IBM Power 720 server offers IBM POWER7 technology and large enterprise compute capability in small form-factor

Table of contents

At a glance

The Power® 720 Express® server is designed to bring the performance and reliability capabilities of POWER7® to your small and distributed business needs. The new Power 720 Express model (8202-E4C) offers:

- Powerful 64-bit POWER7 processors that offer 4-core, 6-core, and 8-core configuration options
- Tower or rack-mount configuration
- Memory capacity increased up to 256 GB of memory with optional memory riser card, optionally augmented with Active Memory™ Expansion
- Up to two optional PCIe I/O drawers or up to four optional PCI-X I/O drawers, adding up to 20 PCIe slots or 24 PCI-X slots
- Rich I/O options in the system unit
  - Five PCIe x8 Gen2 slots in the system unit
  - An additional four PCIe Low-Profile slots available as an option
  - Eight hard disk drive (HDD)/solid-state drive (SSD) SAS SFF (small form-factor) bays -- up to 4.8 TB
  - Optional slimline DVD-RAM
  - Half-high bay for tape or removable drive
  - Integrated SAS/SATA controller for HDD/SSD/tape/DVD
  - 1 Gbps 2-port Ethernet adapter (#9055)
- EnergyScale™ technology

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

Overview

The performance, availability, and flexibility of the Power 720 Express server can enable companies to spend more time running their business, utilizing proven solutions from thousands of ISVs that support the AIX®, IBM i, and Linux™ operating systems. The new Power 720 model (8202-E4C) provides enhancements that can be particularly beneficial to customers running applications driving very high I/O or memory requirements.

As a distributed application server, the Power 720 Express is designed with capabilities to deliver leading-edge application availability and enable more work to be processed with less operational disruption for branch office and in-store applications. As consolidation servers, PowerVM™ Editions provide the flexibility to use leading-edge AIX, IBM i, Linux for Power, and x86 Linux applications. PowerVM Editions offer comprehensive virtualization technologies designed to aggregate and manage resources while helping to simplify and optimize your IT infrastructure and deliver one of the most cost-efficient solutions for UNIX™, IBM i, and Linux deployments.

The Power 720 Express server with IBM i provides a technology foundation with proven reliability and security for the small or midsized company seeking a complete, integrated business system. This business system enables you to avoid increased spending and staffing requirements while becoming more responsive to your customers, improving your productivity, and keeping your data secure. IBM i integrates features to simplify your IT environment and delivers a complete, cost-effective business system that can grow with a business. The Power 720 delivers the performance and capacity to run new and existing core business applications on a single server, to greatly integrate and simplify your IT environment.

The Power 720 Express offers a choice of a 4-core, 6-core, or 8-core configuration, provided in your choice of a 4U rack-mount or a tower form factor. The Power 720 POWER7 3.0 GHz chip offers industry-leading 64-bit, SMT4 threading and up to 32 MB on-chip embedded DRAM L3 cache, among other advantages.

The Power 720 Express server supports a maximum of 16 DDR3 DIMM slots, with eight DIMM slots included in the base configuration and eight DIMM slots available with an optional memory riser card. Memory features (two memory DIMMs per feature) supported are 4 GB, 8 GB, 16 GB, and 32 GB that run at speeds of 1066 MHz. A system with the optional memory riser card installed has a maximum memory of 256 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 or decompression of memory content using processor cycles can allow memory expansion up to 100%. A server with a maximum of 256 GB can effectively be expanded up to 512 GB. 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 6-core and 8-core Power 720 Express server provides great I/O expandability. For example, with 12X-attached I/O drawers, you can have up to 24 PCI-X slots or up to 20 PCIe slots in addition to the PCI slots in the system unit. Using disk bays in the system unit, 12X feature 5802 I/O drawers, and feature 5887 EXP24S Disk Drawers, up to 380 disk drives can be attached. Plus extensive quantities of externally attached storage and tape drives and libraries can also be attached. Note the 4-core Power 720 Express server does not support the attachment of 12X I/O drawers or feature 5887 EXP24S Disk Drawers, and uses just the expansion capabilities in the system unit to offer very adequate expandability for many clients.

The Power 720 Express system offers two storage backplanes. The first supports up to six SFF SAS HDDs/SSDs, an SATA DVD, and a half-high tape drive. The second is a higher-function backplane that supports up to eight SFF SAS HDDs/SSDs, an SATA DVD, a half-high tape drive, Dual 175 MB Write Cache RAID, and an external SAS port. HDDs and SSDs are hot-swap and front accessible.

Other integrated features include:

- Up to 9 PCIe Gen2 expansion slots
  - Five PCIe Gen2 x8 expansion slots
  - Four additional PCIe Gen2 x8 low-profile slots (optional)
- One GX++ slot for 12X I/O loop (6-core and 8-core only)
- One 2-port 10/100/1000 Mbps Ethernet adapter (#9055)
- Service Processor
- Integrated SAS or SATA controller for HDD, SSD, tape, or DVD with RAID 10 support in system unit; RAID 5 and 6 available
- EnergyScale technology
- Two system ports and three USB ports
- Two Hardware Management Console (HMC) ports and two System Power Control Network (SPCN) ports
- Redundant and hot-swap power available
- Redundant and hot-swap cooling

The new Power 720 Express model (8202-E4C) should be particularly recommended when a customer's solution has high communications or other I/O requirements, or requires the maximum amount of memory available. PCIe Gen2 slots can transfer data at double the speed. The high data transfer rates offered by the PCIe Gen2 slots can allow higher I/O performance or consolidation of the I/O demands onto fewer adapters running at higher rates. This can result in better system performance at a lower cost when I/O demands are high.

Key prerequisites

Refer to the Hardware requirements section and Software requirements section.

Planned availability date

- October 21, 2011, except for feature EUC6 on the 8233-E8B and 7989-BCH
- November 22, 2011, for feature EUC6 on the 8233-E8B and 7989-BCH

Description

Power 720

Summary of standard features:

- Tower or rack-mount (4U) configuration
- 4-core, 6-core, and 8-core configurations with one processor module
- 4 GB, 8 GB, 16 GB, or 32 GB of 1066 MHz DDR3 ECC memory (error checking and correcting) memory, expandable to 256 GB
- 6 x 2.5-inch HDD or SSD/Media backplane or 8 x 2.5-inch HDD or SSD/Media backplane with Dual 175 MB Write Cache RAID, and an external SAS port
  - One to eight SFF HDDs or SSDs (mixing allowed)
- Two media bays:
  - One slim bay for an optional DVD-RAM
  - One half-high bay for an optional tape drive or removable disk
- A maximum of five PCIe x8 slots in base configuration:
  - Optional PCIe Riser Card provides an additional four PCIe x8 Low Profile slots.
  - One GX++ slot for I/O loop available unless the PCIe Riser Card is installed in the system (6-core and 8-core systems only).
- Integrated:
  - Service Processor
  - EnergyScale technology
  - Hot-swap and redundant cooling
  - Three USB ports; two system ports
  - Two HMC ports; two SPCN ports
- One Power supply, 1725 watt ac
  - Additional power supply available for redundant power and hot-swap

The minimum Power 720 initial order must include a processor, processor activations, memory, a power supply, a power cord, one HDD/SSD, a storage backplane, an operating system indicator, a cover set indicator, and a Language Group Specify.

If IBM i is the Primary Operating System (#2145), the initial order must also include one additional HDD/SSD, a Mirrored System Disk Level Specify Code, and a System Console on HMC Indicator. A DVD is defaulted on every order but may be de-selected.

The minimum defined initial order configuration, if no choice is made, when AIX or Linux is the primary operating system is:

Feature number	Description
EPC5	0/4 core 3.0 GHz POWER7 Processor
4 x EPD5	4 Processor Activations
EM04	4 GB (2 x 2048 MB) Memory
1886	146.8 GB 15k rpm, SFF HDD
5618	Storage Backplane for 2.5-inch HDD or SSD/SATA DVD/Tape
9055	2-Port 10/100/1000 Base-TX Ethernet PCIe Adapter
5603	Power Supply, 1725 watt ac, Base
7134	IBM Rack-mount Drawer Bezel and Hardware
9300/97xx	Language Group Specify
2146 or 2147	Primary Operating System Indicator - IBM AIX (#2146) or Linux (#2147)
6xxx	One Power Cord

Note: No internal HDD or SSD is required if feature 0837 (Boot from SAN) is selected. A Fibre Channel or Fibre Channel over Ethernet (FCoE) adapter must be ordered if feature 0837 is selected.

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

Feature number	Description
EPC5	0/4 core 3.0 GHz POWER7 Processor
4 x EPD5	4 Processor Activations
EM04	4 GB (2 x 2048 MB) Memory
2 x 1888	139.5 GB, 15k rpm, SAS SFF HDD
EJ01	Storage Backplane for 2.5-inch HDD or SSD/SATA DVD/Tape/RAID/External SAS Port
9055	2-Port 10/100/1000 Base-TX Ethernet PCIe Adapter
5603	Power Supply, 1725 watt ac, Base
7134	IBM Rack-mount Drawer Bezel and Hardware
9300/97xx	Language Group Specify
2145	Primary Operating System Indicator - IBM i
0040	Mirrored System Disk Level Specify Code
0566 or 0567	IBM i 6.1.1 or IBM i 7.1 indicator
5550 or 5553	System Console on HMC Indicator or System Console-Ethernet No IOP
6xxx	One Power Cord

Note: No internal HDD/SSD is required if feature 0837 (Boot from SAN) is selected. A Fibre Channel adapter must be ordered if feature 0837 is selected.

Note: When IBM i is the primary operating system (#2145), a DVD-ROM or DVD-RAM must be accessible by the Power 720.

IBM Editions

IBM Editions are available only as initial order.

If you order a Power 720 Express server IBM Edition as defined below, you can qualify for half the initial configuration's processor core activations at no additional 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 client is entitled to a processor activation at no additional charge.

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

- 3.0 GHz 4-core processor module (#EPC5)
  - 2 x #EPD5 (chargeable) and 2 x #EPE5 (no-charge) with 4-core (1 x #EPC5) configuration
- 3.0 GHz 6-core processor module (#EPC6)
  - 3 x #EPD6 (chargeable) and 3 x #EPE6 (no-charge) with 6-core (1 x #EPC6) configuration
- 3.0 GHz 8-core processor module (#EPC7)
  - 4 x #EPD7 (chargeable) and 4 x #EPE7 (no-charge) with 8-core (1 x #EPC7) configuration

When you purchase an IBM Edition, you must purchase an AIX or IBM i operating system license, or you may choose to purchase the system with or without a Linux operating system. The AIX, IBM i, or Linux operating system is processed via a feature number on AIX 5.3, 6.1, or 7.1; IBM i 6.1.1 or IBM i 7.1; and SUSE Linux Enterprise Server or Red Hat Enterprise Linux. If you choose AIX 5.3, 6.1, or 7.1 for your primary operating system, you can also order IBM i 6.1.1 or IBM i 7.1 and SUSE Linux Enterprise Server or Red Hat Enterprise Linux. 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 HDD or 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 modules and processor activations are only available to Solution Delivery Integration (SDIs) as MES orders.

IBM Edition minimum memory definition details

A minimum of 2 GB memory per core is needed to qualify for the IBM Edition. There can be different valid memory configurations that meet the minimum requirement.

Edition minimum disk/SSD/Fibre Channel/FCoE definition details

- A minimum of two HDD, or two SSD, or two Fibre Channel adapters, or two FCoE adapters. You only need to meet one of these disk/SSD/FC/FCoE criteria. Partial criteria cannot be combined.
  - Two SAS HDDs -- any capacity drives located in the system unit, features 5802, 5886, or 5887 DASD drawers qualify.
  - Two SAS SSDs -- any capacity drives located in the system unit, features 5802, 5886, or 5887 DASD drawers qualify.
  - Two SSD Modules with eMLC (#1995/#1996) -- modules located in the system unit with feature 2053 or 2054, or in feature 5802 or 5887 DASD drawer with feature 2055 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 -- located in the system unit or PCIe 12X-attached I/O drawer.

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

- 3.0 GHz 4-core processor module
- 3.0 GHz 6-core processor module
- 3.0 GHz 8-core processor module

Express Editions and Solution Editions with the IBM i Operating System

Express Editions enable initial ease of ordering and feature a lower price than if you ordered them "a la carte" or build-to-order. Taking advantage of the edition is the only way you can use no-charge features for processor activations and IBM i user license entitlements. The Express Editions are available only during the initial system order and cannot be ordered after your system is shipped.

The IBM configurator offers these easy-to-order Express Editions that include no-charge activations or no-charge IBM i user entitlements. You can modify the Express Edition configurations to match your exact requirements for your initial shipment -- increasing or decreasing the configuration. If you create a configuration that falls below any of the defined minimums, the IBM configurator replaces the no-charge features with equivalent function regular charge features.

Express Editions for the Power 720

4-core Power 720 Express Editions (#0777):

To use the no-charge features on your initial order, you must order:

- 3.0 GHz 4-core processor module (#EPC5).
- IBM i Primary Operating System Indicator (#2145).
- 8 GB minimum memory -- 2 x 4 GB (2 x 2 GB DIMMs)(#EM04) or 1 x 8 GB (2 x 4 GB DIMMs)(#EM08). Memory features EM16 and EM32 are not supported with the 4-core processor module.
- Minimum of two HDD, or two SSD, or two Fibre Channel adapters, or two FCoE adapters. You only need to meet one of these disk/SSD/FC/FCoE criteria. Partial criteria cannot be combined.

  - Two SAS disk drives -- any capacity drives located in the system unit.
  - Two SAS SSDs -- drives located in the system unit.
  - Two SSD Modules with eMLC (#1995/#1996) -- modules located in the system unit with feature 2053 or feature 2054.
  - Two Fibre Channel adapters -- PCIe adapters located in the system unit.
  - Two Fibre Channel over Ethernet adapters -- located in the system unit.

If the above requirements are met, the following are included:

- Two no-charge activations (2 x #EPE5)
- IBM i 5 user entitlements (no-charge)
- One IBM i Access Family license with unlimited users (57xx-XW1)
- Reduced price on 57xx-WDS and 5733-SOA

4-core Entry Edition (#0777) suggested starting configuration:

- One 4-core 3.0 GHz processor card (#EPC5)
- One 8 GB memory feature (#EM08)
- Two 139.5 GB SAS SFF 15,000 rpm disk drives (#1888)
- One 2-Port 10/100/1000 Base-TX Ethernet PCI Express Adapter (#9055)
- One storage backplane with external SAS port (#EJ01)
- One SATA DVD-RAM (#5762)
- One 1.5 TB/3.0 TB LTO-5 SAS tape drive (#5638)
- Two 1725 watt ac power supplies (2 x #5603)
- Two power cords (2 x 6xxx)
- Two processor activations (2 x #EPC5)
- Two processor activations (2 x #EPE5) (no additional charge)
- IBM Tower cover set (#7567) or IBM Rack-mount Bezel and Hardware (#7134)
- IBM i Primary Operating System Indicator (#2145)
- PowerVM Express Edition (#5225), or later
- Five IBM i user entitlements (no additional charge) (57xx--SSC)
- One IBM i Access Family license with unlimited users (57xx-XW1)
- Reduced price on 57xx-WDS and 5733-SOA

6-core and 8-core Power 720 Express Editions (#0779):

To use the no-charge features on your initial order of 6-core and 8-core Power 720 Express Editions (#0779), you must order:

- 3.0 GHz 6-core processor module (#EPC6) or 3.0 GHz 8-core processor module (#EPC7)
- IBM i Primary Operating System Indicator (#2145)
- 16 GB minimum memory -- 4 x 4 GB (2 x 2 GB DIMMs), or 2 x 8 GB (2 x 4 GB DIMMs)(#EM08), or 1 x 16 GB (2 x 8 GB DIMMs)(#EM16), or 1 x 32 GB (2 x 16 GB DIMMs)(#EM32)
- Minimum of two HDD, or two SSD, or two Fibre Channel adapters, or two FCoE adapters. You only need to meet one of these 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, feature 5886 DASD drawer, or feature 5887 DASD drawer qualify.
  - Two SAS SSDs -- any capacity drives located in the system unit, feature 5802 I/O drawer, feature 5886 DASD drawer, or feature 5887 DASD drawer qualify.

  - Two SSD Modules with eMLC (#1995/#1996) -- modules located in the system unit with feature 2053 or 2054, or in the feature 5802/5877 I/O drawer with feature 2055 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.

If the above requirements are met, the following are included:

- Three no-charge activations (3 x #EPE6) with feature EPC6 or four no-charge activations (4 x #EPE7) with feature EPC7
- Thirty IBM i user entitlements (charged)
- One IBM i Access Family license with unlimited users (57xx-XW1)
- Reduced price on 57xx-WDS and 5733-SOA

The suggested starting configuration for the 6-core or 8-core Entry Edition (#0779) is:

- One 6-core 3.0 GHz processor card (#EPC6) or one 8-core 3.0 GHz processor card (#EPC7)
- Two 8 GB memory features (2 x #EM08)
- Two 139.5 GB SAS SFF 15,000 rpm disk drives (#1888)
- One 2-Port 10/100/1000 Base-TX Ethernet PCI Express Adapter (#9055)
- One storage backplane with external SAS port (#EJ01)
- One SATA DVD-RAM (#5762)
- One 1.5 TB/3.0 TB LTO-5 SAS tape drive (#5638)
- Two 1725 watt ac Power Supplies (2 x #5603)
- Two power cords (2 x 6xxx)
- Three processor activations (3 x #EPD6) with feature EPC6 or four processor activations (4 x #EPD7) with feature EPC7
- Three no-charge processor activations (3 x #EPE6) with feature EPC6 or four no-charge processor activations (4 x #EPE7) with feature EPC7
- IBM Tower cover set (#7567) or IBM Rack-mount Bezel and Hardware (#7134)
- IBM i Primary Operating System Indicator (#2145)
- PowerVM Express Edition (#5225), or later
- Thirty IBM i user entitlements (charged) (57xx-SSC)
- One IBM i Access Family license with unlimited users (57xx-XW1)
- Reduced price on 57xx-WDS and 5733-SOA

IBM i Solution Edition for Power 720

The IBM i Solution Editions are designed to help you take advantage of the combined experience and expertise of IBM and ISVs in building business value with your IT investments. A qualifying purchase of software, maintenance, services, or training for a participating ISV solution is required when purchasing an IBM i Solution Edition.

The Power 720 Solution Edition feature 4928 supports the 4-core configuration and feature 4927 supports both 6-core and 8-core configurations. For a list of participating ISVs, registration form, and additional details, visit the Solution Edition website at

http://www-03.ibm.com/systems/power/hardware/editions/solutions.html

The Power 720 Solution Edition includes no-charge features, resulting in a lower initial list price for qualifying clients. Also included is an IBM Service voucher to help speed implementation of the ISV solution.

The requirements to be eligible to purchase a 720 Solution Edition order are:

- The offering must include new or upgrade software licenses or software maintenance from the ISV for the qualifying IBM server. Services or training for the qualifying server can also be provided.
- Proof of purchase of the solution with a participating ISV must be provided to IBM on request. The proof must be dated within 90 days before or after the date of order of the qualifying server.

IBM i for Business Intelligence

Business Intelligence remains a top priority of mid-market companies, but budgets and staff/skills to support enterprise BI solutions are very small in comparison to enterprise accounts. IBM i clients have 90% or more of their data already in DB2® for i, yet a large majority (1000s) are still using Query/400 for reporting purposes. A significant number of clients have invested in tools that have a limited future or are not keeping up with DB2 for IBM i query technology. Other offerings force clients to move data to other systems.

The momentum around "analytics" is creating interest and opportunities to deliver an alternative to Business Intelligence that makes sense by laying the groundwork for data warehousing while showing immediate results with new levels of operational reporting results.

Solution benefits

- Low-cost, value-built solution (IBM i with Power Systems™)
- Builds on popular DB2 Web Query
- Two-stage implementation: Start with operational reporting and optionally grow into data warehousing

Stage 1: Building a reporting foundation

- Get new reports/information in days
- Replicate production database to a second system
- Isolate query workloads (tune, optimize)
- Provide limited data transformation
- Provide low-entry price point that you can build on
- Leverage the system for additional purposes

Stage 2: Growing into a data warehouse

- Requires the additional purchase of ETL software and associated services
- Transforms and cleanses data using the ETL process
- Improves analytics by restructuring of the data (for example, create a client profiling database)
- Isolates query workloads (tune, optimize)
- Needs longer implementations -- more services required

Solution features

Three new orderable hardware features that generate a configuration of defaults/ minimums for the Power 720 (8202-E4C):

Feature	Feature description
4934	IBM i for BI - Small configuration
4935	IBM i for BI - Medium configuration
4936	IBM i for BI - Large configuration

Solution configurations:

Business Intelligence Solution #1

- Feature 4934: IBM i for BI -- Small configuration
- Power 720 Express (four cores active) -- one core licensed for use
- DB2 WebQuery
- Other BI software:
  - IBM i Processor License
  - IBM i User Entitlements (15)
  - One year of SWMA
  - iAccess Family
  - OmniFind® Text Sch DB2
  - DB2 Symmetric Multi-processor
  - RDPower Source Code
  - WebSphere® Development Studio
  - Rational® Developer

Change Data Capture (5724-U70): This software, a key component of the solution, is separately purchased through IBM's Passport order fulfillment system using pre-approved Special Bid pricing.

Business Intelligence Solution #2

- Feature 4935: IBM i for BI -- Medium configuration
- Power 720 Express (six cores active) -- two cores licensed for use
- DB2 WebQuery
- Other BI software:
  - IBM i Processor License
  - IBM i User Entitlements (30)
  - One year of SWMA
  - iAccess Family
  - OmniFind Text Sch DB2
  - DB2 Symmetric Multi-processor
  - RDPower Source Code
  - WebSphere Development Studio
  - Rational Developer

Change Data Capture (5724-U70): This software, a key component of the solution, is separately purchased through IBM's Passport order fulfillment system using pre-approved Special Bid pricing.

Business Intelligence Solution #3

- Feature 4936: IBM i for BI -- Large configuration
- Power 720 Express (six cores active) -- four cores licensed for use
- DB2 WebQuery
- Other BI software:
  - IBM i Processor License
  - IBM i User Entitlements (50)
  - One year of SWMA
  - iAccess Family
  - OmniFind Text Sch DB2

- DB2 Symmetric Multi-processor
- RDPower Source Code
- WebSphere Development Studio
- Rational Developer

Change Data Capture (5724-U70): This software, a key component of the solution, is separately purchased through IBM's Passport order fulfillment system using pre-approved Special Bid pricing.

Model upgrades

Power 520 (8203-E4A) to the Power 720 (8202-E4C)

You can upgrade the 2-core or 4-core 8203-E4A with IBM POWER6® or POWER6+™ processors to the 6-core or 8-core IBM Power 720 (8202-E4C) with POWER7 processors. For upgrades from POWER6 or POWER6+ processor-based systems, IBM will install new CEC enclosures to replace the enclosures the client currently has. The client's current CEC enclosures will be returned to IBM.

Clients taking advantage of the model upgrade offer from a POWER6 or POWER6+ processor-based system are required to return all components of the serialized machine type/model that were not ordered via feature numbers. Any feature for which a feature conversion is used to obtain a new part must be returned to IBM also. Clients may keep and reuse any features from the CEC enclosures that were not involved in a feature conversion transaction.

Upgrade considerations

Feature conversions have been set up for the following:

- POWER6 and POWER6+ processors to POWER7 processors

The following processor conversions are supported:

8203-E4A Feature	8202-E4C Feature
#5634 2-core 4.2 GHz	#EPC6 6-core 3.0 GHz
#5577 2-core 4.7 GHz	#EPC6 6-core 3.0 GHz
#5635 4-core 4.2 GHz	#EPC6 6-core 3.0 GHz
#5587 4-core 4.7 GHz	#EPC6 6-core 3.0 GHz
#5634 2-core 4.2 GHz	#EPC7 8-core 3.0 GHz
#5577 2-core 4.7 GHz	#EPC7 8-core 3.0 GHz
#5635 4-core 4.2 GHz	#EPC7 8-core 3.0 GHz
#5587 4-core 4.7 GHz	#EPC7 8-core 3.0 GHz

The following features present on the current system can be moved to the new system:

- PCIe adapters with cables
- Line cords, keyboards, and displays
- PowerVM (#5225, #5227, and #5228)
- I/O drawers (#5786, #5796, #5802, #5877, #5886, and #5887)
- Racks (#0551, #0553, and #0555)
- Rack doors (#6068, #6069, #6248, and #6249)
- Rack trim kits (#6246 and #6247)
- SATA DVD-ROM (#5743)
- SATA DVD-RAM (#5762)

The Power 720 can support the following 12X drawers and disk-only drawers:

- Feature 5802 and 5877 PCIe 12X I/O drawers

- Feature 5796 and 7413-G30 PCI-X (12X) I/O Drawer
- Feature 5786 and 7031-D24 TotalStorage EXP24 SCSI Disk Drawer
- Feature 5886 EXP12S SAS DASD Drawer
- Feature 5997 EXP24S DASD Drawer

In the Power 720 system unit SAS bays, only the SAS SFF hard disks or SFF solid-state drives are supported internally. The 3.5-inch HDD or SSD can be attached to the Power 720 but must be located in a I/O drawer such as feature 5886.

Dynamic logical partitioning

The dynamic logical partitioning (LPAR) function provides enhanced resource management for the Power 720 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 HDDs or SSDs into your system's configuration without requiring a reboot. Without the optional PowerVM Standard Edition (#5227) or PowerVM Enterprise Edition (#5228) feature, as many as eight LPARs are supported in an 8-core Power 720. 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 80 dynamic LPARs.

An HMC or Integrated Virtualization Manager (IVM) is required to manage the Power 720 (8202-E4C) implementing partitioning. Multiple Power 720 servers can be supported by a single HMC.

If an HMC is used to manage any Power 720 server, the HMC must be a rack-mount HMC model CR3, or later, or deskside HMC model C05, or later.

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 the rack-mount model CR3, or later, or deskside model C06, or later.

PowerVM Editions (optional)

Three optional PowerVM Edition features are now available on the Power 720: PowerVM Express Edition, PowerVM Standard Edition, and PowerVM Enterprise Edition. These are managed using built-in IVM software or optionally through use of an HMC.

PowerVM Standard Edition (#5227) and PowerVM Enterprise Edition (#5228) allow clients 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, 80 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 5227 or 5228 will result in Micro-Partitioning to be enabled during manufacture and the enabling software media and publications to be shipped to the client. When ordering feature number 5227 or 5228 as an MES, an activation key will be posted on an IBM website, and the client must retrieve it and install it on the system.

The IBM website 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 (#5225), 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 operating system levels.
- Active Memory Sharing is planned to be supported with the availability of SUSE Linux Enterprise Server (SLES) 11 SP1.

Clients 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 80 logical partitions on the Power 720. 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.

Power 720 Capacity BackUp (CBU) capability

(Applies to IBM i only)

The Power 720 system's 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 IBM i user license 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 or during a model upgrade from a Power 520 into the Power 720. 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 IBM i user license 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 IBM i user license 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 4-core Power 720 (8202-E4C) server with its IBM i P05 software tier can be a POWER6 or POWER7 server with a P05, P10, or P20 software tier listed below:

Power 520: 9407-M15, 9408-M25, 8203-E4A (1-core, 2-core, 4-core)
Power 720: 8202-E4B, 8202-E4C (4-core, 6-core, 8-core)
Power 740: 8205-E6B, 8205-E6C
Power 750: 8233-E8B
Power 550: 9409-M50, 8204-E8A
Power 560: 8234-EMA

The primary system for a 6-core or 8-core Power 720 (8202-E6C) server with its IBM i P10 software tier can be a POWER6 or POWER7 server with a P10, P20, or P30 software tier listed below:

Power 520: 9408-M25, 8203-E4A (2-core, 4-core)
Power 720: 8202-E4B, 8202-E4C (6-core, 8-core)
Power 740: 8205-E6B, 8205-E6C
Power 750: 8233-E8B
Power 550: 9409-M50, 8204-E8A
Power 560: 8234-EMA
Power 570: 9406-MMA, 9117-MMA
Power 770: 9117-MMB

The primary machine must be in the same enterprise and country 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 IBM i user entitlements, you must have more than the minimum number of IBM i user entitlements on a 9408, 8203, or 8202 primary server. You can then transfer any IBM i user entitlements above the minimum, assuming the total IBM i users on the primary system do not require the IBM i entitlement you want to transfer during the time of the transfer. The Power 550, 560, 740, and 750 do not have user entitlements that can be transferred and only processor license entitlements can be transferred. The minimum number of IBM i users on the POWER6 and POWER7 with i user entitlements are:

- Power 520 1-core (9407-M15, 8203-E4A): 5 users

- Power 520 2-core (9408-M25, 8203-E4A): 30 users
- Power 520 4-core (8203-E4A): 50 users
- Power 720 4-core (8202-E4B): 5 users
- Power 720 6-core or 8-core (8202-E4B): 30 users

For example, if you have a 2-core Power 520 (8203-E4A or 9408-M25) as your primary system with two IBM i processor license entitlements (one above the minimum) and 50 IBM i user entitlements (20 above the minimum), you can temporarily transfer up to one IBM i entitlement and up to 20 user entitlements. During this temporary transfer, the CBU system's internal records of its total number of IBM i processor and user license entitlements is not updated, and you may see IBM i license noncompliance warning messages from the CBU system.

Note that if the Power 720 CBU server has just one partition and if it is using the default parameters set by IBM Manufacturing, the IBM i licensing manager will ignore the temporary transfer and will not use additional processor cores. To work around this restriction for valid CBU situations, you can add a partition with no resource on your server or implement a shared processor pool.

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 720, providing extensive capability to expand the overall server expandability and connectivity.

- Feature 5802 provides 10 PCIe slots and 18 SFF SAS DASD slots.
- Feature 5877 provides 10 PCIe slots.
- Feature 5796 provides six PCI-X slots (supported but not orderable).
- The 7314-G30 provides six PCI-X slots (supported but not orderable).

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

- Feature 5886 EXP12S holds twelve 3.5-inch SAS HDDs or SSDs (supported but not orderable).
- Feature 5887 EXP24S holds twenty-four 2.5-inch (SFF) SAS HDDs or SSDs.
- Feature 5786 EXP24 holds a 3.5-inch SCSI disk (used for migrating existing SCSI drives) (supported but not orderable).
- The 7031-D24/T24 holds twenty-four 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 720 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.

Feature number I/O drawers available for order on the Power 720

PCI-X DDR 12X Expansion Drawer (#5796) (supported only -- not orderable)

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 22.4 cm (8.8 in) 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 720 uses the GX++ Dual-port 12x Channel Attach (#EJ04) adapter to attach a feature 5796 12X I/O Drawer using SDR speed.

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 300 GB disk drives, the feature 5802 provides up to 5.4 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 Gen3 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 720 uses the GX++ Dual-port 12x Channel Attach (#EJ04) adapter to attach a feature 5802 12X I/O Drawer. The feature EJ04 provides double data rate (DDR) capacity bandwidth.

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 Gen3 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 720 uses the GX++ Dual-port 12x Channel Attach (#EJ04) adapter to attach a feature 5877 12X I/O Drawer. Feature EJ04 provides double data rate (DDR) capacity bandwidth.

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

EXP 12S SAS Drawer (#5886) (supported only -- not orderable)

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 SSDs. The EXP 12S SAS drawer has twelve 3.5-inch SAS disk bays with redundant data paths to each bay. The drawer supports redundant hot-plug power and cooling and redundant hot-swap SAS expanders (Enclosure Services Manager-ESM). Each ESM has an independent SCSI Enclosure Services (SES) diagnostic processor.

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

- The large cache PCI-X feature 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 is used for controller redundancy.
- The medium cache PCI-X feature 5902 and PCIe feature 5805 adapters are always paired and use a SAS X cable to attach the feature 5886 I/O drawer.
- The zero cache PCI-X feature 5912 and PCIe feature 5901 use a SAS Y cable when a single port is running the EXP12S. A SAS X cable is used for AIX/Linux environments when a pair of adapters is used for controller redundancy.

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

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

The feature 5886 can also be directly attached to the SAS port on the rear of the Power 720, providing a very low cost disk storage solution. When used this way, the imbedded SAS controllers in the system unit drive the disk drives in EXP12S. A second unit cannot be cascaded to a feature 5886 attached in this way.

EXP24S SFF Gen2-Bay Drawer (#5887)

The EXP24S SFF Gen2-Bay Drawer is an expansion drawer with twenty-four 2.5-inch small form-factor (SFF) SAS bays. It supports up to 24 hot-swap SFF SAS HDDs

on POWER6 or POWER7 servers in 2U of 19-inch rack space. The EXP24S bays are controlled by SAS adapters/controllers attached to the I/O drawer by SAS X or Y cables.

The SFF bays of the EXP24S are different from the SFF bays of the POWER7 system units or 12X PCIe I/O Drawer (#5802). The EXP24S uses Gen2 or SFF-2 SAS drives that physically do not fit in the Gen1 or SFF-1 bays of the POWER7 system unit or 12X PCIe I/O Drawers or vice versa.

The following SFF-2/Gen2 SAS drives can be used in the EXP24S:

- HDD
  - 10,000 rpm 283 GB/300 GB (#1956, #1925, #1844, and #1869)
  - 10,000 rpm 571 GB/600 GB (#1962, #1964, #1817, and #1818)
  - 15,000 rpm 139 GB/146 GB (#1947, #1917, #1868, and #1866)
  - 15,000 rpm 283 GB/300 GB (#1948, #1953, #1927, and #1929)
- SSD
  - 177 GB (#1793, #1794, #1887, and #1958)

The SAS adapters/controllers that support the EXP24S are:

- PCI-X 1.5 GB Cache SAS RAID Adapter 3 Gb (#5908)
- PCIe2 1.8 GB Cache RAID SAS Adapter Tri-port 6 Gb (#5913)
- PCIe Dual-x4 SAS Adapter 3 Gb (#5901, #5278)

The integrated SAS controllers that support the EXP24S off the imbedded SAS port on the rear of the server are in:

- The Power 710, 720, 730, 740, 750, 755, 770, and 780
- The Power 520 (8203-E4A) and Power 550 (8204-E8A)

AIX, Linux, and VIOS support all of the above SAS adapters/controllers with the EXP24S. IBM i supports all but the feature 5901 and 5278 adapters with the EXP24S.

Up to 24 HDDs can be supported with any of the supported SAS adapters/ controllers.

The EXP24S has a fixed-length set of rails that allows it to fit in standard Power Systems 19-inch racks such as the 7014-T42 or -T00 or the feature 0551 or 0553.

19-inch racks

The Model 8202-E4C 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 8202 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 8202-E4C 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 -- supported only)

The 1.3-meter rack (#0555) is a 25 EIA unit rack. The rack is the same rack delivered when you order the 7014-S25 rack.

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 client 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
  - Client-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 highly reliable. The POWER7 processor SCM 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 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.

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.

Fault monitoring functions

- When a POWER7 processor-based system is initially powered on, BIST and POST (power-on self-test) check the 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 client 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 technology-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 is designed to significantly reduce 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 is designed to 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. 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. These systems are designed to avoid a full system outage.

POWER7 single processor checkstopping

As in POWER6, POWER7 provides single processor checkstopping. This is designed to reduce the probability of a fault in 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

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 certain symptoms that may indicate a failure is imminent, the system can dynamically deallocate and call home, when enabled, 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 client 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 client, 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 Client Set Up (CSU), Client 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, 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 amber system fault LED, enclosure fault LED, and the component FRU fault LED. The servicer

can also use the identify function to blink the FRU-level LED. When this function is activated, a roll-up to the blue enclosure locate and system locate LEDs will occur. These LEDs will turn on solid and can be used to follow the light path from the system to the enclosure and down to the specific FRU.

First Failure Data Capture and Error Data Analysis

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

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

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

Diagnostics

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

- Provide a common error code format equivalent to a system reference code, system reference number, checkpoint, or firmware error code.
- Provide fault detection and problem isolation procedures.
- Support the 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 boottime 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, HDD or SSD, DVD, and firmware updates (when possible). The determination of whether a firmware release can be updated concurrently is identified in the readme information file released with the firmware.

Service labels

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

- Location diagrams: Location diagrams are strategically located on the system hardware, relating information regarding the placement of hardware

components. Location diagrams may include location codes, drawings of physical locations, concurrent maintenance status, or other data pertinent to a repair. Location diagrams are especially useful when multiple components are installed such as DIMMs, CPUs, processor books, fans, adapter cards, LEDs, and power supplies.
- Remove/replace procedures: Service labels that contain remove/replace procedures are often found on a cover of the system or in other spots accessible to the servicer. These labels provide systematic procedures, including diagrams, detailing how to remove or 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 screw drivers 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 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. Client 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 client 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 most 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 clients. 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 client'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 client-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 client and the IBM support team. As part of an increased focus to provide even better service to IBM clients, 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 24x7 monitoring and reporting means no more dependency on

human intervention or off-hours client 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 clients a single point of exit from their site. Communication between the client and IBM only flows one way; activating Service Agent does not enable IBM to call into a client's system. System inventory information is stored in a secure database, which is protected behind IBM firewalls. The client'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, clients 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, clients can view system and support information in the "My Systems" and "Premium Search" sections of the Electronic Services website.

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 clients 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 client'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, clients 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 website or contact an IBM Systems Services Representative

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

Accessibility by people with disabilities

A US 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 US Rehabilitation Act

IBM Power 720 server is capable as of October 21, 2011, 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 US Section 508 Voluntary Product Accessibility Template (VPAT) can be requested via the IBM website

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

Statement of general direction

IBM plans to offer a 15 meter, 3 Gb bandwidth SAS cable for the PCIe2 1.8 GB Cache RAID SAS Adapter (#5913) when attaching the EXP24S Drawer (#5887) for large configurations where the 10 meter cable is a distance limitation.

IBM intends to enhance the IBM Systems Director Management Console (SDMC) to support the Power 720 (8202-E4C). IBM also intends for the current Hardware Management Console (HMC) (7042-CR6) to be upgradable to an IBM SDMC that supports the Power 720 (8202-E4C).

Standard Disclaimer

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SUSE intends to support the IBM PCIe2 4-Port 10 Gb & 1 Gb Ethernet Adapters (#5279, #5280, #5744, and #5745) with an upcoming SUSE Linux Enterprise Server 11 Service Pack. SUSE plans availability for first quarter 2012. For additional questions about the availability of this release, contact SUSE.

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Product number

The following are newly announced features on the specific models of the IBM Power Systems 8202 machine type:

Description	Machine type	Model	Feature number
IBM Power 720	8202	E4C	
Power 720 4 core Express Edit	8202	E4C	0777
Power 720 6 8 core Express E	8202	E4C	0779
#1879 Load Source Specify	8202	E4C	0870
#1948 Load Source Specify	8202	E4C	0872
283GB 15K RPM SAS Disk	8202	E4C	1879
300GB 15K RPM SAS Disk	8202	E4C	1880
Quantity 150 of #1948	8202	E4C	1927
Quantity 150 of #1953	8202	E4C	1929
283GB 15k RPM SAS SFF-2 Disk	8202	E4C	1948
300GB 15k RPM SAS SFF-2 Disk	8202	E4C	1953
SAS YO Cable 1.5m - HD 6Gb Ada	8202	E4C	3450
SAS YO Cable 3m - HD 6Gb Adapt	8202	E4C	3451
SAS YO Cable 6m - HD 6Gb Adapt	8202	E4C	3452
SAS YO Cable 10m - HD 6Gb Adap	8202	E4C	3453
SAS X Cable 3m - HD 6Gb 2-Adap	8202	E4C	3454
SAS X Cable 6m - HD 6Gb 2-Adap	8202	E4C	3455
SAS X Cable 10m - HD 6Gb 2-Ada	8202	E4C	3456
SAS AT Cable 0.6m - HD 6Gb Ada	8202	E4C	3689
Power 720 Solution Edition	8202	E4C	4927
Power 720 Solution Edition	8202	E4C	4928
IBM i for BI - Small Config	8202	E4C	4934
IBM i for BI - Medium Config	8202	E4C	4935
IBM i for BI - Large Config	8202	E4C	4936
PCIe2 4Port 10GBE&1GBE SFP+ LP	8202	E4C	5279
PCIe2 4-Port 10GbE&1GbE SR LP	8202	E4C	5280
PCIe LP 2-Port 1GbE TX Adapter	8202	E4C	5281
PCIe 2-Port 4X IB QDR Adapt	8202	E4C	5285
PCIe2 2-port 10GbE SR Adapter	8202	E4C	5287
PCIe2 2-port 10GbE SFP+ Adaptr	8202	E4C	5288
2 Port Async EIA 232 PCIe Adap	8202	E4C	5289
PCIe LP 2 Port Async EIA 232 A	8202	E4C	5290
Sys Console-Ethernet No IOP	8202	E4C	5557
PCIe2 8x 4-port Fibre Channel	8202	E4C	5729
PCIe2 4-Port 10GbE&1GbE SR&RJ4	8202	E4C	5744
PCIe2 4-Port 10GbE&GbE SFP+Cop	8202	E4C	5745
PCIe2 1.8GB Cache RAID SAS Ada	8202	E4C	5913
SAS AA Cable 3m - HD 6Gb Adapt	8202	E4C	5915
SAS AA Cable 6m - HD 6Gb Adapt	8202	E4C	5916
SAS AA Cable 1.5m - HD 6Gb Ada	8202	E4C	5917
SAS AA Cbl 0.6m - HD 6Gb Adapt	8202	E4C	5918
Non-paired Indicator 5913 PCIe	8202	E4C	5924
Redundant or Base PWR Supply	8202	E4C	6260
Redundant or Base PWR Supply	8202	E4C	6261
2 Port 10/100/1000 Base TX Eth	8202	E4C	9055
Specify mode-1 & (2) 5913 EXP	8202	E4C	9385
Specify mode-2 & (4) 5913 EXP	8202	E4C	9386
Storage B/P--8 SFF/RAID/IOA	8202	E4C	EJ01
Split Drive Capability/#5618	8202	E4C	EJ02
GX++ Dual-port 12x Chan Attach	8202	E4C	EJ04
Memory Riser Card	8202	E4C	EM01
4GB (2x2GB) Memory DIMMs 1066	8202	E4C	EM04
8GB (2x4GB) Memory DIMMs 1066	8202	E4C	EM08
16GB(2x8GB) Memory DIMMs, 1066	8202	E4C	EM16
32GB (2x16GB) MemoryDIMMs,1066	8202	E4C	EM32
4-core 3.0 GHz Proc Module	8202	E4C	EPC5
6-core 3.0 GHz Proc Module	8202	E4C	EPC6
8-core 3.0 GHz Proc Module	8202	E4C	EPC7
One Processor Activ for #EPC5	8202	E4C	EPD5
One Processor Activ for #EPC6	8202	E4C	EPD6
One Processor Activ for #EPC7	8202	E4C	EPD7
Zero-priced Proc Act for #EPC5	8202	E4C	EPE5

Zero-priced Proc Act for #EPC6	8202	E4C	EPE6
Zero-priced Proc Act for #EPC7	8202	E4C	EPE7
1TB Removable Disk Cartridge	8202	E4C	EU01

The following are features already announced for the IBM Power Systems 8202 machine type:

Description	Machine type	Model	Feature number
One CSC Billing Unit	8202	E4C	0010
Ten CSC Billing Uits	8202	E4C	0011
Mirrored System Disk Level, Sp	8202	E4C	0040
Device Parity Protection All	8202	E4C	0041
Mirrored System Bus Level	8202	E4C	0043
Device Parity RAID 6 All	8202	E4C	0047
RISC to RISC Data Migration	8202	E4C	0205
AIX Partition Specify	8202	E4C	0265
Linux Partition Specify	8202	E4C	0266
IBM i Partition Specify	8202	E4C	0267
Specify Custom Data Protection	8202	E4C	0296
Mirrored Level System Specify	8202	E4C	0308
RAID Hot Spare Specify	8202	E4C	0347
V.24/EIA232 6.1m (20 Ft) PCI C	8202	E4C	0348
V.24/EIA232 15.2m (50 Ft) PCI	8202	E4C	0349
V.35 6.1m (20 Ft) PCI Cable	8202	E4C	0353
V.35 15.2m (50 Ft) PCI Cable	8202	E4C	0354
V.36 6.1m (20 Ft) PCI Cable	8202	E4C	0356
X.21 6.1m (20 Ft) PCI Cable	8202	E4C	0359
X.21 15.2m (50 Ft) PCI Cable	8202	E4C	0360
V.24/EIA232 (80 Ft) PCI Cable	8202	E4C	0365
CBU Specify	8202	E4C	0444
Customer Specified Placement	8202	E4C	0456
SSD Placement Indicator CEC	8202	E4C	0462
SSD Placement Indicator 5802/3	8202	E4C	0463
SSD Placement Indicator 5886	8202	E4C	0464
SSD Placement Indicator 5887	8202	E4C	0465
19 inch, 1.8 meter high rack	8202	E4C	0551
19 inch, 2.0 meter high rack	8202	E4C	0553
19 inch, 1.3 meter high rack	8202	E4C	0555
IBM i 6.1 w/6.1.1 Machine Code	8202	E4C	0566
IBM i 7.1 Specify Code	8202	E4C	0567
Rack Filler Panel Kit	8202	E4C	0599
Load Source Not in CEC	8202	E4C	0719
#1787 Load Source Specify	8202	E4C	0722
#1996 Load Source Specify	8202	E4C	0724
Specify Load Source in 5786	8202	E4C	0725
Specify Load Source 5802/3/77	8202	E4C	0726
Specify 5886 Load Source plac	8202	E4C	0727
#5887 Load Source Specify	8202	E4C	0728
4327 Load Source Specify	8202	E4C	0835
4328 Load Source Specify	8202	E4C	0836
SAN Load Source Specify	8202	E4C	0837
3676 Load Source Specify	8202	E4C	0838
3677 Load Source Specify	8202	E4C	0839
3678 Load Source Specify	8202	E4C	0840
4329 Load Source Specify	8202	E4C	0841
3658 Load Source Specify	8202	E4C	0844
1884 Load Source Specify	8202	E4C	0851
1888 Load Source Specify	8202	E4C	0853
1909 Load Source Specify	8202	E4C	0854
3587 Load Source Specify	8202	E4C	0855
1911 Load Source Specify	8202	E4C	0856
#1916 Load Source Specify	8202	E4C	0857
#1947 Load Source Specify	8202	E4C	0871
#1956 Load Source Specify	8202	E4C	0874
#1962 Load Source Specify	8202	E4C	0875
#1794 Load Source Specify	8202	E4C	0876
US TAA Compliance Indicator	8202	E4C	0983
USB Internal Docking Station R	8202	E4C	1103

USB External Docking Station R	8202	E4C	1104
USB 160 GB Removable Disk Dr	8202	E4C	1106
USB 500 GB Removable Disk Dr	8202	E4C	1107
Custom Serv. Specify, Roch	8202	E4C	1140
200V 16A 4.3m (14 Ft) TL Line	8202	E4C	1406
4.3m 200V/16A Pwr Cd Italy	8202	E4C	1408
125V 4.3m (14 Ft) Line Cord	8202	E4C	1413
200V 1.8m (6 Ft) Locking Line	8202	E4C	1414
200V 1.8m (6 Ft) Watertight LC	8202	E4C	1415
200V 4.3m (14 Ft) Locking Line	8202	E4C	1416
200V 4.3m (14 Ft) Watertight L	8202	E4C	1417
4.3m 200V/16A Power Cord EU/As	8202	E4C	1420
4.3m 200V/16A Power Cord CH/DK	8202	E4C	1421
200V 1.8m (6 Ft) Locking Line	8202	E4C	1424
200V 1.8m (6 Ft) Watertight Li	8202	E4C	1425
200V 4.3m (14 Ft) Locking Line	8202	E4C	1426
200V 4.3m (14 Ft) Watertight L	8202	E4C	1427
4.3m 200V/10A Power Cord EU/As	8202	E4C	1439
4.3m 200V/10A Power Cord Denma	8202	E4C	1440
4.3m 200V/10A Power Cord S. Af	8202	E4C	1441
4.3m 200V/10A Power Cord Swiss	8202	E4C	1442
4.3m 200V/10A Power Cord UK	8202	E4C	1443
4.3m 200V/10A Power Cord Israe	8202	E4C	1445
4.3m 200V/32A Power Cord EU 1	8202	E4C	1449
4.3m 200V/16A Power Cord EU 2	8202	E4C	1450
200V (6 Ft) 1.8m Line Cord	8202	E4C	1451
200V (14 Ft) 4.3m Line Cord	8202	E4C	1452
200V (6 Ft) 1.8m Locking Line	8202	E4C	1453
200V 12A (14 Ft) 4.3m TL Line	8202	E4C	1454
200V (6 Ft) 1.8m Watertight Li	8202	E4C	1455
200V (14 Ft) 4.3m Watertight L	8202	E4C	1456
200V (6 Ft) 1.8m Upper Line Co	8202	E4C	1457
200V (6 Ft) 1.8m Upper Locking	8202	E4C	1458
200V (6 Ft) 1.8m Locking	8202	E4C	1459
4.3m 200V/16A Pwr Cd	8202	E4C	1477
177GB SFF-1 SSD w/ eMLC AIX/Li	8202	E4C	1775
177GB SFF-1 SSD w/ eMLC IBM i	8202	E4C	1787
600GB 10k RPM SAS SFF Disk	8202	E4C	1790
177GB SFF-2 SSD w/ eMLC AIX/Li	8202	E4C	1793
177GB SFF-2 SSD w/ eMLC IBM i	8202	E4C	1794
Quantity 150 of #1962	8202	E4C	1817
Quantity 150 of #1964	8202	E4C	1818
System port/UPS Conversion Cab	8202	E4C	1827
1.5 Meter 12X to 4X Channel CC	8202	E4C	1828
0.6 Meter 12X Cable	8202	E4C	1829
1.5 Meter 12X cable	8202	E4C	1830
8.0 Meter 12X Cable	8202	E4C	1834
3.0 Meter 12X Cable	8202	E4C	1840
3 Meter 12X to 4X Channel CC	8202	E4C	1841
Quantity 150 of #1956	8202	E4C	1844
10 Meter 12X to 4X Enhance CCC	8202	E4C	1854
0.6 Meter 12X DDR Cable	8202	E4C	1861
1.5 Meter 12X DDR Cable	8202	E4C	1862
8 Meter 12X DDR Cable	8202	E4C	1864
3.0 Meter 12X DDR Cable	8202	E4C	1865
Quantity 150 of #1917	8202	E4C	1866
Quantity 150 of #1947	8202	E4C	1868
Quantity 150 of #1925	8202	E4C	1869
146.8GB 10K RPM SAS SFF Disk D	8202	E4C	1882
73.4 GB 15K RPM SAS SFF Disk D	8202	E4C	1883
69.7 GB 15K RPM SAS SFF Disk D	8202	E4C	1884
300GB 10K RPM SFF SAS Disk D	8202	E4C	1885
146GB 15K RPM SFF SAS Disk D	8202	E4C	1886
Quantity 150 of #1793	8202	E4C	1887
139GB 15K RPM SFF SAS Disk D	8202	E4C	1888
69GB SFF SAS Solid State D	8202	E4C	1890

4 GB Single Port Fibre Channel	8202	E4C	1905
69GB SFF SAS Solid State Drive	8202	E4C	1909
4 GB Dual Port Fibre Channel P	8202	E4C	1910
283GB 10K RPM SFF SAS Disk Dri	8202	E4C	1911
PCI X DDR Dual Channel Ultra32	8202	E4C	1912
571GB 10k RPM SAS SFF Disk	8202	E4C	1916
146GB 15k RPM SAS SFF-2 Disk	8202	E4C	1917
300GB 10k RPM SAS SFF-2 Disk	8202	E4C	1925
139GB 15k RPM SAS SFF-2 Disk	8202	E4C	1947
4 Port 10 100 1000 Base TX PCI	8202	E4C	1954
283GB 10k RPM SAS SFF-2 Disk	8202	E4C	1956
Quantity 150 of #1794	8202	E4C	1958
571GB 10k RPM SAS SFF-2 Disk	8202	E4C	1962
600GB 10k RPM SAS SFF-2 Disk	8202	E4C	1964
73.4 GB 15,000 RPM Ultra320 SC	8202	E4C	1971
146.8 GB 15,000 RPM Ultra320 S	8202	E4C	1972
2 Gigabit Fibre Channel PCI X	8202	E4C	1977
IBM Gigabit Ethernet SX PCI X	8202	E4C	1978
10 100 1000 Base TX Ethernet P	8202	E4C	1979
POWER GXT135P Graphics Acceler	8202	E4C	1980
2-Port Base-TX Etht PCI-X Adpt	8202	E4C	1983
1 Gigabit iSCSI TOE PCI X on C	8202	E4C	1986
1 Gigabit iSCSI TOE PCI X on O	8202	E4C	1987
177GB SSD Module with eMLC (AI	8202	E4C	1995
1 Gigabit iSCSI TOE PCI X on C	8202	E4C	1996
PCIe LP RAID SSD SAS Adapter 3	8202	E4C	2053
PCIe RAID SSD SAS Adapter 3Gb	8202	E4C	2054
PCIe RAID SSD SAS Adapter 3Gb	8202	E4C	2055
Converter Cable, VHDCI to P, M	8202	E4C	2118
Ultra 320 SCSI Cable -1M	8202	E4C	2124
Ultra 320 SCSI Cable -3M	8202	E4C	2125
Ultra 320 SCSI Cable -5M	8202	E4C	2126
Ultra 320 SCSI Cable -10M	8202	E4C	2127
Ultra 320 SCSI Cable -20M	8202	E4C	2128
Ultra 320 SCSI Cable -0.55M	8202	E4C	2138
Primary OS - IBM i	8202	E4C	2145
Primary OS AIX	8202	E4C	2146
Primary OS Linux	8202	E4C	2147
Factory Deconfiguration of 1 c	8202	E4C	2319
LC-SC 50 Micron Fiber Conv Cab	8202	E4C	2456
LC-SC 62.5 Mic.Fib.Conv.Cable	8202	E4C	2459
4 port USB PCIe Adapter	8202	E4C	2728
2 Port USB PCI Adapter	8202	E4C	2738
POWER GXT135P Graphics Acceler	8202	E4C	2849
ARTIC960Hx 4 Port EIA 232 Cabl	8202	E4C	2861
ARTIC960Hx 4 Port X 21 Cable	8202	E4C	2863
ARTIC960Hx 4-Port V.35(DTE)Cab	8202	E4C	2864
PCIe 2 Line WAN w/Modem	8202	E4C	2893
Asynch.Termin/Print.Cbl EIA232	8202	E4C	2934
Asynchronous Cable EIA 232/V	8202	E4C	2936
8P Async Adp. EIA232/RS-422	8202	E4C	2943
ARTIC960Hx 4Port Mult.PCI Adp	8202	E4C	2947
Cable, V.24 / EIA-232	8202	E4C	2951
Cable, V.35	8202	E4C	2952
Cable, V.36 / EIA 499	8202	E4C	2953
Cable, X.21	8202	E4C	2954
2-Port Multip. PCI Adapter	8202	E4C	2962
Ser to Ser Port Cab Draw/Draw	8202	E4C	3124
Serial to Se.Port Cbl Rack 8M	8202	E4C	3125
73.4GB 15K RPM U320 SCSI DDA	8202	E4C	3278
146.8GB 15K RPM U320 SCSI DDA	8202	E4C	3279
1m QDR IB/E'Net Copper Cable	8202	E4C	3287
3m QDR IB/E'Net Copper Cable	8202	E4C	3288
5m QDR IB/E'Net Copper Cable	8202	E4C	3289
10m QDR IB Optic Cable	8202	E4C	3290
30m QDR IB Optic Cable	8202	E4C	3293
300 GB 15K RPM SCSI Disk Drive	8202	E4C	3585
69GB 3.5 SAS Solid State Driv	8202	E4C	3586
69GB 3.5 SAS Solid State Driv	8202	E4C	3587
Widescreen LCD Monitor	8202	E4C	3632
T541H/L150p 15inchTFT Col.M	8202	E4C	3637
ThinkVision L170p Flat Pan.M	8202	E4C	3639
ThinkVision L171p Flat Panel M	8202	E4C	3640

IBM T115 Flat Panel Monitor	8202	E4C	3641
ThinkVision L191p Flat Panel M	8202	E4C	3642
IBM T120 Flat Panel Monitor	8202	E4C	3643
19in. Flat Panel Monitor	8202	E4C	3644
17in. Flat Panel Monitor	8202	E4C	3645
73GB 15K RPM SAS Disk Drive	8202	E4C	3646
146GB 15K RPM SAS Disk Drive	8202	E4C	3647
300GB 15K RPM SAS Disk Drive	8202	E4C	3648
450GB 15K RPM SAS Disk Drive	8202	E4C	3649
SAS Cable (EE) Drawer to Dr 1M	8202	E4C	3652
SAS Cable (EE) Drawer to Dr 3M	8202	E4C	3653
SAS Cable (EE) Drawer to Dr 6M	8202	E4C	3654
SAS SFF Cable	8202	E4C	3656
428GB 15K RPM SAS Disk Drive	8202	E4C	3658
SAS Cable (X) Adapter to SAS E	8202	E4C	3661
SAS Cbl X Adp SAS Enclosure 6M	8202	E4C	3662
SAS Cbl X Adp SAS Encl 15M	8202	E4C	3663
69.7GB 15k rpm SAS Disk Drv	8202	E4C	3676
139.5GB 15k rpm SAS Disk Drive	8202	E4C	3677
283.7GB 15k rpm SAS Disk Drive	8202	E4C	3678
3M SAS CABLE, ADPTR TO ADPTR (	8202	E4C	3681
6M SAS CABLE, ADPTR TO ADPTR (	8202	E4C	3682
SAS Cab (AE) Adapter to En 3M	8202	E4C	3684
SAS Cable(AE) Adapter to En 6M	8202	E4C	3685
SAS Ca(YI) System to SAS 1.5M	8202	E4C	3686
SAS Ca(YI) System to SAS 3M	8202	E4C	3687
SAS Cable (AT) 0.6 Meter	8202	E4C	3688
SAS Cab(YO) Adapter to SAS1.5M	8202	E4C	3691
SAS Cab(YO) Adapter to SAS 3M	8202	E4C	3692
SAS Cab(YO) Adapter to SAS 6M	8202	E4C	3693
SAS Cab(YO) Adapter to SAS 15M	8202	E4C	3694
0.3M Serial Prt Converter Cbl	8202	E4C	3925
Asynch Printer/Term.Cab,4M	8202	E4C	3926
Serial Port Null Mod Cab 3.7M	8202	E4C	3927
Ser.Port Null Modem Cable,10M	8202	E4C	3928
System Serial Port Converter C	8202	E4C	3930
6Foot Extend.Cbl for Displays	8202	E4C	4242
Extender Cable USB Keybo 1.8M	8202	E4C	4256
VGA to DVI Connection Converte	8202	E4C	4276
70.56GB 15k rpm Disk Unit	8202	E4C	4327
141.12GB 15k RPM Disk Unit	8202	E4C	4328
282.25GB 15k rpm Disk Unit	8202	E4C	4329
Package 5X 2055 20X 1995	8202	E4C	4367
Package 5X 2055 20X 1995	8202	E4C	4377
One and only one rack indicator feature is required on all orders (#4650 to #4666).			
No Factory Integration Ind.	8202	E4C	4650
Rack Indicator, Rack 1	8202	E4C	4651
Rack Indicator, Rack 2	8202	E4C	4652
Rack Indicator, Rack 3	8202	E4C	4653
Rack Indicator, Rack 1	8202	E4C	4654
Rack Indicator, Rack 5	8202	E4C	4655
Rack Indicator, Rack 6	8202	E4C	4656
Rack Indicator, Rack 7	8202	E4C	4657
Rack Indicator, Rack 8	8202	E4C	4658
Rack Indicator, Rack 9	8202	E4C	4659
Rack Indicator, Rack 10	8202	E4C	4660
Rack Indicator, Rack 11	8202	E4C	4661
Rack Indicator, Rack 12	8202	E4C	4662
Rack Indicator, Rack 13	8202	E4C	4663
Rack Indicator, Rack 14	8202	E4C	4664
Rack Indicator, Rack 15	8202	E4C	4665
Rack Indicator, Rack 16	8202	E4C	4666
PCI-X Crypt.Coproc.(FIPS 4)	8202	E4C	4764
Power Active Memory Expansion	8202	E4C	4793
PCIe Crypto Coprocessor No B	8202	E4C	4807
PCIe Crypto Coprocessor Gen3	8202	E4C	4808
Software Preload Required	8202	E4C	5000
Customer Solution Center Roche	8202	E4C	5002
Power Dist Unit 1 Phase NEMA	8202	E4C	5160
Power Dist Unit 1 Phase IEC	8202	E4C	5161
Power Dist Unit 2 of 3 Phase	8202	E4C	5162
Power Dist Unit - 3 Phase	8202	E4C	5163
PowerVM Express Edition	8202	E4C	5225

PowerVM Standard Edition	8202	E4C	5227
PowerVM Enterprise Edition	8202	E4C	5228
PCIe LP POWER GXT145 Graphics	8202	E4C	5269
PCIe LP 10Gb FCoE 2 port Adapt	8202	E4C	5270
PCIe LP 4 Port 10/100/1000 Bas	8202	E4C	5271
PCIe LP 10GbE CX4 1 port Adapt	8202	E4C	5272
PCIe LP 8Gb 2 Port Fibre Chann	8202	E4C	5273
PCIe LP 2 Port 1GbE SX Adapter	8202	E4C	5274
PCIe LP 10GbE SR 1 port Adapt	8202	E4C	5275
PCIe LP 4Gb 2 Port Fibre Chann	8202	E4C	5276
PCIe LP 4 Port Async EIA 232 A	8202	E4C	5277
PCIe LP 2 x4 port SAS Adapter	8202	E4C	5278
PCIe2 LP 2-Port 4X IB QDR Adap	8202	E4C	5283
PCIe2 LP 2 port 10GbE SR Adapt	8202	E4C	5284
PCIe2 LP 2 Port 10GbE SFP Copp	8202	E4C	5286
RFID Tags for Servers, Blades	8202	E4C	5524
Sys Console On HMC	8202	E4C	5550
System AC Power Supply, 1725 W	8202	E4C	5603
Storage Backplane 6 SFF Bays	8202	E4C	5618
80/160GB DAT160 SAS Tape Drive	8202	E4C	5619
1.5TB/3.0TB LTO™ 5 SAS Tape Dr	8202	E4C	5638
DAT320 160/320 GB Tape Drive	8202	E4C	5661
DAT320 160 GB USB Tape Drive	8202	E4C	5673
PCIe Riser Card (Gen2)	8202	E4C	5685
DAT160 Data Cartridge	8202	E4C	5689
IBM Gigab.Eth-SX PCI-X Adapter	8202	E4C	5700
10/100/1000 BaseTX Eth.PCI-X	8202	E4C	5701
2-Port BaseTX Etht.PCI-X Adp	8202	E4C	5706
10Gb FCoE PCIe Dual Port Adapt	8202	E4C	5708
1Gb iSCSI TOE PCI-X-Copp.Adpt	8202	E4C	5713
1Gb iSCSI TOE PCI-X-Opt.Adpt	8202	E4C	5714
2 Gigab.Fibre Chann.PCI-X Adp	8202	E4C	5716
4 Port 10/100/1000 Base TX PCI	8202	E4C	5717
10Gb Etht-SR PCI-X 2.0 DDR Adp	8202	E4C	5721
10Gb Etht-LR PCI-X 2.0 DDR Adp	8202	E4C	5722
2 Port Asyn.EIA-232 PCI Adpt	8202	E4C	5723
10 Gigabit Ethernet CX4 PCI Ex	8202	E4C	5732
8 Gigabit PCI Express Dual Por	8202	E4C	5735
PCI X DDR Dual Channel Ultra32	8202	E4C	5736
4-Port 10/100/1000 BaseTX Adpt	8202	E4C	5740
Single Bus repeater for 5786	8202	E4C	5741
Dual Bus repeater for 5786	8202	E4C	5742
SATA Slim DVD-ROM drive	8202	E4C	5743
Half High 800GB/1.6TB LTO4 SAS	8202	E4C	5746
LTO Ultrium™ 4 800 GB Data Cart	8202	E4C	5747
POWER GXT145 PCI Express Graph	8202	E4C	5748
4Gbps Fibre Channel (2 Port)	8202	E4C	5749
4 GB Single-Port Fibre Channel	8202	E4C	5758
4 Gb Dual Port Fibre Channel	8202	E4C	5759
SATA Slimline DVD RAM Drive	8202	E4C	5762
2 Port 10/100/1000 Base TX Eth	8202	E4C	5767
2 Port Gigabit Ethernet SX PCI	8202	E4C	5768
10 Gb Eth SR PCI Express Adp	8202	E4C	5769
10 Gigabit Ethernet LR PCI	8202	E4C	5772
4GigabitPCI-E Single Port Fibr	8202	E4C	5773
4 Gigabit PCI Express Dual Por	8202	E4C	5774
PCI-X EXP24 Ctl-1.5GB No IOP	8202	E4C	5782
4 Port Async EIA 232 PCIe Adap	8202	E4C	5785
TotalStorage EXP24 Disk Dwr	8202	E4C	5786
TotalStorage EXP24 Disk Twr	8202	E4C	5787
PCI DDR 12X Expansion Drawer	8202	E4C	5796
12X I/O Drawer PCIe, SFF disk	8202	E4C	5802
PCIe 380MB Cache Dual x4 3Gb S	8202	E4C	5805
12X I/O Drawer PCIe, No Disk	8202	E4C	5877
EXP 12S Expansion Drawer	8202	E4C	5886
EXP24S SFF Gen2-bay Drawer	8202	E4C	5887
PCI-X SAS Adaper	8202	E4C	5900
PCIe Dual x4 SAS Adapter	8202	E4C	5901
PCI X DDR Dual x4 3Gb SAS RAID	8202	E4C	5902
PCI X DDR 1.5GB Cache SAS RAID	8202	E4C	5908
PCI X DDR Dual x4 SAS Adapter	8202	E4C	5912
Non paired SAS RAID indicator	8202	E4C	5922
Non paired PCIe SAS RAID Ind	8202	E4C	5923

Full Width Key USB, US English	8202	E4C	5951
Full Width Key USB, French	8202	E4C	5952
Full Width Key USB, Italian	8202	E4C	5953
Full Width Key USB, German/Aus	8202	E4C	5954
Full Width Key USB, UK English	8202	E4C	5955
Full Width Key USB, Spanish	8202	E4C	5956
Full Width Key USB, Japanese	8202	E4C	5957
Full Width Key USB, BrazilianP	8202	E4C	5958
Full Width Key USB, Hungarian	8202	E4C	5959
Full Width Key USB, Korean	8202	E4C	5960
Full Width Key USB, Chinese	8202	E4C	5961
Full Width Key USB, French Can	8202	E4C	5962
Full Width Key USB, Belgian/UK	8202	E4C	5964
Full Width Key USB, Swedish/Fi	8202	E4C	5965
Full Width Key USB, Danish	8202	E4C	5966
Full Width Key USB, Bulgarian	8202	E4C	5967
Full Width Key USB, Swiss/Fr/G	8202	E4C	5968
Full Width Key USB, Norwegian	8202	E4C	5969
Full Width Key USB, Dutch	8202	E4C	5970
Full Width Key USB, Portuguese	8202	E4C	5971
Full Width Key USB, Greek	8202	E4C	5972
Full Width Key USB, Hebrew	8202	E4C	5973
Full Width Key USB, Polish	8202	E4C	5974
Full Width Key USB, Slovakian	8202	E4C	5975
Full Width Key USB, Czech	8202	E4C	5976
Full Width Key USB, Turkish	8202	E4C	5977
Full Width Key USB, LA Spanish	8202	E4C	5978
Full Width Key USB, Arabic	8202	E4C	5979
Full Width Key USB, Thai	8202	E4C	5980
Full Width Key USB, Russian	8202	E4C	5981
Full Width Key USB, Slovenian	8202	E4C	5982
Full Width Key USB, US English	8202	E4C	5983
Power Control Cable(SPCN)-2m	8202	E4C	6001
Power Control Cbl (SPCN) 3 m	8202	E4C	6006
Power Control Cbl (SPCN) 15 m	8202	E4C	6007
Power Control Cable(SPCN)-6m	8202	E4C	6008
Power Control Cable(SPCN)-30m	8202	E4C	6029
Opt Front Door for 1.8m Rack	8202	E4C	6068
Opt Front Door for 2.0m Rack	8202	E4C	6069
1.8m Rack Trim Kit	8202	E4C	6246
2.0m Rack Trim Kit	8202	E4C	6247
1.8m Rack Acoustic Doors	8202	E4C	6248
2.0m Rack Acoustic Doors	8202	E4C	6249
1.8m Rack Trim Kit	8202	E4C	6263
2.0m Rack Trim Kit	8202	E4C	6272
Dual prt 12X Chan Attach Short	8202	E4C	6446
Dual port 12X Chan Attach Long	8202	E4C	6457
Pwr Cbl 14FT, Drwr - IBM PDU	8202	E4C	6458
Pwr Crd (14FT), Drwr - OEM PDU	8202	E4C	6460
Pwr Crd 4.3M, Drwr - OEM PDU	8202	E4C	6469
PWR Cord(6foot),To Wall	8202	E4C	6470
Pwr Crd 2.7m 9ft Wall OEM PDU	8202	E4C	6471
Pwr Crd 2.7m 9ft Wall OEM PDU	8202	E4C	6472
Pwr Crd 2.7m 9ft Wall OEM PDU	8202	E4C	6473
Pwr Crd 2.7m 9ft Wall OEM PDU	8202	E4C	6474
Pwr Crd 2.7m 9ft Wall OEM PDU	8202	E4C	6475
Pwr Crd 2.7m 9ft Wall OEM PDU	8202	E4C	6476
Pwr Crd 2.7m 9ft Wall OEM PDU	8202	E4C	6477
Pwr Crd 2.7m 9ft Wall OEM PDU	8202	E4C	6478
PWR Cord(9foot),(250V,10A)	8202	E4C	6479
PWR Cord(9foot),(125V,15A)	8202	E4C	6488
4.3m (14 Ft) 3PH/24A Power Cor	8202	E4C	6489
4.3m (14 Ft) 1PH/48A Pwr Cord	8202	E4C	6491
4.3m (14 Ft) 1PH/48 60A Pwr Co	8202	E4C	6492
Pwr Crd 2.7m 9ft Wall 250V,10A	8202	E4C	6493
Pwr Crd 2.7m 9ft Wall 250V,10A	8202	E4C	6494
To Wall/OEM PDU, (250V, 10A)	8202	E4C	6495
Pwr Crd 2.7m 9ft Wall 250V,10A	8202	E4C	6496
PWR Cord(6ft),To Wall/OEM PDU	8202	E4C	6497
Power Cord 6ftTo Wall OEM PDU	8202	E4C	6498
Power Cable Drawer to IBM PD	8202	E4C	6577
Optional Rack Security Kit	8202	E4C	6580
Modem Tray for 19-Inch Rack	8202	E4C	6586
Pwr Crd 2.7m 9ft Wall 125V,15A	8202	E4C	6651

4.3m 1PH/24-30A Pwr Cord	8202	E4C	6654
4.3m 14Ft 1PH/24 30A WR Pwr	8202	E4C	6655
4.3m 14Ft 1PH/24A Power Cord	8202	E4C	6656
Pwr.Cord(9ft),To Wall/OEM PDU	8202	E4C	6659
PWR Cord(14ft),Dr.to OEM PDU	8202	E4C	6660
Pwr Cord 3M, Drwr to IBM PDU	8202	E4C	6665
Pwr Crd 4.3M, Drwr - OEM PDU	8202	E4C	6669
Pwr Crd 6-FT, (125V,15A)PT#59	8202	E4C	6670
Pwr Crd 2.7M, Drwr - IBM PDU	8202	E4C	6671
Pwr Crd 1.5M, Drwr - IBM PDU	8202	E4C	6672
Pwr Crd 2.7M, Wall - OEM PDU	8202	E4C	6680
Power Cord (6ft),To Wall	8202	E4C	6687
PCI 2-Line WAN IOA No IOP	8202	E4C	6805
PCI 4-Modem WAN IOA No IOP	8202	E4C	6808
PCI 2-Line WAN w/Modem NoIOP	8202	E4C	6833
IIntelligent PDU+ 1 EIA Unit	8202	E4C	7109
Environmental Monitoring Probe	8202	E4C	7118
IBM Rack mount Drawer Bezel	8202	E4C	7134
OEM Rack mount Drawer Bezel	8202	E4C	7135
IBM/OEM Rack mount Drawer Rail	8202	E4C	7145
Power Distribution Unit	8202	E4C	7188
Quantity 150 of #2124	8202	E4C	7204
Quantity 150 of #2125	8202	E4C	7205
Quantity 150 of #2126	8202	E4C	7206
Quantity 150 of #2127	8202	E4C	7207
Quantity 150 of #2128	8202	E4C	7208
Quantity 150 of #2138	8202	E4C	7213
AAP Software Pre-Inst.Indic.	8202	E4C	7305
Dual I/O Unit Enclosure	8202	E4C	7311
I/O Drawer Mounting Enclosure	8202	E4C	7314
Quantity 150 of #4327	8202	E4C	7509
Quantity 150 of #4328	8202	E4C	7510
Quantity 150 of #4329	8202	E4C	7511
Quantity 150 of #3676	8202	E4C	7517
Quantity 150 of #3677	8202	E4C	7518
Quantity 150 of #3678	8202	E4C	7519
Quantity 150 of 3586	8202	E4C	7535
Quantity 150 of 3587	8202	E4C	7536
Quantity 150 of 3658	8202	E4C	7538
Quantity 150 of 3647	8202	E4C	7549
Quantity 150 of 3648	8202	E4C	7564
Quantity 150 of 3649	8202	E4C	7565
IBM Tower Cover Set	8202	E4C	7567
OEM Tower Cover Set	8202	E4C	7568
2.0m Rack Side Attach Kit	8202	E4C	7780
Eth Cbl 6M HW Management	8202	E4C	7801
Eth Cbl 15M HW Management	8202	E4C	7802
Side-by-Side for 1.8m Racks	8202	E4C	7840
Ruggedize Rack Kit	8202	E4C	7841
Linux Software Preinstall	8202	E4C	8143
Linux Software Preinstall BP	8202	E4C	8144
Mouse-USB,Black KBD Att C	8202	E4C	8841
USB Mouse	8202	E4C	8845
Order Routing Indicator Syste	8202	E4C	9169
Language Group Spcf-US Eng	8202	E4C	9300
specify mode-1 & (1)5901/5278	8202	E4C	9359
Specify mode-1 & (2)5901/5278	8202	E4C	9360
Specify mode-2 & (2)5901/5278	8202	E4C	9361
Specify mode-4 & (4)5901/5278	8202	E4C	9365
Specify mode-2 & (4)5901/5278	8202	E4C	9366
Specify mode-1 & (2)5903/5805	8202	E4C	9367
Specify mode-2 & (4)5903/5805	8202	E4C	9368
Specify mode-1 & (1)5904/6/8	8202	E4C	9382
Specify mode-1 & (2) 5904/6/8	8202	E4C	9383
Specify mode-1 & CEC SAS port	8202	E4C	9384

New AIX License Core Counter	8202	E4C	9440
New IBM i Lic Core Counter	8202	E4C	9441
New Red Hat Lic Core Counter	8202	E4C	9442
New SUSE Lic Core Counter	8202	E4C	9443
Other AIX Lic Core Counter	8202	E4C	9444
Other Linux Lic Core Counter	8202	E4C	9445
3rd Party Linux Lic Core Cnt	8202	E4C	9446
VIOS Core Counter	8202	E4C	9447
Month Indicator	8202	E4C	9461
Day Indicator	8202	E4C	9462
Hour Indicator	8202	E4C	9463
Minute Indicator	8202	E4C	9464
Qty Indicator	8202	E4C	9465
Countable Member Indicator	8202	E4C	9466
Language Group Spcf-Dutch	8202	E4C	9700
Language Group Spcf-French	8202	E4C	9703
Language Group Spcf-German	8202	E4C	9704
Language Group Spcf-Polish	8202	E4C	9705
Lang Group Specify - Norwegian	8202	E4C	9706
Lang.Group Spcf-Portuguese	8202	E4C	9707
Language Group Spcf-Spanish	8202	E4C	9708
Language Group Spcf-Italian	8202	E4C	9711
Langua Gr Speci Canadian Frenc	8202	E4C	9712
Language Group Spcf-Japanese	8202	E4C	9714
Language Group Specify Tr Chin	8202	E4C	9715
Language Group Spcf-Korean	8202	E4C	9716
Language Group Spcf-Turkish	8202	E4C	9718
Language Group Spcf-Hungarian	8202	E4C	9719
Language Group Spcf-Slovakian	8202	E4C	9720
Language Group Spcf-Russian	8202	E4C	9721
Lang Group Spcf Simpl Chinese	8202	E4C	9722
Language Group Spcf-Czech	8202	E4C	9724
Language Group Spcf-Romanian	8202	E4C	9725
Lang Group Specify - Croatian	8202	E4C	9726
Language Group Spcf-Slovenian	8202	E4C	9727
Lang Group Specify - Braz Port	8202	E4C	9728
Lang Group Specify - Thai	8202	E4C	9729
Trial Live Partition Mobility	8202	E4C	ELPM
1m 10GbE Cable SFP+ Act Twinax	8202	E4C	EN01
3m 10GbE Cable SFP+ Act Twinax	8202	E4C	EN02
5m 10GbE Cable SFP+ Act Twinax	8202	E4C	EN03

The following are newly announced features on the specific models of the IBM Power Systems 7891, 7989, 8233, and 8236 machine type:

Description	Machine type	Model	Feature number
8GB (2x4GB) Memory DIMMs 1066	8233	E8B	EM08
	8236	E8C	
16GB(2x8GB) Memory DIMMs, 1066	8233	E8B	EM16
	8236	E8C	
32GB (2x16GB) MemoryDIMMs,1066	8233	E8B	EM32
	8236	E8C	
32GB (2x16GB RDIMMs) Memory	7891	73X	EM34
		74X	
Service Provider Payment	7989	BCH	EUC6
	8233	E8B	

Model conversion

From Type	From Model	To Type	To Model
8203	E4A	8202	E4C

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 8202-E4C adapter features

From FC:	To FC:	Return parts
2054 - PCIe RAID & SSD SAS Adapter 3Gb	2055 - PCIe RAID & SSD SAS Adapter 3Gb w/ Blind Swap Cassette	No
4807 - PCIe Crypto Coprocessor No BSC 4765-001	4808 - PCIe Crypto Coprocessor Gen3 BSC 4765-001	No

Feature conversions for 8202-E4C rack-related features

From FC:	To FC:	Return parts
6246 - 1.8m Rack Trim Kit	6263 - 1.8m Rack Trim Kit	No
6247 - 2.0m Rack Trim Kit	6272 - 2.0m Rack Trim Kit	No

Feature conversions for 8202-E4C virtualization engine features

From FC:	To FC:	Return parts
5225 - PowerVM Express Edition	5227 - PowerVM Standard Edition	No
5225 - PowerVM Express Edition	5228 - PowerVM Enterprise Edition	No
5227 - PowerVM Standard Edition	5228 - PowerVM Enterprise Edition	No

Feature conversions for 8203-E4A to 8202-E4C adapter features

From FC:	To FC:	Return parts
5903 - PCIe 380MB Cache Dual - x4 3Gb SAS RAID Adapter	5805 - PCIe 380MB Cache Dual - x4 3Gb SAS RAID Adapter	No
5904 - PCI-X DDR 1.5GB Cache SAS RAID Adapter	5908 - PCI-X DDR 1.5GB Cache SAS RAID Adapter (BSC)	No

Feature conversions for 8203-E4A to 8202-E4C processor features

From FC:	To FC:	Return parts
5577 - 2-core 4.7 GHz POWER6 Processor Card, 4 Memory DIMM Slots	EPC6 - 6-core 3.0 GHz POWER7 Processor Module	No
5587 - 4-core 4.7 GHz POWER6 Processor Card, 8 Memory DIMM Slots	EPC6 - 6-core 3.0 GHz POWER7 Processor Module	No
5634 - 2-core 4.2 GHz POWER6 Processor Card, 4 Memory DIMM Slots	EPC6 - 6-core 3.0 GHz POWER7 Processor Module	No
5635 - 4-core 4.2 GHz POWER6 Processor Card, 8 Memory DIMM Slots	EPC6 - 6-core 3.0 GHz POWER7 Processor Module	No
5577 - 2-core 4.7 GHz POWER6 Processor Card, 4 Memory DIMM Slots	EPC7 - 8-core 3.0 GHz POWER7 Processor Module	No
5587 - 4-core 4.7 GHz	EPC7 - 8-core 3.0 GHz	No

POWER6 Processor Card, 8 Memory DIMM Slots	POWER7 Processor Module	
5634 - 2-core 4.2 GHz	EPC7 - 8-core 3.0 GHz	No
POWER6 Processor Card, 4 Memory DIMM Slots	POWER7 Processor Module	
5635 - 4-core 4.2 GHz	EPC7 - 8-core 3.0 GHz	No
POWER6 Processor Card, 8 Memory DIMM Slots	POWER7 Processor Module	

Feature conversions for 8203-E4A to 8202-E4C virtualization engine features

From FC:	To FC:	Return parts
7983 - PowerVM Express	5225 - PowerVM Express Edition	No
8506 - PowerVM Standard	5227 - PowerVM Standard Edition	No
8507 - PowerVM Enterprise	5228 - PowerVM Enterprise Edition	No

Business Partner information

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

https://www.ibm.com/partnerworld/mem/sla.jsp?num=111-165

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 on a DVD (SK5T-7087) or at

http://publib.boulder.ibm.com/infocenter/powersys/v3r1m5/index.jsp

The following information is shipped with the 8202-E4C:

- Power Hardware Information DVD (SK5T-7087)
- Installing the 8202-E4C
- 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

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

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: 610 mm (24.0 in)
  Height: 173 mm (6.81 in)
  Weight: 48.7 kg (107.4 lb)

Tower:
  Width without tip plate:  183 mm (7.2 in)
  Width with tip plate:  328.5 mm (12.9 in)
  Depth :  688 mm (27.1 in)
  Height:  541 mm (21.3 in)
  Weight without tip plate: 53.7 kg (118.1 lb)
  Weight with tip plate: 57.2 kg (125.8 lb)
```

Operating environment

Operating environment system exception with the 1.5 TB/3.0 TB LTO-5 SAS Tape Drive (#5638)

- Temperature (operating) 10° to 25° C (50° to 95° F); allowable operating temperature 10° to 40° C (50° to 104° F)
- Relative humidity: Nonoperating 10% to 80% noncondensing
- Maximum altitude: 3,048 m (10,000 ft)

System environment limits without the 1.5 TB/3.0 TB LTO-5 SAS Tape Drive (#5638)

- Temperature: (nonoperating) 5° to 45° C (41° to 113° F); recommended temperature (operating) 18° to 27° C (64° to 80° F); allowable operating temperature 5° to 35° C (41° to 95° F)
- Relative humidity: Nonoperating 8% to 80%; recommended 5.5° C (42 F) dew point to 60% RH and 15° C (59° F) dew point
- Maximum dew point: 28° C (84° F)(operating)
- Operating voltage: 100 to 127 V ac or 200 to 240 V ac
- Operating frequency: 47/63 Hz
- Maximum measured power consumption: 840 watts (maximum)
- Power factor: 0.98
- Thermal output: 3,024,845 joules/hour (2,867 Btu/hour) (maximum)
- Power-source loading
  - 0.857 kVa (maximum configuration)
  - Maximum altitude: 3,050 m (10,000 ft)

Note: The maximum measured value is the worst case power consumption expected from a fully populated server under an intensive workload. The maximum measured value also accounts for component tolerance and non-ideal operating conditions. Power consumption and heat load vary greatly by server configuration and utilization. The IBM Systems Energy Estimator should be used to obtain a heat output estimate based on a specific configuration

http://www-912.ibm.com/see/EnergyEstimator

Noise level and sound power

- Tower system: 5.6 bels operating; 5.5 bels idling
- Rack-mount system: 5.6 bels operating; 5.5 bels idling

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.

- US: 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 UK Telecom regulatory authority.

This product is not certified for connection by any means whatsoever to interfaces of public telecommunications networks. Certification may be required by law prior to making any such connection. Contact an IBM representative or reseller for any questions.

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
- 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 720 minimum system configuration:

The Power 720 offers 4-core, 6-core, and 8-core configurations with one processor module. The system can contain up to 256 GB of system memory (128 GB maximum per memory riser card), six PCIe adapters in the base system with an additional four PCIe Low Profile adapters possible with the optional PCIe adapter riser card, and multiple media devices, as desired. This flexibility is made available through the many optional features for the Power 720.

Each Power 720 initial order must include a minimum of the following items:

- One system central electronics complex (CEC) enclosure with the following items:
  - One power cord (#6458, #6460, #6469-#6478, #6488-#6494, #6496, #6577, #6580, #6651, #6653-#6660, #6665, #6669, #6671, #6672, or #6680)
  - One Language Group, Specify (#9300 or #97xx)
- Choose one processor module from:
  - 4-core 3.0 GHz POWER7 processor module (#EPC5)
  - 6-core 3.0 GHz POWER7 processor module (#EPC6)
  - 8-core 3.0 GHz POWER7 processor module (#EPC7)
- Choose processor activations from:
  - 4 x #EPD5, or 2 x #EPD5 and 2 x #EPE5 with processor module #EPC5
  - 6 x #EPD6, or 3 x #EPD6 and 3 x #EPE6 with processor module #EPC6
  - 8 x #EPD7, or 4 x #EPD7 and 4 x #EPE7 with processor module #EPC7
  - Features EPE5, EPE6, and EPE7 are part of IBM Editions.
  - Processor activations are only available to SDIs as MES orders.
- Choose 4 GB minimum memory from:
  - 4 GB (2 x 2 GB) Memory DIMMs, 1066 MHz, DDR3 (#EM04)
  - 8 GB (2 x 4 GB) Memory DIMMs, 1066 MHz, DDR3 (#EM08)
  - 16 GB (2 x 8 GB) Memory DIMMs, 1066 MHz, DDR3 (#EM16)
  - 32 GB (2 x 16 GB) Memory DIMMs, 1066 MHz, DDR3 (#EM32)

    Note: 16 GB memory feature EM16 and 32 GB memory feature EM32 are not orderable with 4-core processor module feature EPC5.
- Choose Storage Backplane from:
  - 6 x SFF HDD or SSD/SATA DVD/Media backplane (#5618)
  - 8 x SFF HDD or SSD/SATA DVD/Media backplane with Dual Write Cache RAID, and an external SAS port (#EJ01)
- One 2-Port 10/100/1000 Base-TX Ethernet PCI Express Adapter (#9055)

Note: Takes up one PCIe slot.

- Choose HDD/SSD from:
  - 177 GB SAS SFF SSD (#1775) (AIX/Linux/VIOS)
  - 177 GB SAS SFF SSD (#1787) (IBM i)
  - 600 GB SAS SFF HDD 10,000 RPM (#1790) (AIX/Linux/VIOS)
  - 177 GB SAS SFF HDD (#1793) (AIX/Linux/VIOS)
  - 177 GB SAS SFF HDD (#1794) (IBM i)
  - 283 GB SAS SFF HDD 10,000 RPM (#1879) (IBM i)
  - 300 GB SAS SFF HDD 15,000 RPM (#1880) (AIX/Linux/VIOS)
  - 146.8 GB SAS SFF HDD 15,000 RPM (#1886) (AIX/Linux/VIOS)
  - 300 GB SAS SFF HDD 15,000 RPM (#1885) (AIX/Linux/VIOS)
  - 139.5 GB SAS SFF HDD 15,000 RPM (#1888) (IBM i)
  - 283 GB SAS SFF HDD 10,000 RPM (#1911) (IBM i)
  - 571 GB SAS SFF 10,000 RPM (#1916) (IBM i)
  - 146.8 GB SAS HDD 15,000 RPM (#1917) (AIX/Linux/VIOS)
  - 300 GB SAS HDD 10,000 RPM (#1925) (AIX/Linux/VIOS)
  - 139 GB SAS HDD 15,000 RPM (#1947) (IBM i)
  - 283 GB SAS HDD 15,000 RPM (#1948) (IBM i)
  - 283 GB SAS HDD 10,000 RPM (#1953) (IBM i)
  - 283 GB SAS HDD 10,000 RPM (#1956) (IBM i)
  - 571 GB SAS HDD 10,000 RPM (#1962) (IBM i)
  - 600 GB SAS HDD 10,000 RPM (#1964) (AIX/Linux/VIOS)
  - 177 GB SAS 1.8" Solid State Drive (#1995) (AIX/Linux/VIOS)
  - 177 GB SAS 1.8" Solid State Drive (#1996) (IBM i)
  - Features 1995 and 1996 require feature 2053, 2054, or 2055.
  - When feature 2145, the IBM i operating system, is selected, a minimum of two HDDs or SSDs is required.
  - No internal HDD or SSD 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.
- One 1725 watt ac power supply (#5603)
- Choose cover set from:
  - IBM Tower cover set (#7567)
  - OEM Tower cover set (#7568)
  - IBM Rack-mount Drawer Bezel and Hardware (#7134)
  - OEM Rack-mount Drawer Bezel and Hardware (#7135)
- Choose Primary Operating System Indicator from:
  - IBM i (#2145 -- requires #0566 or #0567, and #0040)
  - AIX (#2146)
  - Linux (#2147)

Note: One nonfeaturized memory riser card is included in the base system. A second memory riser card feature (#EM01) can be ordered.

RAID

Multiple protection options exist for HDD/SSD drives in the SAS SFF bays in the Power 720 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 HDD/SSD drives are protected.

This HDD/SSD drive protection can be provided by AIX/IBM i/Linux software or by the HDD/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 RAID 6. To further augment HDD/SSD protection, hot spare capability can be used for protected drives. Specific hot spare prerequisites apply.

An integrated SAS HDD/SSD controller is provided in the Power 720 system unit and is indicated by feature 5618 and provides support for JBOD and RAID 0, 1, and 10. Feature 5618 is optionally augmented by the ability to split the drive bays into two groups when feature EJ02 is added to the configuration. For even more function, feature EJ01 can be used instead of feature 5618 or feature 5618 plus feature EJ02. Feature EJ01 provides JBOD, RAID 0, 5, 6, and 10. In addition to these protection options, mirroring of drives by the operating system is supported. AIX or Linux supports all of these options. IBM i does not use JBOD and uses imbedded functions instead of RAID 10, but does leverage the RAID 5 or 6 function of the integrated controllers. 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 with one exception. The PCIe RAID and SSD SAS Adapter has no write cache but supports RAID 5 and RAID 6.

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.

Software requirements

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

- AIX Version 7.1 with the 7100-01 Technology Level, or later
- AIX Version 7.1 with the 7100-00 Technology Level and Service Pack 4, or later (planned availability November 16, 2011)
- AIX Version 6.1 with the 6100-07 Technology Level, or later
- AIX Version 6.1 with the 6100-06 Technology Level and Service Pack 6, or later
- AIX Version 6.1 with the 6100-05 Technology Level and Service Pack 7, or later
- AIX Version 5.3 with the 5300-12 Technology Level and Service Pack 5, or later

Note: VIOS support requires VIOS 2.2.1.0, or later.

If installing the IBM i operating system (one of these):

- IBM i 6.1 with i 6.1.1 machine code, or later
- IBM i 7.1, or later

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

- SUSE Linux Enterprise Server 11 Service Pack 1, or later, with current maintenance updates available from SUSE to enable all planned functionality
- SUSE Linux Enterprise Server 10 Service Pack 4, or later, with current maintenance updates available from SUSE to enable all planned functionality
- Red Hat Enterprise Linux 6.1 for POWER, or later
- Red Hat Enterprise Linux 5.7 for POWER, or later

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

  http://www.ibm.com/support/customercare/sas/f/lopdiags/home.html

If installing VIOS:

- VIOS 2.2.1.0, or later

If installing IBM Systems Director:

- IBM Systems Director for Power Systems, V6.2.1, or later
- IBM Systems Director Editions for Power Systems, V6.2.1, or later

Firmware level 7.4, or later, is required.

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

Refer to the IBM Prerequisite website for software requirements for each feature number

https://www-912.ibm.com/e_dir/eServerPrereq.nsf

Limitations

System

- 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. IBM i can continue to use a system port for communication to a UPS, even with an HMC attached.
- The integrated system ports are supported for modem and async terminal connections by AIX or Linux. 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. IBM i only supports the use of the system ports for attachment to a UPS.

Hardware Management Console (HMC) machine code

An HMC or IVM is required to manage the Power 720 (8202-E4C) implementing partitioning. Multiple POWER7 processor-based servers can be supported by a single HMC.

If an HMC is used to manage the Power 720, the HMC must be a rack-mount HMC model CR3, or later, or deskside HMC model C05, or later.

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

https://www14.software.ibm.com/webapp/set2/sas/f/hmc/home.html

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.

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, deskside.

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:
  - #0722 -- #1787 (177 GB SFF SSD) Load Source Specify
  - #0724 -- #1996 (177 GB 1.8" SSD) Load Source Specify
  - #0725 -- Remote Load Source Specify in #5786/#5787 (supported)
  - #0726 -- Remote Load Source Specify in #5802/#5803
  - #0727 -- Remote Load Source Specify in #5886
  - #0728 -- Remote Load Source Specify in #5887
  - #0835 -- #4327 (70.56 GB 15K RPM HDD) Load Source Specify (supported)
  - #0836 -- #4328 (141.12 GB 15K RPM HDD) Load Source Specify (supported)
  - #0838 -- #3676 (69.7 GB 15K RPM HDD) Load Source Specify (supported)
  - #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 (supported)
  - #0844 -- #3658 (428 GB 15K RPM HDD) Load Source Specify
  - #0851 -- #1884 (69.7 GB 15K RPM SFF HDD) Load Source Specify
  - #0853 -- #1888 (139.5 GB 15K RPM SFF HDD) Load Source Specify
  - #0854 -- #1909 (69 GB SFF SSD) Load Source Specify
  - #0855 -- #3586 (69 GB SSD) Load Source Specify
  - #0856 -- #1911 (283 GB 10K RPM SFF HDD) Load Source Specify
  - #0857 -- #1916 (571 GB 10K RPM SFF HDD) Load Source Specify
  - #0870 -- #1879 (283 GB 15K RPM SFF HDD) Load Source Specify
  - #0871 -- #1947 (139 GB 15K RPM SFF HDD) Load Source Specify
  - #0872 -- #1948 (283 GB 15K RPM SFF HDD) Load Source Specify
  - #0874 -- #1956 (283 GB 10K RPM SFF HDD) Load Source Specify
  - #0875 -- #1962 (571 GB 10K RPM SFF HDD) Load Source Specify
  - #0876 -- #1794 (177 GB SFF 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:
  - #0726 -- Remote Load Source in #5802 12X I/O Drawer PCIe, SFF Disk
  - #0727 -- Remote Load Source in #5886 EXP 12S Expansion Drawer
  - #0728 -- Remote Load Source in #5887 EXP 24S 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 modules

- A minimum of one processor module is required on an order with four, six, or eight processor cores on the processor module. A maximum of one processor module is allowed on an order.
- All processor cores must be activated.

- The 4-core 3.0 GHz processor module (#EPC5) requires that four processor activation codes be ordered. A maximum of four processor activation code features (4 x #EPD5, or 2 x #EPD5 and 2 x #EPE5) is allowed per processor module.
- The 6-core 3.0 GHz processor module (#EPC6) requires that six processor activation codes be ordered. A maximum of six processor activation code features (6 x #EPD6, or 3 x #EPD6 and 3 x #EPE6) are allowed per processor module.
- The 8-core 3.0 GHz processor module (#EPC7) requires that eight processor activation codes be ordered. A maximum of eight processor activation code features (8 x #EPD7, or 4 x #EPD7 and 4 x #EPE7) are allowed per processor module.

Power supply

- The base machine contains one 1725 watt ac power supply.
- A second 1725 watt ac power supply (#5603) is available for redundant power and hot-swap.

Redundant fans

- Redundant fans standard

Power cords

One power cord is required for each power supply installed in the system. A maximum of 2 x feature 6665 is allowed on the system unless a valid I/O drawer or tower is attached to the system.

The Power 720 supports 110-127 V ac and 200-240 V ac.

System memory

- A minimum 4 GB or two DIMMs of memory is required on the Power 720 system.
- A system with the 4-core processor module (#EPC5) does not support the 16 GB memory feature EM16 or the 32 GB memory feature EM32. Maximum system memory with feature EPC5 is 32 GB without feature EM01 and 64 GB with feature EM01.
- The base machine contains one nonfeaturized memory riser card with eight DIMM sockets. Memory features consume two memory DIMM sockets.
- An optional memory riser card feature (#EM01) with an additional eight DIMM sockets is available. Maximum system memory is 128 GB without feature EM01 and 256 GB with feature EM01.
- A system can be ordered with a single memory feature.
- It is generally recommended that memory be installed evenly across all memory riser cards in the system. Balancing memory across the installed memory riser 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 memory riser 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
4 GB 1066 MHz (2 x 2 GB RDIMMs)	EM04	0	8
8 GB 1066 MHz (2 x 4 GB RDIMMs)	EM08	0	8

16 GB 1066 MHz (2 x 8 GB RDIMMs)	EM16	0	8
32 GB 1066 MHz (2 x 16 GB RDIMMs)	EM32	0	8

Drawer/Tower attachment:

- 7314-G30 (#5796) PCIX Expansion Drawer (supported -- not orderable)
  - A maximum of four drawers is allowed per GX++ adapter (#EJ04 or follow-ons) or per 12X loop.
  - A maximum of one GX++ adapter is allowed on the Power 720.
  - The system maximum is 4.
  - The PCIX Expansion Drawer is not supported on a 4-core system (#EPC5).
- 7031-D24/T24 (#5786/#5787) EXP4 SCSI HDD or SSD Drawer/Tower (supported -- not orderable)
  - EXP24 drawers/towers are attached to a PCI-X SCSI adapter via one or more SCSI cables.
  - The system maximum is 14.
  - The 7031-D24/T24 is not supported on a 4-core system (#EPC5).
- Feature number 5886 EXP12S SAS HDD or SSD Expansion Drawer (supported -- not orderable)
  - Feature number EJ01 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 28.
  - Feature 5886 is not supported on a 4-core system (#EPC5).
- Feature number 5887 EXP24S SAS HDD or SSD Expansion Drawer
  - Feature number EJ01 supports one feature number 5887 drawer directly off the system unit's SAS port.
  - EXP24S drawers are attached to a PCI-X or PCIe SAS adapter via SAS cables.
  - The system maximum is 14.
  - Feature 5887 is not orderable on a 4-core system (#EPC5).
- 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 two is supported on the Power 720.
  - No mixing of features 5802 and 5877 is allowed with other drawers on the same loop.
  - Feature 5887 is not orderable on a 4-core system (#EPC5).

The following list shows I/O drawers that are supported or available on the 8202 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	Supported	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 DASD Drawer	Supported	SAS
5887	Exp 24S SAS DASD Drawer	Available	SAS
7031-D24/T24	EXP24 SCSI Disk Drawer/Tower	Supported	SCSI
7214-1U2	Tape and DVD Enclosure	Supported	SAS/USB
7216-1U2	Tape and DVD Enclosure	Available	SAS
7314-G30	PCI-X DDR 12X I/O Drawer	Supported	12X

Maximum number of attached I/O drawers per system:

Feature	Power 720 (6-core or 8-core)		
O/S	AIX	Linux	IBM i
5786	14	14	14
5787	14	14	14
5796	4	4	4
5802	2	2	2
5877	2	2	2
5886	28	28	28
5887	14	14	14
7031-D24	14	14	14
7031-T24	14	14	14
7214-1U2	6	6	6
7314-G30	4	4	4

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 720 (8202-E4C) contains five full-height, short, 8x, PCIe slots. An optional PCIe Adapter Riser Card feature 5685 adds four short, 8x, PCIe Low Profile slots. One GX++ slot is available. When feature 5685 is installed in the system, the GX++ slot is unavailable. Feature EJ04 can be installed in the GX++ slot. Feature number 9055 is required in the 8202-E4C minimum configuration.

Notes:

- Optional 12X GX++ adapter is used for attaching I/O expansion drawers with PCI slots and, optionally, disk/SSD bays.
- Full-height PCIe adapters and low-profile PCIe adapters are not interchangeable. Even if the card was designed with low-profile dimensions, the tail stock at the end of the adapter is specific to either low-profile or full-height PCIe slots.

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 720 CEC is four. Not supported under IBM i.

I/O adapters

- 2-Port 10/100/1000 Base-TX Ethernet PCI Express Adapter (#9055) is in the 8202-E4C minimum configuration.
- All low-profile adapters can be installed in the PCIe Adapter Riser Card (#5685).
- Refer to Figure 2 for additional I/O adapter information.

Figure 2. I/O adapter features

I/O adapter	Orderable feature number	Supported feature number	CEC Max qty	Sys Max qty	Size
PCIe LP RAID & SSD SAS A	2053		2	2	Short
PCIe RAID & SSD SAS		2054	2	2	Short
PCIe RAID & SSD SAS w/ BSC	2055		0	10	Short
4-port USB PCIe	2728		5	25	Short
2-port USB PCI		2738	0	24	Short
8-port Asynchronous EIA-232		2943	0	24	Short
4-port ARTIC960Hx		2947	0	24	Long
2-port Multiprotocol		2962	0	24	Short
GXT135P Graphics Accelerator		2849/1980	0	8	Short
PCIe 2-Line WAN w/Modem	2893		5	25	Short
PCIe 2-Line WAN w/Modem CIM	2894		5	25	Short
PCI-X Cryptographic Coprocessor		4764	0	24	Long
PCIe Crypto Coprocessor No BSC	4807		2	2	Short
PCIe Crypto Coprocessor Gen3 BSC	4808		0	8	Short
PCIe LP POWER GXT145 Graphics Acc	5269		4	4	LP
PCIe LP 10Gb FCoE 2-port Adapter	5270		4	4	LP
PCIe LP 4-Port 10/100/1000 Base-T	5271		4	4	LP
PCIe LP 10GbE CX4 1-port Adapter	5272		4	4	LP
PCIe LP 8Gb 2-Port Fibre Channel	5273		4	4	LP
PCIe LP 2-Port 1GbE SX Adapter	5274		4	4	LP
PCIe LP 10GbE SR 1-port Adapter	5275		4	4	LP
PCIe LP 4Gb 2-Port Fibre Channel	5276		4	4	LP
PCIe LP 4-Port Async EIA-232 Adap	5277		4	4	LP
PCIe LP 2-x4-port SAS Adapter 3Gb	5278		4	4	LP
PCIe2 LP 4-port 1/10GbE SFP+	5279		4	4	LP
PCIe2 LP 4-port 1/10GbE SR	5280		4	4	LP
PCIe2 LP 2-port 1GbE	5281		4	4	LP
PCIe2 LP PCIe2 2-port 4X IB QDR	5283		4	4	LP
PCIe2 LP PCIe2 2-port 10GbE SR	5284		4	4	LP
PCIe2 PCIe2 2-port 4X IB QDR	5285		5	5	Short
PCIe2 LP PCIe2 2-Port 10GbE SFP	5286		4	4	LP
PCIe2 2-port 10GbE SR	5287		5	5	Short
PCIe2 2-port 10GbE SFP+	5288		5	5	Short
PCIe2 2-Port Async EIA 232	5289		2	12	Short
PCIe LP 2-Port Async EIA 232	5290		2	2	LP
Gigabit Ethernet		5700/1978	0	24	Short
10/100/1000 Ethernet		5701/1979	0	24	Short
2-port 10/100/1000 Ethernet	5706	1983	0	24	Short
10 Gigabit FCoE PCIe Dual Port	5708		5	25	Short
ISCI TOE Gb Ethernet (Copper)	5713	1986	0	24	Short
ISCI TOE Gb Ethernet (Fiber)		5714/1987	0	24	Short
2 Gb Fibre Channel PCI-X		5716/1977	0	24	Short
4-port 1 Gb Ethernet PCI-e 4x	5717		5	25	Short
10 Gb Ethernet - Short Reach		5721	0	24	Short
10 Gb Ethernet - Long Reach		5722	0	24	Short
2-port Asynchronous EIA-232		5723	0	24	Short
PCIe2 8x 4-port Fibre Channel	5729		5	5	Short
10 Gigabit Ethernet-CX4 PCI Exp.	5732		5	25	Short
8 Gb Dual-port Fibre Channel	5735		5	25	Short
PCI-X Ultra320 SCSI DDR	5736	1912	0	24	Short
4-port 10/100/1000 Ethernet		5740/1954	0	24	Short
PCIe2 4-Port 10GbE/1GbE SR&RJ4	5744		5	5	Short
PCIe2 4-Port 10GbE/1GbE SFP+Cop	5745		5	5	Short
GXT145 PCIe Graphics Accelerator	5748		4	8	Short
2-port 4 Gbps Fibre Channel	5749		0	24	Short
1-port 4 Gb Fibre Channel		5758/1905	0	24	Short
2-port 4 Gb Fibre Channel	5759	1910	0	24	Short
2-port 1 Gb Ethernet (UTP) PCIe	5767		5	25	Short

2-port 1 Gb Ethernet (Fiber) PCIe	5768		5	25	Short
10 Gb Ethernet-SR	5769		5	25	Short
10 Gb Ethernet-LR	5772		5	25	Short
1-port 4 Gb Fibre Channel		5773	5	25	Short
2-port 4 Gb Fibre Channel	5774		5	25	Short
PCI-X EXP24 Ctl-1.5GB No IOP		5782	0	8	Short
4-port Asynch EIA-232 PCIe	5785		5	25	Short
PCIe 380MB Cache Dual SAS RAID	5805		5	25	Short
SAS Controller PCI-X 2.0		5900	0	24	Short
PCIe Dual-x4 SAS	5901		5	25	Short
PCI-X DDR Dual-x4 SAS RAID		5902	0	24	Long
PCI-X DDR SAS RAID Adapter (BSC)	5908		0	12	Long
PCI-X DDR Dual-x4 SAS	5912		0	24	Short
PCIe2 1.8GB Cache RAID SAS	5913		2	18	Short
PCI 2-line WAN IOA, no IOP		6805	0	24	Short
PCI 4-Modem WAN IOA, no IOP		6808	0	24	Short
PCI 4-Modem WAN IOA, no IOP, CIM		6809	0	24	Short
PCI 2-line WAN w/Modem, no IOP		6833	0	24	Short
PCI 2-line WAN w/Modem, no IOP, CIM		6834	0	24	Short
GX++ Dual-port 12x Chan Attach	EJ04		1	1	GX++

Note: All low-profile (LP) adapter cards require feature number 5685.

Storage devices/bays

- The Power 720 has a slim media bay that can contain an optional DVD-ROM (#5743, or follow-on) or DVD-RAM (#5762 or follow-on) and a half-high bay that can contain a tape drive or removable disk drive.
- Either feature number 5618 or EJ01 must be selected.
  - Feature number 5618 supports six small form-factor (SFF) disk units, either HDD or SSD. Split (3x3) drive bays supported with feature EJ02. No RAID 5/6 support. No IBM i support.
  - Feature number EJ01 supports eight SFF disk units, either HDD or SSD. RAID 5 or RAID 6 support. No split backplane.
  - A valid orderable HDD or SSD is required in a minimum configuration. (No HDDs/SSDs are required in the CEC if feature number 0837 is selected).
  - If tape device feature 5619, 5638, 5746, or 5661 is installed in the half-high media bay, feature 3656 must be selected.
  - Disk units can be placed in any slot at any time with or without a split backplane.
  - A half-high tape feature and a feature 1103 Removable USB Disk Drive Docking Station are mutually exclusive. One or the other can be in the half-high bay in the system but not both. Feature 3656 is not required with feature 1103.
- Split storage backplane drive bay support requirements:
  - Storage backplane feature 5618 with feature EJ02 supports 3 x 3 split drive bays.
- SAS-bay-based SSDs (#1775, #1787, #1793, #1794, #1890, #1909, #3586, and #3587) support restrictions:
  - SFF features 1775, 1787, 1793, 1794, 1890, and 1909 are supported in the Power 720 CEC.
  - 3.5-inch features 3586 and 3587 are not supported in the Power 720 CEC.
  - SSDs and HDDs are not allowed to mirror each other.
  - SSDs are not supported by features 5278, 5900, 5901, 5902, and 5912.
  - When an SSD is placed in feature EJ01, no feature 5886 or 5887 DASD drawer is allowed to connect to the system's external SAS port.
  - When an SSD is placed in a feature 5886 or 5887 DASD drawer, the drawer is not allowed to connect to the system's external SAS port.
  - 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 5886's. A feature 5886 containing SSD drives cannot be attached to the CEC external SAS port on the Power 720.

  - In a Power 720 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 backplane.
  - In a Power 720 without a split backplane, SSDs and HDDs may be mixed in any combination. However, they cannot be in the same RAID array.
- HDD/SSD 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 EJ01
  - 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	
80GB/160GB DAT160 Tape-SAS	1	Half high	5619	
1.5TB/3.0TB LTO-5 Tape-SAS	1	Half high	5638	
800GB/1.6TB LTO4 Tape-SAS	1	Half high		5746
DAT320 160/320GB Tape-SAS	1	Half high		5661
DAT320 160 GB Tape-USB	1	Half high		5673
Internal Docking Station for Removable Disk Drive	1	Half high	1103	
External Docking Station for Removable Disk Drive	1	USB Port	1104	

Device	Maximum quantity			Bay	Orderable feature number	Supported feature number
	AIX	IBM i	Linux			
177 GB SAS SFF, SSD	44	0	44	SFF 1-8, 36 in 2 x #5802	1775	
177 GB SAS SFF, SSD	0	44	0	SFF 1-8, 36 in 2 x #5802	1787	
600 GB 10K, SAS, SFF	44	0	44	SFF 1-8, 36 in 2 x #5802	1790	
177 GB SAS SFF, SSD, GEN2	336	0	336	336 in 14 x #5887	1793	
177 GB SAS SFF, SSD, GEN2	0	336	0	336 in 14 x #5887	1794	
283 GB 10K, SAS, SFF	0	44	0	SFF 1-8 36 in 2 x #5802	1879	
300 GB 10K, SAS, SFF	44	0	44	SFF 1-8, 36 in 2 x #5802	1880	
146.8 GB 15K, SAS, SFF	44	0	44	SFF 1-8, 36 in 2 x #5887		1882
73.4 GB 15K, SAS, SFF	44	0	44	SFF 1-8, 36 in 2 x #5802		1883
69.7 GB 15K, SAS, SFF	0	44	0	SFF 1-8, 36 in 2 x #5802		1884
300 GB 10K, SAS, SFF	44	0	44	SFF 1-8, 36 in 2 x #5802	1885	
146.8 GB 15K, SAS, SFF	44	0	44	SFF 1-8, 36 in 2 x #5802	1886	
139.5 GB 15K, SAS, SFF	0	44	0	SFF 1-8, 36 in 2 x #5802	1888	
69 GB SAS, SFF, Solid-state	44	0	44	SFF 1-8, 36 in 2 x #5802		1890
69 GB SAS, SFF, Solid-state	0	44	0	SFF 1-8, 36 in 2 x #5802		1909
283 GB 10K SAS, SFF	0	44	0	SFF 1-8, 36 in 2 x #5802	1911	

571 GB 10K, SAS, SFF	0	44	0	SFF 1-8, 36 in 2 x #5802	1916	
146.8 GB, 15K, SAS, SFF, GEN2	336	0	336	336 in 14 x #5887	1917	
300 GB 10K, SAS, SFF, GEN2	336	0	336	336 in 14 x #5887	1925	
139 GB 15K, SAS, SFF, GEN2	0	336	0	336 in 14 x #5887	1947	
283 GB 15K, SAS, SFF, GEN2	0	336	0	336 in 14 x #5887	1948	
300 GB 15K, SAS, SFF, GEN2	336	0	336	336 in 14 x #5887	1953	
283 GB 10K, SAS, SFF, GEN2	0	336	0	336 in 14 x #5887	1956	
571 GB 10K, SAS, SFF, GEN2	0	336	0	336 in 14 x #5887	1962	
600 GB 10K, SAS, SFF, GEN2	336	0	336	336 in 14 x #5887	1964	
69 GB SAS, SFF, SDD	48	0	48	2 per #2053, #2054, #2055	1995	
69 GB SAS, SFF, SDD	0	48	0	2 per #2053, #2054, #2055	1996	
69 GB SAS, 3.5", Solid-state	224	0	224	224 in 28 x #5886		3586
69 GB SAS, 3.5", Solid-state	0	224	0	224 in 28 x #5886		3587

- Eight HDD or SSD drives maximum can be installed internally.
- A maximum of 336 Gen2 HDDs or SSDs can be installed in 14 x feature 5887.
- A maximum of 36 HDDs or SSDs can be installed in 2 x feature 5802.
- Feature 3586 and 3587 cannot be installed internally. Eight of feature 3586 or 3587 can be placed in each feature 5886.

Device	Maximum quantity			Bay	Orderable feature number	Supported feature number
	AIX	IBM i	Linux			
73.4 GB 15K,RPM SAS	336	0	336	28 x #5886		3646
146.8 GB 15K RPM, SAS	336	0	336	28 x #5886	3647	
300 GB 15K RPM, SAS	336	0	336	28 x #5886	3648	
450 GB 15K RPM, SAS	336	0	336	28 x #5886	3649	
69.8 GB 15K RPM, SAS	0	336	0	28 x #5886		3676
139.6 GB 15K RPM, SAS	0	336	0	28 x #5886	3677	
283.8 GB 15K RPM, SAS	0	336	0	28 x #5886	3678	
428.4 GB 15K RPM, SAS	0	336	0	28 x #5886	3658	

Note: 3.5-inch DASD is not supported in the 8202-E4C CEC.

Device	Maximum quantity			Bay	Orderable feature number	Supported feature number
	AIX	IBM i	Linux			
73.4 GB 15K RPM, SCSI	336	0	336	See note		3278/1971
146.8 GB 15K RPM, SCSI	336	0	336	See note		3279/1972
300 GB 15K RPM, SCSI	336	0	336	See note		3585
70.56 GB 15K RPM, SCSI	0	336	0	See note		4327

141.14 GB 15K RPM, SCSI	0	336	0	See note	4328
282.25 GB 15K RPM, SCSI	0	336	0	See note	4329
TotalStorage EXP24 14 Disk Drawer	14	14	14	See note	5786
TotalStorage EXP24 14 Disk Tower	14	14	14	See note	5787

Note: SCSI disks are not supported in the 8202-E4C CEC. The 336 system maximum is achieved with a maximum of 14 disks in a maximum of 24 Total Storage EXP 24-Disk Drawers (#5786) or 14 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

Three year.

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

An IBM part or feature installed during the initial installation of an IBM machine is subject to a full warranty effective on the date of installation of the machine. An IBM part or feature that replaces a previously installed part or feature assumes the remainder of the warranty period for the replaced part or feature. An IBM part or feature added to a machine without replacing a previously installed part or feature is subject to a full warranty effective on its date of installation. Unless specified otherwise, the warranty period, type of warranty service, and service level of a part or feature are the same as those for the machine in which it is installed.

Warranty service

If required, IBM provides repair or exchange service depending on the types of warranty service specified for the machine. IBM will attempt to resolve your problem over the telephone, or electronically via an IBM website. You must follow the problem determination and resolution procedures that IBM specifies. Scheduling of service will depend 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-specific and location-specific information.

CRU Service

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

Tier 1 CRU

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

Tier 2 CRU

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

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

The following parts have been designated as Tier 1 CRUs:

- DASD Drive
- DVD Drive
- DASD Backplane
- Fan Air Baffle
- Fans
- All PCI Adapters
- Power Supply
- Adapter - GX ++
- Line/power cord
- Keyboard
- Mouse
- External cables
- Display
- Operator Panel
- TOD Battery
- Memory DIMMs
- Processor VRM
- SAS Conduit Cable
- Tape drive power/signal cable
- Interlock Switch
- RAID Battery
- RAID Battery Card
- RAID Package Card
- SPCN Cable
- Memory Riser Card

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.

Service level is:

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

Non-IBM parts 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. See the Warranty services section for additional details.

IBM will attempt to resolve your problem over the telephone or electronically by access to an IBM website. Certain machines contain remote support capabilities for direct problem reporting, remote problem determination, and resolution with IBM. You must follow the problem determination and resolution procedures that IBM specifies. Following problem determination, if IBM determines on-site service is required, scheduling of service will depend upon the time of your call, machine technology and redundancy, and availability of parts.

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 on-site response-time objectives are available as warranty service upgrades for your machine.

The service level is:

- 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, same day
- 24 hours per day, 7 days a week, 2-hour average response, same day

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 the CRU and On-site Service level specified above. For additional information on the CRU Service, see the warranty information.

Maintenance services

If required, IBM provides repair or exchange service depending on the types of maintenance service specified for the machine. IBM will attempt to resolve your problem over the telephone or electronically, via an IBM website. Certain machines contain remote support capabilities for direct problem reporting, remote problem determination, and resolution with IBM. 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-specific 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.

Service levels are:

- 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, same-business-day
- 24 hours per day, 7 days a week, 4-hour average response, same day
- 24 hours per day, 7 days a week, 2-hour average response, same day

Customer Replaceable Unit (CRU) 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 replacement 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.

Non-IBM parts service

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

This service includes hardware problem determination (PD) on the non-IBM parts (for example, adapter cards, PCMCIA cards, disk drives, memory) installed within IBM machines and provides the labor to replace the failing parts at no additional charge.

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

Usage plan machine

No

IBM hourly service rate classification

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

Yes

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: 8202-E4C

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 website

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.

Product charges

The following are newly announced features on the specific models of the IBM Power Systems 8202 machine type:

Description	Model number	Feature number	Purchase price	Minimum Monthly Maint. Charge	Initial/ MES/ Both/ Support	CSU	RP MES
IBM Power 720							
	E4C					Yes	
One CSC Billing Unit							
	E4C	0010			Both	Yes	No
Ten CSC Billing Units							
	E4C	0011			Both	Yes	No
Mirrored System Disk Level, Sp							
	E4C	0040			Both	Yes	No
Device Parity Protection All							
	E4C	0041			Both	Yes	No
Mirrored System Bus Level							
	E4C	0043			Both	Yes	No
Device Parity RAID 6 All							
	E4C	0047			Both	Yes	No
RISC to RISC Data Migration							
	E4C	0205			Initial	N/A	No
AIX Partition Specify							
	E4C	0265			Both	Yes	No
Linux Partition Specify							

	E4C	0266		Both	Yes No
IBM i Partition Specify					
	E4C	0267		Both	Yes No
Specify Custom Data Protection					
	E4C	0296		Both	Yes No
Mirrored Level System Specify					
	E4C	0308		Both	Yes No
RAID Hot Spare Specify					
	E4C	0347		Both	Yes No
V.24/EIA232 6.1m (20 Ft) PCI C					
	E4C	0348		Both	Yes No
V.24/EIA232 15.2m (50 Ft) PCI					
	E4C	0349		Support	Yes No
V.35 6.1m (20 Ft) PCI Cable					
	E4C	0353		Both	Yes No
V.35 15.2m (50 Ft) PCI Cable					
	E4C	0354		Support	Yes No
V.36 6.1m (20 Ft) PCI Cable					
	E4C	0356		Support	Yes No
X.21 6.1m (20 Ft) PCI Cable					
	E4C	0359		Both	Yes No
X.21 15.2m (50 Ft) PCI Cable					
	E4C	0360		Support	Yes No
V.24/EIA232 (80 Ft) PCI Cable					
	E4C	0365		Support	Yes No
CBU Specify					
	E4C	0444		Both	Yes No
Customer Specified Placement					
	E4C	0456		Initial	N/A No
SSD Placement Indicator CEC					
	E4C	0462		Both	Yes No
SSD Placement Indicator 5802/3					
	E4C	0463		Initial	N/A No
SSD Placement Indicator 5886					
	E4C	0464		Initial	N/A No
SSD Placement Indicator 5887					
	E4C	0465		Initial	N/A No
19 inch, 1.8 meter high rack					
	E4C	0551		MES	Yes No
19 inch, 2.0 meter high rack					
	E4C	0553		MES	Yes No
19 inch, 1.3 meter high rack					
	E4C	0555		Support	Yes No
IBM i 6.1 w/6.1.1 Machine Code					
	E4C	0566		Both	Yes No
IBM i 7.1 Specify Code					
	E4C	0567		Both	Yes No
Rack Filler Panel Kit					
	E4C	0599		Both	Yes No
Load Source Not in CEC					
	E4C	0719		Both	Yes No
#1787 Load Source Specify					
	E4C	0722		Both	Yes No
#1996 Load Source Specify					
	E4C	0724		Both	Yes No
Specify Load Source in 5786					
	E4C	0725		Support	N/A No
Specify Load Source 5802/3/77					
	E4C	0726		Both	Yes No
Specify 5886 Load Source plac					
	E4C	0727		Both	Yes No
#5887 Load Source Specify					
	E4C	0728		Both	Yes No
Power 720 4 core Express Edit					
	E4C	0777		Initial	N/A No
Power 720 6 8 core Express E					
	E4C	0779		Initial	N/A No
4327 Load Source Specify					
	E4C	0835		Support	Yes No
4328 Load Source Specify					
	E4C	0836		Support	Yes No
SAN Load Source Specify					
	E4C	0837		Both	Yes No
3676 Load Source Specify					

	E4C	0838	Support	Yes	No
3677 Load Source Specify					
	E4C	0839	Support	Yes	No
3678 Load Source Specify					
	E4C	0840	Support	Yes	No
4329 Load Source Specify					
	E4C	0841	Support	Yes	No
3658 Load Source Specify					
	E4C	0844	Support	Yes	No
1884 Load Source Specify					
	E4C	0851	Support	Yes	No
1888 Load Source Specify					
	E4C	0853	Both	Yes	No
1909 Load Source Specify					
	E4C	0854	Support	Yes	No
3587 Load Source Specify					
	E4C	0855	Support	Yes	No
1911 Load Source Specify					
	E4C	0856	Both	Yes	No
#1916 Load Source Specify					
	E4C	0857	Both	Yes	No
#1879 Load Source Specify					
	E4C	0870	Both	Yes	No
#1947 Load Source Specify					
	E4C	0871	Both	Yes	No
#1948 Load Source Specify					
	E4C	0872	Both	Yes	No
#1956 Load Source Specify					
	E4C	0874	Both	Yes	No
#1962 Load Source Specify					
	E4C	0875	Both	Yes	No
#1794 Load Source Specify					
	E4C	0876	Both	Yes	No
US TAA Compliance Indicator					
	E4C	0983	Both	Yes	No
USB Internal Docking Station R					
	E4C	1103	Both	Yes	No
USB External Docking Station R					
	E4C	1104	Both	Yes	No
USB 160 GB Removable Disk Dr					
	E4C	1106	Both	Yes	No
USB 500 GB Removable Disk Dr					
	E4C	1107	Both	Yes	No
Custom Serv. Specify, Roch					
	E4C	1140	Both	Yes	No
200V 16A 4.3m (14 Ft) TL Line					
	E4C	1406	Support	Yes	No
4.3m 200V/16A Pwr Cd Italy					
	E4C	1408	Support	Yes	No
125V 4.3m (14 Ft) Line Cord					
	E4C	1413	Support	Yes	No
200V 1.8m (6 Ft) Locking Line					
	E4C	1414	Support	Yes	No
200V 1.8m (6 Ft) Watertight LC					
	E4C	1415	Support	Yes	No
200V 4.3m (14 Ft) Locking Line					
	E4C	1416	Support	Yes	No
200V 4.3m (14 Ft) Watertight L					
	E4C	1417	Support	Yes	No
4.3m 200V/16A Power Cord EU/As					
	E4C	1420	Support	Yes	No
4.3m 200V/16A Power Cord CH/DK					
	E4C	1421	Support	Yes	No
200V 1.8m (6 Ft) Locking Line					
	E4C	1424	Support	Yes	No
200V 1.8m (6 Ft) Watertight Li					
	E4C	1425	Support	Yes	No
200V 4.3m (14 Ft) Locking Line					
	E4C	1426	Support	Yes	No
200V 4.3m (14 Ft) Watertight L					
	E4C	1427	Support	Yes	No

4.3m 200V/10A Power Cord EU/As					
	E4C	1439		Support	Yes No
4.3m 200V/10A Power Cord Denma					
	E4C	1440		Support	Yes No
4.3m 200V/10A Power Cord S. Af					
	E4C	1441		Support	Yes No
4.3m 200V/10A Power Cord Swiss					
	E4C	1442		Support	Yes No
4.3m 200V/10A Power Cord UK					
	E4C	1443		Support	Yes No
4.3m 200V/10A Power Cord Israe					
	E4C	1445		Support	Yes No
4.3m 200V/32A Power Cord EU 1					
	E4C	1449		Support	Yes No
4.3m 200V/16A Power Cord EU 2					
	E4C	1450		Support	Yes No
200V (6 Ft) 1.8m Line Cord					
	E4C	1451		Support	Yes No
200V (14 Ft) 4.3m Line Cord					
	E4C	1452		Support	Yes No
200V (6 Ft) 1.8m Locking Line					
	E4C	1453		Support	Yes No
200V 12A (14 Ft) 4.3m TL Line					
	E4C	1454		Support	Yes No
200V (6 Ft) 1.8m Watertight Li					
	E4C	1455		Support	Yes No
200V (14 Ft) 4.3m Watertight L					
	E4C	1456		Support	Yes No
200V (6 Ft) 1.8m Upper Line Co					
	E4C	1457		Support	Yes No
200V (6 Ft) 1.8m Upper Locking					
	E4C	1458		Support	Yes No
200V (6 Ft) 1.8m Locking					
	E4C	1459		Support	Yes No
4.3m 200V/16A Pwr Cd					
	E4C	1477		Support	Yes No
177GB SFF-1 SSD w/ eMLC AIX/Li					
	E4C	1775		Both	Yes No
177GB SFF-1 SSD w/ eMLC IBM i					
	E4C	1787		Both	Yes No
600GB 10k RPM SAS SFF Disk					
	E4C	1790		Both	Yes No
177GB SFF-2 SSD w/ eMLC AIX/Li					
	E4C	1793		Both	Yes No
177GB SFF-2 SSD w/ eMLC IBM i					
	E4C	1794		Both	Yes No
Quantity 150 of #1962					
	E4C	1817		Both	Yes No
Quantity 150 of #1964					
	E4C	1818		Both	Yes No
System port/UPS Conversion Cab					
	E4C	1827		Both	Yes No
1.5 Meter 12X to 4X Channel CC					
	E4C	1828		Both	Yes No
0.6 Meter 12X Cable					
	E4C	1829		Support	Yes No
1.5 Meter 12X cable					
	E4C	1830		Support	Yes No
8.0 Meter 12X Cable					
	E4C	1834		Support	Yes No
3.0 Meter 12X Cable					
	E4C	1840		Support	Yes No
3 Meter 12X to 4X Channel CC					
	E4C	1841		Both	Yes No
Quantity 150 of #1956					
	E4C	1844		Both	Yes No
10 Meter 12X to 4X Enhance CCC					
	E4C	1854		Both	Yes No
0.6 Meter 12X DDR Cable					
	E4C	1861		Both	Yes No
1.5 Meter 12X DDR Cable					

	E4C	1862		Both	Yes No
8 Meter 12X DDR Cable					
	E4C	1864		Both	Yes No
3.0 Meter 12X DDR Cable					
	E4C	1865		Both	Yes No
Quantity 150 of #1917					
	E4C	1866		Both	Yes No
Quantity 150 of #1947					
	E4C	1868		Both	Yes No
Quantity 150 of #1925					
	E4C	1869		Both	Yes No
283GB 15K RPM SAS Disk					
	E4C	1879		Both	Yes No
300GB 15K RPM SAS Disk					
	E4C	1880		Both	Yes No
146.8GB 10K RPM SAS SFF Disk D					
	E4C	1882		Support	Yes No
73.4 GB 15K RPM SAS SFF Disk D					
	E4C	1883		Support	Yes No
69.7 GB 15K RPM SAS SFF Disk D					
	E4C	1884		Support	Yes No
300GB 10K RPM SFF SAS Disk D					
	E4C	1885		Both	Yes No
146GB 15K RPM SFF SAS Disk D					
	E4C	1886		Both	Yes No
Quantity 150 of #1793					
	E4C	1887		Both	Yes No
139GB 15K RPM SFF SAS Disk D					
	E4C	1888		Both	Yes No
69GB SFF SAS Solid State D					
	E4C	1890		Support	Yes No
4 GB Single Port Fibre Channel					
	E4C	1905		Support	Yes No
69GB SFF SAS Solid State Drive					
	E4C	1909		Support	Yes No
4 GB Dual Port Fibre Channel P					
	E4C	1910		Support	Yes No
283GB 10K RPM SFF SAS Disk Dri					
	E4C	1911		Both	Yes No
PCI X DDR Dual Channel Ultra32					
	E4C	1912		Support	Yes No
571GB 10k RPM SAS SFF Disk					
	E4C	1916		Both	Yes No
146GB 15k RPM SAS SFF-2 Disk					
	E4C	1917		Both	Yes No
300GB 10k RPM SAS SFF-2 Disk					
	E4C	1925		Both	Yes No
Quantity 150 of #1948					
	E4C	1927		Both	Yes No
Quantity 150 of #1953					
	E4C	1929		Both	Yes No
139GB 15k RPM SAS SFF-2 Disk					
	E4C	1947		Both	Yes No
283GB 15k RPM SAS SFF-2 Disk					
	E4C	1948		Both	Yes No
300GB 15k RPM SAS SFF-2 Disk					
	E4C	1953		Both	Yes No
4 Port 10 100 1000 Base TX PCI					
	E4C	1954		Support	Yes No
283GB 10k RPM SAS SFF-2 Disk					
	E4C	1956		Both	Yes No
Quantity 150 of #1794					
	E4C	1958		Both	Yes No
571GB 10k RPM SAS SFF-2 Disk					
	E4C	1962		Both	Yes No
600GB 10k RPM SAS SFF-2 Disk					
	E4C	1964		Both	Yes No
73.4 GB 15,000 RPM Ultra320 SC					
	E4C	1971		Support	Yes No
146.8 GB 15,000 RPM Ultra320 S					
	E4C	1972		Support	Yes No
2 Gigabit Fibre Channel PCI X					
	E4C	1977		Support	Yes No
IBM Gigabit Ethernet SX PCI X					

	E4C	1978	Support	Yes	No
10 100 1000 Base TX Ethernet P					
	E4C	1979	Support	Yes	No
POWER GXT135P Graphics Acceler					
	E4C	1980	Support	Yes	No
2-Port Base-TX Etht PCI-X Adpt					
	E4C	1983	Support	Yes	No
1 Gigabit iSCSI TOE PCI X on C					
	E4C	1986	Support	Yes	No
1 Gigabit iSCSI TOE PCI X on O					
	E4C	1987	Support	Yes	No
177GB SSD Module with eMLC (AI					
	E4C	1995	Both	No	No
1 Gigabit iSCSI TOE PCI X on C					
	E4C	1996	Both	No	No
PCIe LP RAID SSD SAS Adapter 3					
	E4C	2053	Both	Yes	No
PCIe RAID SSD SAS Adapter 3Gb					
	E4C	2054	Support	Yes	No
PCIe RAID SSD SAS Adapter 3Gb					
	E4C	2055	Both	Yes	No
Converter Cable, VHDCI to P, M					
	E4C	2118	Support	Yes	No
Ultra 320 SCSI Cable -1M					
	E4C	2124	Support	Yes	No
Ultra 320 SCSI Cable -3M					
	E4C	2125	Support	Yes	No
Ultra 320 SCSI Cable -5M					
	E4C	2126	Support	Yes	No
Ultra 320 SCSI Cable -10M					
	E4C	2127	Support	Yes	No
Ultra 320 SCSI Cable -20M					
	E4C	2128	Support	Yes	No
Ultra 320 SCSI Cable -0.55M					
	E4C	2138	Support	Yes	No
Primary OS - IBM i					
	E4C	2145	Both	Yes	No
Primary OS AIX					
	E4C	2146	Both	Yes	No
Primary OS Linux					
	E4C	2147	Both	Yes	No
Factory Deconfiguration of 1 c					
	E4C	2319	Initial	N/A	No
LC-SC 50 Micron Fiber Conv Cab					
	E4C	2456	Both	Yes	No
LC-SC 62.5 Mic.Fib.Conv.Cable					
	E4C	2459	Both	Yes	No
4 port USB PCIe Adapter					
	E4C	2728	Both	Yes	No
2 Port USB PCI Adapter					
	E4C	2738	Support	Yes	No
POWER GXT135P Graphics Acceler					
	E4C	2849	Support	Yes	No
ARTIC960Hx 4 Port EIA 232 Cabl					
	E4C	2861	Support	Yes	No
ARTIC960Hx 4 Port X 21 Cable					
	E4C	2863	Support	Yes	No
ARTIC960Hx 4-Port V.35(DTE)Cab					
	E4C	2864	Support	Yes	No
PCIe 2 Line WAN w/Modem					
	E4C	2893	Both	Yes	No
Asynch.Termin/Print.Cbl EIA232					
	E4C	2934	Both	Yes	No
Asynchronous Cable EIA 232/V					
	E4C	2936	Both	Yes	No
8P Async Adp. EIA232/RS-422					
	E4C	2943	Support	Yes	No
ARTIC960Hx 4Port Mult.PCI Adp					
	E4C	2947	Support	Yes	No
Cable, V.24 / EIA-232					
	E4C	2951	Support	Yes	No
Cable, V.35					
	E4C	2952	Support	Yes	No
Cable, V.36 / EIA 499					

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                        E4C     2953                    Support  Yes No
Cable, X.21
                        E4C     2954                    Support  Yes No
2-Port Multip. PCI Adapter
                        E4C     2962                    Support  Yes No
Ser to Ser Port Cab Draw/Draw
                        E4C     3124                    Both     Yes No
Serial to Se.Port Cbl Rack 8M
                        E4C     3125                    Both     Yes No
73.4GB 15K RPM U320 SCSI DDA
                        E4C     3278                    Support  Yes No
146.8GB 15K RPM U320 SCSI DDA
                        E4C     3279                    Support  Yes No
1m QDR IB/E'Net Copper Cable
                        E4C     3287                    Both     Yes No
3m QDR IB/E'Net Copper Cable
                        E4C     3288                    Both     Yes No
5m QDR IB/E'Net Copper Cable
                        E4C     3289                    Both     Yes No
10m QDR IB Optic Cable
                        E4C     3290                    Both     Yes No
30m QDR IB Optic Cable
                        E4C     3293                    Both     Yes No
SAS YO Cable 1.5m - HD 6Gb Ada
                        E4C     3450                    Both     Yes No
SAS YO Cable 3m - HD 6Gb Adapt
                        E4C     3451                    Both     Yes No
SAS YO Cable 6m - HD 6Gb Adapt
                        E4C     3452                    Both     Yes No
SAS YO Cable 10m - HD 6Gb Adap
                        E4C     3453                    Both     Yes No
SAS X Cable 3m - HD 6Gb 2-Adap
                        E4C     3454                    Both     Yes No
SAS X Cable 6m - HD 6Gb 2-Adap
                        E4C     3455                    Both     Yes No
SAS X Cable 10m - HD 6Gb 2-Ada
                        E4C     3456                    Both     Yes No
300 GB 15K RPM SCSI Disk Drive
                        E4C     3585                    Support  Yes No
69GB 3.5 SAS Solid State Driv
                        E4C     3586                    Support  Yes No
69GB 3.5 SAS Solid State Driv
                        E4C     3587                    Support  Yes No

NOTE - The monitor or display features are subject to a $16
Electronic Waste Recycling Fee (15-INCH TO 34-INCH VIDEO DEVICE.)

Widescreen LCD Monitor
                        E4C     3632                    Both     Yes No
T541H/L150p 15inchTFT Col.M
                        E4C     3637                    Support  Yes No
ThinkVision L170p Flat Pan.M
                        E4C     3639                    Support  Yes No
ThinkVision L171p Flat Panel M
                        E4C     3640                    Support  Yes No
IBM T115 Flat Panel Monitor
                        E4C     3641                    Support  Yes No
ThinkVision L191p Flat Panel M
                        E4C     3642                    Support  Yes No
IBM T120 Flat Panel Monitor
                        E4C     3643                    Support  Yes No
19in. Flat Panel Monitor
                        E4C     3644                    Support  Yes No
17in. Flat Panel Monitor
                        E4C     3645                    Support  Yes No
73GB 15K RPM SAS Disk Drive
                        E4C     3646                    Support  Yes No
146GB 15K RPM SAS Disk Drive
                        E4C     3647                    Both     Yes No
300GB 15K RPM SAS Disk Drive
                        E4C     3648                    Both     Yes No
450GB 15K RPM SAS Disk Drive
                        E4C     3649                    Both     Yes No
SAS Cable (EE) Drawer to Dr 1M
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                        E4C     3652                    Both     Yes No
SAS Cable (EE) Drawer to Dr 3M
                        E4C     3653                    Both     Yes No
SAS Cable (EE) Drawer to Dr 6M
                        E4C     3654                    Both     Yes No
SAS SFF Cable
                        E4C     3656                    Both     Yes No
428GB 15K RPM SAS Disk Drive
                        E4C     3658                    Both     Yes No
SAS Cable (X) Adapter to SAS E
                        E4C     3661                    Both     Yes No
SAS Cbl X Adp SAS Enclosure 6M
                        E4C     3662                    Both     Yes No
SAS Cbl X Adp SAS Encl 15M
                        E4C     3663                    Both     Yes No
69.7GB 15k rpm SAS Disk Drv
                        E4C     3676                    Support  Yes No
139.5GB 15k rpm SAS Disk Drive
                        E4C     3677                    Both     Yes No
283.7GB 15k rpm SAS Disk Drive
                        E4C     3678                    Both     Yes No
3M SAS CABLE, ADPTR TO ADPTR (
                        E4C     3681                    Both     Yes No
6M SAS CABLE, ADPTR TO ADPTR (
                        E4C     3682                    Both     Yes No
SAS Cab (AE) Adapter to En 3M
                        E4C     3684                    Both     Yes No
SAS Cable(AE) Adapter to En 6M
                        E4C     3685                    Both     Yes No
SAS Ca(YI) System to SAS 1.5M
                        E4C     3686                    Support  Yes No
SAS Ca(YI) System to SAS 3M
                        E4C     3687                    Both     Yes No
SAS Cable (AT) 0.6 Meter
                        E4C     3688                    Both     Yes No
SAS AT Cable 0.6m - HD 6Gb Ada
                        E4C     3689                    Both     Yes No
SAS Cab(YO) Adapter to SAS1.5M
                        E4C     3691                    Both     Yes No
SAS Cab(YO) Adapter to SAS 3M
                        E4C     3692                    Both     Yes No
SAS Cab(YO) Adapter to SAS 6M
                        E4C     3693                    Both     Yes No
SAS Cab(YO) Adapter to SAS 15M
                        E4C     3694                    Both     Yes No
0.3M Serial Prt Converter Cbl
                        E4C     3925                    Both     Yes No
Asynch Printer/Term.Cab,4M
                        E4C     3926                    Support  Yes No
Serial Port Null Mod Cab 3.7M
                        E4C     3927                    Both     Yes No
Ser.Port Null Modem Cable,10M
                        E4C     3928                    Both     Yes No
System Serial Port Converter C
                        E4C     3930                    Both     Yes No
6Foot Extend.Cbl for Displays
                        E4C     4242                    Both     Yes No
Extender Cable USB Keybo 1.8M
                        E4C     4256                    Both     Yes No
VGA to DVI Connection Converte
                        E4C     4276                    Both     Yes No
70.56GB 15k rpm Disk Unit
                        E4C     4327                    Support  Yes No
141.12GB 15k RPM Disk Unit
                        E4C     4328                    Support  Yes No
282.25GB 15k rpm Disk Unit
                        E4C     4329                    Support  Yes No
Package 5X 2055 20X 1995
                        E4C     4367                    Both     Yes No
Package 5X 2055 20X 1995
                        E4C     4377                    Both     Yes No
One and only one rack indicator feature is required on
all orders (#4650 to #4666).
No Factory Integration Ind.
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	E4C	4650	Initial	N/A	No
Rack Indicator, Rack 1					
	E4C	4651	Initial	N/A	No
Rack Indicator, Rack 2					
	E4C	4652	Initial	N/A	No
Rack Indicator, Rack 3					
	E4C	4653	Initial	N/A	No
Rack Indicator, Rack 1					
	E4C	4654	Initial	N/A	No
Rack Indicator, Rack 5					
	E4C	4655	Initial	N/A	No
Rack Indicator, Rack 6					
	E4C	4656	Initial	N/A	No
Rack Indicator, Rack 7					
	E4C	4657	Initial	N/A	No
Rack Indicator, Rack 8					
	E4C	4658	Initial	N/A	No
Rack Indicator, Rack 9					
	E4C	4659	Initial	N/A	No
Rack Indicator, Rack 10					
	E4C	4660	Initial	N/A	No
Rack Indicator, Rack 11					
	E4C	4661	Initial	N/A	No
Rack Indicator, Rack 12					
	E4C	4662	Initial	N/A	No
Rack Indicator, Rack 13					
	E4C	4663	Initial	N/A	No
Rack Indicator, Rack 14					
	E4C	4664	Initial	N/A	No
Rack Indicator, Rack 15					
	E4C	4665	Initial	N/A	No
Rack Indicator, Rack 16					
	E4C	4666	Initial	N/A	No
PCI-X Crypt.Coproc.(FIPS 4)					
	E4C	4764	Support	Yes	No
Power Active Memory Expansion					
	E4C	4793	Both	Yes	No
PCIe Crypto Coprocessor No B					
	E4C	4807	Both	Yes	No
PCIe Crypto Coprocessor Gen3					
	E4C	4808	Both	Yes	No
Power 720 Solution Edition					
	E4C	4927	Initial	N/A	No
Power 720 Solution Edition					
	E4C	4928	Initial	N/A	No
IBM i for BI - Small Config					
	E4C	4934	Initial	N/A	No
IBM i for BI - Medium Config					
	E4C	4935	Initial	N/A	No
IBM i for BI - Large Config					
	E4C	4936	Initial	N/A	No
Software Preload Required					
	E4C	5000	Initial	N/A	No
Customer Solution Center Roche					
	E4C	5002	Initial	N/A	No
Power Dist Unit 1 Phase NEMA					
	E4C	5160	Support	Yes	No
Power Dist Unit 1 Phase IEC					
	E4C	5161	Support	Yes	No
Power Dist Unit 2 of 3 Phase					
	E4C	5162	Support	Yes	No
Power Dist Unit - 3 Phase					
	E4C	5163	Support	Yes	No
PowerVM Express Edition					
	E4C	5225	Both	Yes	No
PowerVM Standard Edition					
	E4C	5227	Both	Yes	No
PowerVM Enterprise Edition					
	E4C	5228	Both	Yes	No
PCIe LP POWER GXT145 Graphics					
	E4C	5269	Both	Yes	No
PCIe LP 10Gb FCoE 2 port Adapt					
	E4C	5270	Both	Yes	No
PCIe LP 4 Port 10/100/1000 Bas					

E4C	5271	Both	Yes	No
PCIe LP 10GbE CX4 1 port Adapt				
E4C	5272	Both	Yes	No
PCIe LP 8Gb 2 Port Fibre Chann				
E4C	5273	Both	Yes	No
PCIe LP 2 Port 1GbE SX Adapter				
E4C	5274	Both	Yes	No
PCIe LP 10GbE SR 1 port Adapt				
E4C	5275	Both	Yes	No
PCIe LP 4Gb 2 Port Fibre Chann				
E4C	5276	Both	Yes	No
PCIe LP 4 Port Async EIA 232 A				
E4C	5277	Both	Yes	No
PCIe LP 2 x4 port SAS Adapter				
E4C	5278	Both	Yes	No
PCIe2 4Port 10GBE&1GBE SFP+ LP				
E4C	5279	Both	Yes	No
PCIe2 4-Port 10GbE&1GbE SR LP				
E4C	5280	Both	Yes	No
PCIe LP 2-Port 1GbE TX Adapter				
E4C	5281	Both	Yes	No
PCIe2 LP 2-Port 4X IB QDR Adap				
E4C	5283	Both	Yes	No
PCIe2 LP 2 port 10GbE SR Adapt				
E4C	5284	Both	Yes	No
PCIe 2-Port 4X IB QDR Adapt				
E4C	5285	Both	Yes	No
PCIe2 LP 2 Port 10GbE SFP Copp				
E4C	5286	Both	Yes	No
PCIe2 2-port 10GbE SR Adapter				
E4C	5287	Both	Yes	No
PCIe2 2-port 10GbE SFP+ Adaptr				
E4C	5288	Both	Yes	No
2 Port Async EIA 232 PCIe Adap				
E4C	5289	Both	Yes	No
PCIe LP 2 Port Async EIA 232 A				
E4C	5290	Both	Yes	No
RFID Tags for Servers, Blades				
E4C	5524	Both	Yes	No
Sys Console On HMC				
E4C	5550	Both	Yes	No
Sys Console-Ethernet No IOP				
E4C	5557	Both	Yes	No
System AC Power Supply, 1725 W				
E4C	5603	Both	Yes	No
Storage Backplane 6 SFF Bays				
E4C	5618	Both	Yes	No
80/160GB DAT160 SAS Tape Drive				
E4C	5619	Both	Yes	No
1.5TB/3.0TB LTO 5 SAS Tape Dr				
E4C	5638	Both	Yes	No
DAT320 160/320 GB Tape Drive				
E4C	5661	Support	Yes	No
DAT320 160 GB USB Tape Drive				
E4C	5673	Support	Yes	No
PCIe Riser Card (Gen2)				
E4C	5685	Both	Yes	No
DAT160 Data Cartridge				
E4C	5689	Support	Yes	No
IBM Gigab.Eth-SX PCI-X Adapter				
E4C	5700	Support	Yes	No
10/100/1000 BaseTX Eth.PCI-X				
E4C	5701	Support	Yes	No
2-Port BaseTX Etht.PCI-X Adp				
E4C	5706	Both	Yes	No
10Gb FCoE PCIe Dual Port Adapt				
E4C	5708	Both	Yes	No
1Gb iSCSI TOE PCI-X-Copp.Adpt				
E4C	5713	Both	Yes	No
1Gb iSCSI TOE PCI-X-Opt.Adpt				
E4C	5714	Support	Yes	No
2 Gigab.Fibre Chann.PCI-X Adp				
E4C	5716	Support	Yes	No
4 Port 10/100/1000 Base TX PCI				

	E4C	5717		Both	Yes No
10Gb Etht-SR PCI-X 2.0 DDR Adp					
	E4C	5721		Support	Yes No
10Gb Etht-LR PCI-X 2.0 DDR Adp					
	E4C	5722		Support	Yes No
2 Port Asyn.EIA-232 PCI Adpt					
	E4C	5723		Support	Yes No
PCIe2 8x 4-port Fibre Channel					
	E4C	5729		Both	Yes No
10 Gigabit Ethernet CX4 PCI Ex					
	E4C	5732		Both	Yes No
8 Gigabit PCI Express Dual Por					
	E4C	5735		Both	Yes No
PCI X DDR Dual Channel Ultra32					
	E4C	5736		Both	Yes No
4-Port 10/100/1000 BaseTX Adpt					
	E4C	5740		Support	Yes No
Single Bus repeater for 5786					
	E4C	5741		Support	Yes No
Dual Bus repeater for 5786					
	E4C	5742		Support	Yes No
SATA Slim DVD-ROM drive					
	E4C	5743		Support	Yes No
PCIe2 4-Port 10GbE&1GbE SR&RJ4					
	E4C	5744		Both	Yes No
PCIe2 4-Port 10GbE&GbE SFP+Cop					
	E4C	5745		Both	Yes No
Half High 800GB/1.6TB LTO4 SAS					
	E4C	5746		Support	Yes No
LTO Ultrium 4 800 GB Data Cart					
	E4C	5747		Both	Yes No
POWER GXT145 PCI Express Graph					
	E4C	5748		Both	Yes No
4Gbps Fibre Channel (2 Port)					
	E4C	5749		Both	Yes No
4 GB Single-Port Fibre Channel					
	E4C	5758		Support	Yes No
4 Gb Dual Port Fibre Channel					
	E4C	5759		Both	Yes No
SATA Slimline DVD RAM Drive					
	E4C	5762		Both	Yes No
2 Port 10/100/1000 Base TX Eth					
	E4C	5767		Both	Yes No
2 Port Gigabit Ethernet SX PCI					
	E4C	5768		Both	Yes No
10 Gb Eth SR PCI Express Adp					
	E4C	5769		Both	Yes No
10 Gigabit Ethernet LR PCI					
	E4C	5772		Both	Yes No
4GigabitPCI-E Single Port Fibr					
	E4C	5773		Support	Yes No
4 Gigabit PCI Express Dual Por					
	E4C	5774		Both	Yes No
PCI-X EXP24 Ctl-1.5GB No IOP					
	E4C	5782		Support	Yes No
4 Port Async EIA 232 PCIe Adap					
	E4C	5785		Both	Yes No
TotalStorage EXP24 Disk Dwr					
	E4C	5786		Support	Yes No
TotalStorage EXP24 Disk Twr					
	E4C	5787		Support	Yes No
PCI DDR 12X Expansion Drawer					
	E4C	5796		Both	Yes No
12X I/O Drawer PCIe, SFF disk					
	E4C	5802		Both	Yes No
PCIe 380MB Cache Dual x4 3Gb S					
	E4C	5805		Both	Yes No
12X I/O Drawer PCIe, No Disk					
	E4C	5877		Both	Yes No
EXP 12S Expansion Drawer					
	E4C	5886		Support	Yes No
EXP24S SFF Gen2-bay Drawer					
	E4C	5887		Both	Yes No
PCI-X SAS Adaper					

	E4C	5900		Support	Yes No
PCIe Dual x4 SAS Adapter					
	E4C	5901		Both	Yes No
PCI X DDR Dual x4 3Gb SAS RAID					
	E4C	5902		Support	Yes No
PCI X DDR 1.5GB Cache SAS RAID					
	E4C	5908		Both	Yes No
PCI X DDR Dual x4 SAS Adapter					
	E4C	5912		Both	Yes No
PCIe2 1.8GB Cache RAID SAS Ada					
	E4C	5913		Both	Yes No
SAS AA Cable 3m - HD 6Gb Adapt					
	E4C	5915		Both	Yes No
SAS AA Cable 6m - HD 6Gb Adapt					
	E4C	5916		Both	Yes No
SAS AA Cable 1.5m - HD 6Gb Ada					
	E4C	5917		Both	Yes No
SAS AA Cbl 0.6m - HD 6Gb Adapt					
	E4C	5918		Both	Yes No
Non paired SAS RAID indicator					
	E4C	5922		Support	Yes No
Non paired PCIe SAS RAID Ind					
	E4C	5923		Both	Yes No
Non-paired Indicator 5913 PCIe					
	E4C	5924		Both	Yes No
Full Width Key USB, US English					
	E4C	5951		Both	Yes No
Full Width Key USB, French					
	E4C	5952		Both	Yes No
Full Width Key USB, Italian					
	E4C	5953		Both	Yes No
Full Width Key USB, German/Aus					
	E4C	5954		Both	Yes No
Full Width Key USB, UK English					
	E4C	5955		Both	Yes No
Full Width Key USB, Spanish					
	E4C	5956		Both	Yes No
Full Width Key USB, Japanese					
	E4C	5957		Both	Yes No
Full Width Key USB, BrazilianP					
	E4C	5958		Both	Yes No
Full Width Key USB, Hungarian					
	E4C	5959		Both	Yes No
Full Width Key USB, Korean					
	E4C	5960		Both	Yes No
Full Width Key USB, Chinese					
	E4C	5961		Both	Yes No
Full Width Key USB, French Can					
	E4C	5962		Both	Yes No
Full Width Key USB, Belgian/UK					
	E4C	5964		Both	Yes No
Full Width Key USB, Swedish/Fi					
	E4C	5965		Both	Yes No
Full Width Key USB, Danish					
	E4C	5966		Both	Yes No
Full Width Key USB, Bulgarian					
	E4C	5967		Both	Yes No
Full Width Key USB, Swiss/Fr/G					
	E4C	5968		Both	Yes No
Full Width Key USB, Norwegian					
	E4C	5969		Both	Yes No
Full Width Key USB, Dutch					
	E4C	5970		Both	Yes No
Full Width Key USB, Portuguese					
	E4C	5971		Both	Yes No
Full Width Key USB, Greek					
	E4C	5972		Both	Yes No
Full Width Key USB, Hebrew					
	E4C	5973		Both	Yes No
Full Width Key USB, Polish					
	E4C	5974		Both	Yes No
Full Width Key USB, Slovakian					
	E4C	5975		Both	Yes No
Full Width Key USB, Czech					

	E4C	5976		Both	Yes No
Full Width Key USB, Turkish					
	E4C	5977		Both	Yes No
Full Width Key USB, LA Spanish					
	E4C	5978		Both	Yes No
Full Width Key USB, Arabic					
	E4C	5979		Both	Yes No
Full Width Key USB, Thai					
	E4C	5980		Both	Yes No
Full Width Key USB, Russian					
	E4C	5981		Both	Yes No
Full Width Key USB, Slovenian					
	E4C	5982		Both	Yes No
Full Width Key USB, US English					
	E4C	5983		Both	Yes No
Power Control Cable(SPCN)-2m					
	E4C	6001		Support	Yes No
Power Control Cbl (SPCN) 3 m					
	E4C	6006		Both	Yes No
Power Control Cbl (SPCN) 15 m					
	E4C	6007		Both	Yes No
Power Control Cable(SPCN)-6m					
	E4C	6008		Support	Yes No
Power Control Cable(SPCN)-30m					
	E4C	6029		Support	Yes No
Opt Front Door for 1.8m Rack					
	E4C	6068		MES	Yes No
Opt Front Door for 2.0m Rack					
	E4C	6069		MES	Yes No
1.8m Rack Trim Kit					
	E4C	6246		Support	Yes No
2.0m Rack Trim Kit					
	E4C	6247		Support	Yes No
1.8m Rack Acoustic Doors					
	E4C	6248		MES	Yes No
2.0m Rack Acoustic Doors					
	E4C	6249		MES	Yes No
Redundant or Base PWR Supply					
	E4C	6260		Support	Yes No
Redundant or Base PWR Supply					
	E4C	6261		Support	Yes No
1.8m Rack Trim Kit					
	E4C	6263		MES	Yes No
2.0m Rack Trim Kit					
	E4C	6272		MES	Yes No
Dual prt 12X Chan Attach Short					
	E4C	6446		Both	Yes No
Dual port 12X Chan Attach Long					
	E4C	6457		Both	Yes No
Pwr Cbl 14FT, Drwr - IBM PDU					
	E4C	6458		Both	Yes No
Pwr Crd (14FT), Drwr - OEM PDU					
	E4C	6460		Both	Yes No
Pwr Crd 4.3M, Drwr - OEM PDU					
	E4C	6469		Both	Yes No
PWR Cord(6foot),To Wall					
	E4C	6470		Both	Yes No
Pwr Crd 2.7m 9ft Wall OEM PDU					
	E4C	6471		Both	Yes No
Pwr Crd 2.7m 9ft Wall OEM PDU					
	E4C	6472		Both	Yes No
Pwr Crd 2.7m 9ft Wall OEM PDU					
	E4C	6473		Both	Yes No
Pwr Crd 2.7m 9ft Wall OEM PDU					
	E4C	6474		Both	Yes No
Pwr Crd 2.7m 9ft Wall OEM PDU					
	E4C	6475		Both	Yes No
Pwr Crd 2.7m 9ft Wall OEM PDU					
	E4C	6476		Both	Yes No
Pwr Crd 2.7m 9ft Wall OEM PDU					
	E4C	6477		Both	Yes No
Pwr Crd 2.7m 9ft Wall OEM PDU					
	E4C	6478		Both	Yes No
PWR Cord(9foot),(250V,10A)					

E4C	6479		Support	Yes No
PWR Cord(9foot),(125V,15A)				
E4C	6488		Both	Yes No
4.3m (14 Ft) 3PH/24A Power Cor				
E4C	6489		MES	Yes No
4.3m (14 Ft) 1PH/48A Pwr Cord				
E4C	6491		MES	Yes No
4.3m (14 Ft) 1PH/48 60A Pwr Co				
E4C	6492		MES	Yes No
Pwr Crd 2.7m 9ft Wall 250V,10A				
E4C	6493		Both	Yes No
Pwr Crd 2.7m 9ft Wall 250V,10A				
E4C	6494		Both	Yes No
To Wall/OEM PDU, (250V, 10A)				
E4C	6495		Support	Yes No
Pwr Crd 2.7m 9ft Wall 250V,10A				
E4C	6496		Both	Yes No
PWR Cord(6ft),To Wall/OEM PDU				
E4C	6497		Support	Yes No
Power Cord 6ftTo Wall OEM PDU				
E4C	6498		Support	Yes No
Power Cable Drawer to IBM PD				
E4C	6577		Both	Yes No
Optional Rack Security Kit				
E4C	6580		MES	Yes No
Modem Tray for 19-Inch Rack				
E4C	6586		MES	Yes No
Pwr Crd 2.7m 9ft Wall 125V,15A				
E4C	6651		Both	Yes No
4.3m 1PH/24-30A Pwr Cord				
E4C	6654		MES	Yes No
4.3m 14Ft 1PH/24 30A WR Pwr				
E4C	6655		MES	Yes No
4.3m 14Ft 1PH/24A Power Cord				
E4C	6656		MES	Yes No
Pwr.Cord(9ft),To Wall/OEM PDU				
E4C	6659		Both	Yes No
PWR Cord(14ft),Dr.to OEM PDU				
E4C	6660		Both	Yes No
Pwr Cord 3M, Drwr to IBM PDU				
E4C	6665		Both	Yes No
Pwr Crd 4.3M, Drwr - OEM PDU				
E4C	6669		Both	Yes No
Pwr Crd 6-FT, (125V,15A)PT#59				
E4C	6670		Support	Yes No
Pwr Crd 2.7M, Drwr - IBM PDU				
E4C	6671		Both	Yes No
Pwr Crd 1.5M, Drwr - IBM PDU				
E4C	6672		Both	Yes No
Pwr Crd 2.7M, Wall - OEM PDU				
E4C	6680		Both	Yes No
Power Cord (6ft),To Wall				
E4C	6687		Support	Yes No
PCI 2-Line WAN IOA No IOP				
E4C	6805		Support	Yes No
PCI 4-Modem WAN IOA No IOP				
E4C	6808		Support	Yes No
PCI 2-Line WAN w/Modem NoIOP				
E4C	6833		Support	Yes No
IIntelligent PDU+ 1 EIA Unit				
E4C	7109		MES	Yes No
Environmental Monitoring Probe				
E4C	7118		Both	Yes No
IBM Rack mount Drawer Bezel				
E4C	7134		Both	Yes No
OEM Rack mount Drawer Bezel				
E4C	7135		Both	Yes No
IBM/OEM Rack mount Drawer Rail				
E4C	7145		Both	Yes No
Power Distribution Unit				
E4C	7188		MES	Yes No
Quantity 150 of #2124				
E4C	7204		Support	Yes No
Quantity 150 of #2125				

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                      E4C     7205                Support  Yes No
Quantity 150 of #2126
                      E4C     7206                Support  Yes No
Quantity 150 of #2127
                      E4C     7207                Support  Yes No
Quantity 150 of #2128
                      E4C     7208                Support  Yes No
Quantity 150 of #2138
                      E4C     7213                Support  Yes No
AAP Software Pre-Inst.Indic.
                      E4C     7305                Initial  N/A No
Dual I/O Unit Enclosure
                      E4C     7311                Support  Yes No
I/O Drawer Mounting Enclosure
                      E4C     7314                Both     Yes No
Quantity 150 of #4327
                      E4C     7509                Support  Yes No
Quantity 150 of #4328
                      E4C     7510                Support  Yes No
Quantity 150 of #4329
                      E4C     7511                Support  Yes No
Quantity 150 of #3676
                      E4C     7517                Support  Yes No
Quantity 150 of #3677
                      E4C     7518                Both     Yes No
Quantity 150 of #3678
                      E4C     7519                Both     Yes No
Quantity 150 of 3586
                      E4C     7535                Support  Yes No
Quantity 150 of 3587
                      E4C     7536                Support  Yes No
Quantity 150 of 3658
                      E4C     7538                Both     Yes No
Quantity 150 of 3647
                      E4C     7549                Both     Yes No
Quantity 150 of 3648
                      E4C     7564                Both     Yes No
Quantity 150 of 3649
                      E4C     7565                Both     Yes No
IBM Tower Cover Set
                      E4C     7567                Both     Yes No
OEM Tower Cover Set
                      E4C     7568                Both     Yes No
2.0m Rack Side Attach Kit
                      E4C     7780                Support  Yes No
Eth Cbl 6M HW Management
                      E4C     7801                Support  Yes No
Eth Cbl 15M HW Management
                      E4C     7802                Both     Yes No
Side-by-Side for 1.8m Racks
                      E4C     7840                Support  Yes No
Ruggedize Rack Kit
                      E4C     7841                Support  Yes No
Linux Software Preinstall
                      E4C     8143                Initial  N/A No
Linux Software Preinstall BP
                      E4C     8144                Initial  N/A No
Mouse-USB,Black KBD Att C
                      E4C     8841                Support  Yes No
USB Mouse
                      E4C     8845                Both     Yes No
2 Port 10/100/1000 Base TX Eth
                      E4C     9055                Both     N/A No
Order Routing Indicator Syste
                      E4C     9169                Initial  N/A No
Language Group Spcf-US Eng
                      E4C     9300     NC         Initial  N/A No
specify mode-1 & (1)5901/5278
                      E4C     9359                Initial  N/A No
Specify mode-1 & (2)5901/5278
                      E4C     9360                Both     Yes No
Specify mode-2 & (2)5901/5278
                      E4C     9361                Both     Yes No
Specify mode-4 & (4)5901/5278
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                        E4C     9365                    Both     Yes No
Specify mode-2 & (4)5901/5278
                        E4C     9366                    Both     Yes No
Specify mode-1 & (2)5903/5805
                        E4C     9367                    Both     Yes No
Specify mode-2 & (4)5903/5805
                        E4C     9368                    Both     Yes No
Specify mode-1 & (1)5904/6/8
                        E4C     9382                    Both     Yes No
Specify mode-1 & (2) 5904/6/8
                        E4C     9383                    Both     Yes No
Specify mode-1 & CEC SAS port
                        E4C     9384                    Both     Yes No
Specify mode-1 & (2) 5913 EXP
                        E4C     9385                    Both     Yes No
Specify mode-2 & (4) 5913 EXP
                        E4C     9386                    Both     Yes No
New AIX License Core Counter
                        E4C     9440     NC             Initial  N/A No
New IBM i Lic Core Counter
                        E4C     9441     NC             Initial  N/A No
New Red Hat Lic Core Counter
                        E4C     9442     NC             Initial  N/A No
New SUSE Lic Core Counter
                        E4C     9443     NC             Initial  N/A No
Other AIX Lic Core Counter
                        E4C     9444     NC             Initial  N/A No
Other Linux Lic Core Counter
                        E4C     9445     NC             Initial  N/A No
3rd Party Linux Lic Core Cnt
                        E4C     9446     NC             Initial  N/A No
VIOS Core Counter
                        E4C     9447     NC             Initial  N/A No
Month Indicator
                        E4C     9461                    Initial  N/A No
Day Indicator
                        E4C     9462                    Initial  N/A No
Hour Indicator
                        E4C     9463                    Initial  N/A No
Minute Indicator
                        E4C     9464                    Initial  N/A No
Qty Indicator
                        E4C     9465                    Initial  N/A No
Countable Member Indicator
                        E4C     9466                    Initial  N/A No
Language Group Spcf-Dutch
                        E4C     9700     NC             Initial  N/A No
Language Group Spcf-French
                        E4C     9703     NC             Initial  N/A No
Language Group Spcf-German
                        E4C     9704     NC             Initial  N/A No
Language Group Spcf-Polish
                        E4C     9705     NC             Initial  N/A No
Lang Group Specify - Norwegian
                        E4C     9706     NC             Initial  N/A No
Lang.Group Spcf-Portuguese
                        E4C     9707     NC             Initial  N/A No
Language Group Spcf-Spanish
                        E4C     9708     NC             Initial  N/A No
Language Group Spcf-Italian
                        E4C     9711     NC             Initial  N/A No
Langua Gr Speci Canadian Frenc
                        E4C     9712     NC             Initial  N/A No
Language Group Spcf-Japanese
                        E4C     9714     NC             Initial  N/A No
Language Group Specify Tr Chin
                        E4C     9715     NC             Initial  N/A No
Language Group Spcf-Korean
                        E4C     9716     NC             Initial  N/A No
Language Group Spcf-Turkish
                        E4C     9718     NC             Initial  N/A No
Language Group Spcf-Hungarian
                        E4C     9719     NC             Initial  N/A No
Language Group Spcf-Slovakian
```

```
                      E4C     9720     NC           Initial  N/A No
Language Group Spcf-Russian
                      E4C     9721     NC           Initial  N/A No
Lang Group Spcf Simpl Chinese
                      E4C     9722     NC           Initial  N/A No
Language Group Spcf-Czech
                      E4C     9724     NC           Initial  N/A No
Language Group Spcf-Romanian
                      E4C     9725     NC           Initial  N/A No
Lang Group Specify - Croatian
                      E4C     9726     NC           Initial  N/A No
Language Group Spcf-Slovenian
                      E4C     9727     NC           Initial  N/A No
Lang Group Specify - Braz Port
                      E4C     9728     NC           Initial  N/A No
Lang Group Specify - Thai
                      E4C     9729     NC           Initial  N/A No
Storage B/P--8 SFF/RAID/IOA
                      E4C     EJ01                  Both     Yes No
Split Drive Capability/#5618
                      E4C     EJ02                  Both     Yes No
GX++ Dual-port 12x Chan Attach
                      E4C     EJ04                  Both     Yes No
Trial Live Partition Mobility
                      E4C     ELPM                  Both     Yes No
Memory Riser Card
                      E4C     EM01                  Both     Yes No
4GB (2x2GB) Memory DIMMs 1066
                      E4C     EM04                  Both     Yes No
8GB (2x4GB) Memory DIMMs 1066
                      E4C     EM08                  Both     Yes No
16GB(2x8GB) Memory DIMMs, 1066
                      E4C     EM16                  Both     Yes No
32GB (2x16GB) MemoryDIMMs,1066
                      E4C     EM32                  Both     Yes No
1m 10GbE Cable SFP+ Act Twinax
                      E4C     EN01                  Both     Yes No
3m 10GbE Cable SFP+ Act Twinax
                      E4C     EN02                  Both     Yes No
5m 10GbE Cable SFP+ Act Twinax
                      E4C     EN03                  Both     Yes No
4-core 3.0 GHz Proc Module
                      E4C     EPC5                  Both     No  No
6-core 3.0 GHz Proc Module
                      E4C     EPC6                  Both     No  No
8-core 3.0 GHz Proc Module
                      E4C     EPC7                  Both     No  No
One Processor Activ for #EPC5
                      E4C     EPD5                  Both     Yes No
One Processor Activ for #EPC6
                      E4C     EPD6                  Both     Yes No
One Processor Activ for #EPC7
                      E4C     EPD7                  Both     Yes No
Zero-priced Proc Act for #EPC5
                      E4C     EPE5                  Both     Yes No
Zero-priced Proc Act for #EPC6
                      E4C     EPE6                  Both     Yes No
Zero-priced Proc Act for #EPC7
                      E4C     EPE7                  Both     Yes No
1TB Removable Disk Cartridge
                      E4C     EU01                  Both     Yes No
```

The following are newly announced features on the specific models of the IBM Power Systems 7891, 7989, 8233, and 8236 machine type:

```
                                          Minimum Initial/
                                          Monthly MES/
Description          Model  Feature Purchase Maint.  Both/        RP
Machine type 7891    number number  price    Charge  Support  CSU MES

32GB (2x16GB RDIMMs) Memory
                       73X     EM34                  Both     Yes
                       74X                           Both     Yes
```

Description	Model number	Feature number	Purchase price	Minimum Monthly Maint. Charge	Initial/ MES/ Both/ Support	CSU	RP MES
Machine type 7989							
Service Provider Payment	BCH	EUC6			MES	Yes	No

Description	Model number	Feature number	Purchase price	Minimum Monthly Maint. Charge	Initial/ MES/ Both/ Support	CSU	RP MES
Machine Type 8233							
8GB (2x4GB) Memory DIMMs 1066	E8B	EM08			Both	Yes	No
16GB(2x8GB) Memory DIMMs, 1066	E8B	EM16			Both	Yes	No
32GB (2x16GB) MemoryDIMMs,1066	E8B	EM32			Both	Yes	No
Service Provider Payment	E8B	EUC6			MES	Yes	No

Description	Model number	Feature number	Purchase price	Minimum Monthly Maint. Charge	Initial/ MES/ Both/ Support	CSU	RP MES
Machine Type 8236							
8GB (2x4GB) Memory DIMMs 1066	E8C	EM08			Both	Yes	No
16GB(2x8GB) Memory DIMMs, 1066	E8C	EM16			Both	Yes	No
32GB (2x16GB) MemoryDIMMs,1066	E8C	EM32			Both	Yes	No

Feature conversions

Feature conversions for 8202-E4C adapter features

From FC:	To FC:	Parts returned	Purchase price
2054 - PCIe RAID & SSD SAS Adapter 3Gb	2055 - PCIe RAID & SSD SAS Adapter 3Gb w/ Blind Swap Cassette	No	
4807 - PCIe Crypto Coprocessor No BSC 4765-001	4808 - PCIe Crypto Coprocessor Gen3 BSC 4765-001	No	

Feature conversions for 8202-E4C rack-related features

From FC:	To FC:	Parts returned	Purchase price
6246 - 1.8m Rack Trim Kit	6263 - 1.8m Rack Trim Kit	No	
6247 - 2.0m Rack Trim Kit	6272 - 2.0m Rack Trim Kit	No	

Feature conversions for 8202-E4C virtualization engine features

From FC:	To FC:	Parts returned	Purchase price
5225 - PowerVM Express Edition	5227 - PowerVM Standard Edition	No	
5225 - PowerVM Express Edition	5228 - PowerVM Enterprise Edition	No	
5227 - PowerVM Standard Edition	5228 - PowerVM Enterprise Edition	No	

Feature conversions for 8203-E4A to 8202-E4C adapter features

From FC:	To FC:	Parts returned	Purchase price
5903 - PCIe 380MB Cache Dual - x4 3Gb SAS RAID Adapter	5805 - PCIe 380MB Cache Dual - x4 3Gb SAS RAID Adapter	No	
5904 - PCI-X DDR 1.5GB Cache SAS RAID Adapter	5908 - PCI-X DDR 1.5GB Cache SAS RAID Adapter (BSC)	No	

Feature conversions for 8203-E4A to 8202-E4C processor features

From FC:	To FC:	Parts returned	Purchase price
5577 - 2-core 4.7 GHz POWER6 Processor Card, 4 Memory DIMM Slots	EPC6 - 6-core 3.0 GHz POWER7 Processor Module	No	
5587 - 4-core 4.7 GHz POWER6 Processor Card, 8 Memory DIMM Slots	EPC6 - 6-core 3.0 GHz POWER7 Processor Module	No	
5634 - 2-core 4.2 GHz POWER6 Processor Card, 4 Memory DIMM Slots	EPC6 - 6-core 3.0 GHz POWER7 Processor Module	No	
5635 - 4-core 4.2 GHz POWER6 Processor Card, 8 Memory DIMM Slots	EPC6 - 6-core 3.0 GHz POWER7 Processor Module	No	
5577 - 2-core 4.7 GHz POWER6 Processor Card, 4 Memory DIMM Slots	EPC7 - 8-core 3.0 GHz POWER7 Processor Module	No	
5587 - 4-core 4.7 GHz POWER6 Processor Card, 8 Memory DIMM Slots	EPC7 - 8-core 3.0 GHz POWER7 Processor Module	No	
5634 - 2-core 4.2 GHz POWER6 Processor Card, 4 Memory DIMM Slots	EPC7 - 8-core 3.0 GHz POWER7 Processor Module	No	
5635 - 4-core 4.2 GHz POWER6 Processor Card, 8 Memory DIMM Slots	EPC7 - 8-core 3.0 GHz POWER7 Processor Module	No	

Feature conversions for 8203-E4A to 8202-E4C virtualization engine features

From FC:	To FC:	Parts returned	Purchase price
7983 - PowerVM Express	5225 - PowerVM Express Edition	No	
8506 - PowerVM Standard	5227 - PowerVM Standard Edition	No	
8507 - PowerVM Enterprise	5228 - PowerVM Enterprise Edition	No	

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Model conversion purchase price

From	Model To	Model conversion purchase price*
8203-E4A	8202-E4C	

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Corrections

(Corrected on November 22, 2011)

The Model upgrades portion of the Description section was modified.