ibm.com/pod/pod>

Other features of PowerVM Editions:

- If any processors in a system have the Virtualization feature, all active processors must have it.
- Once the Virtualization feature is installed in a system, it cannot be removed.
- Virtual Ethernet and Virtual Storage are part of PowerVM Editions.

PowerVM Enterprise Edition also includes Live Partition Mobility, which allows for the movement of a logical partition from one POWER6™ or POWER7 server to another with no application downtime, and Active Memory Sharing, which dynamically reallocates memory between running logical partitions on a server. Also available is PowerVM Express (#7793), designed for users looking for an introduction to more advanced virtualization features at a highly affordable price. With PowerVM Express and IVM, users can create up to three partitions on the server, leverage (VIOS), utilize Shared Dedicated Capacity to help optimize use of processor cycles, and even

try out the Shared Processor Pool. With its intuitive browser-based interface, IVM is easy to use and helps reduce the time and effort required to manage virtual devices, processors, and partitions. An HMC is not required.

Notes:

- PowerVM 2.1.2.11 with Fix Pack 22.1 and Service Pack 1, or later, and a supported AIX or Linux operating system level are minimum requirements for performing Live Partition Mobility functions on POWER7. Refer to the [Software requirements](#) section for more information on minimum AIX and Linux OS levels.
- Active Memory Sharing is planned to be supported with the availability of SLES 11 SP1.

Customers can upgrade from PowerVM Express to either PowerVM Standard or PowerVM Enterprise, or they can upgrade from PowerVM Standard to PowerVM Enterprise.

By upgrading to PowerVM Standard or PowerVM Enterprise, users gain the ability to create up to 160 logical partitions on the Power System 750. Users also gain the ability to manage their PowerVM enabled machine with either an HMC or the Integrated Virtualization Manager.

By upgrading to PowerVM Enterprise, users can leverage Live Partition Mobility and Active Memory Sharing.

Active Memory Expansion (optional)

Active Memory Expansion is an innovative POWER7 technology that allows the effective maximum memory capacity to be much larger than the true physical memory maximum. Sophisticated compression/decompression of memory content can allow memory expansion up to 100%. This can allow a partition to do significantly more work or support more users with the same physical amount of memory. Similarly, it can allow a server to run more partitions and do more work for the same physical amount of memory.

Active Memory Expansion is available for partitions running AIX 6.1, or later. Technology Level 4 with SP2 is needed.

Active Memory Expansion uses CPU resource to compress/decompress the memory contents. The trade-off of memory capacity for processor cycles can be an excellent choice, but the degree of expansion varies, depending on how compressible the memory content is, and it also depends on having adequate spare CPU capacity available for this compression/decompression. Tests in IBM laboratories using sample workloads showed excellent results for many workloads in terms of memory expansion per additional CPU utilized. Other test workloads had more modest results.

Clients have a great deal of control over Active Memory Expansion usage. Each individual AIX partition can turn on or turn off Active Memory Expansion. Control parameters set the amount of expansion desired in each partition to help control the amount of CPU used by the Active Memory Expansion function. An IPL is required for the specific partition that is turning memory expansion on or off. Once turned on, there are monitoring capabilities in standard AIX performance tools such as lparstat, vmstat, topas, and svmon.

A planning tool is included with AIX 6.1 TL4, allowing you to sample actual workloads and estimate both how expandable the partition's memory is and how much CPU resource is needed. Any Power Systems model can run the planning tool. In addition, a one-time, 60-day trial of Active Memory Expansion is available to provide more exact memory expansion and CPU measurements. The trial can be requested using the Capacity on Demand Web page

<http://www.ibm.com/systems/power/hardware/cod/>

Active Memory Expansion is enabled by a chargeable hardware feature (#4792), which can be ordered with the initial order of the server or as an MES order. A

software key is provided when the enablement feature is ordered, which is applied to the server. An IPL is not required to enable the server. The key is specific to an individual server and is permanent. It cannot be moved to a different server.

The additional CPU resource used to expand memory is part of the CPU resource assigned to the AIX partition running Active Memory Expansion. Normal licensing requirements apply.

Power 750 Capacity BackUp (CBU) capability

(Applies to IBM i only)

The Power 750 systems' CBU designation can help meet your requirements for a second system to use for backup, high availability, and disaster recovery. It enables you to temporarily transfer IBM i processor license entitlements and 5250 Enterprise Enablement entitlements purchased for a primary machine to a secondary CBU-designated system. Temporarily transferring these resources instead of purchasing them for your secondary system may result in significant savings. Processor activations cannot be transferred.

The CBU specify feature 0444 is available only as part of a new server purchase. Certain system prerequisites must be met and system registration and approval are required before the CBU specify feature can be applied on a new server. Standard IBM i terms and conditions do not allow either IBM i processor license entitlements or 5250 OLTP (Enterprise Enablement) entitlements to be transferred permanently or temporarily. These entitlements remain with the machine they were ordered for. When you register the association between your primary and on-order CBU system, you must agree to certain terms and conditions regarding the temporary transfer.

After a CBU system designation is approved and the system is installed, you can temporarily move your optional IBM i processor license entitlement and 5250 Enterprise Enablement entitlements from the primary system to the CBU system when the primary system is down or while the primary system processors are inactive. The CBU system can then better support failover and role swapping for a full range of test, disaster recovery, and high availability scenarios. Temporary entitlement transfer means that the entitlement is a property transferred from the primary system to the CBU system and may remain in use on the CBU system as long as the registered primary and CBU system are in deployment for the high availability or disaster recovery operation.

The primary system for a Power 750 (8233-E8B) server can be:

- 9179-MHB
- 9117-MMB
- 8233-E8B
- 9117-MMA
- 9406-MMA
- 9406-570
- 8234-EMA
- 8204-E8A
- 9409-M50
- 9406-550

These systems have IBM i software licenses with an IBM i P20 or P30 software tier. The primary machine must be in the same enterprise as the CBU system.

Before you can temporarily transfer IBM i processor license entitlements from the registered primary system, you must have more than one IBM i processor license on the primary machine and at least one IBM i processor license on the CBU server. An activated processor must be available on the CBU server to use the transferred entitlement. You can then transfer any IBM i processor entitlements above the minimum one, assuming the total IBM i workload on the primary system does not require the IBM i entitlement you would like to transfer during the time of the transfer. During this temporary transfer, the CBU system's internal records of its

total number of IBM i processor license entitlements are not updated, and you may see IBM i license noncompliance warning messages from the CBU system. These warning messages in this situation do not mean you are not in compliance. Before you can temporarily transfer 5250 entitlements, you must have more than one 5250 Enterprise Enablement entitlement on the primary server and at least one 5250 Enterprise Enablement entitlement on the CBU system. You can then transfer the entitlements that are not required on the primary server during the time of transfer and that are above the minimum of one entitlement.

For example, if you have a 6-core Power 750 as your primary system with two IBM i processor license entitlements (one above the minimum) and two 5250 Enterprise Enablement entitlements (one above the minimum), you can temporarily transfer only one IBM i entitlement and one 5250 Enterprise Enablement entitlement. During the temporary transfer, the CBU system's internal records of its total number of IBM i processor entitlements is not updated, and you may see IBM i license noncompliance warning messages from the CBU system.

If your primary or CBU machine is sold or discontinued from use, any temporary entitlement transfers must be returned to the machine on which they were originally acquired. For CBU registration and further information, visit

<http://www.ibm.com/systems/power/hardware/cbu>

I/O drawer availability

Four 12X attached I/O drawers are supported on the Power 750, providing extensive capability to expand the overall server expandability and connectivity.

- Feature 5802 provides PCIe slots and SSF SAS disk slots.
- Feature 5877 provides PCIe slots.
- Feature 5796 provides PCI-X slots.
- The 7314-G30 provides PCI-X slots (supported but not orderable).

Three disk-only I/O drawers are also supported, providing large storage capacity and multiple partition support:

- Feature 5886 EXP12S holds 3.5-inch SAS disk or SSD.
- Feature 5786 EXP24 holds 3.5-inch SCSI disk (used for migrating existing SCSI drives).
- The 7031-D24 holds 3.5-inch SCSI disk (supported but not orderable).

TotalStorage® EXP24 Disk Drawer (#5786)(supported only -- not orderable)

The TotalStorage EXP24 (#5786) is a 4 EIA unit drawer and mounts in a 19-inch rack. The front of the IBM TotalStorage EXP24 Ultra320 SCSI Expandable Storage Disk Enclosure has bays for up to 12 disk drives organized in two SCSI groups of up to six drives. The rear also has bays for up to 12 disk drives organized in two additional SCSI groups of up to six drives plus slots for the four SCSI interface cards. Each SCSI drive group can be connected by either a Single Bus Ultra320 SCSI Repeater Card (#5741) or a Dual Bus Ultra320 SCSI Repeater Card (#5742). This allows the EXP24 to be configured as four sets of six bays, two sets of 12 bays, or two sets of six bays plus one set of 12 bays.

The EXP24 feature 5786 has three cooling fans and two power supplies to provide redundant power and cooling. The SCSI disk drives contained in the EXP24 are controlled by PCI-X SCSI adapters connected to the EXP24 SCSI repeater cards via SCSI cables. The PCI-X adapters are located in the Power 750 system unit or in an attached I/O drawer with PCI-X slots.

The EXP24S SCSI Disk Drawer is an earlier technology drawer compared to the later SAS EXP12S drawer. It is used to house the older SCSI disk drives that are supported but no longer orderable.

The following feature number I/O drawers are available for order on the Power 750.

PCI-X DDR 12X Expansion Drawer (#5796)

The PCI-X DDR 12X Expansion Drawer (#5796) is a 4 EIA unit tall drawer and mounts in a 19-inch rack. Feature 5796 is 8.8 inches wide and takes up half the width of the 4 EIA rack space. Feature 5796 requires the use of a feature 7314 drawer-mounting enclosure. The 4 EIA tall enclosure can hold up to two feature 5796 drawers mounted side by side in the enclosure. The PCI-DDR 12X Expansion Drawer has six 64-bit, 3.3 V, PCI-X DDR slots running at 266 MHz that use blind-swap cassettes and support hot plugging of adapter cards. The drawer includes redundant hot-plug power and cooling. The client must select one of the two available interface adapters for use in the feature 5796 drawer, either the Dual-Port 12X Channel Attach Adapter -- Long Run (#6457) or the Dual-Port 12X Channel Attach Adapter Short Run (#6446). The adapter selection is based on how close the host system or the next I/O drawer in the loop is physically located.

A maximum of four feature 5796 drawers can be placed on the same 12X loop. Mixing features 5802 or 5877 and 5796 on the same loop is not supported. Mixing feature 5796 and the 7314-G30 on the same loop is supported with a maximum of four drawers total per loop. A minimum configuration of two 12X cables (either SDR or DDR) and two ac power cables and two SPCN cables is required to ensure proper redundancy. The drawer attaches to the host CEC enclosure with a 12X adapter in a GX slot via 12X SDR or DDR cables.

The Power 750 uses GX Dual-port 12X Channel Attach (#5609) or GX Dual-port 12X Channel Attach (#5616) to attach a feature 5796 12X I/O Drawer using SDR speed, no matter which GX adapter is used.

PCI-X DDR 12X Expansion Drawer (7314-G30) (supported, not orderable)

The 7314-G30 is equivalent to the feature 5796 described above with one key difference -- IBM i does not support this I/O drawer. Otherwise, it provides the same six PCI-X DDR slots per unit and has the same configuration rules/considerations as feature 5796.

12X I/O Drawer PCIe, SFF disk (#5802)

This feature provides a 4U high 19-inch I/O drawer containing 10 PCIe 8x I/O adapter slots and 18 SAS hot-swap SFF SAS disk bays, which can be used for either disk drives or SSDs. Using 146 GB disk drives, the feature 5802 provides up to 2.6 TB of storage.

The 18 disk bays can be organized either into one group of 18 bays (AIX/Linux), two groups of nine slots (AIX/IBM i/Linux), or four groups of four or five bays (AIX/Linux). Selecting either one, two, or four groups of drive bays is done with a mode switch on the drawer.

A maximum of two feature 5802 drawers can be placed on the same 12X loop. Mixing feature 5802 and feature 5796 and the 7314-G30 on the same loop is not supported. Mixing feature 5802 and feature 5877 on the same loop is supported with a maximum of two drawers total per loop. The PCIe adapter slots use Gen 3 blind-swap cassettes and support hot plugging of adapter cards. A minimum configuration of two 12X DDR cables and two ac power cables and two SPCN cables is required to ensure proper redundancy. 12X SDR cables are not supported. The drawer attaches to the host CEC enclosure with a 12X adapter in a GX slot via 12X DDR cables (#1861/#1862/#1864/#1865).

The Power 750 uses GX Dual-port 12X Channel Attach (#5609) or GX Dual-port 12X Channel Attach (#5616) to attach a feature 5802 12X I/O Drawer. The feature 5609 provides the higher capacity bandwidth (DDR).

12X I/O Drawer PCIe, No disk (#5877)

This feature provides a 4U high 19-inch I/O drawer containing 10 PCIe 8x I/O adapter slots.

A maximum of two feature 5877 drawers can be placed on the same 12X loop. Mixing features 5877 and 5796/7314-G30 on the same loop is not supported. Mixing features 5802 and 5877 on the same loop is supported with a maximum of two drawers total per loop. The PCIe adapter slots use Gen 3 blind-swap cassettes and support hot plugging of adapter cards. A minimum configuration of two 12X DDR cables and two ac power cables and two SPCN cables is required to ensure proper redundancy. 12X SDR cables are not supported. The drawer attaches to the host CEC enclosure with a 12X adapter in a GX slot via 12X DDR cables (#1861/#1862/#1864/#1865).

The Power 750 uses GX Dual-port 12X Channel Attach (#5609) or GX Dual-port 12X Channel Attach (#5616) to attach a feature 5877 12X I/O Drawer. Feature 5609 provides the higher capacity bandwidth (DDR).

Note that conversions between a diskless feature 5877 and a feature 5802 with disk bays are not available.

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 SSD 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 feature 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 are 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.

The feature 5886 can also be directly attached to the SAS port on the rear of the Power 750, 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 feature 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.

19-inch racks

The Model 8233-E8B 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.

1.3-Meter Rack (#0555)

The 1.3-Meter Rack (#0555) is a 25 EIA unit rack. The rack that is delivered as feature 0555 is the same rack delivered when you order the 7014-S25 rack. Order the feature 0555 only when required to support rack integration of MES orders prior to shipment from IBM.

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.

IBM Power Systems Deployment-ready Services

IBM offers a portfolio of integration, configuration, and customization services for IBM Power Systems. These Deployment-ready Services are designed to accelerate customer solution deployment and reduce related resources and cost. Offerings include:

- Integration
 - Component integration
 - Rack integration
 - Operating system preinstallation
 - Unit personalization
 - Third-party hardware/software installation
 - Customer Specified Placement
- Asset tagging: Standard tagging Radio Frequency Item Device (RFID)
- Special packaging: Box consolidation
- System customization: Remote access Partitioning Customized operating system/firmware

For more information on Deployment-ready Services, refer to

<http://www.ibm.com/power/deploymentreadyservices/>

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 and IBM i operating systems provide 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 processor-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. 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. There are two service strategies for non-HMC systems
 - Full system partition: A single partition owns all the server resources and only one operating system may be installed.
 - Partitioned system: In this configuration, the system can have more than one partition and can be running more than one operating system. In this environment, partitions are managed by the Integrated Virtualization Manager (IVM), which provides some of the functions provided by the HMC.

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
- Service Focal Point Lite on IVM

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-level 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 service intervention.

First Failure Data Capture 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 service 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 flathead 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 Electronics 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 at

<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

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

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 750 Express 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 via the IBM web site

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

Statement of general direction

IBM plans for PowerVM to support up to 320 logical partitions on the Power 750 server and up to 640 logical partitions on the Power 770 and 780 servers. For future POWER7 systems, IBM plans for PowerVM to support up to 1,000 logical partitions per server.

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 during first half 2010. For additional questions on the availability of this release, contact Red Hat.

IBM plans for PowerVM Lx86 to support POWER7 systems in second quarter 2010.

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 8233 machine type:

Description	MT	Model	Feature
IBM Power 750	8233	E8B	
Specify Code for External High Speed Modem	8233	E8B	0032
Mirrored System Disk Level, Specify Code	8233	E8B	0040
Device Parity Protection-All, Specify Code	8233	E8B	0041
Mirrored System Bus Level, Specify Code	8233	E8B	0043
Device Parity RAID-6 All, Specify Code	8233	E8B	0047
RISC-to-RISC Data Migration	8233	E8B	0205
AIX Partition Specify	8233	E8B	0265
Linux Partition Specify	8233	E8B	0266
IBM i Operating System Partition Specify	8233	E8B	0267
CSC Specify	8233	E8B	0275
Specify Custom Data Protection	8233	E8B	0296
Mirrored Level System Specify Code	8233	E8B	0308
RAID Hot Spare Specify	8233	E8B	0347
V.24/EIA232 6.1m (20-Ft) PCI Cable	8233	E8B	0348
V.24/EIA232 15.2m (50-Ft) PCI Cable	8233	E8B	0349
V.35 6.1m (20-Ft) PCI Cable	8233	E8B	0353
V.35 15.2m (50-Ft) PCI Cable	8233	E8B	0354
V.36 6.1m (20-Ft) PCI Cable	8233	E8B	0356
X.21 6.1m (20-Ft) PCI Cable	8233	E8B	0359
X.21 15.2m (50-Ft) PCI Cable	8233	E8B	0360
V.24/EIA232 (80-Ft) PCI Cable	8233	E8B	0365
CBU Specify	8233	E8B	0444
Customer Specified Placement	8233	E8B	0456
SSD Placement Indicator - CEC	8233	E8B	0462
SSD Placement Indicator (5802/5803)	8233	E8B	0463
SSD Placement Indicator - 5886	8233	E8B	0464

19 inch, 1.8 meter high rack	8233	E8B	0551
19 inch, 2.0 meter high rack	8233	E8B	0553
19 inch, 1.3 meter high rack	8233	E8B	0555
IBM i 6.1 with 6.1.1 Machine Code Specify Code	8233	E8B	0566
Rack Filler Panel Kit	8233	E8B	0599
Load Source Not in CEC	8233	E8B	0719
Specify Load Source in #5786	8233	E8B	0725
Specify Load Source in #5802/5803	8233	E8B	0726
Specify #5886 Load Source placement	8233	E8B	0727
#4327 Load Source Specify	8233	E8B	0835
#4328 Load Source Specify	8233	E8B	0836
SAN Load Source Specify	8233	E8B	0837
#3676 Load Source Specify	8233	E8B	0838
#3677 Load Source Specify	8233	E8B	0839
#3678 Load Source Specify	8233	E8B	0840
#4329 Load Source Specify	8233	E8B	0841
#3658 Load Source Specify	8233	E8B	0844
#1884 Load Source Specify	8233	E8B	0851
#1888 Load Source Specify	8233	E8B	0853
#1909 Load Source Specify	8233	E8B	0854
#3587 Load Source Specify	8233	E8B	0855
US TAA Compliance Indicator	8233	E8B	0983
Modem Cable - US/Canada and General Use	8233	E8B	1025
USB Internal Docking Station for Removable Disk Drive	8233	E8B	1103
USB External Docking Station for Removable Disk Drive	8233	E8B	1104
USB 160 GB Removable Disk Drive	8233	E8B	1106
USB 500 GB Removable Disk Drive	8233	E8B	1107
200V 16A 4.3m (14-Ft) TL Line Cord	8233	E8B	1406
125V 4.3m (14-Ft) Line Cord	8233	E8B	1413
200V 1.8m (6-Ft) Locking Line Cord	8233	E8B	1414
4.3m 200V/16A Power Cord S. Africa	8233	E8B	1418
4.3m 200V/16A Power Cord Israel	8233	E8B	1419
4.3m 200V/16A Power Cord EU/Asia	8233	E8B	1420
4.3m 200V/16A Power Cord CH/DK	8233	E8B	1421
200V 1.8m (6-Ft) Locking Line Cord	8233	E8B	1424
200V 1.8m (6-Ft) Watertight Line Cord	8233	E8B	1425
200V 4.3m (14-Ft) Locking Line Cord	8233	E8B	1426
200V 4.3m (14-Ft) Watertight Line Cord	8233	E8B	1427
4.3m 200V/10A Power Cord EU/Asia	8233	E8B	1439
4.3m 200V/10A Power Cord Denmark	8233	E8B	1440
4.3m 200V/10A Power Cord S. Africa	8233	E8B	1441
4.3m 200V/10A Power Cord Swiss	8233	E8B	1442
4.3m 200V/10A Power Cord UK	8233	E8B	1443
4.3m 200V/10A Power Cord Israel	8233	E8B	1445
4.3m 200V/32A Power Cord EU 1-PH	8233	E8B	1449
4.3m 200V/16A Power Cord EU 2-PH	8233	E8B	1450
200V (6-Ft) 1.8m Line Cord	8233	E8B	1451
200V (14-Ft) 4.3m Line Cord	8233	E8B	1452
200V (6-Ft) 1.8m Locking Line Cord	8233	E8B	1453
200V 12A (14-Ft) 4.3m TL Line Cord	8233	E8B	1454
200V (6-Ft) 1.8m Upper Locking Cord	8233	E8B	1458
200V (6-Ft) 1.8m Upper Locking Cord	8233	E8B	1459
4.3m 200V/12A Pwr Cd UK	8233	E8B	1476
4.3m 200V/16A Pwr Cd	8233	E8B	1477
System port/UPS Conversion Cable	8233	E8B	1827
1.5 Meter 12X to 4X Channel Conversion Cable	8233	E8B	1828
0.6 Meter 12X Cable	8233	E8B	1829
1.5 Meter 12X cable	8233	E8B	1830
8.0 Meter 12X Cable	8233	E8B	1834
3.0 Meter 12X Cable	8233	E8B	1840
3 Meter 12X to 4X Channel Conversion Cable	8233	E8B	1841
10 Meter 12X to 4X Enhanced Channel Conversion Cable	8233	E8B	1854
0.6 Meter 12X DDR Cable	8233	E8B	1861
1.5 Meter 12X DDR Cable	8233	E8B	1862
8.0 Meter 12X DDR Cable	8233	E8B	1864
3.0 Meter 12X DDR Cable	8233	E8B	1865
Op Panel Cable for Rack-mount Drawer w/2.5" DASD	8233	E8B	1878
146.8GB 10K RPM SAS SFF Disk Drive	8233	E8B	1882

73.4 GB 15K RPM SAS SFF Disk Drive	8233	E8B	1883
69.7 GB 15K RPM SAS SFF Disk Drive	8233	E8B	1884
300GB 10K RPM SFF SAS Disk Drive	8233	E8B	1885
146GB 15K RPM SFF SAS Disk Drive	8233	E8B	1886
139GB 15K RPM SFF SAS Disk Drive	8233	E8B	1888
69GB SFF SAS Solid State Drive	8233	E8B	1890
4 GB Single-Port Fibre Channel PCI-X 2.0 DDR Adapter	8233	E8B	1905
69GB SFF SAS Solid State Drive	8233	E8B	1909
4 GB Dual-Port Fibre Channel PCI-X 2.0 DDR Adapter	8233	E8B	1910
PCI-X DDR Dual Channel Ultra320 SCSI Adapter	8233	E8B	1912
4-Port 10/100/1000 Base-TX PCI-X Adapter	8233	E8B	1954
73.4 GB 15,000 RPM Ultra320 SCSI Disk Drive Assembly	8233	E8B	1971
146.8 GB 15,000 RPM Ultra320 SCSI Disk Drive Assembly	8233	E8B	1972
2 Gigabit Fibre Channel PCI-X Adapter	8233	E8B	1977
IBM Gigabit Ethernet-SX PCI-X Adapter	8233	E8B	1978
IBM 10/100/1000 Base-TX Ethernet PCI-X Adapter	8233	E8B	1979
POWER GXT135P Graphics Accelerator with Digital Support	8233	E8B	1980
IBM 2-Port 10/100/1000 Base-TX Ethernet PCI-X Adapter	8233	E8B	1983
1 Gigabit iSCSI TOE PCI-X on Copper Media Adapter	8233	E8B	1986
1 Gigabit iSCSI TOE PCI-X on Optical Media Adapter	8233	E8B	1987
Converter Cable, VHDCI to P, Mini-68 pin to 68 pin, 0.3M	8233	E8B	2118
Ultra 320 SCSI Cable 1 Meter	8233	E8B	2124
Ultra 320 SCSI Cable 3 Meter	8233	E8B	2125
Ultra 320 SCSI Cable 5 Meter	8233	E8B	2126
Ultra 320 SCSI Cable 10 Meter	8233	E8B	2127
Ultra 320 SCSI Cable 20 Meter	8233	E8B	2128
0.55 Meter Ultra 320 SCSI Cable	8233	E8B	2138
Primary OS - IBM i	8233	E8B	2145
Primary OS - AIX	8233	E8B	2146
Primary OS - Linux	8233	E8B	2147
Zero-priced Processor Activation for #8334	8233	E8B	2324
Zero-priced Processor Activation for #8332	8233	E8B	2325
Zero-priced Processor Activation for #8336	8233	E8B	2326
Zero-priced Processor Activation for #8335	8233	E8B	2327
2M LC-SC 50 Micron Fiber Converter Cable	8233	E8B	2456
2M LC-SC 62.5 Micron Fiber Converter Cable	8233	E8B	2459
4 port USB PCIe Adapter	8233	E8B	2728
2-Port USB PCI Adapter	8233	E8B	2738
POWER GXT135P Graphics Accelerator with Digital Support	8233	E8B	2849
ARTIC960Hx 4-Port EIA-232 Cable	8233	E8B	2861
ARTIC960Hx 4-Port X.21 Cable	8233	E8B	2863
ARTIC960Hx 4-Port V.35 (DTE) Cable	8233	E8B	2864
PCIe 2-Line WAN w/Modem	8233	E8B	2893
3M Asynchronous Terminal/Printer Cable EIA-232	8233	E8B	2934
Asynchronous Cable EIA-232/V.24 3M	8233	E8B	2936
8-Port Asynchronous Adapter EIA-232/RS-422, PCI bus	8233	E8B	2943
IBM ARTIC960Hx 4-Port Multiprotocol PCI Adapter	8233	E8B	2947
Cable, v.24 / EIA-232	8233	E8B	2951
Cable, v.35	8233	E8B	2952
Cable, v.36 / EIA-499	8233	E8B	2953
Cable, X.21	8233	E8B	2954
2-Port Multiprotocol PCI Adapter	8233	E8B	2962
Serial-to-Serial Port Cable for Drawer/Drawer-3.7M	8233	E8B	3124
Serial-to-Serial Port Cable for Rack/Rack- 8M	8233	E8B	3125
73.4 GB 15,000 RPM Ultra320 SCSI Disk Drive Assembly	8233	E8B	3278
146.8 GB 15,000 RPM Ultra320 SCSI Disk Drive Assembly	8233	E8B	3279
300 GB 15K RPM SCSI Disk Drive	8233	E8B	3585
69GB 3.5" SAS Solid State Drive	8233	E8B	3586
69GB 3.5" SAS Solid State Drive	8233	E8B	3587
widescreen LCD Monitor	8233	E8B	3632

IBM T541H /L150p 15" TFT Color Monitor	8233	E8B	3637
IBM ThinkVision® L170p Flat Panel Monitor	8233	E8B	3639
ThinkVision L171p Flat Panel Monitor	8233	E8B	3640
IBM T115 Flat Panel Monitor	8233	E8B	3641
ThinkVision L191p Flat Panel Monitor	8233	E8B	3642
IBM T120 Flat Panel Monitor	8233	E8B	3643
IBM T119 Flat Panel Monitor	8233	E8B	3644
IBM T117 Flat Panel Monitor	8233	E8B	3645
73GB 15K RPM SAS Disk Drive	8233	E8B	3646
146GB 15K RPM SAS Disk Drive	8233	E8B	3647
300GB 15K RPM SAS Disk Drive	8233	E8B	3648
450GB 15K RPM SAS Disk Drive	8233	E8B	3649
SAS Cable (EE) Drawer to Drawer 1M	8233	E8B	3652
SAS Cable (EE) Drawer to Drawer 3M	8233	E8B	3653
SAS Cable (EE) Drawer to Drawer 6M	8233	E8B	3654
SAS SFF Cable	8233	E8B	3656
Right Angle SAS Tape Drive Cable	8233	E8B	3657
428GB 15K RPM SAS Disk Drive	8233	E8B	3658
SAS Cable (X) Adapter to SAS Enclosure, Dual Controller/Dual Path 3M:	8233	E8B	3661
SAS Cable (X) Adapter to SAS Enclosure, Dual Controller/Dual Path 6M:	8233	E8B	3662
SAS Cable (X) Adapter to SAS Enclosure, Dual Controller/Dual Path 15M:	8233	E8B	3663
SAS Cable, DASD Backplane to Rear Bulkhead	8233	E8B	3668
SAS Cable, DASD Backplane (Split) to Rear Bulkhead)	8233	E8B	3669
69.7GB 15k rpm SAS Disk Drive	8233	E8B	3676
139.5GB 15k rpm SAS Disk Drive	8233	E8B	3677
283.7GB 15k rpm SAS Disk Drive	8233	E8B	3678
SAS Cable (AI)- Adapter to Internal drive 1M	8233	E8B	3679
3M SAS CABLE, ADPTR TO ADPTR (AA)	8233	E8B	3681
6M SAS CABLE, ADPTR TO ADPTR (AA)	8233	E8B	3682
SAS Cable (AE) Adapter to Enclosure, single controller/single path 3M	8233	E8B	3684
SAS Cable (AE) Adapter to Enclosure, single controller/single path 6M	8233	E8B	3685
SAS Cable (YI) System to SAS Enclosure, Single Controller/Dual Path 1.5M	8233	E8B	3686
SAS Cable (YI) System to SAS Enclosure, Single Controller/Dual Path 3M	8233	E8B	3687
SAS Cable (AT) 0.6 Meter	8233	E8B	3688
SAS Cable (YO) Adapter to SAS Enclosure, Single Controller/Dual Path 1.5 M	8233	E8B	3691
SAS Cable (YO) Adapter to SAS Enclosure, Single Controller/Dual Path 3 M	8233	E8B	3692
SAS Cable (YO) Adapter to SAS Enclosure, Single Controller/Dual Path 6 M	8233	E8B	3693
SAS Cable (YO) Adapter to SAS Enclosure, Single Controller/Dual Path 15 M	8233	E8B	3694
0.3M Serial Port Converter Cable, 9-Pin to 25-Pin	8233	E8B	3925
Asynch Printer/Terminal Cable, 9-pin to 25-pin, 4M	8233	E8B	3926
Serial Port Null Modem Cable, 9-pin to 9-pin, 3.7M	8233	E8B	3927
Serial Port Null Modem Cable, 9-pin to 9-pin, 10M	8233	E8B	3928
1.8 M (6-ft) Extender Cable for Displays (15-pin D-shell to 15-pin D-shell)	8233	E8B	4242
Extender Cable - USB Keyboards, 2M	8233	E8B	4256
VGA to DVI Connection Converter	8233	E8B	4276
70.56GB 15k rpm Disk Unit	8233	E8B	4327
141.12GB 15k rpm Disk Unit	8233	E8B	4328
282.25GB 15k rpm Disk Unit	8233	E8B	4329
8GB (2x4GB) Memory DIMMs, 1066 MHZ, 2Gb DDR3	8233	E8B	4526
16GB (2x8GB) Memory DIMMs, 1066 MHZ, 2Gb DDR3 DRAM	8233	E8B	4527
32GB (2x16GB) Memory DIMMs, 1066 MHZ, 2Gb DDR3 DRAM	8233	E8B	4528
Rack Indicator- Not Factory Integrated	8233	E8B	4650
Rack Indicator, Rack #1	8233	E8B	4651
Rack Indicator, Rack #2	8233	E8B	4652
Rack Indicator, Rack #3	8233	E8B	4653
Rack Indicator, Rack #4	8233	E8B	4654
Rack Indicator, Rack #5	8233	E8B	4655

Rack Indicator, Rack #6	8233	E8B	4656
Rack Indicator, Rack #7	8233	E8B	4657
Rack Indicator, Rack #8	8233	E8B	4658
Rack Indicator, Rack #9	8233	E8B	4659
Rack Indicator, Rack #10	8233	E8B	4660
Rack Indicator, Rack #11	8233	E8B	4661
Rack Indicator, Rack #12	8233	E8B	4662
Rack Indicator, Rack #13	8233	E8B	4663
Rack Indicator, Rack #14	8233	E8B	4664
Rack Indicator, Rack #15	8233	E8B	4665
Rack Indicator, Rack #16	8233	E8B	4666
PCI-X Cryptographic Coprocessor (FIPS 4)	8233	E8B	4764
Active Memory Expansion Enablement	8233	E8B	4792
One Processor of 5250 Enterprise Enablement	8233	E8B	4988
Full 5250 Enterprise Enablement	8233	E8B	4989
Software Preload Required	8233	E8B	5000
Custom Service Specify, Off-Site	8233	E8B	5001Customer Solution Center - Rochester Mfg
Power Dist Unit 1 Phase NEMA	8233	E8B	5160
Power Dist Unit 1 Phase IEC	8233	E8B	5161
Power Dist Unit 2 of 3 Phase	8233	E8B	5162
Power Dist Unit - 3 Phase	8233	E8B	5163
RFID TAGS FOR SERVERS, BLADES, BLADECENTERS, RACKS, AND HMCS	8233	E8B	5524
Sys Console On HMC	8233	E8B	5550
Sys Console-Ethernet No IOP	8233	E8B	5553
GX Dual-port 12X Channel Attach	8233	E8B	5609
Dual Port (SR) Integrated Virtual Ethernet 10Gb Daughter Card	8233	E8B	5613
GX Dual-port 12x Channel Attach	8233	E8B	5616
80/160GB DAT160 SAS Tape Drive	8233	E8B	5619
Dual Port 1Gb Integrated Virtual Ethernet Daughter Card	8233	E8B	5623
4-Port 1Gb Integrated Virtual Ethernet Daughter Card	8233	E8B	5624
Blind Swap Type III Cassette- PCIe, Short Slot	8233	E8B	5646
Blind Swap Type III Cassette- PCI-X or PCIe, Standard Slot	8233	E8B	5647
DAT320 160/320 GB Tape Drive	8233	E8B	5661
SAS RAID Enablement	8233	E8B	5679
DAT160 Data Cartridge	8233	E8B	5689
IBM Gigabit Ethernet-SX PCI-X Adapter	8233	E8B	5700
IBM 10/100/1000 Base-TX Ethernet PCI-X Adapter	8233	E8B	5701
IBM 2-Port 10/100/1000 Base-TX Ethernet PCI-X Adapter	8233	E8B	5706
10Gb FCoE PCIe Dual Port Adapter	8233	E8B	5708
1 Gigabit iSCSI TOE PCI-X on Copper Media Adapter	8233	E8B	5713
1 Gigabit iSCSI TOE PCI-X on Optical Media Adapter	8233	E8B	5714
2 Gigabit Fibre Channel PCI-X Adapter	8233	E8B	5716
4-Port 10/100/1000 Base-TX PCI Express Adapter	8233	E8B	5717
10 Gb Ethernet-SR PCI-X 2.0 DDR Adapter	8233	E8B	5721
10 Gb Ethernet-LR PCI-X 2.0 DDR Adapter	8233	E8B	5722
2-Port Asynchronous EIA-232 PCI Adapter	8233	E8B	5723
10 Gigabit Ethernet-CX4 PCI Express Adapter	8233	E8B	5732
8 Gigabit PCI Express Dual Port Fibre Channel Adapter	8233	E8B	5735
PCI-X DDR Dual Channel Ultra320 SCSI Adapter	8233	E8B	5736
4-Port 10/100/1000 Base-TX PCI-X Adapter	8233	E8B	5740
IBM Single Bus Ultra 320 SCSI Repeater Card	8233	E8B	5741
IBM Dual Bus Ultra 320 SCSI Repeater Card	8233	E8B	5742
SATA Slimline DVD-ROM Drive	8233	E8B	5743
Half High 800GB/1.6TB LTO4 SAS Tape Drive	8233	E8B	5746
IBM LTO Ultrium 4 800 GB Data Cartridge	8233	E8B	5747
POWER GXT145 PCI Express Graphics Accelerator	8233	E8B	5748
4Gbps Fibre Channel (2-Port)	8233	E8B	5749
4 GB Single-Port Fibre Channel PCI-X 2.0 DDR Adapter	8233	E8B	5758
4 Gb Dual-Port Fibre Channel PCI-X 2.0 DDR Adapter	8233	E8B	5759
SATA Slimline DVD-RAM Drive	8233	E8B	5762
2-Port 10/100/1000 Base-TX Ethernet PCI Express Adapter	8233	E8B	5767
2-Port Gigabit Ethernet-SX PCI Express Adapter	8233	E8B	5768
10 Gigabit Ethernet-SR PCI Express Adapter	8233	E8B	5769

10 Gigabit Ethernet-LR PCI Express Adapter	8233	E8B	5772
4 Gigabit PCI Express Single Port Fibre Channel Adapter	8233	E8B	5773
4 Gigabit PCI Express Dual Port Fibre Channel Adapter	8233	E8B	5774
PCI-X EXP24 Ctl-1.5GB No IOP	8233	E8B	5778
PCI-X EXP24 Ctl-1.5GB No IOP	8233	E8B	5782
4 Port Async EIA-232 PCIe Adapter	8233	E8B	5785
TotalStorage EXP24 Disk Dwr	8233	E8B	5786
TotalStorage EXP24 Disk Twr	8233	E8B	5787
PCI-DDR 12X Expansion Drawer	8233	E8B	5796
12X I/O Drawer PCIe, SFF disk	8233	E8B	5802
12X I/O Drawer PCIe, No Disk	8233	E8B	5877
EXP 12S Expansion Drawer	8233	E8B	5886
PCI-X DDR Dual -x4 SAS Adapter	8233	E8B	5900
PCIe Dual-x4 SAS Adapter	8233	E8B	5901
PCI-X DDR Dual - x4 3Gb SAS RAID Adapter	8233	E8B	5902
PCIe 380MB Cache Dual - x4 3Gb SAS RAID Adapter	8233	E8B	5903
PCI-X DDR 1.5GB Cache SAS RAID Adapter	8233	E8B	5904
PCI-X DDR 1.5GB Cache SAS RAID Adapter (BSC)	8233	E8B	5908
PCI-X DDR Dual - x4 SAS Adapter	8233	E8B	5912
Non-paired SAS RAID indicator	8233	E8B	5922
Non-paired PCIe SAS RAID Indicator	8233	E8B	5923
Full width Keyboard -- USB, US English, #103P	8233	E8B	5951
Full width Keyboard -- USB, French, #189	8233	E8B	5952
Full width Keyboard -- USB, Italian, #142	8233	E8B	5953
Full width Keyboard -- USB, German/Austrian, #129	8233	E8B	5954
Full width Keyboard -- USB, UK English, #166P	8233	E8B	5955
Full width Keyboard -- USB, Spanish, #172	8233	E8B	5956
Full width Keyboard -- USB, Japanese, #194	8233	E8B	5957
Full width Keyboard -- USB, Brazilian Portuguese, #275	8233	E8B	5958
Full width Keyboard -- USB, Hungarian, #208	8233	E8B	5959
Full width Keyboard -- USB, Korean, #413	8233	E8B	5960
Full width Keyboard -- USB, Chinese, #467	8233	E8B	5961
Full width Keyboard -- USB, French Canadian, #445	8233	E8B	5962
Full width Keyboard -- USB, Belgian/UK, #120	8233	E8B	5964
Full width Keyboard -- USB, Swedish/Finnish, #153	8233	E8B	5965
Full width Keyboard -- USB, Danish, #159	8233	E8B	5966
Full width Keyboard -- USB, Bulgarian, #442	8233	E8B	5967
Full width Keyboard -- USB, Swiss/French/German, #150	8233	E8B	5968
Full width Keyboard -- USB, Norwegian, #155	8233	E8B	5969
Full width Keyboard -- USB, Dutch, #143	8233	E8B	5970
Full width Keyboard -- USB, Portuguese, #163	8233	E8B	5971
Full width Keyboard -- USB, Greek, #319	8233	E8B	5972
Full width Keyboard -- USB, Hebrew, #212	8233	E8B	5973
Full width Keyboard -- USB, Polish, #214	8233	E8B	5974
Full width Keyboard -- USB, Slovakian, #245	8233	E8B	5975
Full width Keyboard -- USB, Czech, #243	8233	E8B	5976
Full width Keyboard -- USB, Turkish, #179	8233	E8B	5977
Full width Keyboard -- USB, LA Spanish, #171	8233	E8B	5978
Full width Keyboard -- USB, Arabic, #253	8233	E8B	5979
Full width Keyboard -- USB, Thai, #191	8233	E8B	5980
Full width Keyboard -- USB, Russian, #443	8233	E8B	5981
Full width Keyboard -- USB, Slovenian, #234	8233	E8B	5982
Full width Keyboard -- USB, US English Euro, #103P	8233	E8B	5983
Power Control Cable (SPCN) - 2 meter	8233	E8B	6001
Power Control Cable (SPCN) - 3 meter	8233	E8B	6006
Power Control Cable (SPCN) - 15 meter	8233	E8B	6007
Power Control Cable (SPCN) - 6 meter	8233	E8B	6008
Power Control Cable (SPCN) - 30 meter	8233	E8B	6029
Opt Front Door for 1.8m Rack	8233	E8B	6068
Opt Front Door for 2.0m Rack	8233	E8B	6069
1.8m Rack Acoustic Doors	8233	E8B	6248
2.0m Rack Acoustic Doors	8233	E8B	6249
1.8m Rack Trim Kit	8233	E8B	6263
2.0m Rack Trim Kit	8233	E8B	6272
Dual-port 12X Channel Attach- Short Run	8233	E8B	6446
Dual-port 12X Channel Attach- Long Run	8233	E8B	6457
Power Cable -- Drawer to IBM PDU, 14-foot, 250V/10A	8233	E8B	6458
Power Cord 4.3m (14-ft), Drawer To OEM PDU			

(125V, 15A)	8233	E8B	6460
Power Cord 4.3m (14-foot), Drawer to OEM PDU, (250V, 15A), U. S.	8233	E8B	6469
Power Cord 1.8m(6-foot), To wall (125V, 15A)	8233	E8B	6470
Power Cord 2.7m (9-foot), To wall/OEM PDU, (125V, 15A)	8233	E8B	6471
Power Cord 2.7m (9-foot), To wall/OEM PDU, (250V, 16A)	8233	E8B	6472
Power Cord 2.7m (9-foot), To wall/OEM PDU, (250V, 10A)	8233	E8B	6473
Power Cord 2.7M (9-foot), To wall/OEM PDU, (250V, 13A)	8233	E8B	6474
Power Cord 2.7M (9-foot), To wall/OEM PDU, (250V, 16A)	8233	E8B	6475
Power Cord 2.7M (9-foot), To wall/OEM PDU, (250V, 10A)	8233	E8B	6476
Power Cord 2.7M (9-foot), To wall/OEM PDU, (250V, 16A)	8233	E8B	6477
Power Cord 2.7 M(9-foot), To wall/OEM PDU, (250V, 16A)	8233	E8B	6478
Power Cord (9-foot) , To wall/OEM PDU, (250V, 10A)	8233	E8B	6479
Power Cord 1.8M (6-foot),To wall, (250V, 15A), United States	8233	E8B	6487
Power Cord 2.7M (9-foot), To wall/OEM PDU, (125V, 15A or 250V, 10A)	8233	E8B	6488
4.3m (14-Ft) 3PH/24A Power Cord	8233	E8B	6489
4.3m (14-Ft) 1PH/48A Pwr Cord	8233	E8B	6491
4.3m (14-Ft) 1PH/48-60A Pwr Cord	8233	E8B	6492
Power Cord 2.7M (9-foot), To wall/OEM PDU, (250V, 10A)	8233	E8B	6493
Power Cord 2.7M (9-foot), To wall/OEM PDU, (250V, 10A)	8233	E8B	6494
Power Cord (9-foot), To wall/OEM PDU, (250V, 10A)	8233	E8B	6495
Power Cord 2.7M (9-foot), To wall/OEM PDU, (250V, 10A)	8233	E8B	6496
Power Cord (6-foot), To wall/OEM PDU, (250V, 10A)	8233	E8B	6497
Power Cord (6-foot), To wall/OEM PDU, (250V, 15A)	8233	E8B	6498
Power Cable - Drawer to IBM PDU, 200-240v/10A	8233	E8B	6577
Optional Rack Security Kit	8233	E8B	6580
Modem Tray for 19-Inch Rack	8233	E8B	6586
Power Cord 2.7M (9-foot), To wall/OEM PDU, (125V, 15A)	8233	E8B	6651
4.3m (14-Ft) 1PH/24-30A Pwr Cord	8233	E8B	6654
4.3m (14-Ft) 1PH/24-30A WR Pwr Cord	8233	E8B	6655
4.3m (14-Ft)1PH/24A Power Cord	8233	E8B	6656
Power Cord 2.7M (9-foot), To wall/OEM PDU, (250V, 15A)	8233	E8B	6659
Power Cord (14-foot), Drawer To OEM PDU (125V, 15A)	8233	E8B	6660
Power Cord 3 M (10 ft), Drawer to IBM PDU, 250V/10A	8233	E8B	6665
Power Cord 4.3M (14-foot), Drawer to OEM PDU, (250V, 15A)	8233	E8B	6669
Power Cord (6-foot), To wall (125V, 15A),	8233	E8B	6670
Power Cord 2.7M (9-foot), Drawer to IBM PDU, 250V/10A	8233	E8B	6671
Power Cord 1.5M (5-foot), Drawer to IBM PDU, 250V/10A	8233	E8B	6672
Power Cord 2.7M (9-foot), To wall/OEM PDU, (250V, 10A)	8233	E8B	6680
Power Cord (6-foot), To wall, (250V, 15A)	8233	E8B	6687
PCI 2-Line WAN IOA No IOP	8233	E8B	6805
PCI 4-Modem WAN IOA No IOP	8233	E8B	6808
PCI 2-Line WAN w/Modem NoIOP	8233	E8B	6833
Intelligent PDU+, 1 EIA Unit, Universal UTG0247 Connector	8233	E8B	7109
Environmental Monitoring Probe	8233	E8B	7118

Power Distribution Unit	8233	E8B	7188
Quantity 150 of #2124	8233	E8B	7204
Quantity 150 of #2125	8233	E8B	7205
Quantity 150 of #2126	8233	E8B	7206
Quantity 150 of #2127	8233	E8B	7207
Quantity 150 of #2128	8233	E8B	7208
Quantity 150 of #2138	8233	E8B	7213
SDI Software Pre-Install Indicator	8233	E8B	7305
Dual I/O Unit Enclosure	8233	E8B	7307
I/O Drawer Mounting Enclosure	8233	E8B	7314
Quantity 150 of #4327	8233	E8B	7509
Quantity 150 of #4328	8233	E8B	7510
Quantity 150 of #4329	8233	E8B	7511
Quantity 150 of #3676	8233	E8B	7517
Quantity 150 of #3677	8233	E8B	7518
Quantity 150 of #3678	8233	E8B	7519
Quantity 150 of #3586	8233	E8B	7535
Quantity 150 of #3587	8233	E8B	7536
Quantity 150 of #3658	8233	E8B	7538
Quantity 150 of #3647	8233	E8B	7549
Quantity 150 of #3648	8233	E8B	7564
Quantity 150 of #3649	8233	E8B	7565
One Processor Activation for Processor Feature #8334	8233	E8B	7714
One Processor Activation for Processor Feature #8332	8233	E8B	7715
One Processor Activation for Processor Feature #8336	8233	E8B	7716
One Processor Activation for Processor Feature #8335	8233	E8B	7717
Power Supply, 1725 Watt AC, Hot-swap, Base or Redundant	8233	E8B	7740
2.0m Rack Side Attach Kit	8233	E8B	7780
PowerVM Express	8233	E8B	7793
PowerVM Standard	8233	E8B	7794
PowerVM Enterprise	8233	E8B	7795
Ethernet Cable, 6M, Hardware Management Console to System Unit	8233	E8B	7801
Ethernet Cable, 15m, Hardware Management Console to System Unit	8233	E8B	7802
Side-by-Side for 1.8m Racks	8233	E8B	7840
Ruggedize Rack Kit	8233	E8B	7841
PCI Blind Swap Cassette Kit, Double Wide Adapters, Type II	8233	E8B	7863
Linux Software Preinstall	8233	E8B	8143
Linux Software Preinstall (Business Partners)	8233	E8B	8144
8-core 3.3 GHZ POWER7 Processor Card	8233	E8B	8332
8-core 3.0 GHZ POWER7 Processor Card	8233	E8B	8334
6-core 3.3 GHZ POWER7 Processor Card	8233	E8B	8335
8-core 3.55 GHZ POWER7 Processor Card	8233	E8B	8336
Enhanced DASD/Media Backplane for 2.5" DASD/SATA DVD/Tape with External SAS Port	8233	E8B	8340
Mouse - USB, with Keyboard Attachment Cable	8233	E8B	8841
USB Mouse	8233	E8B	8845
Order Routing Indicator- System Plant	8233	E8B	9169
Language Group Specify - US English	8233	E8B	9300
New AIX License Core Counter	8233	E8B	9440
New IBM i License Core Counter	8233	E8B	9441
New Red Hat License Core Counter	8233	E8B	9442
New SUSE License Core Counter	8233	E8B	9443
Other AIX License Core Counter	8233	E8B	9444
Other Linux License Core Counter	8233	E8B	9445
3rd Party Linux License Core Counter	8233	E8B	9446
VIOS Core Counter	8233	E8B	9447
Month Indicator	8233	E8B	9461
Day Indicator	8233	E8B	9462
Hour Indicator	8233	E8B	9463
Minute Indicator	8233	E8B	9464
Qty Indicator	8233	E8B	9465
Countable Member Indicator	8233	E8B	9466
POWER7 Tivoli® Storage Manager Specify	8233	E8B	9666
Language Group Specify - Dutch	8233	E8B	9700
Language Group Specify - French	8233	E8B	9703
Language Group Specify - German	8233	E8B	9704

Language Group Specify - Polish	8233	E8B	9705
Language Group Specify - Norwegian	8233	E8B	9706
Language Group Specify - Portuguese	8233	E8B	9707
Language Group Specify - Spanish	8233	E8B	9708
Language Group Specify - Italian	8233	E8B	9711
Language Group Specify - Canadian French	8233	E8B	9712
Language Group Specify - Japanese	8233	E8B	9714
Language Group Specify - Traditional Chinese (Taiwan)	8233	E8B	9715
Language Group Specify - Korean	8233	E8B	9716
Language Group Specify - Turkish	8233	E8B	9718
Language Group Specify - Hungarian	8233	E8B	9719
Language Group Specify - Slovakian	8233	E8B	9720
Language Group Specify - Russian	8233	E8B	9721
Language Group Specify - Simplified Chinese (PRC)	8233	E8B	9722
Language Group Specify - Czech	8233	E8B	9724
Language Group Specify -- Romanian	8233	E8B	9725
Language Group Specify - Croatian	8233	E8B	9726
Language Group Specify -- Slovenian	8233	E8B	9727
Language Group Specify - Brazilian Portuguese	8233	E8B	9728
Language Group Specify - Thai	8233	E8B	9729

The following are newly announced features on the specific models of the IBM Power Systems 7014 machine type:

Description	MT	Model	Feature
Rack Content Specify: 8233-E8B - 4U	7014	B42 S25 T00 T42	0297

Feature conversions

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

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

The following conversions are available to customers:

Feature conversions for 8233-E8B virtualization engine features

From FC:	To FC:	Return parts
7793 - PowerVM Express	7794 - PowerVM Standard	No
7793 - PowerVM Express	7795 - PowerVM Enterprise	No
7794 - PowerVM Standard	7795 - PowerVM Enterprise	No

Business Partner information

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

<https://www.ibm.com/partnerworld/mem/sla.jsp?num=110-009>

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 8233-E8B.

8233-E8B 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>

The IBM Systems Information Center provides you with a single information center where you can access product documentation for IBM systems hardware, operating systems, and server software. Through a consistent framework, you can efficiently find information and personalize your access. The IBM Systems Information Center

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

IBM Publications Center Portal

<http://www.ibm.com/shop/publications/order>

The Publications Center is a worldwide central repository for IBM product publications and marketing material with a catalog of 70,000 items. Extensive search facilities are provided, as well as payment options via credit card. A large

number of publications are available online in various file formats, which can currently be downloaded free of charge.

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° - 45°C (41° - 113°F); recommended temperature (operating) 18° - 27°C (64° - 80°F); allowable operating temperature 5° - 35°C (41° - 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 750 minimum system configuration: The Power 750 has four processor slots, each of which can contain a 6-core or 8-core processor. The system can contain up to 512 GB of system memory (128 GB maximum per processor card), five PCI adapters, and multiple media devices, as desired. This flexibility is made available through the many optional features for the Power 750.

Each Power 750 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)
- Choose one processor card from:
 - 6-core 3.3 GHz POWER7 processor card (#8335)
 - 8-core 3.0 GHz POWER7 processor card (#8334)
 - 8-core 3.3 GHz POWER7 processor card (#8332)
 - 4 x 8-core 3.55 GHz POWER7 processor card (#8336)
- Choose six or eight processor activations from:
 - 6 x #7717, or 3 x #7717 and 3 x #2327 with processor card #8335
 - 8 x #7714, or 4 x #7714 and 4 x #2324 with processor card #8334
 - 32 x #7716, or 16 x #7716 and 16 x #2326 with 4x processor card #8336
 - 8 x #7715, or 4 x #7715 and 4 x #2325 with processor card #8332

Notes:

- Features 2324, 2325, 2326, and 2327 are part of IBM Editions.
- Processor activations are only available to SDIs as MES orders.
- Choose 8 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)
 - 32 GB (2 x 16 GB) Memory DIMMs, 1066 MHz, 2 Gb (#4528)

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 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)
 - 300 GB SAS 2.5-inch 15,000 RPM (#1885) (AIX/Linux/VIOS)
 - 69.7 GB SAS 2.5-inch 15,000 RPM (#1884) (IBM i)
 - 139.5 GB SAS 2.5-inch 15,000 RPM (#1888) (IBM i)
 - 69 GB SAS 2.5-inch Solid State Drive (#1890) (AIX/Linux/VIOS)
 - 69 GB SAS 2.5-inch Solid State Drive (#1909) (IBM i)

Notes:

- When feature 2145, IBM i operating system, is selected, a minimum of two DASD is required.
- 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 power supply, Hot-swap (2 x #7740)
- Choose Primary Operating System Indicator from:
 - IBM i (#2145 -- requires #0566 and #0040)
 - AIX (#2146)
 - Linux (#2147)

RAID

There are multiple protection options for disk/SSD drives in the SAS SFF bays in Power 750 system unit or drives in 12X attached I/O drawers or drives in disk-only I/O drawers. Although protecting drives is always recommended, AIX/Linux users may choose to leave some or all drives unprotected at their own risk and IBM supports these configurations. IBM i configuration rules differ in this regard, and IBM supports IBM i partition configurations only when disk/SSD drives are protected.

This disk/SSD drive protection can be provided by AIX/IBM i/Linux software or by the disk/SSD hardware controllers. Mirroring of drives is provided by AIX/IBM i/Linux software. In addition, AIX/Linux supports controllers providing RAID 0, 5, 6, or 10. IBM i integrated storage management already provides striping so IBM i also supports controllers providing RAID 5 or 6. To further augment disk/SSD protection, hot spare capability can be used for protected drives. Specific hot spare prerequisites apply.

An integrated SAS Disk/SSD controller is provided in the Power 750 system unit. It is optionally augmented by a 175 MB write cache and RAID 5 and RAID 6 capability when feature 5679 is added to the configuration. Without feature 5679, the integrated controller supports system mirroring protection for AIX/IBM i/Linux and supports RAID 0 or 10 protection for AIX/Linux. Other disk/SSD controllers are provided as PCI adapters. PCI-X SCSI, PCI-X SAS, and PCIe SAS adapters are supported. PCI Controllers with and without write cache are supported. RAID 5 and RAID 6 on controllers with write cache are supported.

AIX/Linux can use disk drives formatted with 512 byte blocks when being mirrored by the operating system. These disk drives must be reformatted to 528 byte sectors when used in RAID arrays. Although a small percentage of the drive's capacity is lost, additional data protection such as ECC and bad block detection is gained in this reformatting. For example, a 300 GB disk drive when reformatted provides around 283 GB. IBM i always uses drives formatted to 528 byte. IBM Power SSDs are formatted to 528 byte.

RAID 0 (minimum two drives) provides striping without parity for performance, but does not offer any fault tolerance. In data striping, data is broken down into several smaller, equally sized pieces. Each piece is then written to or read from multiple drives. This process increases I/O bandwidth by simultaneously accessing multiple data paths. Because RAID 0 does not offer any redundancy, a single drive failure can result in the loss of all data in a striped set. This means that all of the data on all the drives could be lost if even a single drive fails.

Note that RAID 0 drives can be mirrored by software to provide protection.

RAID 5 (minimum three drives) uses block-level data striping with distributed parity. RAID 5 stripes both data and parity information across three or more drives. Fault tolerance is maintained by ensuring that the parity information for any given block of data is placed on a drive separate from those used to store the data itself. RAID 5 requires N+1 drives to accommodate this parity data, thus the available storage capacity for each array is reduced by one drive to provide protection.

RAID 6 (minimum four drives) uses block-level data striping with dual distributed parity, the same as RAID 5 except RAID 6 uses a second level of independently calculated and distributed parity information for additional fault tolerance. This extra fault tolerance provides data security in the event two drives fail before a drive can be replaced. RAID 6 requires N+2 drives to accommodate the additional parity data.

RAID 10 is RAID 0 plus redundancy. In this type of implementation, an array with an even number of drives is created with mirrored pairs of drives within the array. A RAID 0 stripe set of data is created across the mirrored pairs for performance and for redundancy.

If a protected drive fails, the failing drive can be removed from its hot-plug bay and the drive replaced while the server and partition continue to run. The contents can then be re-created while the system continues to run. Note that until the drive is both replaced and its contents re-created, the protection provided using

just mirroring or RAID 10 is absent for that drive's now unmirrored paired drive. Similarly, the entire RAID 5 array is unprotected until the failed drive is replaced and re-created. RAID 6 and hot spare were designed to provide additional protection.

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)

If installing the IBM i operating system:

- IBM i 6.1 with i 6.1.1 machine code, or later (planned availability: March 16, 2010)

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

- SUSE Linux Enterprise Server 11 for the POWER 750 Express 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 750 Express 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, 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.

Hardware management console (HMC) machine code

If attaching an HMC to a new server or adding function to an existing server that requires a firmware update, the HMC machine code may need to be updated.

To determine the HMC machine code level required for the firmware level on any server, go to the following Web page to access the Fix Level Recommendation Tool (FLRT) on or after the planned availability date for this product. FLRT will identify the correct HMC machine code for the selected system firmware level

<http://www14.software.ibm.com/webapp/set2/flrt/home>

If a single HMC is attached to multiple servers, the HMC machine code level must be updated to the server with the most recent firmware level. All prior levels of server firmware are supported with the latest HMC machine code level.

Boot requirements

- Selection of feature 0837 will indicate boot from SAN.
- If IBM i (#2145) is selected as the primary operating system and SAN boot is not selected (#0837), one of the following Load/Source specify codes must be specified:
 - #0835 -- #4327 (70.56 GB 15K RPM HDD) Load Source Specify
 - #0836 -- #4328 (141.12 GB 15K RPM HDD) Load Source Specify
 - #0838 -- #3676 (69.7 GB 15K RPM HDD) Load Source Specify
 - #0839 -- #3677 (139.5 GB 15K RPM HDD) Load Source Specify
 - #0840 -- #3678 (283.7 GB 15K RPM HDD) Load Source Specify
 - #0841 -- #4329 (282.25 GB 15K RPM HDD) Load Source Specify
 - #0844 -- #3658 (428 GB 15K RPM HDD) Load Source Specify
 - #0851 -- #1884 (69.7 GB 15K RPM SFF HDD) Load Source Specify
 - #0853 -- #1888 (138 GB 15K RPM SFF HDD) Load Source Specify
 - #0854 -- #1890 (69 GB SFF SSD) Load Source Specify
 - #0855 -- #3586 (69 GB SSD) Load Source Specify
- If IBM i (#2145) is selected and the load source disk unit is not in the CEC (system unit), one of the following specify codes must also be selected:
 - #0725 -- Remote Load Source in #5786 or #5787 TotalStorage EXP24 Expansion Drawer/Tower
 - #0726 -- Remote Load Source in #5802 12X I/O Drawer PCIe, SFF Disk
 - #0727 -- Remote Load Source in #5886 EXP 12S Expansion Drawer
 - #0837 -- SAN Load Source Specify (Boot from SAN)
- If IBM i (#2145) is selected, one of the following system console specify codes must be selected:
 - #5550 -- System Console on HMC
 - #5553 -- System Console - Internal LAN

Processor cards

- A minimum of one processor card is required on an order with a maximum of 32 processor cores on four processor cards.
- One, two, three, or four 6-core 3.3 GHz (#8335), or 8-core 3.0 GHz (#8332)/3.3 GHz (#8334) processor cards may be installed in a system. Four 8-core 3.55 GHz (#8336) processor cards may be installed in a system.

- Processor cards (#8332, #8334, #8335, and #8336) may not be mixed in the system.
- All processors must be activated.
 - The 6-core 3.3 GHz processor card (#8335) requires that six processor activation codes be ordered. A maximum of six processor activation code features (6 x #7717, or 3 x #7717 and 3 x #2327) are allowed per processor card.
 - The 8-core 3.0 GHz processor card (#8334) requires that eight processor activation codes be ordered. A maximum of eight processor activation code features (8 x #7714, or 4 x #7714 and 4 x #2324) are allowed per processor card.
 - The 8-core 3.55 GHz processor card (#8336) requires that eight processor activation codes be ordered. A maximum of eight processor activation code features (8 x #7716, or 4 x #7716 and 4 x #2326) are allowed per processor card. Thirty-two processor activations are required.
 - The 8-core 3.3 GHz processor card (#8332) requires that eight processor activation codes be ordered. A maximum of eight processor activation code features (8 x #7715, or 4 x #7715 and 4 x #2325) are allowed per processor card.

Power supply

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

Redundant fans

- Redundant fans standard

Power cords

Two power cords are required.

The Power 750 requires 200-240 V for all configurations.

System memory

- A minimum 8 GB or two DIMMs of memory is required on the Power 750 system.
- Eight memory DIMM slots are on a processor card. The maximum system memory with one processor card is 128 GB. The maximum system memory is 512 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
32 GB 1066 MHz (2 x 16 GB RDIMMs)	4528	0	16

Drawer/Tower attachment:

- 7314-G30 (#5796) PCIX Expansion Drawer
 - Maximum of four drawers per GX adapter (#5609, #5616, or follow-ons) or per 12X loop
 - Maximum of two 12X loops per server (maximum of one loop per server with one processor card installed in the system)
 - Maximum of eight drawers per Power 750 system
- 7031-D24/T24 (#5786/#5787) EXP4 SCSI DASD Drawer/Tower
 - EXP24 drawers/towers are attached to a PCI-X SCSI adapter via one or more SCSI cables.
 - The system maximum is 24.
- Feature number 5886 EXP12S SAS DASD Expansion Drawer
 - 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.
 - The system maximum is 48.
- Feature number 5802 12X I/O Drawer PCIe SFF Disk and feature number 5877 12X I/O Drawer PCIe No Disks
 - A maximum of two per 12X loop is allowed.
 - A maximum of four is supported on the Power 750.
 - No mixing of features 5802 and 5877 is allowed with other drawers on the same loop.

Note: A configuration with two or three feature 5802 or 5877 drawers will not be available until April 30, 2010.

The following list shows I/O drawers that are supported or available on the 8233 machine type and the correct interface to use for each of the drawers.

Feature	Description	Order Status	Interface
5786	EXP24 SCSI Disk Drawer	Supported	SCSI
5787	EXP24 SCSI Disk Tower	Supported	SCSI
5796	PCI-X DDR 12X Exp Drawer	Available	12X
5802	PCIe 12X I/O Drawer (w/Disk Bays)	Available	12X
5877	PCIe 12X I/O Drawer (No Disk Bays)	Available	12X
5886	Exp 12S SAS Disk Drawer	Available	SAS
7031-D24/T24	EXP24 SCSI Disk Drawer/Tower	Supported	SCSI
7214-1U2	Tape and DVD Enclosure	Available	SCSI/SAS
7314-G30	PCI-X DDR 12X I/O Drawer	Supported	12X

Maximum number of attached I/O drawers per system:

Feature	Power 750 (32-core)		
	O/S	AIX	Linux IBM i
5786	24	24	24
5787	24	24	24
5796	8	8	8
5802	4	4	4
5877	4	4	4
5886	48	48	48

7031-D24	24	24	24
7031-T24	24	24	24
7214-1U2	1	1	6
7314-G30	8	8	8

I/O drawers are connected to the adapters in the CEC with the following cables:

- Data transfer cables:
 - 12X DDR cables for the feature 5802 and 5877 I/O drawers
 - 12X SDR or DDR cables for the feature 5796 and 7314-G30 I/O drawers
- Power control cables

12X I/O drawer cable connections are always made in loops to help protect against a single point-of-failure resulting from an open, missing, or disconnected cable. A system with nonlooped configurations could experience degraded performance and serviceability. If a nonloop connection is detected, a problem is reported.

The first 12X I/O drawer attached in any I/O drawer loop requires two data transfer cables. Each additional drawer in the loop (up to the maximum allowed) requires one additional data transfer cable.

The first 12X I/O drawer attached to a system unit requires two power control cables. Each additional I/O drawer added to a system requires one additional power control cable. Each system has one power control loop. All I/O drawers attached to a system are included in the same power control loop. Power control cable loops are different in this regard from data transfer cable loops.

Dual-Port 12X Adapter Options

Dual-Port 12X Channel Attach Adapter (#6446): Use the short run adapter for feature 5796 or 7314-G30 expansion I/O drawers located in close proximity to the host system or to other drawers in the I/O expansion loop. This adapter does not include signal repeaters.

Dual-Port 12X Channel Attach Adapter (#6457): Use the long run adapter for feature 5796 or 7314-G30 expansion I/O drawers located farther from the host system or other I/O drawers in the I/O expansion loop. This adapter includes signal repeaters to accommodate the longer cable lengths.

12X Cable Choice

Each feature 5796 or 7314-G30 12X drawer requires one Dual-Port 12X Channel Adapter, either Short Run (#6446) or Long Run (#6457). The choice of adapters is dependent on the distance to the next 12X Channel connection in the loop, either to another I/O drawer or the system unit. The following table identifies the supported cable lengths for each 12X Channel adapter. I/O drawers containing the Short Run adapter can be mixed in a single loop with I/O drawers containing the Long Run adapter. In this table, a "Yes" indicates that the 12X cable identified in that column can be used to connect the drawer configuration identified to the left. A "No" means it cannot be used. The 12X DDR or SDR cables can be used with the feature 5796 or 7314-G30.

	12X Cable Options			
	0.6 M	1.5 M	3.0 M	8.0 M
(#1829) (1) (#1830) (1) (#1840) (2) (#1834) (3)				
12X DDR	(#1861) (1) (#1862) (1) (#1865) (2) (#1864) (3)			
5796 to 5796 w/12X Short Run adapter (#6446) in both drawers	Yes	Yes	No	No
5796 w/ 12X Short Run adapter (#6446)				

to 5796 w/ 12X Long Run adapter (#6457)	Yes	Yes	Yes	No
5796 to 5796 w/12X Long Run adapter (#6457) in both drawers	Yes	Yes	Yes	Yes
5796 w/12X Short Run adapter (#6446) to system unit	No	Yes	Yes	No
5796 w/12X Long Run adapter (#6457) to system unit	No	Yes	Yes	Yes

¹ The 0.6M and 1.5M 12X cables (#1829/#1830 or #1861/#1862) have very limited use due to their short length. They cannot be used to connect to a system drawer because of the short length. They are intended for use between two feature 5796 or 7314-G30 drawers mounted side by side in the same enclosure (#7314). They can also be used to connect between two modules located one beneath the other in a 19-inch rack.

² It is possible in some limited configurations to use the 3.0 M, 12X cable (#1840 or #1865) to locate 5796 modules in adjacent racks. The cable length requires careful management of each drawer location within the rack. The best choice for connecting a feature 5796 or G30 I/O Drawer in an adjacent rack is the 8.0 M, 12X cable (#1834 or #1864).

³ The 8M 12X cable (#1834 or #1864) is intended for use when connecting between two modules that are located in adjacent racks. This cable may not be connected to the 12X Short Run adapter (#6446).

PCI card slots

The Power 750 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. A GX+ slot shares this slot.
- Slot 3 is a PCIe x8 full-length slot.
- Slots 4 and 5 are PCI-X DDR 266 MHz full-length slots.
- All slots are hot pluggable except slots 1 and 2 when used as GX slots.

Note: Optional 12X GX+ and GX++ adapters are used for attaching I/O expansion drawers with PCI slots and, optionally, disk/SSD bays.

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 750 is three. Not supported under IBM i.

I/O adapters

- The 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.
- To install a GX++ adapter in the system, two or more processor cards are required.

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
2-port USB PCI		2738	2	Short
8-port Asynchronous EIA-232		2943	2	Short
4-port ARTIC960Hx		2947	2	Long
2-port Multiprotocol		2962	2	Short
GXT135P Graphics Accelerator		2849/1980	2	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
GX Dual-port 12x Channel Attach	5616		1	GX+ slot
2-port 1 Gb IVE Daughter Card		5623	1	N/A
4-port 1 Gb IVE Daughter Card	5624		1	N/A
SAS RAID Enablement Card	5679		1	N/A
Gigabit Ethernet		5700/1978	2	Short
10/100/1000 Ethernet		5701/1979	2	Short
2-port 10/100/1000 Ethernet	5706	1983	2	Short
10 Gigabit FCoE PCIe Dual Port	5708		3	Short
ISCI TOE Gb Ethernet (Copper)	5713	1986	2	Short
ISCI TOE Gb Ethernet (Fiber)		5714/1987	2	Short
2 Gb Fibre Channel PCI-X		5716/1977	2	Short
4-port 1 Gb Ethernet PCI-e 4x	5717		3	Short
10 Gb Ethernet - Short Reach		5721	2	Short
10 Gb Ethernet - Long Reach		5722	2	Short
2-port Asynchronous EIA-232		5723	2	Short
10 Gigabit Ethernet-CX4 PCI Exp.	5732		3	Short
8 Gb Dual-port Fibre Channel	5735		3	Short
PCI-X Ultra320 SCSI DDR	5736	1912	2	Short
4-port 10/100/1000 Ethernet		5740/1954	2	Short
GXT145 PCIe Graphics Accelerator	5748		3	Short
2-port 4 Gbps Fibre Channel	5749		2	Short
1-port 4 Gb Fibre Channel		5758/1905	2	Short
2-port 4 Gb Fibre Channel	5759	1910	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
1-port 4 Gb Fibre Channel		5773	3	Short
2-port 4 Gb Fibre Channel	5774		3	Short
PCI-X EXP24 Ctl-1.5 GB No IOP		5778	1	Long
4-port Asynch EIA-232 PCIe	5785		3	Short
SAS Controller PCI-X 2.0		5900	2	Short
PCIe Dual-x4 SAS	5901		3	Short
PCI-X DDR Dual-x4 SAS RAID		5902	2	Long
PCIe 380MB Cache Dual-x4 SAS RAID	5903		3	Short
PCI-X DDR Dual-x4 SAS RAID	5904		1	Long
PCI-X DDR Dual-x4 SAS		5912	2	Short
PCI 2-line WAN IOA, no IOP		6805	2	Short
PCI 4-Modem WAN IOA, no IOP	6808		2	Short
PCI 4-Modem WAN IOA, no IOP, CIM	6809		2	Short
PCI 2-line WAN w/Modem, no IOP		6833	2	Short
PCI 2-line WAN w/Modem, no IOP, CIM		6834	2	Short

Note: Maximums are for CEC only.

Storage devices/bays

- The Power 750 has a slim media bay that contains a mandatory DVD-RAM (#5762 or follow-on) and a half-high bay that can contain a tape drive or removable disk drive.

- Feature number 8340 must be selected and supports only SFF disks or SSD; 3.5-inch drives are not supported with feature 8340:
 - Feature number 1878 must be selected.
 - One of feature numbers 1882, 1883, 1884, 1885, 1886, 1888, 1890, or 1909 must be selected (no disks/SSD are required if feature number 0837 is selected).
 - If connection of a feature 5886 EXP12S drawer is desired using the external SAS port on feature 8340, feature number 3668 or 3669 is required.
 - If tape device feature 5619 is installed in the half-high media bay, feature 3656 must be selected.
 - If a tape device feature 5746 or 5661 is installed in the half-high media bay, feature 3657 must be selected.
- Split DASD backplane support requirements:
 - High-function DASD backplane (#8340, or follow-on).
 - SAS Cable, DASD Backplane (Split) to Rear Bulkhead (#3669). Feature 3669 replaces feature 3668 in this configuration.
 - SAS Adapter (#5900, #5901, #5912, or follow-on).
 - External SAS cable.
 - SAS Cable feature 3669 is not available with feature 2145 (IBM i).
- Solid State Drive (SSDs)(#1890, #1909, #3586, #3587) support restrictions:
 - SFF features 1890 and 1909 are supported in the Power 750 CEC.
 - 3.5-inch features 3586 and 3587 are not supported in the Power 750 CEC.
 - SSDs and disk drives (HDDs) are not allowed to mirror each other.
 - SSDs are not supported by features 5900, 5901, 5902, and 5912.
 - A maximum of eight per feature 5886 drawer is allowed. No mixing of SSDs and HDDs is allowed in a feature 5886. A maximum of one feature 5886 EXP12S drawer 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 port on the Power 750.
 - In a Power 750 with a split backplane, SSDs and HDDs may be placed in either "split" but no mixing of SSDs and HDDs within a split is allowed. IBM i does not support split DASD mode.
 - In a Power 750 without a split backplane, SSDs and HDDs may be mixed in any combination. However, they cannot be in the same RAID array.
- DASD/Data Protection -- if IBM i (#2145) is selected, one of the following is required:
 - Disk mirroring (default) -- requires feature 0040, 0043, or 0308
 - SAN boot (#0837)
 - RAID -- requires feature 5679 and either feature 0041 or 0047
 - Mixed Data Protection (#0296)

Figure 3. Storage device features

Device	Maximum quantity	Bay	Orderable feature number	Supported feature number
DVD-ROM (SATA)	1	Slim		5743
DVD-RAM (SATA)	1	Slim	5762	
80/160GB DAT160 Tape-SAS	1	Half high	5619	
800GB/1.6TB LTO4 Tape-SAS	1	Half high	5746	
DAT320 160/320GB Tape-SAS	1	Half high	5661	
Internal Docking Station for Removable Disk Drive	1	Half high	1103	

Note: The DAT320 160/320GB Tape-SAS (#5661) is planned to be supported by the IBM i operating system on March 16, 2010.

Device	Maximum quantity		Bay	Orderable feature number
AIX IBM i Linux				
146.8 GB 15K, SAS, SFF	80	0	80	DASD 1-8, 1882 72 in 4 x #5802
73.4 GB 15K, SAS, SFF	80	0	80	DASD 1-8, 1883 72 in 4 x #5802
69.7 GB 15K, SAS, SFF	0	80	0	DASD 1-8, 1884 72 in 4 x #5802
300 GB 10K, SAS, SFF	80	0	80	DASD 1-8, 1885 72 in 4 x #5802
146.8 GB 15K, SAS, SFF	80	0	80	DASD 1-8, 1886 72 in 4 x #5802
139.5 GB 15K, SAS, SFF	0	80	0	DASD 1-8, 1888 72 in 4 x #5802
69 GB SAS, SFF, Solid-state	80	0	80	DASD 1-8, 1890 72 in 4 x #5802
69 GB SAS, SFF, Solid-state	0	80	0	DASD 1-8, 1909 72 in 4 x #5802
69 GB SAS, SFF, Solid-state	328	0	328	3586 328 in 41 x #5886
69 GB SAS, SFF, Solid-state	0	328	0	3587 328 in 41 x #5886

Note: Eight disks or solid-state drives maximum can be installed internally; 72 disks or solid-state drives maximum can be installed in 4 x #5802. Features 3586 and 3587 cannot be installed internally. 8 x #3586 or #3587 can be placed in each #5886.

Device	Maximum quantity		Bay	Orderable feature number	Supported feature number
AIX IBM i Linux					
73.4 GB 15K,RPM SAS	576	0	576	48 x #5886	3646
146.8 GB 15K RPM, SAS	576	0	576	48 x #5886	3647
300 GB 15K RPM, SAS	576	0	576	48 x #5886	3648
450 GB 15K RPM, SAS	576	0	576	48 x #5886	3649
69.8 GB 15K RPM, SAS	0	576	0	48 x #5886	3676
139.6 GB 15K RPM, SAS	0	576	0	48 x #5886	3677
283.8 GB 15K RPM, SAS	0	576	0	48 x #5886	3678
428.4 GB 15K RPM, SAS	0	576	0	48 x #5886	3658

Note: 3.5-inch DASD are not supported in the 8233-E8B CEC.

Device	Maximum quantity		Bay	Orderable feature number	Supported feature number
AIX IBM i Linux					
73.4 GB 15K RPM, SCSI	576	0	576	See note	3278/1971
146.8 GB 15K RPM, SAS	576	0	576	See note	3279/1972

SCSI						
300 GB 15K RPM,	576	0	576	See note		3585
SCSI						
70.56 GB 15K RPM,	0	576	0	See note		4327
SCSI						
141.14 GB 15K RPM,	0	576	0	See note		4328
SCSI						
282.25 GB 15K RPM,	0	576	0	See note		4329
SCSI						
TotalStorage EXP24	24	24	24	See note		5786
Disk Drawer						
TotalStorage EXP24	24	24	24	See note		5787
Disk Tower						

Note: SCSI disks are not supported in the 8233-E8B CEC. The 576 system maximum is achieved with a maximum of 24 disks in a maximum of 24 Total Storage EXP24 Disk Drawers (#5786) or 24 TotalStorage EXP2 4 Disk Towers (#5787).

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>

Terms and conditions

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
- RAID Base Card

- RAID Auxiliary Card
- RAID Auxiliary card battery
- Thermal Card (TPMD)
- VPD card
- Adapter - GX +
- 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 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://techsupport.services.ibm.com/server/mdownload>

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 numbers
Widescreen LCD Monitor	E8B	3632
IBM T541H /L150p 15" TFT Color Monitor	E8B	3637
IBM ThinkVision L170p Flat Panel Monitor	E8B	3639
ThinkVision L171p Flat Panel Monitor	E8B	3640
IBM T115 Flat Panel Monitor	E8B	3641
ThinkVision L191p Flat Panel Monitor	E8B	3642
IBM T120 Flat Panel Monitor	E8B	3643
IBM T119 Flat Panel Monitor	E8B	3644
IBM T117 Flat Panel Monitor	E8B	3645

Note: These features are 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 8233 machine type:

Description	Model number	Feature Numbers	Purchase price	Minimum Initial/ Monthly MES/ charge	Both/ Support	RP CSU MES
IBM Power 750	E8B				Yes	
Specify Code for External High Speed Modem	E8B	0032			Both	Yes No
Mirrored System Disk Level, Specify Code	E8B	0040			Both	Yes No
Device Parity Protection-All, Specify Code	E8B	0041			Both	Yes No
Mirrored System Bus Level, Specify Code	E8B	0043			Both	Yes No
Device Parity RAID-6 All, Specify Code	E8B	0047			Both	Yes No
RISC-to-RISC Data Migration	E8B	0205		Initial		N/A No
AIX Partition Specify	E8B	0265		Both		Yes No
Linux Partition Specify	E8B	0266		Both		Yes No
IBM i Operating System Partition Specify	E8B	0267		Both		Yes No
CSC Specify	E8B	0275		Both		N/A No

Specify Custom Data Protection	E8B	0296	Both	Yes	No
Mirrored Level System Specify Code	E8B	0308	Both	Yes	No
RAID Hot Spare Specify	E8B	0347	Both	Yes	No
V.24/EIA232 6.1m (20-Ft) PCI Cable	E8B	0348	Both	Yes	No
V.24/EIA232 15.2m (50-Ft) PCI Cable	E8B	0349	Support	Yes	No
V.35 6.1m (20-Ft) PCI Cable	E8B	0353	Both	Yes	No
V.35 15.2m (50-Ft) PCI Cable	E8B	0354	Support	Yes	No
V.36 6.1m (20-Ft) PCI Cable	E8B	0356	Support	Yes	No
X.21 6.1m (20-Ft) PCI Cable	E8B	0359	Both	Yes	No
X.21 15.2m (50-Ft) PCI Cable	E8B	0360	Support	Yes	No
V.24/EIA232 (80-Ft) PCI Cable	E8B	0365	Support	Yes	No
CBU Specify	E8B	0444	Both	Yes	No
Customer Specified Placement	E8B	0456	Initial	N/A	No
SSD Placement Indicator - CEC	E8B	0462	Both	N/A	No
SSD Placement Indicator (5802/5803)	E8B	0463	Initial	N/A	No
SSD Placement Indicator - 5886	E8B	0464	Initial	N/A	No
19 inch, 1.8 meter high rack	E8B	0551	MES	Yes	No
19 inch, 2.0 meter high rack	E8B	0553	MES	Yes	No
19 inch, 1.3 meter high rack	E8B	0555	Support	Yes	No
IBM i 6.1 with 6.1.1 Machine Code Specify Code	E8B	0566	Both	Yes	No
Rack Filler Panel Kit	E8B	0599	Both	Yes	No
Load Source Not in CEC	E8B	0719	Both	Yes	No
Specify Load Source in #5786	E8B	0725	Support	Yes	No
Specify Load Source in #5802/5803	E8B	0726	Both	Yes	No
Specify #5886 Load Source placement	E8B	0727	Both	Yes	No
#4327 Load Source Specify	E8B	0835	Support	Yes	No
#4328 Load Source Specify	E8B	0836	Support	Yes	No
SAN Load Source Specify	E8B	0837	Both	Yes	No
#3676 Load Source Specify	E8B	0838	Support	Yes	No
#3677 Load Source Specify	E8B	0839	Both	Yes	No
#3678 Load Source Specify	E8B	0840	Both	Yes	No
#4329 Load Source Specify	E8B	0841	Support	Yes	No
#3658 Load Source Specify	E8B	0844	Both	Yes	No
#1884 Load Source Specify	E8B	0851	Both	Yes	No
#1888 Load Source Specify	E8B	0853	Both	Yes	No
#1909 Load Source Specify	E8B	0854	Both	Yes	No
#3587 Load Source Specify					

	E8B	0855		Both	Yes	No
US TAA Compliance Indicator	E8B	0983	NC		Initial	N/A No
Modem Cable - US/Canada and General Use						
	E8B	1025		Both	Yes	No
USB Internal Docking Station for Removable Disk Drive	E8B	1103		Both	Yes	No
USB External Docking Station for Removable Disk Drive	E8B	1104		Both	Yes	No
USB 160 GB Removable Disk Drive	E8B	1106		Both	Yes	No
USB 500 GB Removable Disk Drive	E8B	1107		Both	Yes	No
200V 16A 4.3m (14-Ft) TL Line Cord						
	E8B	1406		Support	Yes	No
125V 4.3m (14-Ft) Line Cord						
	E8B	1413		Support	Yes	No
200V 1.8m (6-Ft) Locking Line Cord						
	E8B	1414		Support	Yes	No
	E8B	1415		Support	Yes	No
	E8B	1416		Support	Yes	No
	E8B	1417		Support	Yes	No
4.3m 200V/16A Power Cord S. Africa						
	E8B	1418		Support	Yes	No
4.3m 200V/16A Power Cord Israel						
	E8B	1419		Support	Yes	No
4.3m 200V/16A Power Cord EU/Asia						
	E8B	1420		Support	Yes	No
4.3m 200V/16A Power Cord CH/DK						
	E8B	1421		Support	Yes	No
200V 1.8m (6-Ft) Locking Line Cord						
	E8B	1424		Support	Yes	No
200V 1.8m (6-Ft) Watertight Line Cord						
	E8B	1425		Support	Yes	No
200V 4.3m (14-Ft) Locking Line Cord						
	E8B	1426		Support	Yes	No
200V 4.3m (14-Ft) Watertight Line Cord						
	E8B	1427		Support	Yes	No
4.3m 200V/10A Power Cord EU/Asia						
	E8B	1439		Support	Yes	No
4.3m 200V/10A Power Cord Denmark						
	E8B	1440		Support	Yes	No
4.3m 200V/10A Power Cord S. Africa						
	E8B	1441		Support	Yes	No
4.3m 200V/10A Power Cord Swiss						
	E8B	1442		Support	Yes	No
4.3m 200V/10A Power Cord UK						
	E8B	1443		Support	Yes	No
4.3m 200V/10A Power Cord Israel						
	E8B	1445		Support	Yes	No
4.3m 200V/32A Power Cord EU 1-PH						
	E8B	1449		Support	Yes	No
4.3m 200V/16A Power Cord EU 2-PH						
	E8B	1450		Support	Yes	No
200V (6-Ft) 1.8m Line Cord						
	E8B	1451		Support	Yes	No
200V (14-Ft) 4.3m Line Cord						
	E8B	1452		Support	Yes	No
200V (6-Ft) 1.8m Locking Line Cord						
	E8B	1453		Support	Yes	No
200V 12A (14-Ft) 4.3m TL Line Cord						
	E8B	1454		Support	Yes	No
	E8B	1455		Support	Yes	No
	E8B	1456		Support	Yes	No
	E8B	1457		Support	Yes	No
200V (6-Ft) 1.8m Upper Locking Cord						
	E8B	1458		Support	Yes	No
200V (6-Ft) 1.8m Upper Locking Cord						
	E8B	1459		Support	Yes	No
4.3m 200V/12A Pwr Cd UK						

	E8B	1476	Support	Yes	No
4.3m 200V/16A Pwr Cd	E8B	1477	Support	Yes	No
System port/UPS Conversion Cable	E8B	1827	Both	Yes	No
1.5 Meter 12X to 4X Channel Conversion Cable	E8B	1828	Both	Yes	No
0.6 Meter 12X Cable	E8B	1829	Support	Yes	No
1.5 Meter 12X cable	E8B	1830	Support	Yes	No
8.0 Meter 12X Cable	E8B	1834	Support	Yes	No
3.0 Meter 12X Cable	E8B	1840	Support	Yes	No
3 Meter 12X to 4X Channel Conversion Cable	E8B	1841	Both	Yes	No
10 Meter 12X to 4X Enhanced Channel Conversion Cable	E8B	1854	Both	Yes	No
0.6 Meter 12X DDR Cable	E8B	1861	Both	Yes	No
1.5 Meter 12X DDR Cable	E8B	1862	Both	Yes	No
8.0 Meter 12X DDR Cable	E8B	1864	Both	Yes	No
3.0 Meter 12X DDR Cable	E8B	1865	Both	Yes	No
Op Panel Cable for Rack-mount Drawer w/2.5" DASD	E8B	1878	Both	Yes	No
146.8GB 10K RPM SAS SFF Disk Drive	E8B	1882	Both	Yes	No
73.4 GB 15K RPM SAS SFF Disk Drive	E8B	1883	Both	Yes	No
69.7 GB 15K RPM SAS SFF Disk Drive	E8B	1884	Both	Yes	No
300GB 10K RPM SFF SAS Disk Drive	E8B	1885	Both	Yes	No
146GB 15K RPM SFF SAS Disk Drive	E8B	1886	Both	Yes	No
139GB 15K RPM SFF SAS Disk Drive	E8B	1888	Both	Yes	No
69GB SFF SAS Solid State Drive	E8B	1890	Both	Yes	No
4 GB Single-Port Fibre Channel PCI-X 2.0 DDR Adapter	E8B	1905	Support	Yes	No
69GB SFF SAS Solid State Drive	E8B	1909	Both	Yes	No
4 GB Dual-Port Fibre Channel PCI-X 2.0 DDR Adapter	E8B	1910	Support	Yes	No
PCI-X DDR Dual Channel Ultra320 SCSI Adapter	E8B	1912	Support	Yes	No
4-Port 10/100/1000 Base-TX PCI-X Adapter	E8B	1954	Support	Yes	No
73.4 GB 15,000 RPM Ultra320 SCSI Disk Drive Assembly	E8B	1971	Support	Yes	No
146.8 GB 15,000 RPM Ultra320 SCSI Disk Drive Assembly	E8B	1972	Support	Yes	No
2 Gigabit Fibre Channel PCI-X Adapter	E8B	1977	Support	Yes	No
IBM Gigabit Ethernet-SX PCI-X Adapter	E8B	1978	Support	Yes	No
IBM 10/100/1000 Base-TX Ethernet PCI-X Adapter	E8B	1979	Support	Yes	No
POWER GXT135P Graphics Accelerator with Digital Support	E8B	1980	Support	Yes	No
IBM 2-Port 10/100/1000 Base-TX Ethernet PCI-X Adapter	E8B	1983	Support	Yes	No
1 Gigabit iSCSI TOE PCI-X on Copper Media Adapter	E8B	1986	Support	Yes	No
1 Gigabit iSCSI TOE PCI-X on Optical Media Adapter	E8B	1987	Support	Yes	No
Converter Cable, VHDCI to P, Mini-68 pin to 68 pin, 0.3M	E8B	2118	Support	Yes	No
Ultra 320 SCSI Cable 1 Meter					

Ultra 320 SCSI Cable 3 Meter	E8B 2124	Support	Yes	No
Ultra 320 SCSI Cable 5 Meter	E8B 2125	Support	Yes	No
Ultra 320 SCSI Cable 10 Meter	E8B 2126	Support	Yes	No
Ultra 320 SCSI Cable 20 Meter	E8B 2127	Support	Yes	No
0.55 Meter Ultra 320 SCSI Cable	E8B 2128	Support	Yes	No
Primary OS - IBM i	E8B 2138	Support	Yes	No
Primary OS - AIX	E8B 2145	Both	Yes	No
Primary OS - Linux	E8B 2146	Both	Yes	No
Zero-priced Processor Activation for #8334	E8B 2147	Both	Yes	No
Zero-priced Processor Activation for #8332	E8B 2324	Both	Yes	No
Zero-priced Processor Activation for #8336	E8B 2325	Both	Yes	No
Zero-priced Processor Activation for #8335	E8B 2326	Both	Yes	No
Zero-priced Processor Activation for #8335	E8B 2327	Both	Yes	No
2M LC-SC 50 Micron Fiber Converter Cable	E8B 2456	Both	Yes	No
2M LC-SC 62.5 Micron Fiber Converter Cable	E8B 2459	Both	Yes	No
4 port USB PCIe Adapter	E8B 2728	Both	Yes	No
2-Port USB PCI Adapter	E8B 2738	Support	Yes	No
POWER GXT135P Graphics Accelerator with Digital Support	E8B 2849	Support	Yes	No
ARTIC960Hx 4-Port EIA-232 Cable	E8B 2861	Support	Yes	No
ARTIC960Hx 4-Port X.21 Cable	E8B 2863	Support	Yes	No
ARTIC960Hx 4-Port V.35 (DTE) Cable	E8B 2864	Support	Yes	No
PCIe 2-Line WAN w/Modem	E8B 2893	Both	Yes	No
3M Asynchronous Terminal/Printer Cable EIA-232	E8B 2934	Both	Yes	No
Asynchronous Cable EIA-232/V.24 3M	E8B 2936	Both	Yes	No
8-Port Asynchronous Adapter EIA-232/RS-422, PCI bus	E8B 2943	Support	Yes	No
IBM ARTIC960Hx 4-Port Multiprotocol PCI Adapter	E8B 2947	Support	Yes	No
Cable, V.24 / EIA-232	E8B 2951	Support	Yes	No
Cable, V.35	E8B 2952	Support	Yes	No
Cable, V.36 / EIA-499	E8B 2953	Support	Yes	No
Cable, X.21	E8B 2954	Support	Yes	No
2-Port Multiprotocol PCI Adapter	E8B 2962	Support	Yes	No
Serial-to-Serial Port Cable for Drawer/Drawer- 3.7M	E8B 3124	Both	Yes	No
Serial-to-Serial Port Cable for Rack/Rack- 8M	E8B 3125	Both	Yes	No
73.4 GB 15,000 RPM Ultra320 SCSI Disk Drive Assembly	E8B 3278	Support	Yes	No
146.8 GB 15,000 RPM Ultra320 SCSI Disk Drive Assembly	E8B 3279	Support	Yes	No
300 GB 15K RPM SCSI Disk Drive	E8B 3585	Support	Yes	No
69GB 3.5" SAS Solid State Drive	E8B 3586	Both	Yes	No

69GB 3.5" SAS Solid State Drive	E8B	3587	Both	Yes	No
Widescreen LCD Monitor	E8B	3632	Both	Yes	No
IBM T541H /L150p 15" TFT Color Monitor	E8B	3637	Support	Yes	No
IBM ThinkVision L170p Flat Panel Monitor	E8B	3639	Support	Yes	No
ThinkVision L171p Flat Panel Monitor	E8B	3640	Support	Yes	No
IBM T115 Flat Panel Monitor	E8B	3641	Support	Yes	No
ThinkVision L191p Flat Panel Monitor	E8B	3642	Support	Yes	No
IBM T120 Flat Panel Monitor	E8B	3643	Support	Yes	No
IBM T119 Flat Panel Monitor	E8B	3644	Support	Yes	No
IBM T117 Flat Panel Monitor	E8B	3645	Support	Yes	No
73GB 15K RPM SAS Disk Drive	E8B	3646	Support	Yes	No
146GB 15K RPM SAS Disk Drive	E8B	3647	Both	Yes	No
300GB 15K RPM SAS Disk Drive	E8B	3648	Both	Yes	No
450GB 15K RPM SAS Disk Drive	E8B	3649	Both	Yes	No
SAS Cable (EE) Drawer to Drawer 1M	E8B	3652	Both	Yes	No
SAS Cable (EE) Drawer to Drawer 3M	E8B	3653	Both	Yes	No
SAS Cable (EE) Drawer to Drawer 6M	E8B	3654	Both	Yes	No
SAS SFF Cable	E8B	3656	Both	Yes	No
Right Angle SAS Tape Drive Cable	E8B	3657	Both	Yes	No
428GB 15K RPM SAS Disk Drive	E8B	3658	Both	Yes	No
SAS Cable (X) Adapter to SAS Enclosure, Dual Controller/Dual Path 3M:	E8B	3661	Both	Yes	No
SAS Cable (X) Adapter to SAS Enclosure, Dual Controller/Dual Path 6M:	E8B	3662	Both	Yes	No
SAS Cable (X) Adapter to SAS Enclosure, Dual Controller/Dual Path 15M:	E8B	3663	Both	Yes	No
SAS Cable, DASD Backplane to Rear Bulkhead	E8B	3668	Both	Yes	No
SAS Cable, DASD Backplane (Split) to Rear Bulkhead)	E8B	3669	Both	Yes	No
69.7GB 15k rpm SAS Disk Drive	E8B	3676	Support	Yes	No
139.5GB 15k rpm SAS Disk Drive	E8B	3677	Both	Yes	No
283.7GB 15k rpm SAS Disk Drive	E8B	3678	Both	Yes	No
SAS Cable (AI)- Adapter to Internal drive 1M	E8B	3679	Both	Yes	No
3M SAS CABLE, ADPTR TO ADPTR (AA)	E8B	3681	Both	Yes	No
6M SAS CABLE, ADPTR TO ADPTR (AA)	E8B	3682	Both	Yes	No
SAS Cable (AE) Adapter to Enclosure, single controller/single path 3M	E8B	3684	Both	Yes	No
SAS Cable (AE) Adapter to Enclosure, single controller/single path 6M	E8B	3685	Both	Yes	No
SAS Cable (YI) System to SAS Enclosure, Single Controller/Dual Path 1.5M	E8B	3686	Both	Yes	No
SAS Cable (YI) System to SAS Enclosure, Single Controller/Dual Path 3M	E8B	3687	Both	Yes	No
SAS Cable (AT) 0.6 Meter					

SAS Cable (YO) Adapter to SAS Enclosure, Single Controller/Dual Path 1.5 M	E8B 3688	Both	Yes	No
SAS Cable (YO) Adapter to SAS Enclosure, Single Controller/Dual Path 3 M	E8B 3691	Both	Yes	No
SAS Cable (YO) Adapter to SAS Enclosure, Single Controller/Dual Path 6 M	E8B 3692	Both	Yes	No
SAS Cable (YO) Adapter to SAS Enclosure, Single Controller/Dual Path 15 M	E8B 3693	Both	Yes	No
0.3M Serial Port Converter Cable, 9-Pin to 25-Pin	E8B 3694	Both	Yes	No
Asynch Printer/Terminal Cable, 9-pin to 25-pin, 4M	E8B 3925	Both	Yes	No
Serial Port Null Modem Cable, 9-pin to 9-pin, 3.7M	E8B 3926	Both	Yes	No
Serial Port Null Modem Cable, 9-pin to 9-pin, 10M	E8B 3927	Both	Yes	No
1.8 M (6-ft) Extender Cable for Displays (15-pin D-shell to 15-pin D-shell)	E8B 3928	Both	Yes	No
Extender Cable - USB Keyboards, 2M	E8B 4242	Both	Yes	No
VGA to DVI Connection Converter	E8B 4256	Both	Yes	No
70.56GB 15k rpm Disk Unit	E8B 4276	Both	Yes	No
141.12GB 15k rpm Disk Unit	E8B 4327	Support	Yes	No
282.25GB 15k rpm Disk Unit	E8B 4328	Support	Yes	No
8GB (2x4GB) Memory DIMMS, 1066 MHZ, 2Gb DDR3 DRAM	E8B 4329	Support	Yes	No
16GB (2x8GB) Memory DIMMS, 1066 MHZ, 2Gb DDR3 DRAM	E8B 4526	Both	Yes	No
32GB (2x16GB) Memory DIMMS, 1066 MHZ, 2Gb DDR3 DRAM	E8B 4527	Both	Yes	No
One and only one rack indicator features is required on all orders (#4650 to #4666). Rack Indicator- Not Factory Integrated	E8B 4528	Both	Yes	No
Rack Indicator, Rack #1	E8B 4650	Initial	N/A	No
Rack Indicator, Rack #2	E8B 4651	Initial	N/A	No
Rack Indicator, Rack #3	E8B 4652	Initial	N/A	No
Rack Indicator, Rack #4	E8B 4653	Initial	N/A	No
Rack Indicator, Rack #5	E8B 4654	Initial	N/A	No
Rack Indicator, Rack #6	E8B 4655	Initial	N/A	No
Rack Indicator, Rack #7	E8B 4656	Initial	N/A	No
Rack Indicator, Rack #8	E8B 4657	Initial	N/A	No
Rack Indicator, Rack #9	E8B 4658	Initial	N/A	No
Rack Indicator, Rack #10	E8B 4659	Initial	N/A	No
Rack Indicator, Rack #11	E8B 4660	Initial	N/A	No
Rack Indicator, Rack #12	E8B 4661	Initial	N/A	No
Rack Indicator, Rack #13	E8B 4662	Initial	N/A	No
Rack Indicator, Rack #14	E8B 4663	Initial	N/A	No
Rack Indicator, Rack #15	E8B 4664	Initial	N/A	No
Rack Indicator, Rack #16	E8B 4665	Initial	N/A	No

PCI-X Cryptographic Coprocessor (FIPS 4)	E8B 4666	Initial	N/A	No
Active Memory Expansion Enablement	E8B 4764	Both	Yes	No
One Processor of 5250 Enterprise Enablement	E8B 4792	Both	Yes	No
Full 5250 Enterprise Enablement	E8B 4988	Both	Yes	No
Software Preload Required	E8B 4989	Both	Yes	No
Custom Service Specify, Off-Site	E8B 5000	Initial	N/A	No
Power Dist Unit 1 Phase NEMA	E8B 5001	Support	N/A	No
Power Dist Unit 1 Phase IEC	E8B 5002	Initial	N/A	No
Power Dist Unit 2 of 3 Phase	E8B 5160	Support	Yes	No
Power Dist Unit - 3 Phase	E8B 5161	Support	Yes	No
RFID TAGS FOR SERVERS, BLADES, BLADECENTERS, RACKS, AND HMCS	E8B 5162	Support	Yes	No
Sys Console On HMC	E8B 5163	Support	Yes	No
Sys Console-Ethernet No IOP	E8B 5524	Initial	N/A	No
GX Dual-port 12x Channel Attach	E8B 5550	Both	Yes	No
Dual Port (SR) Integrated Virtual Ethernet 10Gb Daughter Card	E8B 5553	Both	Yes	No
GX Dual-port 12x Channel Attach	E8B 5609	Both	Yes	No
80/160GB DAT160 SAS Tape Drive	E8B 5613	Both	Yes	No
Dual Port 1Gb Integrated Virtual Ethernet Daughter Card	E8B 5616	Both	Yes	No
4-Port 1Gb Integrated Virtual Ethernet Daughter Card	E8B 5619	Both	Yes	No
Blind Swap Type III Cassette- PCIe, Short Slot	E8B 5623	Support	Yes	No
Blind Swap Type III Cassette- PCI-X or PCIe, Standard Slot	E8B 5624	Both	Yes	No
DAT320 160/320 GB Tape Drive	E8B 5646	MES	Yes	No
SAS RAID Enablement	E8B 5647	MES	Yes	No
DAT160 Data Cartridge	E8B 5661	Both	Yes	No
IBM Gigabit Ethernet-SX PCI-X Adapter	E8B 5679	Both	Yes	No
IBM 10/100/1000 Base-TX Ethernet PCI-X Adapter	E8B 5689	Support	Yes	No
IBM 2-Port 10/100/1000 Base-TX Ethernet PCI-X Adapter	E8B 5700	Support	Yes	No
10Gb FCoE PCIe Dual Port Adapter	E8B 5701	Support	Yes	No
1 Gigabit iSCSI TOE PCI-X on Copper Media Adapter	E8B 5706	Both	Yes	No
1 Gigabit iSCSI TOE PCI-X on Optical Media Adapter	E8B 5708	Both	Yes	No
2 Gigabit Fibre Channel PCI-X Adapter	E8B 5713	Both	Yes	No
4-Port 10/100/1000 Base-TX PCI Express Adapter	E8B 5714	Support	Yes	No
10 Gb Ethernet-SR PCI-X 2.0 DDR Adapter	E8B 5716	Support	Yes	No
10 Gb Ethernet-LR PCI-X 2.0 DDR Adapter	E8B 5717	Both	Yes	No
2-Port Asynchronous EIA-232 PCI Adapter	E8B 5721	Support	Yes	No
10 Gigabit Ethernet-CX4 PCI Express Adapter	E8B 5722	Support	Yes	No
	E8B 5723	Support	Yes	No
	E8B 5732	Both	Yes	No

8 Gigabit PCI Express Dual Port Fibre Channel Adapter	E8B 5735	Both	Yes	No
PCI-X DDR Dual Channel Ultra320 SCSI Adapter	E8B 5736	Both	Yes	No
4-Port 10/100/1000 Base-TX PCI-X Adapter	E8B 5740	Support	Yes	No
IBM Single Bus Ultra 320 SCSI Repeater Card	E8B 5741	Support	Yes	No
IBM Dual Bus Ultra 320 SCSI Repeater Card	E8B 5742	Support	Yes	No
SATA Slimline DVD-ROM Drive	E8B 5743	Support	Yes	No
Half High 800GB/1.6TB LTO4 SAS Tape Drive	E8B 5746	Both	Yes	No
IBM LTO Ultrium 4 800 GB Data Cartridge	E8B 5747	Both	Yes	No
POWER GXT145 PCI Express Graphics Accelerator	E8B 5748	Both	Yes	No
4Gbps Fibre Channel (2-Port)	E8B 5749	Both	Yes	No
4 GB Single-Port Fibre Channel PCI-X 2.0 DDR Adapter	E8B 5758	Support	Yes	No
4 Gb Dual-Port Fibre Channel PCI-X 2.0 DDR Adapter	E8B 5759	Both	Yes	No
SATA Slimline DVD-RAM Drive	E8B 5762	Both	Yes	No
2-Port 10/100/1000 Base-TX Ethernet PCI Express Adapter	E8B 5767	Both	Yes	No
2-Port Gigabit Ethernet-SX PCI Express Adapter	E8B 5768	Both	Yes	No
10 Gigabit Ethernet-SR PCI Express Adapter	E8B 5769	Both	Yes	No
10 Gigabit Ethernet-LR PCI Express Adapter	E8B 5772	Both	Yes	No
4 Gigabit PCI Express Single Port Fibre Channel Adapter	E8B 5773	Support	Yes	No
4 Gigabit PCI Express Dual Port Fibre Channel Adapter	E8B 5774	Both	Yes	No
PCI-X EXP24 Ctl-1.5GB No IOP	E8B 5778	Support	Yes	No
PCI-X EXP24 Ctl-1.5GB No IOP	E8B 5782	Support	Yes	No
4 Port Async EIA-232 PCIe Adapter	E8B 5785	Both	Yes	No
TotalStorage EXP24 Disk Dwr	E8B 5786	Support	Yes	No
TotalStorage EXP24 Disk Twr	E8B 5787	Support	Yes	No
PCI-DDR 12X Expansion Drawer	E8B 5796	Both	Yes	No
12X I/O Drawer PCIe, SFF disk	E8B 5802	Both	Yes	No
12X I/O Drawer PCIe, No Disk	E8B 5877	Both	Yes	No
EXP 12S Expansion Drawer	E8B 5886	Both	Yes	No
PCI-X DDR Dual -x4 SAS Adapter	E8B 5900	Support	Yes	No
PCIe Dual-x4 SAS Adapter	E8B 5901	Both	Yes	No
PCI-X DDR Dual - x4 3Gb SAS RAID Adapter	E8B 5902	Support	Yes	No
PCIe 380MB Cache Dual - x4 3Gb SAS RAID Adapter	E8B 5903	Both	Yes	No
PCI-X DDR 1.5GB Cache SAS RAID Adapter	E8B 5904	Both	Yes	No
PCI-X DDR 1.5GB Cache SAS RAID Adapter (BSC)	E8B 5908	Both	Yes	No
PCI-X DDR Dual - x4 SAS Adapter	E8B 5912	Support	Yes	No
Non-paired SAS RAID indicator	E8B 5922	Support	Yes	No
Non-paired PCIe SAS RAID Indicator	E8B 5923	Both	Yes	No

Full width Keyboard	-- USB, US English, #103P			
	E8B 5951	Both	Yes	No
Full width Keyboard	-- USB, French, #189			
	E8B 5952	Both	Yes	No
Full width Keyboard	-- USB, Italian, #142			
	E8B 5953	Both	Yes	No
Full width Keyboard	-- USB, German/Austrian, #129			
	E8B 5954	Both	Yes	No
Full width Keyboard	-- USB, UK English, #166P			
	E8B 5955	Both	Yes	No
Full width Keyboard	-- USB, Spanish, #172			
	E8B 5956	Both	Yes	No
Full width Keyboard	-- USB, Japanese, #194			
	E8B 5957	Both	Yes	No
Full width Keyboard	-- USB, Brazilian Portuguese, #275			
	E8B 5958	Both	Yes	No
Full width Keyboard	-- USB, Hungarian, #208			
	E8B 5959	Both	Yes	No
Full width Keyboard	-- USB, Korean, #413			
	E8B 5960	Both	Yes	No
Full width Keyboard	-- USB, Chinese, #467			
	E8B 5961	Both	Yes	No
Full width Keyboard	-- USB, French Canadian, #445			
	E8B 5962	Both	Yes	No
Full width Keyboard	-- USB, Belgian/UK, #120			
	E8B 5964	Both	Yes	No
Full width Keyboard	-- USB, Swedish/Finnish, #153			
	E8B 5965	Both	Yes	No
Full width Keyboard	-- USB, Danish, #159			
	E8B 5966	Both	Yes	No
Full width Keyboard	-- USB, Bulgarian, #442			
	E8B 5967	Both	Yes	No
Full width Keyboard	-- USB, Swiss/French/German, #150			
	E8B 5968	Both	Yes	No
Full width Keyboard	-- USB, Norwegian, #155			
	E8B 5969	Both	Yes	No
Full width Keyboard	-- USB, Dutch, #143			
	E8B 5970	Both	Yes	No
Full width Keyboard	-- USB, Portuguese, #163			
	E8B 5971	Both	Yes	No
Full width Keyboard	-- USB, Greek, #319			
	E8B 5972	Both	Yes	No
Full width Keyboard	-- USB, Hebrew, #212			
	E8B 5973	Both	Yes	No
Full width Keyboard	-- USB, Polish, #214			
	E8B 5974	Both	Yes	No
Full width Keyboard	-- USB, Slovakian, #245			
	E8B 5975	Both	Yes	No
Full width Keyboard	-- USB, Czech, #243			
	E8B 5976	Both	Yes	No
Full width Keyboard	-- USB, Turkish, #179			
	E8B 5977	Both	Yes	No
Full width Keyboard	-- USB, LA Spanish, #171			
	E8B 5978	Both	Yes	No
Full width Keyboard	-- USB, Arabic, #253			
	E8B 5979	Both	Yes	No
Full width Keyboard	-- USB, Thai, #191			
	E8B 5980	Both	Yes	No
Full width Keyboard	-- USB, Russian, #443			
	E8B 5981	Both	Yes	No
Full width Keyboard	-- USB, Slovenian, #234			
	E8B 5982	Both	Yes	No
Full width Keyboard	-- USB, US English Euro, #103P			
	E8B 5983	Both	Yes	No
Power Control Cable (SPCN) - 2 meter				
	E8B 6001	Support	Yes	No
Power Control Cable (SPCN) - 3 meter				
	E8B 6006	Both	Yes	No
Power Control Cable (SPCN) - 15 meter				
	E8B 6007	Both	Yes	No
Power Control Cable (SPCN) - 6 meter				
	E8B 6008	Support	Yes	No
Power Control Cable (SPCN) - 30 meter				
	E8B 6029	Support	Yes	No

Opt Front Door for 1.8m Rack	E8B	6068	MES	Yes	No
Opt Front Door for 2.0m Rack	E8B	6069	MES	Yes	No
1.8m Rack Acoustic Doors	E8B	6248	MES	Yes	No
2.0m Rack Acoustic Doors	E8B	6249	MES	Yes	No
1.8m Rack Trim Kit	E8B	6263	Both	Yes	No
2.0m Rack Trim Kit	E8B	6272	Both	Yes	No
Dual-port 12X Channel Attach- Short Run	E8B	6446	Both	Yes	No
Dual-port 12X Channel Attach- Long Run	E8B	6457	Both	Yes	No
Power Cable -- Drawer to IBM PDU, 14-foot, 250V/10A	E8B	6458	Both	Yes	No
Power Cord 4.3m (14-ft), Drawer To OEM PDU (125V, 15A)	E8B	6460	Both	Yes	No
Power Cord 4.3m (14-foot), Drawer to OEM PDU, (250V, 15A), U. S.	E8B	6469	Both	Yes	No
Power Cord 1.8m(6-foot), To wall (125V, 15A)	E8B	6470	Both	Yes	No
Power Cord 2.7m (9-foot), To wall/OEM PDU, (125V, 15A)	E8B	6471	Both	Yes	No
Power Cord 2.7m (9-foot), To wall/OEM PDU, (250V, 16A)	E8B	6472	Both	Yes	No
Power Cord 2.7m (9-foot), To wall/OEM PDU, (250V, 10A)	E8B	6473	Both	Yes	No
Power Cord 2.7M (9-foot), To wall/OEM PDU, (250V, 13A)	E8B	6474	Both	Yes	No
Power Cord 2.7M (9-foot), To wall/OEM PDU, (250V, 16A)	E8B	6475	Both	Yes	No
Power Cord 2.7M (9-foot), To wall/OEM PDU, (250V, 10A)	E8B	6476	Both	Yes	No
Power Cord 2.7M (9-foot), To wall/OEM PDU, (250V, 16A)	E8B	6477	Both	Yes	No
Power Cord 2.7 M(9-foot), To wall/OEM PDU, (250V, 16A)	E8B	6478	Both	Yes	No
Power Cord (9-foot) , To wall/OEM PDU, (250V, 10A)	E8B	6479	Support	Yes	No
Power Cord 1.8M (6-foot),To wall, (250V, 15A), United States	E8B	6487	Both	Yes	No
Power Cord 2.7M (9-foot), To wall/OEM PDU, (125V, 15A or 250V, 10A)	E8B	6488	Both	Yes	No
4.3m (14-Ft) 3PH/24A Power Cord	E8B	6489	MES	Yes	No
4.3m (14-Ft) 1PH/48A Pwr Cord	E8B	6491	MES	Yes	No
4.3m (14-Ft) 1PH/48-60A Pwr Cord	E8B	6492	MES	Yes	No
Power Cord 2.7M (9-foot), To wall/OEM PDU, (250V, 10A)	E8B	6493	Both	Yes	No
Power Cord 2.7M (9-foot), To wall/OEM PDU, (250V, 10A)	E8B	6494	Both	Yes	No
Power Cord (9-foot), To wall/OEM PDU, (250V, 10A)	E8B	6495	Support	Yes	No
Power Cord 2.7M (9-foot), To wall/OEM PDU, (250V, 10A)	E8B	6496	Both	Yes	No
Power Cord (6-foot), To wall/OEM PDU, (250V, 10A)	E8B	6497	Support	Yes	No
Power Cord (6-foot), To wall/OEM PDU, (250V, 15A)	E8B	6498	Support	Yes	No
Power Cable - Drawer to IBM PDU, 200-240V/10A	E8B	6577	Initial	N/A	No
Optional Rack Security Kit	E8B	6580	MES	Yes	No
Modem Tray for 19-Inch Rack	E8B	6586	MES	Yes	No
Power Cord 2.7M (9-foot), To wall/OEM PDU, (125V, 15A)	E8B	6651	Both	Yes	No
4.3m (14-Ft) 1PH/24-30A Pwr Cord	E8B	6654	MES	Yes	No

4.3m (14-Ft) 1PH/24-30A WR Pwr Cord	E8B	6655	MES	Yes	No
4.3m (14-Ft) 1PH/24A Power Cord	E8B	6656	MES	Yes	No
Power Cord 2.7M (9-foot), To Wall/OEM PDU, (250V, 15A)	E8B	6659	Both	Yes	No
Power Cord (14-foot), Drawer To OEM PDU (125V, 15A)	E8B	6660	Both	Yes	No
Power Cord 3 M (10 ft), Drawer to IBM PDU, 250V/10A	E8B	6665	Both	Yes	No
Power Cord 4.3M (14-foot), Drawer to OEM PDU, (250V, 15A)	E8B	6669	Both	Yes	No
Power Cord (6-foot), To Wall (125V, 15A),	E8B	6670	Support	Yes	No
Power Cord 2.7M (9-foot), Drawer to IBM PDU, 250V/10A	E8B	6671	Both	Yes	No
Power Cord 1.5M (5-foot), Drawer to IBM PDU, 250V/10A	E8B	6672	Both	Yes	No
Power Cord 2.7M (9-foot), To Wall/OEM PDU, (250V, 10A)	E8B	6680	Both	Yes	No
Power Cord (6-foot), To wall, (250V, 15A)	E8B	6687	Support	Yes	No
PCI 2-Line WAN IOA No IOP	E8B	6805	Support	Yes	No
PCI 4-Modem WAN IOA No IOP	E8B	6808	Both	Yes	No
PCI 2-Line WAN w/Modem NoIOP	E8B	6833	Support	Yes	No
Intelligent PDU+, 1 EIA Unit, Universal UTG0247 Connector	E8B	7109	MES	Yes	No
Environmental Monitoring Probe	E8B	7118	Both	Yes	No
Power Distribution Unit	E8B	7188	MES	Yes	No
Quantity 150 of #2124	E8B	7204	Support	Yes	No
Quantity 150 of #2125	E8B	7205	Support	Yes	No
Quantity 150 of #2126	E8B	7206	Support	Yes	No
Quantity 150 of #2127	E8B	7207	Support	Yes	No
Quantity 150 of #2128	E8B	7208	Support	Yes	No
Quantity 150 of #2138	E8B	7213	Support	Yes	No
SDI Software Pre-Install Indicator	E8B	7305	NC	Initial	N/A No
Dual I/O Unit Enclosure	E8B	7307	Both	Yes	No
I/O Drawer Mounting Enclosure	E8B	7314	Both	Yes	No
Quantity 150 of #4327	E8B	7509	Support	Yes	No
Quantity 150 of #4328	E8B	7510	Support	Yes	No
Quantity 150 of #4329	E8B	7511	Support	Yes	No
Quantity 150 of #3676	E8B	7517	Support	Yes	No
Quantity 150 of #3677	E8B	7518	Support	Yes	No
Quantity 150 of #3678	E8B	7519	Both	Yes	No
Quantity 150 of #3586	E8B	7535	Both	Yes	No
Quantity 150 of #3587	E8B	7536	Both	Yes	No

Quantity 150 of #3658					
	E8B	7538		Both	Yes No
Quantity 150 of #3647					
	E8B	7549		Both	Yes No
Quantity 150 of #3648					
	E8B	7564		Both	Yes No
Quantity 150 of #3649					
	E8B	7565		Both	Yes No
One Processor Activation for Processor Feature #8334					
	E8B	7714		Both	Yes No
One Processor Activation for Processor Feature #8332					
	E8B	7715		Both	Yes No
One Processor Activation for Processor Feature #8336					
	E8B	7716		Both	Yes No
One Processor Activation for Processor Feature #8335					
	E8B	7717		Both	Yes No
Power Supply, 1725 Watt AC, Hot-swap, Base or Redundant					
	E8B	7740		Initial	N/A No
2.0m Rack Side Attach Kit					
	E8B	7780		Support	Yes No
PowerVM Express					
	E8B	7793		Both	Yes No
PowerVM Standard					
	E8B	7794		Both	Yes No
PowerVM Enterprise					
	E8B	7795		Both	Yes No
Ethernet Cable, 6M, Hardware Management Console to System Unit					
	E8B	7801		Support	Yes No
Ethernet Cable, 15m, Hardware Management Console to System Unit					
	E8B	7802		Both	Yes No
Side-by-Side for 1.8m Racks					
	E8B	7840		Support	Yes No
Ruggedize Rack Kit					
	E8B	7841		Support	Yes No
PCI Blind Swap Cassette Kit, Double Wide Adapters, Type II					
	E8B	7863		MES	Yes No
Linux Software Preinstall					
	E8B	8143		Initial	N/A No
Linux Software Preinstall (Business Partners)					
	E8B	8144		Initial	N/A No
8-core 3.3 GHZ POWER7 Processor Card					
	E8B	8332		Both	Yes No
8-core 3.0 GHZ POWER7 Processor Card					
	E8B	8334		Both	Yes No
6-core 3.3 GHZ POWER7 Processor Card					
	E8B	8335		Both	Yes No
8-core 3.55 GHZ POWER7 Processor Card					
	E8B	8336		Both	Yes No
Enhanced DASD/Media Backplane for 2.5" DASD/SATA DVD/Tape with External SAS Port					
	E8B	8340		Initial	N/A No
Mouse - USB, with Keyboard Attachment Cable					
	E8B	8841		Support	Yes No
USB Mouse					
	E8B	8845		Both	Yes No
Order Routing Indicator- System Plant					
	E8B	9169	NC	Initial	N/A No
Language Group Specify - US English					
	E8B	9300	NC	Initial	N/A No
New AIX License Core Counter					
	E8B	9440	NC	Initial	N/A No
New IBM i License Core Counter					
	E8B	9441	NC	Initial	N/A No
New Red Hat License Core Counter					
	E8B	9442	NC	Initial	N/A No
New SUSE License Core Counter					
	E8B	9443	NC	Initial	N/A No
Other AIX License Core Counter					
	E8B	9444	NC	Initial	N/A No
Other Linux License Core Counter					
	E8B	9445	NC	Initial	N/A No
3rd Party Linux License Core Counter					
	E8B	9446	NC	Initial	N/A No
VIOS Core Counter					

Month Indicator	E8B	9447	NC	Initial	N/A	No
Day Indicator	E8B	9461	NC	Initial	N/A	No
Hour Indicator	E8B	9462	NC	Initial	N/A	No
Minute Indicator	E8B	9463	NC	Initial	N/A	No
Qty Indicator	E8B	9464	NC	Initial	N/A	No
Countable Member Indicator	E8B	9465	NC	Initial	N/A	No
POWER7 Tivoli Storage Manager Specify	E8B	9466	NC	Initial	N/A	No
Language Group Specify - Dutch	E8B	9666	NC	Initial	N/A	No
Language Group Specify - French	E8B	9700	NC	Initial	N/A	No
Language Group Specify - German	E8B	9703	NC	Initial	N/A	No
Language Group Specify - Polish	E8B	9704	NC	Initial	N/A	No
Language Group Specify - Norwegian	E8B	9705	NC	Initial	N/A	No
Language Group Specify - Portuguese	E8B	9706	NC	Initial	N/A	No
Language Group Specify - Spanish	E8B	9707	NC	Initial	N/A	No
Language Group Specify - Italian	E8B	9708	NC	Initial	N/A	No
Language Group Specify - Canadian French	E8B	9711	NC	Initial	N/A	No
Language Group Specify - Japanese	E8B	9712	NC	Initial	N/A	No
Language Group Specify - Traditional Chinese (Taiwan)	E8B	9714	NC	Initial	N/A	No
Language Group Specify - Korean	E8B	9715	NC	Initial	N/A	No
Language Group Specify - Turkish	E8B	9716	NC	Initial	N/A	No
Language Group Specify - Hungarian	E8B	9718	NC	Initial	N/A	No
Language Group Specify - Slovakian	E8B	9719	NC	Initial	N/A	No
Language Group Specify - Russian	E8B	9720	NC	Initial	N/A	No
Language Group Specify - Simplified Chinese (PRC)	E8B	9721	NC	Initial	N/A	No
Language Group Specify - Czech	E8B	9722	NC	Initial	N/A	No
Language Group Specify -- Romanian	E8B	9724	NC	Initial	N/A	No
Language Group Specify - Croatian	E8B	9725	NC	Initial	N/A	No
Language Group Specify -- Slovenian	E8B	9726	NC	Initial	N/A	No
Language Group Specify - Brazilian Portuguese	E8B	9727	NC	Initial	N/A	No
Language Group Specify - Thai	E8B	9728	NC	Initial	N/A	No
	E8B	9729	NC	Initial	N/A	No

The following are newly announced features on the specific models of the IBM Power Systems 7014 machine type:

Description	Model	Feature	Purchase	Minimum	Initial/	
Machine Type 7014	number	number	price	Maint.	Monthly	RP
				charge	MES/	CSU
					Both/	MES
					Support	

Rack Content Specify: 8233-E8B - 4U

B42	0297	NC	Initial	N/A	No
S25			Initial	N/A	No
T00			Initial	N/A	No
T42			Initial	N/A	No

Machine type	Model	Description	MMMC* IOR 24x7	One-time charge
8233	E8B	IBM 8233-E8B	\$ 146	\$ 7,498

* Minimum monthly maintenance charge

Machine type	Model	Feature number	Description	One-time charge
8233	E8B	0032	SPCFY CD EXT HIGH SPEED MO	\$ 519
8233	E8B	0040	MIRRORED SYS DISK LEVEL SP	0
8233	E8B	0041	DEVICE PARITY PROTECTION A	0
8233	E8B	0043	MIRRORED SYS BUS LEVEL SPC	0
8233	E8B	0047	DEVICE PARITY RAID 6 ALL S	0
8233	E8B	0205	RISC TO RISC DATA MIGRATIO	0
8233	E8B	0265	AIX PARTITION SPECIFY	0
8233	E8B	0266	LINUX PARTITION SPECIFY	0
8233	E8B	0267	IBM I OPERATING SYS PARTIT	0
8233	E8B	0275	CSC SPECIFY	0
8233	E8B	0296	SPECIFY CUSTOM DATA PROTEC	0
8233	E8B	0308	MIRRORED LEVEL SYSTEM SPCF	0
8233	E8B	0347	RAID HOT SPARE SPECIFY	0
8233	E8B	0348	V.24/EIA232 6.1M 20FT PCI	124
8233	E8B	0349	V.24/EIA232 15.2M 50FT PCI	173
8233	E8B	0353	V.35 6.1M 20FT PCI CBL	124
8233	E8B	0354	V.35 15.2M 50FT PCI CBL	173
8233	E8B	0356	V.36 6.1M 20FT PCI CBL	124
8233	E8B	0359	X.21 6.1M 20FT PCI CBL	371
8233	E8B	0360	X.21 15.2M 50FT PCI CBL	173
8233	E8B	0365	V.24 EIA232 (80 FT) PCI CA	198
8233	E8B	0444	CBU SPECIFY	0
8233	E8B	0456	CUSTOMER SPECIFIED PLACEME	400
8233	E8B	0462	SSD PLACEMENT INDICATOR CE	0
8233	E8B	0463		0

			SSD PLACEM INDICATOR 5802	
8233	E8B	0464	SSD PLACEMENT INDICATOR 58	0
8233	E8B	0551	19 INCH, 1.8 METER HIGH RA	2,644
8233	E8B	0553	19 INCH, 2.0 METER HIGH RA	3,585
8233	E8B	0555	19 INCH, 1.3 METER HIGH RA	1,978
8233	E8B	0566	I 6.1 WITH 6.1.1 MACHINE C	0
8233	E8B	0599	RACK FILLER PANEL KIT	74
8233	E8B	0719	LOAD SOURCE NOT IN CEC	0
8233	E8B	0725	SPECIFY LOAD SOURCE IN 578	0
8233	E8B	0726	SPCFY LOAD SOURCE IN 5802/	0
8233	E8B	0727	SPCFY 5886 LOAD SOURCE PLC	0
8233	E8B	0835	4327 LOAD SOURCE SPECIFY	0
8233	E8B	0836	4328 LOAD SOURCE SPECIFY	0
8233	E8B	0837	SAN LOAD SOURCE SPECIFY	0
8233	E8B	0838	3676 LOAD SOURCE SPECIFY	0
8233	E8B	0839	3677 LOAD SOURCE SPECIFY	0
8233	E8B	0840	3678 LOAD SOURCE SPECIFY	0
8233	E8B	0841	4329 LOAD SOURCE SPECIFY	0
8233	E8B	0844	3658 LOAD SOURCE SPECIFY	0
8233	E8B	0851	1884 LOAD SOURCE SPECIFY	0
8233	E8B	0853	#1888 LOAD SOURCE SPECIFY	0
8233	E8B	0854	1909 LOAD SOURCE SPECIFY	0
8233	E8B	0855	3587 LOAD SOURCE SPECIFY	0

8233	E8B	0983	US TAA COMPLIANCE INDICATO	0
8233	E8B	1025	MODEM CABLE US/CANADA GENE	13
8233	E8B	1103	USB INTERNAL DOCKING STATI	225
8233	E8B	1104	USB EXTERNAL DOCKING STATI	275
8233	E8B	1106	USB 160 GB REMOVABLE DISKD	315
8233	E8B	1107	USB 500 GB REMOVABLE DISKD	709
8233	E8B	1406	200V 16A 4.3M 14FT TL LINE	0
8233	E8B	1413	125V 4.3M 14FT LINE CORD	0
8233	E8B	1414	200V 1.8M 6FT LOCKING LINE	0
8233	E8B	1415	200V 1.8M 6FT WATERTIGHT L	0
8233	E8B	1416	200V 4.3M 14 FT LOCKING LI	0
8233	E8B	1417	200V 4.3M 14FT WATERTIGHT	0
8233	E8B	1418	4.3M 200V/16A PWR CRD S.AF	13
8233	E8B	1419	4.3M 200V/16A POWER CRD IS	13
8233	E8B	1420	4.3M 200V/16A PWR CRD EU/A	13
8233	E8B	1421	4.3M 200V/16A POWER CRD CH	13
8233	E8B	1424	200V 1.8M 6FT LOCKING LINE	0
8233	E8B	1425	200V 1.8M 6FT WATERTIGHT L	0
8233	E8B	1426	200V 4.3M 14FT LOCKING LIN	0
8233	E8B	1427	200V 4.3M 14FT WATERTIGHT	0
8233	E8B	1439	4.3M 200V/10A PWR CRD EU/A	13
8233	E8B	1440	4.3M 200V/10A PWR CD DENMA	13
8233	E8B	1441	4.3M 200V/10A PWR CD S. AF	13
8233	E8B	1442	4.3M 200V/10A POWER CRD SW	13
8233	E8B	1443	4.3M 200V/10A POWER CRD UK	13
8233	E8B	1445	4.3M 200V/10A POWER CRD IS	13

8233	E8B	1449	4.3M 200V/32A POWER CRD EU	238
8233	E8B	1450	4.3M 200V/16A POWER CRD EU	13
8233	E8B	1451	200V 6FT 1.8M LINE CORD	39
8233	E8B	1452	200V 14FT 4.3M LINE CORD	39
8233	E8B	1453	200V 6FT 1.8M LOCKING LINE	39
8233	E8B	1454	200V 12A 14FT 4.3M TL LINE	198
8233	E8B	1455	200V 6FT 1.8M WATERTIGHT L	198
8233	E8B	1456	200V 14FT 4.3M WATERTIGHT	198
8233	E8B	1457	200V 6FT 1.8M UPPER LINE C	0
8233	E8B	1458	200V 6FT 1.8M UPPER LOCKIN	0
8233	E8B	1459	200V 6FT 1.8M UPPER LOCKIN	198
8233	E8B	1476	4.3M 200V/12A PWR CD UK	13
8233	E8B	1477	4.3M 200V/16A PWR CD	198
8233	E8B	1827	SYS PORT/UPS CONVERSION CA	95
8233	E8B	1828	1.5 M 12X TO 4X CHANNEL CO	300
8233	E8B	1829	0.6 METER 12X CABLE	350
8233	E8B	1830	1.5 METER 12X CABLE	400
8233	E8B	1834	8.0 METER 12X CABLE	725
8233	E8B	1840	3.0 METER 12X CABLE	475
8233	E8B	1841	3 M 12X TO 4X CHANNEL CONV	375
8233	E8B	1854	10 METER 12X TO 4X ENHANCE	600
8233	E8B	1861	0.6 METER 12X DDR CABLE	350
8233	E8B	1862	1.5 METER 12X DDR CABLE	400
8233	E8B	1864	8.0 METER 12X DDR CABLE	725
8233	E8B	1865	3.0 METER 12X DDR CABLE	475
8233	E8B	1878	OP PANEL CBL RACK MOUNT SY	6
8233	E8B	1882	146.8 GB 10K RPM SAS SFF D	650
8233	E8B	1883	73.4 GB 15K RPM SAS SFF DI	498

8233	E8B	1884	69.7 GB 15K RPM SAS SFF DI	498
8233	E8B	1885	300GB 10K RPM SFF SAS DISK	1050
8233	E8B	1886	146GB 15K RPM SFF SAS DISK	798
8233	E8B	1888	139GB 15K RPM SFF SAS DISK	798
8233	E8B	1890	69GB SFF SAS SOLID STATE D	5,200
8233	E8B	1905	4 GB SINGLE PORT FIBRE CHA	1,510
8233	E8B	1909	69GB SFF SAS SOLID STATE D	5,200
8233	E8B	1910	4 GB DUAL PORT FIBRE CHANN	2,499
8233	E8B	1912	ULTRA320 SCSI ADAPTER	587
8233	E8B	1954	BASE TX PCI X ADAPTER	830
8233	E8B	1971	73.4GB 15,000RPM ULTRA320	379
8233	E8B	1972	146.8GB 15,000RPM ULTRA320	699
8233	E8B	1977	2 GB FIBRE CHANNEL PCI X A	1,399
8233	E8B	1978	ETHERNET SX PCI X ADAPTER	863
8233	E8B	1979	BASE TX ETHERNET PCI X ADA	205
8233	E8B	1980	POWER GXT135P GRAPHICS	339
8233	E8B	1983	BASE TX ETHERNET LR PCI X	332
8233	E8B	1986	PCI X ON COPPER MEDIA ADP	725
8233	E8B	1987	PCI X ON OPTICAL MEDIA ADP	1,100
8233	E8B	2118	CONVERTER CBL, VHDCI TO P	50
8233	E8B	2124	ULTRA 320 SCSI CABLE 1 MET	125
8233	E8B	2125	ULTRA 320 SCSI CABLE 3 MET	140
8233	E8B	2126	ULTRA 320 SCSI CABLE 5 MET	156
8233	E8B	2127	ULTRA 320 SCSI CABLE 10 ME	210

8233	E8B	2128	ULTRA 320 SCSI CABLE 20 ME	330
8233	E8B	2138	0.55 METER ULTRA 320 SCSI	76
8233	E8B	2145	PRIMARY OS IBM I	0
8233	E8B	2146	PRIMARY OS AIX	0
8233	E8B	2147	PRIMARY OS LINUX	0
8233	E8B	2324	Zero-priced Proc Act for #8334	0
8233	E8B	2325	Zero-priced Proc Act for #8332	0
8233	E8B	2326	Zero-priced Proc Act for #8336	0
8233	E8B	2327	Zero-priced Proc Act for #8335	0
8233	E8B	2456	MICRON FIBER CONVERTER CAB	83
8233	E8B	2459	MICRON FIBER CONVERTER CAB	83
8233	E8B	2728	4 PORT USB PCIE ADAPTER	150
8233	E8B	2738	2 PORT USB PCI ADAPTER	45
8233	E8B	2849	POWER GXT135P GRAPHICS	339
8233	E8B	2861	ARTIC960HX 4 PORT EIA 232	354
8233	E8B	2863	ARTIC960HX 4 PORT X.21 CBL	417
8233	E8B	2864	ARTIC960HX 4 PORT V.35 CBL	700
8233	E8B	2893	PCIE 2 LINE WAN W/ MODEM	579
8233	E8B	2934	TERMINAL/ PRINTER CBL EIA 2	37
8233	E8B	2936	ASYNCHRONOUS CBL. EIA 232/	61
8233	E8B	2943	8 PORT ASYNCHRONOUS CBL	1,162
8233	E8B	2947	MULTIPROTOCOL PCI ADAPTER	3,021
8233	E8B	2951	CABLE, V.24 / EIA 232	146
8233	E8B	2952	CABLE, V.35	267
8233	E8B	2953	CABLE, V.36 / EIA 499	212
8233	E8B	2954	CABLE, X. 21	146
8233	E8B	2962	2 PORT MULTIPROTOCOL PCI A	1,666
8233	E8B	3124	PORT CBL. FOR DRAWER/ DRAWE	67

8233	E8B	3125	PORT CBL. FOR RACK/RACK	67
8233	E8B	3278	73.4GB 15,000RPM ULTRA320	498
8233	E8B	3279	146.8GB 15,000RPM ULTRA320	981
8233	E8B	3585	300GB 15K RPM SCSI DISK DR	1,510
8233	E8B	3586	69GB 3.5" SAS SOLID STATE	5,200
8233	E8B	3587	69GB 3.5" SAS SOLID STATE	5,200
8233	E8B	3632	WIDESCREEN LCD MONITOR	999
8233	E8B	3637	15" TFT COLOR MONITOR	407
8233	E8B	3639	L170P FLAT PANEL MONITOR	829
8233	E8B	3640	L171P FLAT PANEL MONITOR	580
8233	E8B	3641	T115 FLAT PANEL MONITOR	559
8233	E8B	3642	L191P FLAT PANEL MONITOR	680
8233	E8B	3643	T120 FLAT PANEL MONITOR	1,325
8233	E8B	3644	T119 FLAT PANEL MONITOR	845
8233	E8B	3645	T117 FLAT PANEL MONITOR	700
8233	E8B	3646	73 GB 15K RPM SAS DISK DRI	498
8233	E8B	3647	146 GB 15K RPM SAS DISK DR	498
8233	E8B	3648	300 GB 15K RPM SAS DISK DR	1,150
8233	E8B	3649	450GB 15K RPM SAS DISK DRI	1,599
8233	E8B	3652	SAS CBL (EE) DRAWER TO DRA	50
8233	E8B	3653	SAS CBL (EE) DRAWER TO DRA	70
8233	E8B	3654	SAS CBL (EE) DRAWER TO DRA	120
8233	E8B	3656	SAS SFF CABLE	40
8233	E8B	3657	SAS SFF CABLE	21
8233	E8B	3658	428GB 15K RPM SAS DISK DRI	1,599
8233	E8B	3661	SAS CBL (X) ADP ENCLOSURE	150

8233	E8B	3662	SAS CBL (X) ADP ENCLOSURE	301
8233	E8B	3663	SAS CBL (X) ADP ENCLOSURE	611
8233	E8B	3668	SAS CABLE, DASD BACKPLANE	80
8233	E8B	3669	SAS CBL DASD BACKPLANE (SP)	85
8233	E8B	3676	69.7GB 15K RPM SAS DISK DR	498
8233	E8B	3677	139.5GB 15K RPM SAS DISK D	498
8233	E8B	3678	283.7GB 15K RPM SAS DISK D	1,150
8233	E8B	3679	SAS CABLE (AI) 1 M	53
8233	E8B	3681	3M SAS CABLE, ADPTR TO ADP	75
8233	E8B	3682	6M SAS CABLE, ADPTR TO ADP	150
8233	E8B	3684	SAS CBL (AE) ADP ENCLOSURE	150
8233	E8B	3685	SAS CBL (AE) ADP ENCLOSURE	301
8233	E8B	3686	SAS CABLE (YI) SYSTEM TO S	90
8233	E8B	3687	SAS CABLE (YI) SYSTEM TO S	110
8233	E8B	3688	SAS CABLE (AT) 0.6 METER	90
8233	E8B	3691	SAS CBL (YO) ADP TO SAS	90
8233	E8B	3692	SAS CBL (YO) ADP TO SAS	110
8233	E8B	3693	SAS CBL (YO) ADP TO SAS	150
8233	E8B	3694	SAS CBL (YO) ADP ENCLOSURE	528
8233	E8B	3925	SERIAL PORT CONVERTER CABL	21
8233	E8B	3926	ASYNCH PRINTER/ TERMINAL CB	146
8233	E8B	3927	SERIAL PORT NULL MODEM CAB	67
8233	E8B	3928	SERIAL PORT NULL MODEM CAB	67
8233	E8B	4242	6 FOOT EXTENDER CABLE	83

8233	E8B	4256	EXTENDER CBL. USB KEYBOARD	42
8233	E8B	4276	VGA TO DVI CONNECT. CONVER	8
8233	E8B	4327	70.56GB 15K RPM DISK UNIT	754
8233	E8B	4328	141,12GB 15K RPM DISK UNIT	981
8233	E8B	4329	282.25GB 15K RPM DISK UNIT	2,114
8233	E8B	4526	8GB (2x4GB) DIMMs	1,065
8233	E8B	4527	16GB (2x8GB) DIMMs	2,130
8233	E8B	4528	32GB (2x16GB) DIMMs	6,390
8233	E8B	4650	RACK INDICATOR NOT FACTORY	0
8233	E8B	4651	RACK INDICATOR, RACK 1	0
8233	E8B	4652	RACK INDICATOR, RACK 2	0
8233	E8B	4653	RACK INDICATOR, RACK 3	0
8233	E8B	4654	RACK INDICATOR, RACK 4	0
8233	E8B	4655	RACK INDICATOR, RACK 5	0
8233	E8B	4656	RACK INDICATOR, RACK 6	0
8233	E8B	4657	RACK INDICATOR, RACK 7	0
8233	E8B	4658	RACK INDICATOR, RACK 8	0
8233	E8B	4659	RACK INDICATOR, RACK 9	0
8233	E8B	4660	RACK INDICATOR, RACK 10	0
8233	E8B	4661	RACK INDICATOR, RACK 11	0
8233	E8B	4662	RACK INDICATOR, RACK 12	0
8233	E8B	4663	RACK INDICATOR, RACK 13	0
8233	E8B	4664	RACK INDICATOR, RACK 14	0

8233	E8B	4665	RACK INDICATOR, RACK 15	0
8233	E8B	4666	RACK INDICATOR, RACK 16	0
8233	E8B	4764	CRYPTOGRAPHIC COPROCESSOR	9,000
8233	E8B	4792	Active Memory Exp Enablement	2,600
8233	E8B	4988	One Proc 5250 Ent Enablement	50,000
8233	E8B	4989	Full 5250 Ent Enablement	150,000
8233	E8B	5000	SOFTWARE PRELOAD REQUIRED	0
8233	E8B	5001	CUSTOM SERV SPECIFY, OFF S	0
8233	E8B	5002	CUSTOMER SOLUTION CENTER R	0
8233	E8B	5160	POWER DIST UNIT 1 PHASE NE	989
8233	E8B	5161	POWER DIST UNIT 1 PHASE IE	989
8233	E8B	5162	POWER DIST UNIT 2 OF 3 PHA	989
8233	E8B	5163	POWER DIST UNIT 3 PHASE	989
8233	E8B	5524	RFID TAGS FOR SERVERS BLAD	20
8233	E8B	5550	SYS CONSOLE ON HMC	0
8233	E8B	5553	SYS CONSOLE ETHERNET NO IO	0
8233	E8B	5609	GX DUALPORT 12X CHANNEL AT	2,200
8233	E8B	5613	DUAL PORT (SR) INTEG VIRTU	3,500
8233	E8B	5616	GX DUAL PORT 12X CHANN. AT	1,100
8233	E8B	5619	80/160GB DAT160 SAS TAPE D	1,661
8233	E8B	5623	VIRTUAL ETHERNET DAUGHTER	301
8233	E8B	5624	VIRTUAL ETHERNET DAUGHTER	528
8233	E8B	5646	BLIND SWAP TYPE III CASSET	38
8233	E8B	5647	BLIND SWAP TYPE III CASSET	38
8233	E8B	5661	DAT320 160GB SAS tape drive	2,100

8233	E8B	5679	SAS RAID ENABLEMENT	2,500
8233	E8B	5689	DAT160 MEDIA CARTRIDGE	452
8233	E8B	5700	GIGABIT ETHERNET SX PCI X	863
8233	E8B	5701	BASE TX ETHERNET PCI X ADP	528
8233	E8B	5706	BASE TX ETHERNET PCI X ADP	755
8233	E8B	5708	10GB FCOE PCIE DUAL PORT A	4,154
8233	E8B	5713	TOE PCI X ON COPPER MEDIA	900
8233	E8B	5714	TOE PCI X ON OPTICAL MEDIA	1,400
8233	E8B	5716	2 GIGABIT FIBRE CHANNEL PC	1,510
8233	E8B	5717	4 PORT BASE TX PCI EXPRESS	830
8233	E8B	5721	10 GB ETHER. SR PCI X 2.0	4,742
8233	E8B	5722	10 GB ETHER. LR PCI X 2.0	7,999
8233	E8B	5723	2 PORT ASYNCH. EIA 232 PCI	129
8233	E8B	5732	10 GB ETH CX4 PCI EXPRESS	3,626
8233	E8B	5735	8GB PCI EXPRESS DUAL PRT F	3,499
8233	E8B	5736	DUAL CHANNEL ULTRA320 SCSI	587
8233	E8B	5740	4 PORT BASE TX PCI X ADP	830
8233	E8B	5741	SINGLE BUS ULTRA 320 SCSI	499
8233	E8B	5742	DUAL BUS ULTRA320 SCSI REP	998
8233	E8B	5743	SATA SLIMLINE DVD ROM DRIV	208
8233	E8B	5746	HALF HIGH 800GB/1.6TB LTO4	3,777
8233	E8B	5747	IBM LTO ULTRIUM 4 800 GB D	600
8233	E8B	5748	POWER GXT145 PCI EXPRESS	378
8233	E8B	5749	4GBPS FIBRE CHANNEL 2 PORT	2,499
8233	E8B	5758	4 GB SINGLE PORT FIBRE CHA	1,510

8233	E8B	5759	4 GB DUAL PORT FIBRE CHANN	2,499
8233	E8B	5762	SATA SLIMLINE DVD RAM DRIV	299
8233	E8B	5767	BASE TX ETHER. PCI EXPRESS	528
8233	E8B	5768	ETHERNET SX PCI EXPRESS AD	1,322
8233	E8B	5769	10 GB ETH SR PCI EXPRESS A	4,003
8233	E8B	5772	10 GB ETHERNET LR PCI EXPR	4,742
8233	E8B	5773	SINGLE PORT FIBRE CHANNEL	1,510
8233	E8B	5774	DUAL PORT FIBRE CHANNEL AD	2,499
8233	E8B	5778	PCI X EXP24 CTL 1.5GB NO I	8,407
8233	E8B	5782	PCI X EXP24 CTL 1.5GB NO I	8,457
8233	E8B	5785	4 PORT ASYNC EIA 232 PCIE	699
8233	E8B	5786	TOTALSTORAGE EXP24 DISK DW	5,440
8233	E8B	5787	TOTALSTORAGE EXP24 DISK TW	6,750
8233	E8B	5796	PCI DDR 12X EXPANSION DRAW	4,945
8233	E8B	5802	12X I/O DRAWER PCIE, SFF D	10,900
8233	E8B	5877	12X I O DRAWER PCIE NO DIS	9,900
8233	E8B	5886	EXP 12S	4,500
8233	E8B	5900	PCI X DDR DUAL X4 SAS ADP	587
8233	E8B	5901	PCIE DUAL X4 SAS ADAPTER	749
8233	E8B	5902	PCI X DDR DUAL X4 3GB SAS	1,889
8233	E8B	5903	PCIE DUAL X4 3GB SAS RAID	2,199
8233	E8B	5904	PCI X DDR 1.5GB CACHE SAS	8,500
8233	E8B	5908	PCI X DDR 1.5GB CACHE SAS	8,500
8233	E8B	5912	PCI X DDR DUAL X4 SAS ADAP	825
8233	E8B	5922	NON PAIRED SAS RAID INDICA	0

8233	E8B	5923	NON PAIRED PCIE SAS RAID I	0
8233	E8B	5951	KEYBOARD USB, US ENGLISH,	83
8233	E8B	5952	KEYBOARD USB, FRENCH, 189	83
8233	E8B	5953	KEYBOARD USB, ITALIAN, 142	83
8233	E8B	5954	USB, GERMAN/ AUSTRIAN, 129	83
8233	E8B	5955	KEYBOARD USB, UK ENGLISH,	83
8233	E8B	5956	KEYBOARD USB, SPANISH, 172	83
8233	E8B	5957	KEYBOARD USB, JAPANESE, 19	83
8233	E8B	5958	USB, BRAZILIAN PORTUGUESE,	83
8233	E8B	5959	KEYBOARD USB, HUNGARIAN, 2	83
8233	E8B	5960	KEYBOARD USB, KOREAN, 413	83
8233	E8B	5961	KEYBOARD USB, CHINESE, 467	83
8233	E8B	5962	USB, FRENCH CANADIAN, 445	83
8233	E8B	5964	KEYBOARD USB, BELGIAN/ UK,	83
8233	E8B	5965	USB, SWEDISH/ FINNISH, 153	83
8233	E8B	5966	KEYBOARD USB, DANISH, 159	83
8233	E8B	5967	KEYBOARD USB, BULGARIAN, 4	83
8233	E8B	5968	USB, SWISS/ FRENCH/ GERMAN 1	83
8233	E8B	5969	KEYBOARD USB, NORWEGIAN, 1	83
8233	E8B	5970	KEYBOARD USB, DUTCH, 143	83
8233	E8B	5971	KEYBOARD USB, PORTUGUESE,	83
8233	E8B	5972	KEYBOARD USB, GREEK, 319	83
8233	E8B	5973	KEYBOARD USB, HEBREW, 212	83

8233	E8B	5974	KEYBOARD USB, POLISH, 214	83
8233	E8B	5975	KEYBOARD USB, SLOVAKIAN, 2	83
8233	E8B	5976	KEYBOARD USB, CZECH, 243	83
8233	E8B	5977	KEYBOARD USB, TURKISH, 179	83
8233	E8B	5978	KEYBOARD USB, LA SPANISH,	83
8233	E8B	5979	KEYBOARD USB, ARABIC, 253	83
8233	E8B	5980	KEYBOARD USB, THAI, 191	83
8233	E8B	5981	KEYBOARD USB, RUSSIAN, 443	83
8233	E8B	5982	KEYBOARD USB, SLOVENIAN, 2	83
8233	E8B	5983	USB, US ENGLISH EURO, 103P	83
8233	E8B	6001	POWER CONTROL CABLE (SPCN)	25
8233	E8B	6006	POWER CONTROL CABLE (SPCN)	40
8233	E8B	6007	POWER CONTROL CBL. (SPCN)	80
8233	E8B	6008	POWER CONTROL CABLE (SPCN)	50
8233	E8B	6029	POWER CONTROL CBL. (SPCN)	90
8233	E8B	6068	OPT FRONT DOOR FOR 1.8M RA	340
8233	E8B	6069	OPT FRONT DOOR FOR 2.0M RA	416
8233	E8B	6248	1.8M RACK ACOUSTIC DOORS	3,513
8233	E8B	6249	2.0M RACK ACOUSTIC DOORS	3,513
8233	E8B	6263	1.8M Rack Trim Kit	399
8233	E8B	6272	2.0M Rack Trim Kit	399
8233	E8B	6446	DUAL PRT 12X CHAN ATTACH S	576
8233	E8B	6457	DUAL PORT 12X CHAN ATTACH	2,500
8233	E8B	6458	POWER CBL. 14 FOOT, 250V/1	14

8233	E8B	6460	DRAWER TO OEM PDU (125V, 1	14
8233	E8B	6469	DRAWER TO OEM PDU, (250V,	14
8233	E8B	6470	TO WALL (125V, 15A)	14
8233	E8B	6471	TO WALL/OEM PDU, (125V, 15	14
8233	E8B	6472	TO WALL/OEM PDU, (250V, 16	14
8233	E8B	6473	TO WALL/OEM PDU, (250V, 10	14
8233	E8B	6474	TO WALL/OEM PDU, (250V, 13	14
8233	E8B	6475	TO WALL/OEM PDU, (250V, 16	14
8233	E8B	6476	TO WALL/OEM PDU, (250V, 10	14
8233	E8B	6477	TO WALL/OEM PDU, (250V, 16	14
8233	E8B	6478	TO WALL/OEM PDU, (250V, 16	14
8233	E8B	6479	PWR CRD 9FT WALL OEM PDU 2	14
8233	E8B	6487	TO WALL/OEM PDU, (250V, 15	14
8233	E8B	6488	PDU, (125V, 15A OR 250V, 1	40
8233	E8B	6489	4.3M 14FT 3PH/24A POWER CO	275
8233	E8B	6491	4.3M 14FT 1PH/48A PWR CORD	302
8233	E8B	6492	4.3M 14FT 1PH/48 60A PWR C	302
8233	E8B	6493	TO WALL/OEM PDU, (250V, 10	14
8233	E8B	6494	TO WALL/OEM PDU, (250V, 10	14
8233	E8B	6495	TO WALL/OEM PDU, (250V, 10	14
8233	E8B	6496	TO WALL/OEM PDU, (250V, 10	14
8233	E8B	6497	PWR CRD 6FT WALL OEM PDU 2	25
8233	E8B	6498	PWR CRD 6FT WALL/OEM PDU	780
8233	E8B	6577	PWR CABLE - DRWR to IBM PDU	0
8233	E8B	6580	OPTIONAL RACK	136
8233	E8B	6586	SECURITY KIT MODEM TRAY FOR 19 INCH RAC	189
8233	E8B	6651	TO WALL/OEM PDU, (125V, 15	14

8233	E8B	6654	4.3M 14FT 1PH/24 30A PWR C	181
8233	E8B	6655	4.3M 14FT 1PH/24 30A WR PW	400
8233	E8B	6656	4.3M 14FT 1PH/24A WR PWR C	181
8233	E8B	6659	TO WALL/OEM PDU, (250V, 15	14
8233	E8B	6660	DRAWER TO OEM PDU, (125V,	14
8233	E8B	6665	PWR CD 3M 10FT DRAWER PDU	14
8233	E8B	6669	DRAWER TO OEM PDU, (250V,	14
8233	E8B	6670	TO WALL (125V, 15A)	14
8233	E8B	6671	DRAWER TO PDU, (250V/10A)	14
8233	E8B	6672	DRAWER TO PDU, (250V/10A)	14
8233	E8B	6680	TO WALL/OEM PDU, (250V, 10	14
8233	E8B	6687	TO WALL, (250V, 15A)	14
8233	E8B	6805	PCI 2 LINE WAN IOA NO IOP	420
8233	E8B	6808	PCI 4 MODEM WAN IOA NO IOP	1,583
8233	E8B	6833	PCI 2 LINE WAN W/ MODEM NOI	579
8233	E8B	7109	INTELLIGENT PDU+ 1 EIA UNI	1099
8233	E8B	7118	Environmental Monitoring Probe	280
8233	E8B	7188	POWER DISTRIBUTION UNIT	756
8233	E8B	7204	QUANTITY 150 OF 2124	18,750
8233	E8B	7205	QUANTITY 150 OF 2125	21,000
8233	E8B	7206	QUANTITY 150 OF 2126	23,400
8233	E8B	7207	QUANTITY 150 OF 2127	31,500
8233	E8B	7208	QUANTITY 150 OF 2128	49,500
8233	E8B	7213	QUANTITY 150 OF 2138	11,400
8233	E8B	7305	SDI SOFTWARE PRE INSTALL I	0
8233	E8B	7307	DUAL I/O UNIT ENCLOSURE	525

8233	E8B	7314	I/O DRAWER MOUNTING ENCLOS	525
8233	E8B	7509	QUANTITY 150 OF 4327	113,100
8233	E8B	7510	QUANTITY 150 OF 4328	147,150
8233	E8B	7511	QUANTITY 150 OF 4329	317,100
8233	E8B	7517	QUANTITY 150 OF 3676	74,700
8233	E8B	7518	QUANTITY 150 OF 3677	74,700
8233	E8B	7519	QUANTITY 150 OF 3678	172,500
8233	E8B	7535	QUANTITY 150 OF 3586	780,000
8233	E8B	7536	QUANTITY 150 OF 3587	780,000
8233	E8B	7538	QUANTITY 150 OF 3658	239,850
8233	E8B	7549	QUANTITY 150 OF 3647	74,700
8233	E8B	7564	QUANTITY 150 OF 3648	172,500
8233	E8B	7565	QUANTITY 150 OF 3649	239,850
8233	E8B	7714	One Proc Activation for #8334	3,100
8233	E8B	7715	One Proc Activation for #8332	6,000
8233	E8B	7716	One Proc Activation for #8336	9,000
8233	E8B	7717	One Proc Activation for #8335	4,850
8233	E8B	7740	Power Supply, 1725 Watt AC	699
8233	E8B	7780	2.0M RACK SIDE ATTACH KIT	148
8233	E8B	7793	PowerVM Express	0
8233	E8B	7794	PowerVM Standard	0
8233	E8B	7795	PowerVM Enterprise	0
8233	E8B	7801	ETHERNET CABLE, 6M, HW	12
8233	E8B	7802	ETHERNET CABLE, 15M, HW	26
8233	E8B	7840	SIDE BY SIDE FOR 1.8M RACK	494
8233	E8B	7841	RUGGEDIZE RACK KIT	1,484
8233	E8B	7863	PCI BLIND SWAP CASSETTE KI	50
8233	E8B	8143	LINUX SOFTWARE PREINSTALL	60

8233	E8B	8144	LINUX SOFTWARE PREINSTALL	60
8233	E8B	8332	8-core 3.3 GHz POWER7 Proc	12,400
8233	E8B	8334	8-core 3.0 GHz POWER7 Proc	5,940
8233	E8B	8335	6-core 3.3 GHz POWER7 Proc	7,000
8233	E8B	8336	8-core 3.55 GHz POWER7 Proc	17,700
8233	E8B	8340	Enhanced DASD/Media Backplane	799
8233	E8B	8841	MOUSE USB, WITH KEYBOARD	62
8233	E8B	8845	USB MOUSE	30
8233	E8B	9169	ORDER ROUTING IND SYSTEM P	0
8233	E8B	9300	LANGUAGE GROUP SPECIFY US	0
8233	E8B	9440	NEW AIX LICENSE CORE COUNT	0
8233	E8B	9441	NEW IBM I LIC CORE COUNTER	0
8233	E8B	9442	NEW RED HAT LIC CORE COUNT	0
8233	E8B	9443	NEW SUSE LIC CORE COUNTER	0
8233	E8B	9444	OTHER AIX LIC CORE COUNTER	0
8233	E8B	9445	OTHER LINUX LIC CORE COUNT	0
8233	E8B	9446	3RD PARTY LINUX LIC CORE C	0
8233	E8B	9447	VIOS CORE COUNTER	0
8233	E8B	9461	MONTH INDICATOR	0
8233	E8B	9462	DAY INDICATOR	0
8233	E8B	9463	HOUR INDICATOR	0
8233	E8B	9464	MINUTE INDICATOR	0
8233	E8B	9465	QTY INDICATOR	0
8233	E8B	9466	COUNTABLE MEMBER INDICATOR	0
8233	E8B	9666	Tivoli Storage Mgr Specify	0
8233	E8B	9700	LANGUAGE GROUP SPECIFY DUT	0

8233	E8B	9703	LANGUAGE GROUP SPECIFY FRE	0
8233	E8B	9704	LANGUAGE GROUP SPECIFY GER	0
8233	E8B	9705	LANGUAGE GROUP SPECIFY POL	0
8233	E8B	9706	LANG. GROUP SPECIFY NORWEG	0
8233	E8B	9707	LANG. GROUP SPECIFY PORTUG	0
8233	E8B	9708	LANGUAGE GROUP SPECIFY SPA	0
8233	E8B	9711	LANGUAGE GROUP SPECIFY ITA	0
8233	E8B	9712	LANG. GROUP SPECIFY CANADI	0
8233	E8B	9714	LANG. GROUP SPECIFY JAPANE	0
8233	E8B	9715	TRADITIONAL CHINESE (TAIWA	0
8233	E8B	9716	LANGUAGE GROUP SPECIFY KOR	0
8233	E8B	9718	LANGUAGE GROUP SPECIFY TUR	0
8233	E8B	9719	LANG. GROUP SPECIFY HUNGAR	0
8233	E8B	9720	LANG. GROUP SPECIFY SLOVAK	0
8233	E8B	9721	LANGUAGE GROUP SPECIFY RUS	0
8233	E8B	9722	SIMPLIFIED CHINESE (PRC)	0
8233	E8B	9724	LANGUAGE GROUP SPECIFY CZE	0
8233	E8B	9725	LANG. GROUP SPECIFY ROMANI	0
8233	E8B	9726	LANG. GROUP SPECIFY CROATI	0
8233	E8B	9727	LANG. GROUP SPECIFY SLOVEN	0
8233	E8B	9728	SPECIFY BRAZILIAN PORTUGUE	0
8233	E8B	9729	LANGUAGE GROUP SPECIFY THA	0
7014	B42	0297	RACK CONTENT SPECIFY: 8233-E8B	0

7014	S25	0297	RACK CONTENT SPECIFY: 8233-E8B	0
7014	T00	0297	RACK CONTENT SPECIFY: 8233-E8B	0
7014	T42	0297	RACK CONTENT SPECIFY: 8233-E8B	0

Machine type	Model	Feature number	Description	MMMC IOR24
8233	E8B	0551	19 INCH, 1.8 METER HIGH RA	\$ 40
8233	E8B	0553	19 INCH, 2.0 METER HIGH RA	47
8233	E8B	0555	19 INCH, 1.3 METER HIGH RA	26
8233	E8B	1890	69GB SFF SAS SOLID STATE D	73
8233	E8B	1909	69GB SFF SAS SOLID STATE D	73
8233	E8B	3586	69GB 3.5" SAS SOLID STATE	73
8233	E8B	3587	69GB 3.5" SAS SOLID STATE	73
8233	E8B	5619	80/160GB DAT160 SAS TAPE D	61
8233	E8B	5661	DAT320 160GB SAS tape drive	61
8233	E8B	5746	HALF HIGH 800GB/1.6TB LTO4	61
8233	E8B	5786	TOTALSTORAGE EXP24 DISK DW	62
8233	E8B	5787	TOTALSTORAGE EXP24 DISK TW	62
8233	E8B	5796	PCI DDR 12X EXPANSION DRAW	86
8233	E8B	5802	12X I/O DRAWER PCIE, SFF D	371
8233	E8B	5877	12X I O DRAWER PCIE NO DIS	142
8233	E8B	5886	EXP 12S	228
8233	E8B	7535	QUANTITY 150 OF 3586	10920
8233	E8B	7536	QUANTITY 150 OF 3587	10920
8233	E8B	8332	8-core 3.3 GHz POWER7 Proc	273
8233	E8B	8334	8-core 3.0 GHz POWER7 Proc	228
8233	E8B	8335	6-core 3.3 GHz POWER7 Proc	251
8233	E8B	8336	8-core 3.55 GHz POWER7 Proc	319

Feature conversions

Feature conversions for 8233-E8B virtualization engine features

From FC:	To FC:	Parts returned	Purchase price
7793 - PowerVM Express	7794 - PowerVM Standard	No	
7793 - PowerVM Express	7795 - PowerVM Enterprise	No	
7794 - PowerVM Standard	7795 - PowerVM Enterprise	No	

Machine type	Model	Part number	Description	One-time charge
8233	E8B	823377937794	Feat Conv 7793 to 7794	\$ 0
8233	E8B	823377937795	Feat Conv 7793 to 7795	0
8233	E8B	823377947795	Feat Conv 7794 to 7795	0

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