New IBM Power 770 system utilizes latest POWER7 processor technology designed to deliver unprecedented performance, scalability, reliability, and manageability for demanding commercial workloads

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At a glance

The Power® 770 enterprise server is designed to deliver outstanding price/performance, mainframe-inspired reliability and availability features, flexible capacity upgrades, and innovative virtualization feature. The Power 770 features:

- Up to 64 POWER7 cores with four processor cards per server.
- POWER7 processor card per CEC enclosure: 16-core at 3.1 GHz or 12-core at 3.5 GHz.
- Up to 2.0 TB of DDR3 memory with frequencies up to 1,066 MHz, optionally augmented with Active Memory™ Expansion.
- Up to six SAS Small Form Factor drives (disk or SSD) per CEC enclosure.
- Eight I/O expansion slots (6 PCIe and 2 GX++) per enclosure (up to 32 slots without using I/O drawers).
- Up to 184 PCIe slots or up to 192 PCI-X DDR per system using I/O drawers
- Logical partitions -- up to 160 per system (optional) increasing to 640 per system per the PowerVM™ SOD.

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

Overview

The new IBM Power 770 server (9117-MMB) utilizes the latest POWER7 processor technology designed to deliver unprecedented performance, scalability, reliability, and manageability for demanding commercial workloads.

The innovative IBM Power 770 server with POWER7 processors is a symmetric multiprocessing (SMP), rack-mounted server. This modular-built system uses one to four enclosures; each enclosure is four EIA units tall and is housed in a 19-inch rack. Each of the four system enclosures contains one powerful POWER7 processor card feature, comprised of two single-chip module processors. Each of the POWER7 processors in this server has 64-bit architecture, includes up to eight cores on a single-chip module, and contains 2 MB of L2 cache (256 KB per core) and 32 MB of L3 cache (4 MB per core). Each POWER7 SCM processor is available at frequencies

of 3.1 GHz with eight cores and 3.5 GHz with six cores. This new model server is available starting as low as four active cores and increases in increments of one core at a time through built in Capacity on Demand (CoD) functions.

The POWER7 DDR3 memory uses a new memory architecture to provide greater bandwidth and capacity. This enables operating at a higher data rate for large memory configurations. Each new POWER7 processor can support up to eight DDR3 DIMMs running at speeds up to 1,066 MHz. A full system can contain up to 2.0 TB of memory (delayed GA of large DIMMS). Memory can be optionally augmented with Active Memory expansion.

Key prerequisites

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

- AIX 5.3 with the 5300-11 Technology Level and Service Pack 2, or later
- AIX 5.3 with the 5300-10 Technology Level and Service Pack 4, or later, available May 28, 2010
- AIX 5.3 with the 5300-09 Technology Level and Service Pack 7, or later, available May 28, 2010
- AIX 6.1 with the 6100-04 Technology Level and Service Pack 3, or later
- AIX 6.1 with the 6100-03 Technology Level and Service Pack 5, or later, available June 25, 2010
- AIX 6.1 with the 6100-02 Technology Level and Service Pack 8, or later, available June 25, 2010

If installing the IBM i operating system:

- IBM i 6.1 with 6.1.1 machine code, or later

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

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

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

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

If installing VIOS:

- VIOS 2.1.2.12 with Fix Pack 22.1 and Service Pack 2, or later

If installing 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, refer to the following Web site

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

Planned availability date

- March 16, 2010: IBM Power 770 server and all features, including the following MES orderable features:
  - Processor activations (#5459 and #5468).
  - Memory activations (#8212 and #8213).

  - COD (#7642, #7643, #7644, #7645, #7646, #7647, #7648, and #7649).
  - Secondary Operating System (#0265, #0266, and #0267).
- June 4, 2010: Model conversion (9117-MMA to 9117-MMB), upgrades, and all additional MES orderable features.
- June 18, 2010: The Base Customer Specified Placement feature (#8453).
- November 19, 2010: Hot-node Add, Memory Upgrade, and Hot-node Repair and for 128 GB memory feature (#5602).
- November 19, 2010: 128 GB memory feature (#5602).

Description

Summary of features

The following features are available on the Power 770:

- 4U 19-inch rack-mount system enclosure
- One to four system enclosures: 16U maximum system size
- One processor card feature per enclosure (includes the voltage regulator):
  - 0/12 way, 3.5 GHz processor card (#4980)
  - 0/16 way, 3.1 GHz processor card (#4981)
- POWER7 DDR3 Memory DIMMs (16 DIMM slots per processor card):
  - 0/32 GB (4 X 8 GB), 1066 MHz (#5600)
  - 0/64 GB (4 X 16 GB), 1066 MHz (#5601)
  - 0/128 GB (4 X 32 GB), 800 MHz (#5602)
- Six hot-swappable, 2.5-inch, small form factor, SAS disk or SSD bays per enclosure
- One hot-plug, slim-line, SATA media bay per enclosure (optional)
- Redundant hot-swap AC power supplies in each enclosure
- Choice of integrated (HEA) I/O options; one per enclosure
  - Quad 1 Gb Ethernet
  - Dual 10 Gb Optical + Dual 1 Gb Ethernet
  - Dual 10 Gb Copper + Dual 1 Gb Ethernet
- One serial port, three USB ports per enclosure (max nine per system)
- Two HMC ports per enclosure (4 max per system)
- Eight I/O expansion slots per enclosure (32 max per system)
  - Six PCIe 8x slots plus two GX++ slots per enclosure
- Dynamic LPAR support, Processor and Memory CUoD
- PowerVM (optional):
  - Micro-Partitioning™
  - Virtual I/O Server (VIOS)
  - Automated CPU and memory reconfiguration Support for dedicated and shared processor logical partition (LPAR) groups
  - Support for manual provisioning of resources partition migration (PowerVM - Enterprise Edition)
- Optional PowerHA for AIX, IBM i and Linux
- 12X I/O drawer with PCI slots
  - Up to 16 PCIe I/O drawers (#5802 or #5877)
  - Up to 32 PCI-X DDR I/O drawers (7314-G30 or feature 5796)
- Disk-only I/O drawers
  - Up to 110 EXP12S SAS DASD/SSD I/O drawers on SAS PCI controllers (feature 5886)

  - Up to 60 EXP24 SCSI DASD Expansion drawers on SCSI PCI controllers (7031-D24 or feature 5786)
- IBM Systems Director Active Energy Manager™.

Processors

- The following SMP and FSP cable features are required to connect the processors together when connecting two-, three-, and four-drawer CEC enclosures.

	SMP Cables	FSP Cables
Two-drawer	3711, 3712	3671
Three-drawer	3712, 3713	3671, 3672
Four-drawer	3712, 3713, 3714	3671, 3672, 3673

- A system can have from one to four CEC enclosures, and each CEC enclosure requires one processor card. Each processor card has two SCM processors.
- The processor card feature must be populated with POWER7 DDR3 Memory DIMMs.
- All processor cards in the system must have the same feature number.
- Each system must have a minimum of four active processors.
- Processor Capacity on Demand activations will activate processor hardware only in the system serial number they are purchased for. If you move processor hardware to another system the processor may not be functional in that system until arrangements are made to move the processor activations or purchase additional processor activations. Contact your IBM representative or IBM Business Partner for more information.

Memory

- Each processor card feature must have a minimum of one memory feature (one feature per processor card) installed. This includes inactive processor card features present in the system.
- Memory features include a total of four DIMMs. There is a required plug location for every memory feature attached to a processor.
- All POWER7 memory features must be purchased with sufficient permanent memory activation features so that the system memory is at least 50% active.
- Each system must contain a minimum of 16 GB of active system memory.
- Memory feature numbers 5600, 5601, and 5602 can be mixed on the same POWER7 processor module. Frequencies must be the same across the memory controller (4 dimm slots).
- All processor cards have 16 memory DIMM slots (eight per processor) and must be populated with POWER7 DDR3 Memory DIMMs.
- Memory Capacity on Demand activations will activate memory hardware only in the system serial number they are purchased for. If you move memory hardware to another system, the memory may not be functional in that system until arrangements are made to move the memory activations or purchase additional memory activations. Contact you IBM representative or IBM Business Partner for more information.
- It is recommended that memory be installed evenly across all processor cards in the system. Balancing memory across the installed processor cards allows memory access in a consistent manner and typically results in the best possible performance for your configuration.
- 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.

I/O Drawers Availability

- To further reduce possible single points of failure, POWER7 implements enhanced disk storage configuration rules. IBM configuration tools and IBM technical support personnel do not support integrated cached disk controller configurations unless they have a protected write cache. Disk controllers with write cache must protect the cache by either pairing the disk controllers (write cache replication or IOA-

level mirroring) or by using an auxiliary write cache IOA. This is true for all partitions in the Power 770 using any operating systems.
- It is recommended that any attached remote I/O drawers be located in the same rack as the Power 770 server for ease of service, but they can be installed in separate racks if the application or other rack content requires it.
- The following is a list of the I/O drawers that are supported or available on the Model 770, with the correct interface to use for each of the drawers and the maximum number of attached I/O drawers:

Feature	Order Description	Status	Interface	Maximum Number
5786	EXP24 SCSI Disk Drawer	Supported	SCSI	60
5796	PCI-X DDR 12X I/O Drawer	Available	12X	32
5802	PCIe 12X I/O W/Disks Drawer (disk bays)	Available	12X	16
5877	PCIe 12X I/O No Disk Drawer (no disk bays)	Available	12X	16
5886	Exp 12S SAS Disk Drawer	Available	SAS	110
7031-D24/T24	EXP24 SCSI Disk Drawer/Tower	Supported	SCSI	60
7314-G30	PCI-X DDR 12X I/O Drawer	Supported	12X	32

The following feature-coded I/O Drawers are available for order on the Power 770:

PCI-X DDR 12X EXPANSION DRAWER (#5796)

The PCI-X DDR 12X Expansion Drawer (#5796) is a 4 EIA unit tall drawer and mounts in a 19-inch rack. Feature 5796 is 8.8 inches wide and takes up half the width of the 4 EIA rack space. Feature 5796 requires the use of a feature 7314 drawer mounting enclosure. The 4 EIA tall enclosure can hold up to two feature 5796 drawers mounted side by side in the enclosure. The drawer is 31.5 inches deep and can weigh up to 44 pounds. The PCI-X DDR 12X Expansion Drawer has six 64-bit, 3.3V, 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. 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. Feature 5796 attaches to a host system CEC enclosure with a 12X adapter in a GX++ slot via SDR and/or DDR cables. A maximum of four feature 5796 drawers can be placed on the same 12X loop. Mixing features 5802/5877 and 5796 on the same loop is not supported. Mixing feature 5796 and 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), two AC power cables and two SPCN cables is required to ensure proper redundancy.

PCIe 12X I/O Drawer (#5802 and #5877)

The PCIe 12X I/O Drawer is a 19-inch I/O and storage drawer. It provides a 4 EIA unit tall drawer containing 10 PCI-E based I/O adapter slots and 18 SAS hot-swap Small Form Factor disk bays, which can be used for either disk drives or SSD, organized into two groups of nine . Each group of disk slots is controlled by one or two PCIe SAS storage adapters located in a PCIe slot in the same feature 5802 as the SAS drives. A maximum of two feature 5802 drawers can be placed on the same 12X loop. Mixing features 5802 and #5796/7314-G30 on the same loop is not supported. Feature 5877 is the same as feature 5802 except it does not support any disk bays. Feature 5877 can be on the same loop as feature 5802. Feature 5877 cannot be upgraded to feature 5802.

The physical dimensions of the drawer measure 17.5 inches (444.5 mm) wide by 7.0 inches (177.8 mm) high by 28.0 inches (711.2 mm) deep for use in a 19-inch rack. The adapter slots use blind swap cassettes and support hot plugging of adapter cards. A minimum configurations of two 12X DDR cables, 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 DDR cables available

in different cable lengths: 0.6 (#1861), 1.5 (#1862), 3.0 (#1865), or 8 meters (#1864). The 12X SDR cables are not supported.

EXP 12S SAS Drawer (#5886)

The EXP 12S SAS Drawer (#5886) is a 2 EIA tall drawer and mounts in a 19-inch rack. The drawer can hold either SAS disk drives or SSD. The drawer is 20.12 inches long and can weigh up to 40 pounds, without SAS disks. The EXP 12S SAS drawer has twelve 3.5-inch SAS bays with redundant data paths to each bay. The drawer supports redundant hot-plug power and cooling and redundant hot-swap SAS expanders (Enclosure Services Manager-ESM). Each ESM has an independent SCSI Enclosure Services (SES) diagnostic processor.

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

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

In all of the above configurations, all twelve 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 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 770 providing a very low cost disk storage solution. When used this way, the embedded SAS RAID controllers augmented by the 175 MB Cache RAID - Dual IOA Enablement Card #5662 in the system unit control the disk drives in EXP12S. A second unit cannot be cascaded to a feature 5886 attached in this way.

12X I/O Drawer Cables

- I/O Drawers are connected to the adapters in the CEC enclosure with the following cables: data transfer cables (12X DDR cables for the feature 5802 and feature 5877 I/O drawers and 12X SDR and/or DDR cables for the feature 5796 and 7314-G30 I/O drawers) and power control cables.
- 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.
- PCIe 12X Cable choices: the PCIe 12x drawer attaches to the host CEC enclosure with a 12x adapter in a GX++ slot via 12X DDR cables available in different cable lengths: 1.5 (#1862), 3.0 (#1865), or 8 meters (#1864).
- PCI-DDR 12X Cable choices: each feature 5796 drawer requires one Dual-Port PCI-DDR 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 Range adapter can be mixed in a single loop with I/O drawers containing the Long Range 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.

PCI-DDR 12X Cable Options

	0.6 M	1.5 M	3.0 M	8.0 M
12X SDR	(#1829)[1]	(#1830)	(#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 PCI-DDR 12X Cable (#1829 or #1861 or #1862) is limited to connecting CEC to drawer if in the same rack and within 20 EIA. It has very limited use due to its short length. It cannot be used to connect to a system drawer because of the short length. It is intended for use between two feature 5796 or G30 drawers mounted side by side in the same enclosure (#7314). It can also be used to connect between two modules located one beneath the other in a 19-inch rack.

[2] The PCI-DDR 12X Cable (#1840 or #1865) is limited to connecting CEC to drawer if in the same rack and further than 20 EIA. 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 the 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 PCI-DDR 12X Cable (#1834 or #1864) is limited to connecting CEC to drawer if in different racks. It 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).

19-INCH RACKS

The 9117-MMB and its I/O Drawers are designed to mount in the 7014-T00, 7014-T42, 7014-B42, 7014-S25, #0551, #0553 or #0555 rack. These are built to the 19-inch EIA standard. When ordering a new 9117 system, the appropriate 7014 rack model can be ordered with the system hardware on the same initial order. IBM also makes the racks available as features of the 9117-MMB when you order additional I/O drawer hardware for an existing system (MES order). The rack feature code (#0551/0553) 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.

The 9117-MMB has the following rack requirements:

- The Power 770 may be ordered without a rack.
- The Power 770 consists of one to four CEC enclosures. Each enclosure occupies 4U of vertical rack space. The Power 770 can be installed in a 7014-T00, 7014-B42, 7014-S25, or 7014-T42 and shipped from IBM to the client rack. An existing

7014-T00, 7014-B42, 7014-S25, 7014-T42, #0551, #0553, or #0555 rack can be used for the Power 770 if sufficient space and power are available.

- For Power 770 configurations with two, three, or four drawers, all drawers must be installed together in the same rack, in a contiguous space of 8U, 12U, or 16U within the rack. The uppermost enclosure in the system is the base enclosure. This enclosure will contain the active Service Processor and the Operator Panel, if an Operator Panel is present in the system. If a second CEC enclosure is part of the system, the backup service processor is contained in the second CEC enclosure. The service processor is a component of the Service Interface Card in these enclosures.
- When a Power 770 system is installed in an 7014-T00, 7014-B42, or 7014-T42 rack or in a feature 0551 or 0553 rack that has no front door, a Thin Profile Front Trim Kit must be ordered for the rack. The required trim kit for the 7014-T00 rack or feature 0551 is feature number 6263. The required trim kit for the 7014-T42, -B42, or feature rack is feature number 6272. When upgrading from a 9117-MMA, trim kits feature 6246 or 6247 may be used for one drawer enclosures only.
- The design of the Power 770 is optimized for use in a 7014-T00, -B42, - S25, -T42, #0551, or #0553 rack. Both the front cover and the processor flex cables occupy space on the front left and right side of an IBM 7014 or #055x rack that may not be available in typical non-IBM racks.
- Acoustic Door features are available with the 7014-T00, 7014-B42, 7014-T42, #0551 and #0553 racks to meet the lower acoustic levels identified in the specification section of this document. The Acoustic Door feature can be ordered on new T00, B42, T42, #0551 and #0553 racks or ordered for the T00, B42, T42, #0551 and #0553 racks that clients already own.
- The 36 EIA unit (1.8 meter) rack (#0551) and the 42 EIA unit (2.0 meter) rack (#0553) are available for order on MES upgrade orders only. For initial system orders, the racks should be ordered as machine type 7014, Model T00, B42, S25, or T42.

1.3 Meter Rack (#0555)

The 1.3 Meter Rack (#0555) is a 25 EIA unit rack. The rack that is delivered as feature 0555 is the same rack delivered when you order the 7014-S25 rack; the included features may be different. Feature 0555 is supported only.

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 Mfg.

2.0 Meter Rack (#0553)

The 2.0 Meter Rack (#0553) is a 42 EIA unit rack. The rack that is delivered as feature 0553 is the same rack delivered when you order the 7014-T42 or B42 rack, the included features may be different. Some features that are delivered as part of the 7014-T42 or B42 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 Mfg.

Integrated I/O

- Although each CEC enclosure is equipped with serial port external connectors, these ports do not function with the attachment of the required HMC.
- Each CEC enclosure must contain one Virtual Ethernet (HEA) Integrated I/O port card (#1803, #1804, or #1813).
- Each system has two HMC ports on the Service Interface Card in each CEC enclosure. If there are two CEC enclosures, the HMC must be connected to both service interface cards.

Disks, media, and boot devices

- A device capable of reading a DVD must be attached to the system and available to perform operating system installation, maintenance, problem determination and service actions such as maintaining system firmware and I/O microcode at their latest levels. Alternatively, the system must be attached to a network with an AIX NIM server configured to perform these functions.
- System boot is supported via DASD or SSD located in the CEC enclosure, located in a DASD drawer attached to a PCI adapter or located in an 12X I/O drawer attached to GX++ adapter, or from a network via LAN adapters.
- The minimum system configuration requires at least one SAS disk drive in the system for AIX/Linux and two for IBM i, or if using a Fibre Channel attached SAN (indicated by feature number 0837) a disk drive is not required. Attachment of the SAN using a Fibre Channel over Ethernet connection is also supported.
- Each CEC enclosure can support one media device when the Disk/Media Enclosure and Backplane feature (#5652) is ordered. Any supported DVD-RAM drive can be installed. Each system can support up to four media devices in the CEC enclosure - a maximum of one in each enclosue.
- The model MMB supports only the SAS SFF DASD hard disks internally. The 3.5"-inch DASD hard files can be attached to the Model MMB but must be located in a feature 5886 EXP12S I/O drawer.
- When ordering feature 1819, you must also order feature 5662. This applies to MES orders of feature 1819 unless feature 5662 is already present in the system. Feature 1815 and feature 5662 cannot be installed in the same drawer. Feature 1819 must not be installed in a drawer unless feature 5662 is also installed.

I/O slots and adapters

- Each Power 770 CEC enclosure has six, full length, 8X, PCIe slots and two, GX++ slots.
- Eight I/O expansion slots per enclosure (32 max per system).

Slot ID	Adapter	Type	Slot Size
P2-C1	PCIe	8X	Full length
P2-C2	PCIe	8X	Full length
P2-C3	PCIe	8X	Full length
P2-C4	PCIe	8X	Full length
P2-C5	PCIe	8X	Full length
P2-C6	PCIe	8X	Full length
P1-C2	GX++		
P1-C3	GX++		

- The Power 770 I/O slot population rules are complex. Extensive configuration rules and checking procedures are incorporated into the Marketing Configurator ECFGPWR to help ensure a valid system configuration. Configurations generated without using the ECFGPWR configurator may create orders that cannot be built, resulting in possible order rejection or delayed delivery.
- Feature maximum limits in the feature descriptions of this document for adapters and devices may not provide optimal system performance. These limits are given to assist with connectivity and functional assurance. The maximum values shown here apply to the features installed in the system CEC enclosures. Adding remote I/O drawers will increase these limits.

Power

- Each Power 770 system with two or more CEC enclosures must have one Power Control Cable (#6006 or similar) to connect the Service Interface Card in the first enclosure to the Service Interface Card in the second enclosure.
- Two AC power supplies are required for each CEC enclosure; the second power supply provides redundant power for enhanced system availability. A CEC enclosure will continue to function with one working power supply. A failed power supply can be hot swapped but must remain in the system until the replacement power supply is available for exchange.

Power Distribution Units

For systems installed in IBM 7014 or #055x racks, the following Power Distribution Unit (PDU) rules apply (not all PDUs are available in all models of the 7014 or #055x):

- For PDU feature numbers 7188 and 7109 when using power cord feature numbers 6654, 6655, 6656, 6657, or 6658: each pair of PDUs can power up to three Power 770 CEC enclosures.
- For PDU feature numbers 7188 and 7109 when using power cord feature numbers 6489, 6491, 6492, or 6653: each pair of PDUs can power up to seven Power 770 CEC enclosures.

To provide full redundancy each server drawer has two power supplies, which must be connected to separate PDUs.

Hot-plug options

- The following options are Hot-Plug capable:
  - GX++ Adapters.
  - System AC power supplies: one functional power supply must remain installed at all times while the system is operating.
  - Disk drives.
  - Most PCIe adapters.
  - Media devices.
- Hot-Plug procedures are contained in the Customer Information Center on ibm.com®.
- If the system boot device or system console is attached using an I/O adapter feature, that adapter may not be hot-plugged.

Logical partitioning

- Without PowerVM Dynamic LPAR allows one partition per processor.
- With PowerVM up to 10 partitions per processor. Supported when PowerVM (#7942 or #7995) is ordered.
- For Linux partitions, a DVD-RAM and a Media Enclosure and Backplane (#5652) are required.

Available Backplane Configurations

The 770 CEC drawer has an extremely flexible and powerful backplane for supporting disk or Solid State Drives. The six SFF bays can be configured in three different ways to match your business needs. There are two built-in SAS controllers which can be optionally augmented with a 175 MB Cache RAID Battery Card. Two embedded SAS disk/SSD controllers are provided for redundancy or for additional flexibility. The optional #5662 175MB Cache RAID - Dual IOA Enablement Card feature enables dual 175 MB write cache and provides dual batteries for protection of that write cache.

The Backplane can be configured as one set of six bays, two sets of three bays (3/3), or three sets of two bays (2/2/2). Configuration options will vary depending up the controller options and the operating system selected. The controllers for the six-bay or 3/3 configurations are always the two pair of embedded controllers. But if the 2/2/2 configuration is used, the two embedded controllers run the first two sets of bays (2/2) and a #5901 PCIe SAS adapter located in a PCIe slot in a CEC enclosure controls the third set (2). By having three controllers, you can have three boot drives supporting three partitions.

The following SSD/HDD configuration rules apply:

- You can mix SSD and HDD drives when configured as one set of six bays.

- If you want to have both SSD and HDD within a 3/3 split configuration you must use the same type of drive within each set of three. You can not mix SSD and HDD within a subset of three bays.
- If you want to have both SSD and HDD within a 2/2/2 split configuration you must use the same type of drive within each set of two. You can not mix SSD and HDD within a subset of two bays. The #5901 PCIe SAS adapter which controls the remaining two bays in a 2/2/2 configuration does not support SSD.

You can configure the two embedded controllers together as a pair for higher redundancy or you can configure them separately. If you configure them separately, they can be owned by different partitions or they could be treated independently within the same partition. If configured as a pair, they provide controller redundancy and can automatically switch over to the other controller should one have problems. Also, if configured as a pair, both can be active at the same time (active/active) assuming there are two or more arrays configured, providing additional performance capability as well as redundancy. If configured as a pair, the pair control all six SFF bays and both see all six drives. The 3/3 or 2/2/2 configurations are not used with the paired controllers. RAID 0 and RAID 10 are supported and you can also mirror two sets of controller/drives using the operating system.

Adding the optional 175 MB Cache RAID - Dual IOA Enablement Card feature #5662 causes the pair of embedded controllers in that processor enclosure to be configured as dual controllers accessing all six SAS bays. Without the #5662, each of the two controllers can access only two or three SAS bays. With the 175 MB Cache RAID - Dual IOA Enablement Card, you can get controller redundancy, additional RAID protection options, and additional I/O performance. RAID 5 (a minimum of three drives required) and RAID 6 (a minimum of four drives required) are available when configured as dual controllers with one set of six bays.

Another expansion option available using the paired embedded controller configuration with the 175 MB Cache RAID - Dual IOA Enablement Card feature is a SAS expansion port. The SAS expansion port can add more SAS bays to the six bays in the system unit. A #5886 SAS disk drawer is attached using a SAS port on the rear of processor drawer and its twelve SAS bays are run by the pair of embedded controllers. The pair of embedded controllers are now running 18 SAS bays (six SFF bays in the system unit and twelve 3.5-inch bays in the drawer). The disk drawer is attached to the SAS port with a SAS YI cable and the embedded controllers connected to the port using a #1819 cable assembly. In this 18-bay configuration all drives must be HDD.

IBM i supports configurations using one set of six bays but does not support logically splitting the backplane into 3/3 or 2/2/2. Thus the #5662 175 MB Cache RAID - Dual IOA Enablement Card is required if IBM i is to access any of the SAS bays in that processor enclosure. AIX and Linux support configurations using two sets of three bays (3/3), or three sets of two bays (2/2/2) without #5662 and supports dual controllers running one set of six bays with #5662.

The system backplane also includes a third embedded controller for running the DVD-RAM drive in the CEC drawer. Since the controller is independent from the two SAS disk/SSD controllers, it allows the DVD to be switched between multiple partitions without impacting the assignment of disk or SSD in the CEC drawer.

Capacity on Demand

Several types of Capacity on Demand (CoD) are optionally available on the Power 770 server to help meet changing resource requirements in an on demand environment by using resources installed on the system but not activated.

Capacity Upgrade On Demand

Capacity Upgrade on Demand (CUoD) allows you to purchase additional permanent processor or memory capacity and dynamically activate them when needed.

On/Off Capacity on Demand

On/Off CoD enables processors or memory to be temporarily activated in full-day increments as needed. Charges are based on usage reporting collected monthly. Processors and memory may be activated and turned off an unlimited number of times, whenever you want additional processing resources. This offering provides a system administrator an interface at the HMC to manage the activation and deactivation of resources. A monitor that resides on the server logs the usage activity. You must send this usage data to IBM monthly. A bill is then generated based on the total amount of processor and memory resources utilized, in increments of Processor and Memory (1 GB) Days. Before using temporary capacity on your server, you must enable your server. To do this, order an enablement feature (MES only) and sign the required contracts.

If a Power 770 server uses the IBM i operating system in addition to any other supported operating system on the same server, the Client must inform the sales team placing the billing feature order which operating system caused the temporary On/Off CoD processor use so that the correct feature can be used for billing.

The following features are used to order enablement codes and support billing charges on the Power 770:

IBM i

Model	Processor Feature	On/Off CoD Processor Enablement Feature	On/Off CoD Processor Billing Feature	On/Off CoD Processor Billing Feature
MMB	4980	7951	7644	7645
MMB	4981	7951	7648	7649

Model	Memory Features	On/Off CoD Memory Enablement Feature	On/Off CoD Memory Billing Feature
MMB	5600	7954	7377
MMB	5601	7954	7377
MMB	5602	7954	7377

The On/Off CoD process consists of three steps: Enablement, Activation, and Billing.

On/Off CoD Enablement: Description

Before requesting temporary capacity on a server, you must "enable" it for On/Off CoD. To do this, order an enablement feature (MES only) and sign the required contracts. IBM will generate an enablement code, mail it to you, and post it on the Web for you to retrieve and enter on your server. A processor enablement code lets you request up to 360 processor days of temporary capacity. If you have reached the limit of 360 processor days, place an order for another processor enablement code to reset the number of days you can request to 360.

A memory enablement code lets you request up to 999 memory days of temporary capacity. If you have reached the limit of 999 memory days, place an order for another memory enablement code to reset the number of days you can request to 999.

On/Off CoD Enablement: Step-by-Step

Prerequisite 1: Sales channel (IBM Business Partner) must sign one of the following contracts, if applicable:

- IBM Business Partner Agreement, Distributor Attachment for On/Off Capacity On Demand
- IBM Business Partner Agreement for Solution Providers -- Attachment for On/Off Capacity On Demand

- IBM Business Partner Agreement -- Attachment for On/Off Capacity On Demand

Prerequisite 2: Sales channel (IBM Business Partner or IBM Direct) must register at the following Web site

http://www.ibm.com/servers/eserver/iseries/ondemand/cod

- Step 1: Client initiates request for On/Off CoD use by requesting Sales channel to enable the machine for temporary capacity.
- Step 2: Client must complete and sign the following contracts. It is the Sales Channel's responsibility to return the signed contract to the responsible CSO organization and fax a copy to IBM at 507-253-4553 or e-mail to tcod@us.ibm.com.
  - Required: IBM Customer Agreement, Attachment for On/Off Capacity On Demand; IBM Supplement for On/Off Capacity On Demand
  - Optional: IBM Addendum for On/Off Capacity On Demand Alternative Reporting
- Step 3: Sales channel places an order for processor or memory enablement features.
- Step 4: Sales channel updates the Web site registration data (see prerequisite 2 above) with information about the customer machine being enabled for temporary capacity. Note: The order for an enablement feature will not be fulfilled until this step is completed.
- Step 5: IBM generates an enablement code and mails/posts it.
- Step 6: Customer retrieves the enablement code and applies it to the server.

On/Off Activation Requests: Description

When On/Off CoD temporary capacity is needed , simply use the HMC menu for On/Off CoD and specify how many of the inactive processors or GBs of memory you would like temporarily activated for some number of days.

You will be billed for the days requested, whether the capacity is assigned to partitions or left in the shared processor pool.

At the end of the temporary period (days you requested), you must ensure the temporarily activated capacity is available to be reclaimed by the server (not assigned to partitions), or you will be billed for any unreturned processor days (per the contract you signed).

On/Off CoD Activation Requests: Step-by-Step

When there is a need for temporary capacity, use the On/Off CoD temporary capacity HMC menu for the server and specify how many of the inactive processors or GBs of memory you would like temporarily activated for some number of days. The user must assign the temporary capacity to a partition (whether or not the machine is configured for LPAR) to begin using temporary capacity.

On/Off CoD Billing: Description

The contract, signed by the client before receiving the enablement code, requires On/Off CoD user to report billing data at least once a month (whether there is activity or not). This data is used to determine the proper amount to bill at the end of each billing period (calendar quarter). Failure to report billing data for use of temporary processor or memory capacity during a billing quarter will result in default billing equivalent to 90 processor days of temporary capacity. The Sales channel will be notified of customer requests for temporary capacity. As a result, the Sales channel must order a quantity of billing features (one feature for each billable processor and memory day reported).

On/Off CoD Billing: Step-by-step

The client must report billing data (requested and unreturned processor and memory days) at a minimum of once per month either electronically or via fax (stated requirement in the signed contract). At the end of each billing period

(calendar quarter), IBM will process the accumulated data reported and notify the Sales channel for proper billing. The Sales channel places an order for the appropriate quantity of billing features (one processor billing feature ordered for each processor day used, or one memory day for each memory day utilized). IBM will ship a billing notice (notifies customer of billing actions) to the ship-to address on the order as part of the fulfillment process. Customer pays the Sales channel and the Sales channel pays IBM for the fulfillment of the billing features.

For more information regarding registration, enablement, and usage of On/Off CoD, visit

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

Utility CoD

Utility CoD autonomically provides additional processor performance on a temporary basis within the shared processor pool. Utility CoD enables you to place a quantity of inactive processors into the server's Shared Processor Pool, which then becomes available to the pool's resource manager. When the server recognizes that the combined processor utilization within the shared pool exceeds 100% of the level of base (purchased/active) processors assigned across uncapped partitions, then a Utility CoD Processor Minute is charged and this level of performance is available for the next minute of use. If additional workload requires a higher level of performance, the system will automatically allow the additional Utility CoD processors to be used and the system automatically and continuously monitors and charges for the performance needed above the base (permanent) level. Registration and usage reporting for Utility CoD is made using a public Web site and payment is based on reported usage. Utility CoD requires PowerVM Standard Edition (#7942) or PowerVM Enterprise Edition (#7995) to be active on the 9117-MMB.

If a Power 770 server uses the IBM i operating system in addition to any other supported operating system on the same server, the client must inform the sales team placing the billing feature order which operating system caused the temporary Utility CoD processor use so that the correct feature can be used for billing.

Model	Utility Billing Processor Feature	Utility CoD Feature Description
MMB	7642	100 Processor minutes for #4980
MMB	7643	100 Processor minutes for #4980, IBM i
MMB	7646	100 Processor minutes for #4981
MMB	7647	100 Processor minutes for #4981, IBM i

For more information regarding registration, enablement, and use of Utility CoD, visit

http://www-947.ibm.com/systems/support/planning/capacity/index.html

Trial Capacity on Demand (Trial CoD)

Clients can request either a Standard or an Exception Trial, visit

https://www-912.ibm.com/tcod_reg.nsf/TrialCod?OpenForm

Software licensing

For software licensing considerations with the various CoD offerings, refer to the latest revision of the *Capacity on Demand Planning Guide* at

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

Services

The IBM Server Product Services offers implementation and migration services to help you put your IBM Power System server quickly into your production environment in order to support your business applications. These services include in-depth planning sessions to help ensure the end result is in line with your requirements. A variety of product services are available to suit your needs. Our goal is to continually enhance these offers to provide you with a comprehensive selection of services. To see what IBM can do for you:

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

IBM Power Systems Deployment Ready Services

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

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

For more information on Deployment-Ready Services, refer to

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

Model upgrades

You can upgrade the 9117-MMA with IBM POWER6™ or POWER6+™ processors to the IBM Power 770 with POWER7 processors. For upgrades from POWER6 or POWER6+ processor-based systems, IBM will install new CEC enclosures to replace the enclosures the customer currently has. The customer's current CEC enclosures will be returned to IBM in exchange for the financial consideration identified under the applicable feature conversions for each upgrade.

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 codes. 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
- DDR2 memory DIMMS to DDR3 memory DIMMS
- Trim kits (a new trim kit is needed when upgrading to a two-, three- or four-door system)
- Enterprise enablement

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 (#7942 and 7995)
- I/O drawers (#5786, 5796, 5802, 5877, and 5886)
- Racks (#0551, 0553, and 0555)
- Doors (#6068, 6069, 6248, 6249, 6858)
- Trim kits (#6246 and 6247) for one drawer configurations only or for racks holding only I/O and no 770 processor enclosures.
- SATA DVD-RAM (#5762)

The Power 770 can support the following 12X drawers and disk-only drawers:

- #5802 and #5877 PCIe 12X I/O drawers
- #5797 and 7413-G30 PCI-X (12X) I/O Drawer
- #5786 and 7031-D24 TotalStorage® EXP24 SCSI Disk Drawer
- #5886 EXP12S SAS Disk Drawer

The Model MMB supports only the SAS DASD SFF hard disks internally. The older 3.5-inch DASD hard disks can be attached to the Model MMB but must be located in a I/O drawer such as 5886. For POWER6 or POWER6+ processor-based systems that have the On/Off CoD function enabled, you must reorder the On/Off enablement features (#7951 and 7954) when placing the upgrade MES order for the new Power 770 system to keep the On/Off CoD function active. The On/Off enablement features should be removed from the configuration file before the MES order is started to initiate the model upgrade. Any temporary use of processors or memory owed to IBM on the existing system must be paid before installing the new Power 770 Model MMB. Feature 8018 is available to support migration of the PowerVM feature 7942 during the initial order and build of the Upgrade MES MMB order. Customers may add feature 8018 to their upgrade orders in a quantity not to exceed the quantity of feature 7942 obtained for the system being upgraded. The feature 7942 feature code should be migrated to the new configuration report in a quantity that equals feature 8018. Additional 7942 features can be ordered during the upgrade.

PowerVM

PowerVM is available on the 9117-MMB:

- PowerVM Editions are available as a hardware feature, (#7942 for Standard Edition, #7995 for Enterprise Edition). Clients select the feature that provides the level of virtualization appropriate for their workloads.
- Micro-partitioning allows a single processor core to be shared by up to 10 logical partitions.
- Virtual I/O Server is a single-function appliance that resides in a IBM POWER5™, POWER6, or POWER7 processor-based partition. It facilitates the sharing of physical I/O resources between client partitions (AIX V5.3, or later, IBM i V6.1 or Linux) within the server. VIOS provides virtual SCSI targets and shared Ethernet adapter (SEA) virtual I/O to client LPARs.
- Virtual SCSI (VSCSI) enables the sharing of physical storage adapters (SCSI and Fibre Channel) and storage devices (disk and optical) between logical partitions.
- Virtual networking: A shared Ethernet adapter enables connectivity between internal and external virtual LANs (VLANs); virtual Ethernet provides high-speed connections between partitions.
- PowerVM Lx86 supports running most x86 Linux applications within Linux partitions.
- Live Partition Mobility, available only with PowerVM-Enterprise Edition, will allow you to move a running AIX or Linux LPAR from one physical server to another with no downtime if both servers are using POWER6 or POWER7 processors. This

capability can be used to evacuate workloads from a system before performing scheduled maintenance, moving workloads across a pool of different physical resources as business needs shift, and moving workloads away from under-utilized machines so that they can be powered off to save on energy and cooling costs.
- Active Memory Sharing allows memory to be dynamically moved between running partitions for optimal resource usage.

PowerVM Editions:

- PowerVM Standard Edition (#7942) supports up to 10 partitions per core, VIOS, PowerVM Lx86 and multiple shared processor pools.
- PowerVM Enterprise Edition (#7995) adds support for Live Partition Mobility and Active Memory Sharing.

Other PowerVM technologies include:

- Workload Partitions (WPARs) provide isolated instances on top of a single AIX 6.1 image.
- Live Application Mobility (available with WPAR Manager) provides the movement of a running AIX application from one server to another.
- System Planning Tool simplifies the process of planning and deploying Power System LPARs and virtual I/O.

Capacity Backup Offering (applies to IBM i only)

The Power 770 systems' Capacity Backup (CBU) designation can help meet your requirements for a second system to use for backup, high availability, and disaster recovery. It enables you to temporarily transfer IBM i processor license entitlements and 5250 Enterprise Enablement entitlements purchased for a primary machine to a secondary CBU-designated system. Temporarily transferring these resources instead of purchasing them for your secondary system may result in significant savings. Processor activations cannot be transferred.

The CBU specify feature number 4891 is available only as part of a new server purchase or during an MES upgrade from an existing system to a 9117-MMB. Certain system prerequisites must be met and system registration and approval are required before the CBU specify feature can be applied on a new server.

Standard IBM i terms and conditions do not allow either IBM i processor license entitlements or 5250 OLTP (Enterprise Enablement) entitlements to be transferred permanently or temporarily. These entitlements remain with the machine they were ordered for. When you register the association between your primary and on-order CBU system, you must agree to certain terms and conditions regarding the temporary transfer.

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

The primary system for a Power 770 server can be:

- 9119-FHA
- 9406-595
- 9117-MMA
- 9406-MMA

- 9406-570
- 9117-MMB
- 9179-MHB

These systems have IBM i software licenses with an IBM i P30 software tier or higher. The primary machine must be in the same enterprise as the CBU system. Before you can temporarily transfer IBM i processor license entitlements from the registered primary system, you must have more than one IBM i processor license on the primary machine and at least one IBM i processor license on the CBU server. An activated processor must be available on the CBU server to use the transferred entitlement. You may 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. Such messages that arise in this situation do not mean you are not in compliance. Before you can temporarily transfer 5250 entitlements, you must have more than one 5250 Enterprise Enablement entitlement on the primary server and at least one 5250 Enterprise Enablement entitlement on the CBU system. You may then transfer the entitlements that are not required on the primary server during the time of transfer and that are above the minimum of one entitlement. For example, if you have a eight-core Power 770 as your primary system with four IBM i processor license entitlements (three above the minimum) and two 5250 Enterprise Enablement entitlements (one above the minimum), you can temporarily transfer up to three IBM i entitlements and one 5250 Enterprise Enablement entitlement. During the temporary transfer, the CBU system's internal records of its total number of IBM i processor entitlements is not updated, and you may see IBM i license noncompliance warning messages from the CBU system. If your primary or CBU machine is sold or discontinued from use, any temporary entitlement transfers must be returned to the machine on which they were originally acquired. For CBU registration and further information, visit

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

Active Memory Expansion

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

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

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

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

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

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

Active Memory Expansion is enabled by a chargeable hardware feature, #4791, which can be ordered with the initial order of the server or as an MES order. A software key is provided when the enablement feature is ordered which is applied to the server. An IPL is not required to enable the server. The key is specific to an individual server and is permanent. It can not be moved to a different server.

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

IBM i Operating System

For customers loading the IBM i operating system, the four-digit numeric QPRCFEAT value used on the 9117-MMB is the same as the four-digit numeric feature code for the processors used in the System. For example, if the processor feature code in a system is 4980, the QPRCFEAT value for the system would be 4980.

- The QPRCFEAT value in a Power 770 server does not change with the addition of more processors or additional CEC enclosures.
- The QPRCFEAT value in a Power 770 server would change only if the feature code of the processors was changed due to a processor upgrade.

Accessibility by people with disabilities

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

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

Section 508 of the U.S. Rehabilitation Act

IBM Power 770 is capable as of March 16, 2010, when used in accordance with associated IBM documentation, of satisfying the applicable requirements of Section 508 of the Rehabilitation Act, provided that any assistive technology used with the product properly interoperates with it. A U.S. Section 508 Voluntary Product Accessibility Template (VPAT) can be requested via the IBM Web site

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

Statement of general direction

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

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

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

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

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

Reference information

Refer to Hardware Announcement 110-023, dated February 09, 2010.

Business Partner information

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

https://www.ibm.com/partnerworld/mem/sla.jsp?num=110-025

Product number

The following are newly announced features on the specific models of the IBM Power Systems 9117 machine type:

Description	MT	Model	Feature
IBM Power 770	9117	MMB	
Integrated, 4 Port- 1Gb Virtual Ethernet, I/O ports	9117	MMB	1803
Integrated, 4 Port (2x1Gb and 2x10Gb SFP+ Optical ports)	9117	MMB	1804
GX++ 12X DDR Adapter, Dual-port	9117	MMB	1808
Integrated, 4 Port (2x1Gb and 2x10Gb SFP+ Copper twinax ports)	9117	MMB	1813
SAS Cable for triple split DASD backplane	9117	MMB	1815
SAS Cable Assembly for SAS Port	9117	MMB	1819
Operator Panel	9117	MMB	1853
PCI-X DDR Dual Channel Ultra320 SCSI Adapter	9117	MMB	1912
Serv Interface Cable- 2, 3, and 4 Enclosure	9117	MMB	3671
Serv Interface Cable- 3 and 4 Enclosure	9117	MMB	3672
Serv Interface Cable- 4 Enclosure	9117	MMB	3673
SAS Cable (YI) System to SAS Enclosure, Single Controller/Dual Path 1.5M	9117	MMB	3686
SAS Cable (YI) System to SAS Enclosure, Single Controller/Dual Path 3M	9117	MMB	3687
Processor Cable, Two-Drawer System	9117	MMB	3711
Processor Cable, Two, Three or Four Drawer System	9117	MMB	3712
Processor Cable, Three or Four Drawer System	9117	MMB	3713
Processor Cable, Four-Drawer System	9117	MMB	3714
ACTIVE MEMORY EXPANSION ENABLEMENT	9117	MMB	4791
3.5 GHz Proc Card, 0/12 Core POWER7, 16 DDR3 Memory Slots	9117	MMB	4980
3.1 GHz Proc Card, 0/16 Core POWER7, 16 DDR3 Memory Slots	9117	MMB	4981
Single 5250 Enterprise Enablement	9117	MMB	4992
Full 5250 Enterprise Enablement	9117	MMB	4997

One Processor Activation for Processor Feature #4980	9117	MMB	5459
One Processor Activation for Processor Feature #4981	9117	MMB	5468
0/32GB DDR3 Memory (4X8GB) DIMMS - 1066 MHz - POWER7 CoD Memory	9117	MMB	5600
0/64GB DDR3 Memory (4X16GB) DIMMS - 1066 MHz - POWER7 CoD Memory	9117	MMB	5601
0/128GB DDR3 Memory (4X32GB) DIMMS - 800 MHz - POWER7 CoD Memory	9117	MMB	5602
System AC Power Supply, 1725 W	9117	MMB	5632
Disk/Media Backplane	9117	MMB	5652
System CEC Enclosure with IBM BEZEL, I/O Backplane, and System Midplane	9117	MMB	5659
175MB Cache RAID - Dual IOA Enablement Card	9117	MMB	5662
Service Processor	9117	MMB	5664
FSP/Clock Pass Through Card	9117	MMB	5665
System CEC Enclosure with OEM BEZEL, I/O Backplane, and System Midplane	9117	MMB	5669
Activation of 100 GB DDR2 Memory	9117	MMB	5684
1.8m Rack Trim Kit	9117	MMB	6263
2.0m Rack Trim Kit	9117	MMB	6272
Power Cable - Drawer to IBM PDU, 200-240V/10A	9117	MMB	6577
Environmental Monitoring Probe	9117	MMB	7118
On/Off, 1GB-1Day, Memory Billing POWER7	9117	MMB	7377
Quantity 150 of #1890	9117	MMB	7545
Quantity 150 of #1909	9117	MMB	7546
PROC COD UTILITY BILLING FOR FC 4980, 100 PROC-MINS	9117	MMB	7642
PROC COD UTILITY BILLING FOR FC 4980. 100 PROC-MINS, FOR IBM i	9117	MMB	7643
1 PROC-DAY ON/OFF BILLING FOR FC 4980	9117	MMB	7644
1 PROC-DAY ON/OFF BILLING FOR FC 4980, FOR IBM i	9117	MMB	7645
PROC COD UTILITY BILLING FOR FC 4981, 100 PROC-MINS	9117	MMB	7646
PROC COD UTILITY BILLING FOR FC 4981, 100 PROC-MINS, FOR IBM i	9117	MMB	7647
1 PROC-DAY ON/OFF BILLING FOR FC 4981	9117	MMB	7648
1 PROC-DAY ON/OFF BILLING FOR FC 4981, FOR IBM i	9117	MMB	7649
Activation of 1 GB DDR3 POWER7 Memory	9117	MMB	8212
Activation of 100 GB DDR3 POWER7 Memory	9117	MMB	8213

The following are features already announced for the IBM Power Systems 9117 machine type:

Description	MT	Model	Feature
Specify Code for External High Speed Modem	9117	MMB	0032
Mirrored System Disk Level, Specify Code	9117	MMB	0040
Device Parity Protection-All, Specify Code	9117	MMB	0041
Mirrored System IOP Level Specify Code	9117	MMB	0042
Mirrored System Bus Level, Specify Code	9117	MMB	0043
Device Parity RAID-6 All, Specify Code	9117	MMB	0047
RISC-to-RISC Data Migration	9117	MMB	0205
1Gbps Ethernet Specify	9117	MMB	0226
AIX Partition Specify	9117	MMB	0265
Linux Partition Specify	9117	MMB	0266
IBM i Operating System Partition Specify	9117	MMB	0267
CSC Specify	9117	MMB	0275
Ext Tape Attached via #5736	9117	MMB	0290
Specify Custom Data Protection	9117	MMB	0296
Specify EXP24 Attach via Existing Controller	9117	MMB	0302
Mirrored Level System Specify Code	9117	MMB	0308
IPCS Extension Cables for NT	9117	MMB	0325
RAID Hot Spare Specify	9117	MMB	0347

V.24/EIA232 6.1m (20-Ft) PCI Cable	9117	MMB	0348
V.24/EIA232 15.2m (50-Ft) PCI Cable	9117	MMB	0349
V.35 6.1m (20-Ft) PCI Cable	9117	MMB	0353
V.35 15.2m (50-Ft) PCI Cable	9117	MMB	0354
V.36 6.1m (20-Ft) PCI Cable	9117	MMB	0356
X.21 6.1m (20-Ft) PCI Cable	9117	MMB	0359
X.21 15.2m (50-Ft) PCI Cable	9117	MMB	0360
V.24/EIA232 (80-Ft) PCI Cable	9117	MMB	0365
V.24/EIA232 6.1M (20-Ft) PCI Cable	9117	MMB	0367
UPS Factory Integration Specify	9117	MMB	0373
HMC Factory Integration Specify	9117	MMB	0374
Display Factory Integration Specify	9117	MMB	0375
Reserve Rack Space for UPS	9117	MMB	0376
Reserve Rack Space for HMC	9117	MMB	0377
Reserve Rack Space for Display	9117	MMB	0378
MTM Upgrade Indicator	9117	MMB	0395
MMA/MMB/MHB upgrade indicator	9117	MMB	0397
512MB DDR Server Memory	9117	MMB	0446
1GB DDR Server Memory	9117	MMB	0447
Customer Specified Placement	9117	MMB	0453
SSD Placement Indicator - CEC	9117	MMB	0462
SSD Placement Indicator (5802/5803)	9117	MMB	0463
SSD Placement Indicator - 5886	9117	MMB	0464
IBM i 5.4 w/ V5R4M5 Specify Code	9117	MMB	0533
IBM i 6.1 Specify Code	9117	MMB	0534
19 inch, 1.8 meter high rack	9117	MMB	0551
19 inch, 2.0 meter high rack	9117	MMB	0553
19 inch, 1.3 meter high rack	9117	MMB	0555
IBM i 6.1 with 6.1.1 Machine Code Specify Code	9117	MMB	0566
PCI-X Expansion Unit in Rack	9117	MMB	0588
PCI/SCSI Disk Expansion Drawer	9117	MMB	0595
Rack Filler Panel Kit	9117	MMB	0599
#5094 Equivalent	9117	MMB	0694
#5096 Equivalent	9117	MMB	0696
Balanced Warehouse Solution Indicator	9117	MMB	0710
Load Source Not in CEC	9117	MMB	0719
Load Source in #0595	9117	MMB	0720
Load Source in #5094/5294	9117	MMB	0721
Specify Load Source in #5786	9117	MMB	0725
Specify Load Source in #5802/5803	9117	MMB	0726
Specify #5886 Load Source placement	9117	MMB	0727
#4319 Load Source Specify	9117	MMB	0830
#4326 Load Source Specify	9117	MMB	0834
#4327 Load Source Specify	9117	MMB	0835
#4328 Load Source Specify	9117	MMB	0836
SAN Load Source Specify	9117	MMB	0837
#3676 Load Source Specify	9117	MMB	0838
#3677 Load Source Specify	9117	MMB	0839
#3678 Load Source Specify	9117	MMB	0840
#4329 Load Source Specify	9117	MMB	0841
#3658 Load Source Specify	9117	MMB	0844
#1884 Load Source Specify	9117	MMB	0851
#1888 Load Source Specify	9117	MMB	0853
#1909 Load Source Specify	9117	MMB	0854
#3587 Load Source Specify	9117	MMB	0855
US TAA Compliance Indicator	9117	MMB	0983
Modem Cable - US/Canada and General Use	9117	MMB	1025
USB External Docking Station for Removable Disk Drive	9117	MMB	1104
USB 160 GB Removable Disk Drive	9117	MMB	1106
USB 500 GB Removable Disk Drive	9117	MMB	1107
Decline Electronic Service Agent™ Install Indicator	9117	MMB	1120
System Unique Identifier	9117	MMB	1311
200V 16A 4.3m (14-Ft) TL Line Cord	9117	MMB	1406

125V 4.3m (14-Ft) Line Cord	9117	MMB	1413
200V 1.8m (6-Ft) Locking Line Cord	9117	MMB	1414200V 1.8m (6-Ft) Watertight Line Cord
4.3m 200V/16A Power Cord S. Africa	9117	MMB	1418
4.3m 200V/16A Power Cord Israel	9117	MMB	1419
4.3m 200V/16A Power Cord EU/Asia	9117	MMB	1420
4.3m 200V/16A Power Cord CH/DK	9117	MMB	1421
200V 1.8m (6-Ft) Locking Line Cord	9117	MMB	1424
200V 1.8m (6-Ft) Watertight Line Cord	9117	MMB	1425
200V 4.3m (14-Ft) Locking Line Cord	9117	MMB	1426
200V 4.3m (14-Ft) Watertight Line Cord	9117	MMB	14274.3m 200V/10A Power Cord EU/Asia
4.3m 200V/10A Power Cord Denmark	9117	MMB	1440
4.3m 200V/10A Power Cord S. Africa	9117	MMB	1441
4.3m 200V/10A Power Cord Swiss	9117	MMB	1442
4.3m 200V/10A Power Cord UK	9117	MMB	1443
4.3m 200V/10A Power Cord Israel	9117	MMB	1445
4.3m 200V/32A Power Cord EU 1-PH	9117	MMB	1449
4.3m 200V/16A Power Cord EU 2-PH	9117	MMB	1450
200V (6-Ft) 1.8m Line Cord	9117	MMB	1451
200V (14-Ft) 4.3m Line Cord	9117	MMB	1452
200V (6-Ft) 1.8m Locking Line Cord	9117	MMB	1453
200V 12A (14-Ft) 4.3m TL Line Cord	9117	MMB	1454200V (6-Ft) 1.8m Watertight Line Cord
200V (6-Ft) 1.8m Upper Locking Cord	9117	MMB	1458
200V (6-Ft) 1.8m Upper Locking Cord	9117	MMB	1459
3m Copper RIO Cable	9117	MMB	1460
6m Copper RIO Cable	9117	MMB	1461
15m RIO Cable	9117	MMB	1462
30m SPCN Cable	9117	MMB	1466
6m RIO to RIO-2 Cable	9117	MMB	1474
10m RIO to RIO-2 Cable	9117	MMB	1475
4.3m 200V/12A Pwr Cd UK	9117	MMB	1476
4.3m 200V/16A Pwr Cd	9117	MMB	1477
Remote I/O Cable, 15M	9117	MMB	1485
3m RIO to RIO-2 Cable	9117	MMB	1487
IPCS Keyboard/Mouse for NT	9117	MMB	1700
GX Dual Port- RIO-2 Attach	9117	MMB	1800
GX Dual Port- 12X Channel Attach	9117	MMB	1802
System port/UPS Conversion Cable	9117	MMB	1827
1.5 Meter 12X to 4X Channel Conversion Cable	9117	MMB	1828
0.6 Meter 12X Cable	9117	MMB	1829
1.5 Meter 12X cable	9117	MMB	1830
8.0 Meter 12X Cable	9117	MMB	1834
3.0 Meter 12X Cable	9117	MMB	1840
3 Meter 12X to 4X Channel Conversion Cable	9117	MMB	1841
10 Meter 12X to 4X Channel Conversion Cable	9117	MMB	1842
Operator Panel	9117	MMB	1845
Operator Panel	9117	MMB	1846
10 Meter 12X to 4X Enhanced Channel Conversion Cable	9117	MMB	1854
0.6 Meter 12X DDR Cable	9117	MMB	1861
1.5 Meter 12X DDR Cable	9117	MMB	1862
8.0 Meter 12X DDR Cable	9117	MMB	1864
3.0 Meter 12X DDR Cable	9117	MMB	1865
146.8GB 10K RPM SAS SFF Disk Drive	9117	MMB	1882
73.4 GB 15K RPM SAS SFF Disk Drive	9117	MMB	1883
69.7 GB 15K RPM SAS SFF Disk Drive	9117	MMB	1884
300GB 10K RPM SFF SAS Disk Drive	9117	MMB	1885
146GB 15K RPM SFF SAS Disk Drive	9117	MMB	1886
139GB 15K RPM SFF SAS Disk Drive	9117	MMB	1888
69GB SFF SAS Solid State Drive	9117	MMB	1890
Quantity 150 of #1883	9117	MMB	1891

Quantity 150 of #1882	9117	MMB	1899
69GB SFF SAS Solid State Drive	9117	MMB	1909
PCI SCSI Adapter 16-Bit Differential External Y Cable	9117	MMB	2114
Converter Cable, VHDCI to P, Mini-68 pin to 68 pin, 0.3M	9117	MMB	2118
Ultra 320 SCSI Cable 1 Meter	9117	MMB	2124
Ultra 320 SCSI Cable 3 Meter	9117	MMB	2125
Ultra 320 SCSI Cable 5 Meter	9117	MMB	2126
Ultra 320 SCSI Cable 10 Meter	9117	MMB	2127
Ultra 320 SCSI Cable 20 Meter	9117	MMB	2128
0.55 Meter Ultra 320 SCSI Cable	9117	MMB	2138
Primary OS - IBM i	9117	MMB	2145
Primary OS - AIX	9117	MMB	2146
Primary OS - Linux	9117	MMB	2147
0.6M 16-bit SCSI-2 System-to-System Cable	9117	MMB	2424
2.5M 16-bit SCSI-2 System-to-System Cable	9117	MMB	2425
2M LC-SC 50 Micron Fiber Converter Cable	9117	MMB	2456
2M LC-SC 62.5 Micron Fiber Converter Cable	9117	MMB	2459
External USB 1.44 MB Diskette Drive	9117	MMB	2591
4 port USB PCIe Adapter	9117	MMB	2728
2-Port USB PCI Adapter	9117	MMB	2738
PCI Ultra Mag Media Controller	9117	MMB	2749
PCI-X Ultra RAID Disk Controller	9117	MMB	2757
PCI-X Ultra4 RAID Disk Controller	9117	MMB	2780
PCI-X Fibre Chan Disk Controller	9117	MMB	2787
PCI IOP	9117	MMB	2844
PCI IOP for SAN Load Source	9117	MMB	2847
POWER GXT135P Graphics Accelerator with Digital Support	9117	MMB	2849
ARTIC960Hx 4-Port EIA-232 Cable	9117	MMB	2861
ARTIC960Hx 4-Port X.21 Cable	9117	MMB	2863
ARTIC960Hx 4-Port V.35 (DTE) Cable	9117	MMB	2864
PCIe 2-Line WAN w/Modem	9117	MMB	2893
3M Asynchronous Terminal/Printer Cable EIA-232	9117	MMB	2934
Asynchronous Cable EIA-232/V.24 3M	9117	MMB	2936
8-Port Asynchronous Adapter EIA-232/RS-422, PCI bus	9117	MMB	2943
IBM ARTIC960Hx 4-Port Multiprotocol PCI Adapter	9117	MMB	2947
Cable, V.24 / EIA-232	9117	MMB	2951
Cable, V.35	9117	MMB	2952
Cable, V.36 / EIA-499	9117	MMB	2953
Cable, X.21	9117	MMB	2954
2-Port Multiprotocol PCI Adapter	9117	MMB	2962
Serial-to-Serial Port Cable for Drawer/Drawer- 3.7M	9117	MMB	3124
Serial-to-Serial Port Cable for Rack/Rack- 8M	9117	MMB	3125
RIO-2(Remote I/O-2)Cbl, 1.2M	9117	MMB	3146
RIO-2(Remote I/O-2)Cbl, 3.5M	9117	MMB	3147
RIO-2 (Remote I/O-2) Cable, 10M	9117	MMB	3148
RIO-2 (Remote I/O-2) Cable, 1.75M	9117	MMB	3156
RIO-2 (Remote I/O-2) Cbl, 2.5M	9117	MMB	3168
36.4 GB 10,000 RPM Ultra320 SCSI Disk Drive Assembly	9117	MMB	3273
73.4 GB 10,000 RPM Ultra320 SCSI Disk Drive Assembly	9117	MMB	3274
146.8 GB 10,000 RPM Ultra320 SCSI Disk Drive Assembly	9117	MMB	3275
36.4 GB 15,000 RPM Ultra320 SCSI Disk Drive Assembly	9117	MMB	3277
73.4 GB 15,000 RPM Ultra320 SCSI Disk Drive Assembly	9117	MMB	3278
146.8 GB 15,000 RPM Ultra320 SCSI Disk Drive Assembly	9117	MMB	3279
300 GB 10,000 RPM Ultra320 SCSI Disk Drive Assembly	9117	MMB	3578
300 GB 15K RPM SCSI Disk Drive	9117	MMB	3585
69GB 3.5" SAS Solid State Drive	9117	MMB	3586
69GB 3.5" SAS Solid State Drive	9117	MMB	3587
Widescreen LCD Monitor	9117	MMB	3632
T210 Flat-Panel Monitor	9117	MMB	3635

L200P Flat Panel Monitor	9117	MMB	3636
IBM T541H /L150p 15" TFT Color Monitor	9117	MMB	3637
IBM ThinkVision® L170p Flat Panel Monitor	9117	MMB	3639
ThinkVision L171p Flat Panel Monitor	9117	MMB	3640
IBM T115 Flat Panel Monitor	9117	MMB	3641
ThinkVision L191p Flat Panel Monitor	9117	MMB	3642
IBM T120 Flat Panel Monitor	9117	MMB	3643
IBM T119 Flat Panel Monitor	9117	MMB	3644
IBM T117 Flat Panel Monitor	9117	MMB	3645
73GB 15K RPM SAS Disk Drive	9117	MMB	3646
146GB 15K RPM SAS Disk Drive	9117	MMB	3647
300GB 15K RPM SAS Disk Drive	9117	MMB	3648
450GB 15K RPM SAS Disk Drive	9117	MMB	3649
External connection for 3 of 6 internal SAS Disk Slots	9117	MMB	3650
External connection for the 6 internal SAS Disk slots.	9117	MMB	3651
SAS Cable (EE) Drawer to Drawer 1M	9117	MMB	3652
SAS Cable (EE) Drawer to Drawer 3M	9117	MMB	3653
SAS Cable (EE) Drawer to Drawer 6M	9117	MMB	3654
428GB 15K RPM SAS Disk Drive	9117	MMB	3658
Processor Fabric Cable, 2 enclosure	9117	MMB	3660
SAS Cable (X) Adapter to SAS Enclosure, Dual Controller/Dual Path 3M:	9117	MMB	3661
SAS Cable (X) Adapter to SAS Enclosure, Dual Controller/Dual Path 6M:	9117	MMB	3662
SAS Cable (X) Adapter to SAS Enclosure, Dual Controller/Dual Path 15M:	9117	MMB	3663
Processor Fabric Cable, 3 enclosure	9117	MMB	3664
Processor Fabric Cable, 4 enclosure	9117	MMB	3665
SAS Cable (YR) -1M	9117	MMB	3667
69.7GB 15k rpm SAS Disk Drive	9117	MMB	3676
139.5GB 15k rpm SAS Disk Drive	9117	MMB	3677
283.7GB 15k rpm SAS Disk Drive	9117	MMB	3678
SAS Cable (AI)- Adapter to Internal drive 1M	9117	MMB	3679
3M SAS CABLE, ADPTR TO ADPTR (AA)	9117	MMB	3681
6M SAS CABLE, ADPTR TO ADPTR (AA)	9117	MMB	3682
SAS Cable (AE) Adapter to Enclosure, single controller/single path 3M	9117	MMB	3684
SAS Cable (AE) Adapter to Enclosure, single controller/single path 6M	9117	MMB	3685
SAS Cable (AT) 0.6 Meter	9117	MMB	3688
SAS Cable (YO) Adapter to SAS Enclosure, Single Controller/Dual Path 1.5 M	9117	MMB	3691
SAS Cable (YO) Adapter to SAS Enclosure, Single Controller/Dual Path 3 M	9117	MMB	3692
SAS Cable (YO) Adapter to SAS Enclosure, Single Controller/Dual Path 6 M	9117	MMB	3693
SAS Cable (YO) Adapter to SAS Enclosure, Single Controller/Dual Path 15 M	9117	MMB	3694
External xSeries® Attach	9117	MMB	3704
PCI IOP	9117	MMB	3705
DVD-ROM	9117	MMB	3706
30GB 1/4-Inch Cartridge Tape	9117	MMB	3707
50GB 1/4-Inch Cartridge Tape	9117	MMB	3708
PCI 100/10Mbps Ethernet IOA	9117	MMB	3709
0.3M Serial Port Converter Cable, 9-Pin to 25-Pin	9117	MMB	3925
Asynch Printer/Terminal Cable, 9-pin to 25-pin, 4M	9117	MMB	3926
Serial Port Null Modem Cable, 9-pin to 9-pin, 3.7M	9117	MMB	3927
Serial Port Null Modem Cable, 9-pin to 9-pin, 10M	9117	MMB	3928
1.8 M (6-ft) Extender Cable for Displays (15-pin D-shell to 15-pin D-shell)	9117	MMB	4242
Extender Cable - USB Keyboards, 2M	9117	MMB	4256
VGA to DVI Connection Converter	9117	MMB	4276
35.16GB 10k rpm Disk Unit	9117	MMB	4319
35.16GB 15k rpm Disk Unit	9117	MMB	4326
70.56GB 15k rpm Disk Unit	9117	MMB	4327
141.12GB 15k rpm Disk Unit	9117	MMB	4328
282.25GB 15k rpm Disk Unit	9117	MMB	4329
DVD-RAM	9117	MMB	4430
50GB 1/4-Inch Cartridge Tape	9117	MMB	4487
4/8GB (4X2GB) DIMMS, 276 PIN 533 MHz, DDR2 SDRAM	9117	MMB	4495

8/16GB (4X4GB) DIMMs, 276 PIN, 533 MHz DDR2 SDRAM	9117	MMB	4496	
16GB (4X4GB) DIMMs, 276 PIN, 533 MHz, DDR2 SDRAM	9117	MMB	4497	
16GB (4X4GB) DIMMs, 276 pin, 400MHz DDR2 SDRAM	9117	MMB	4499	
DVD-RAM	9117	MMB	4630	
DVD-RAM	9117	MMB	4633	
One and only one rack indicator features is required onall orders (#4650 to #4666).				
Rack Indicator- Not Factory Integrated	9117	MMB	4650	
Rack Indicator, Rack #1	9117	MMB	4651	
Rack Indicator, Rack #2	9117	MMB	4652	
Rack Indicator, Rack #3	9117	MMB	4653	
Rack Indicator, Rack #4	9117	MMB	4654	
Rack Indicator, Rack #5	9117	MMB	4655	
Rack Indicator, Rack #6	9117	MMB	4656	
Rack Indicator, Rack #7	9117	MMB	4657	
Rack Indicator, Rack #8	9117	MMB	4658	
Rack Indicator, Rack #9	9117	MMB	4659	
Rack Indicator, Rack #10	9117	MMB	4660	
Rack Indicator, Rack #11	9117	MMB	4661	
Rack Indicator, Rack #12	9117	MMB	4662	
Rack Indicator, Rack #13	9117	MMB	4663	
Rack Indicator, Rack #14	9117	MMB	4664	
Rack Indicator, Rack #15	9117	MMB	4665	
Rack Indicator, Rack #16	9117	MMB	4666	
PCI Twinaxial Workstn IOA	9117	MMB	4746	
PCI-X Cryptographic Coprocessor (FIPS 4)	9117	MMB	4764	
PCI Crypto Coprocessor	9117	MMB	4801	
PCI Crypto Accelerator	9117	MMB	4805	
PCI Integ xSeries Server	9117	MMB	4812	
PCI Integ xSeries Server	9117	MMB	4813	
CBU SPECIFY	9117	MMB	4891	
Single 5250 Enterprise Enablement	9117	MMB	4990	
Full 5250 Enterprise Enablement	9117	MMB	4991	
Software Preload Required	9117	MMB	5000	
Custom Service Specify, Off-Site	9117	MMB	5001	Customer Solution Center - Rochester Mfg
Software Preinstall	9117	MMB	5005	
PCI-X Expansion Unit	9117	MMB	5088	
PCI-X Expansion Tower	9117	MMB	5094	
PCI-X Exp Tower (no disk)	9117	MMB	5096	
30-Disk Expansion Feature	9117	MMB	5108	
Dual Line Cords - Tower	9117	MMB	5115	
Dual Line Cords - 5294 Tower	9117	MMB	5116	
Redundant Power and Cooling	9117	MMB	5138	
Power Dist Unit 1 Phase NEMA	9117	MMB	5160	
Power Dist Unit 1 Phase IEC	9117	MMB	5161	
Power Dist Unit 2 of 3 Phase	9117	MMB	5162	
Power Dist Unit - 3 Phase	9117	MMB	5163	
1.8m I/O Tower	9117	MMB	5294	
1.8m I/O Tower (no disk)	9117	MMB	5296	
One Processor Activation for Processor Feature #7380	9117	MMB	5403	
Utility Billing for FC# 7380- 100 processor minutes	9117	MMB	5404	
Utility Billing for FC# 7380 with IBM i - 100 processor minutes	9117	MMB	5480	
Utility Billing for FC# 5620 with IBM i - 100 processor minutes	9117	MMB	5481	
Utility Billing for FC# 5621 or #5622 with IBM i - 100 processor minutes	9117	MMB	5482	
On/Off Processor Billing for FC#5620 with IBM i - 1 processor day	9117	MMB	5483	
On/Off Processor Billing for Feature #5621 or #5622 with IBM i - 1 processor day	9117	MMB	5484	
On/Off Processor Billing for FC#7380 with IBM i - 1 processor day	9117	MMB	5485	
RFID TAGS FOR SERVERS, BLADES, BLADECENTERS, RACKS, AND HMCS	9117	MMB	5524	
Sys Console on OP Console	9117	MMB	5544	
Sys Console 100Mbps Ethernet	9117	MMB	5548	
Sys Console On HMC	9117	MMB	5550	
Sys Console-Ethernet No IOP	9117	MMB	5553	
Mirror 35GB Disk/Controller Pkg	9117	MMB	5554	
Mirror 70GB Disk/Controller Pkg	9117	MMB	5555	

Mirror 141GB Disk/Controller Pkg	9117	MMB	5556
Mirror 35GB Drawer Package	9117	MMB	5560
Mirror 70GB Drawer Package	9117	MMB	5561
2780 Controller w/Aux Write Cache	9117	MMB	5580
2757 Controller w/Aux Write Cache	9117	MMB	5581
5777 Controller w/Aux Write Cache	9117	MMB	5583
2780 Controller w/Aux Write Cache	9117	MMB	5590
2757 Controller w/Aux Write Cache	9117	MMB	5591
Processor Power Regulator	9117	MMB	5617
3.5 GHz Proc Card, 0/2 Core POWER6, 12 DDR2 Memory Slots	9117	MMB	5620
4.2 GHz Proc Card, 0/2 Core POWER6, 8 DDR2 Memory Slots	9117	MMB	5621
4.2 GHz Proc Card, 0/2 Core POWER6, 12 DDR2 Memory Slots	9117	MMB	5622
Proc Power Regulator	9117	MMB	5625
System CEC Enclosure with IBM Bezel	9117	MMB	5626
Sys AC Power Supply, 1600 W	9117	MMB	5628
Media Enclosure and Backplane	9117	MMB	5629
Integrated, 2 Port- 1Gb Virtual Ethernet, I/O ports	9117	MMB	5636
Integrated, 2 Port- 10Gb (SR) Virtual Ethernet, I/O ports	9117	MMB	5637
Integrated, 4 Port- 1Gb Virtual Ethernet, I/O ports	9117	MMB	5639
Utility Billing for FC# 5620- 100 processor minutes	9117	MMB	5640
Utility Billing for FC# 5621 or #5622 - 100 processor minutes	9117	MMB	5641
Blind Swap Type III Cassette- PCIe, Short Slot	9117	MMB	5646
Blind Swap Type III Cassette- PCI-X or PCIe, Standard Slot	9117	MMB	5647
Service Interface Card	9117	MMB	5648
On/Off Processor Day Billing for Feature #5620	9117	MMB	5650
On/Off Processor Billing for Feature #5621 or #5622 - 1 processor day	9117	MMB	5653
On/Off Processor Day Billing for Feature #7380	9117	MMB	5656
Serv Interface Cable- 2 Enclosure	9117	MMB	5657
Serv Interface Cable- 3 Enclosure	9117	MMB	5658
Serv Interface Cable- 4 Enclosure	9117	MMB	5660
Proc Enclosure and Backplane	9117	MMB	5663
I/O Backplane	9117	MMB	5666
System Midplane	9117	MMB	5667
SAS Disk Backplane -6 slot	9117	MMB	5668
One Processor Activation for Processor Feature #5620	9117	MMB	5670
One Processor Activation for Processor Feature #5621	9117	MMB	5671
One Processor Activation for Processor Feature #5622	9117	MMB	5672
SATA Media Enclosure and Backplane	9117	MMB	5674
0/4 Core Processor Enclosure and Backplane	9117	MMB	5675
Activation of 1GB DDR2 POWER6 Memory	9117	MMB	5680
Activation of 256 GB DDR2 POWER6 Memory	9117	MMB	5681
Power 570 System Bezel	9117	MMB	5682
System Chassis - 4 EIA	9117	MMB	5683
Virtual Processor Power Regulator	9117	MMB	5686
0/32GB DDR2 Memory (4X8GB) DIMMS- 400 MHz- POWER6 CoD Memory	9117	MMB	5690
On/Off, 1GB-1Day, Memory Billing POWER6 Memory	9117	MMB	5691
0/2GB DDR2 Memory (4X0.5GB) DIMMS- 667 MHz- POWER6 Memory	9117	MMB	5692
0/4GB DDR2 Memory (4X1GB) DIMMS- 667 MHz- POWER6 CoD Memory	9117	MMB	5693
0/8GB DDR2 Memory (4X2GB) DIMMS- 667 MHz- POWER6 CoD Memory	9117	MMB	5694
0/16GB DDR2 Memory (4X4GB) DIMMS- 533 MHz- POWER6 CoD Memory	9117	MMB	5695
0/32GB DDR2 Memory (4X8GB) DIMMS- 400 MHz- POWER6 CoD Memory	9117	MMB	5696
System Ship Group	9117	MMB	5699
IBM Gigabit Ethernet-SX PCI-X Adapter	9117	MMB	5700
IBM 10/100/1000 Base-TX Ethernet PCI-X Adapter	9117	MMB	5701

PCI-X Ultra Tape Controller	9117	MMB	5702
PCI-X Fibre Channel Tape Controller	9117	MMB	5704
IBM 2-Port 10/100/1000 Base-TX Ethernet PCI-X Adapter	9117	MMB	5706
IBM 2-Port Gigabit Ethernet-SX PCI-X Adapter	9117	MMB	5707
10Gb FCoE PCIe Dual Port Adapter	9117	MMB	5708
PCI-X Dual Channel Ultra320 SCSI Adapter	9117	MMB	5712
1 Gigabit iSCSI TOE PCI-X on Copper Media Adapter	9117	MMB	5713
1 Gigabit iSCSI TOE PCI-X on Optical Media Adapter	9117	MMB	5714
2 Gigabit Fibre Channel PCI-X Adapter	9117	MMB	5716
4-Port 10/100/1000 Base-TX PCI Express Adapter	9117	MMB	5717
10 Gigabit Ethernet -SR PCI-X Adapter	9117	MMB	5718
IBM 10 Gigabit Ethernet-LR PCI-X Adapter	9117	MMB	5719
10 Gb Ethernet-SR PCI-X 2.0 DDR Adapter	9117	MMB	5721
10 Gb Ethernet-LR PCI-X 2.0 DDR Adapter	9117	MMB	5722
2-Port Asynchronous EIA-232 PCI Adapter	9117	MMB	5723
10 Gigabit Ethernet-CX4 PCI Express Adapter	9117	MMB	5732
8 Gigabit PCI Express Dual Port Fibre Channel Adapter	9117	MMB	5735
PCI-X DDR Dual Channel Ultra320 SCSI Adapter	9117	MMB	5736
4-Port 10/100/1000 Base-TX PCI-X Adapter	9117	MMB	5740
IBM Single Bus Ultra 320 SCSI Repeater Card	9117	MMB	5741
IBM Dual Bus Ultra 320 SCSI Repeater Card	9117	MMB	5742
SATA Slimline DVD-ROM Drive	9117	MMB	5743
POWER GXT145 PCI Express Graphics Accelerator	9117	MMB	5748
4Gbps Fibre Channel (2-Port)	9117	MMB	5749
IDE Slimline DVD-ROM Drive	9117	MMB	5756
IBM 4.7 GB IDE Slimline DVD-RAM Drive	9117	MMB	5757
4 GB Single-Port Fibre Channel PCI-X 2.0 DDR Adapter	9117	MMB	5758
4 Gb Dual-Port Fibre Channel PCI-X 2.0 DDR Adapter	9117	MMB	5759
PCI-X Fibre Chan Disk Controller	9117	MMB	5760
PCI-X Fibre Chan Tape Controller	9117	MMB	5761
SATA Slimline DVD-RAM Drive	9117	MMB	5762
2-Port 10/100/1000 Base-TX Ethernet PCI Express Adapter	9117	MMB	5767
2-Port Gigabit Ethernet-SX PCI Express Adapter	9117	MMB	5768
10 Gigabit Ethernet-SR PCI Express Adapter	9117	MMB	5769
10 Gigabit Ethernet-LR PCI Express Adapter	9117	MMB	5772
4 Gigabit PCI Express Single Port Fibre Channel Adapter	9117	MMB	5773
4 Gigabit PCI Express Dual Port Fibre Channel Adapter	9117	MMB	5774
PCI-X Disk Controller-90MB No IOP	9117	MMB	5776
PCI-X Disk Controller-1.5GB No IOP	9117	MMB	5777
PCI-X EXP24 Ctl-1.5GB No IOP	9117	MMB	5778
PCI-X EXP24 Ctl-1.5GB No IOP	9117	MMB	5782
4 Port Async EIA-232 PCIe Adapter	9117	MMB	5785
TotalStorage EXP24 Disk Dwr	9117	MMB	5786
PCI Expansion Drawer	9117	MMB	5790
PCI-DDR 12X Expansion Drawer	9117	MMB	5796
12X I/O Drawer PCIe, SFF disk	9117	MMB	5802
PCI-X DDR Dual Channel Ultra320 SCSI Adapter	9117	MMB	5806
12X I/O Drawer PCIe, No Disk	9117	MMB	5877
SAS Disk Backplane -6 slot	9117	MMB	5878
EXP 12S Expansion Drawer	9117	MMB	5886
PCI-X DDR Dual -x4 SAS Adapter	9117	MMB	5900
PCIe Dual-x4 SAS Adapter	9117	MMB	5901
PCI-X DDR Dual - x4 3Gb SAS RAID Adapter	9117	MMB	5902
PCIe 380MB Cache Dual - x4 3Gb SAS RAID Adapter	9117	MMB	5903
PCI-X DDR 1.5GB Cache SAS RAID Adapter	9117	MMB	5904
PCI-X DDR 1.5GB Cache SAS RAID Adapter (BSC)	9117	MMB	5908
Alternate SAS controller for 3 of 6 internal SAS Disk Slots	9117	MMB	5909
SAS adapter for internal Split DASD option	9117	MMB	5911
PCI-X DDR Dual - x4 SAS Adapter	9117	MMB	5912
Non-paired PCIx SAS RAID Indicator	9117	MMB	5921
Non-paired SAS RAID indicator	9117	MMB	5922
Non-paired PCIe SAS RAID Indicator	9117	MMB	5923
Full Width Keyboard -- USB, US English, #103P	9117	MMB	5951
Full Width Keyboard -- USB, French, #189	9117	MMB	5952
Full Width Keyboard -- USB, Italian, #142	9117	MMB	5953

Full Width Keyboard -- USB, German/Austrian, #129	9117	MMB	5954
Full Width Keyboard -- USB, UK English, #166P	9117	MMB	5955
Full Width Keyboard -- USB, Spanish, #172	9117	MMB	5956
Full Width Keyboard -- USB, Japanese, #194	9117	MMB	5957
Full Width Keyboard -- USB, Brazilian Portuguese, #275	9117	MMB	5958
Full Width Keyboard -- USB, Hungarian, #208	9117	MMB	5959
Full Width Keyboard -- USB, Korean, #413	9117	MMB	5960
Full Width Keyboard -- USB, Chinese, #467	9117	MMB	5961
Full Width Keyboard -- USB, French Canadian, #445	9117	MMB	5962
Full Width Keyboard -- USB, Canadian French, #058	9117	MMB	5963
Full Width Keyboard -- USB, Belgian/UK, #120	9117	MMB	5964
Full Width Keyboard -- USB, Swedish/Finnish, #153	9117	MMB	5965
Full Width Keyboard -- USB, Danish, #159	9117	MMB	5966
Full Width Keyboard -- USB, Bulgarian, #442	9117	MMB	5967
Full Width Keyboard -- USB, Swiss/French/German, #150	9117	MMB	5968
Full Width Keyboard -- USB, Norwegian,#155	9117	MMB	5969
Full Width Keyboard -- USB, Dutch, #143	9117	MMB	5970
Full Width Keyboard -- USB, Portuguese, #163	9117	MMB	5971
Full Width Keyboard -- USB, Greek, #319	9117	MMB	5972
Full Width Keyboard -- USB, Hebrew, #212	9117	MMB	5973
Full Width Keyboard -- USB, Polish, #214	9117	MMB	5974
Full Width Keyboard -- USB, Slovakian, #245	9117	MMB	5975
Full Width Keyboard -- USB, Czech, #243	9117	MMB	5976
Full Width Keyboard -- USB, Turkish, #179	9117	MMB	5977
Full Width Keyboard -- USB, LA Spanish, #171	9117	MMB	5978
Full Width Keyboard -- USB, Arabic, #253	9117	MMB	5979
Full Width Keyboard -- USB, Thai, #191	9117	MMB	5980
Full Width Keyboard -- USB, Russian, #443	9117	MMB	5981
Full Width Keyboard -- USB, Slovenian, #234	9117	MMB	5982
Full Width Keyboard -- USB, US English Euro, #103P	9117	MMB	5983
Power Control Cable (SPCN) - 2 meter	9117	MMB	6001
Power Control Cable (SPCN) - 3 meter	9117	MMB	6006
Power Control Cable (SPCN) - 15 meter	9117	MMB	6007
Power Control Cable (SPCN) - 6 meter	9117	MMB	6008
Power Control Cable (SPCN) - 30 meter	9117	MMB	6029
Opt Front Door for 1.8m Rack	9117	MMB	6068
Opt Front Door for 2.0m Rack	9117	MMB	6069
1.8m Rack Trim Kit	9117	MMB	6246
2.0m Rack Trim Kit	9117	MMB	6247
1.8m Rack Acoustic Doors	9117	MMB	6248
2.0m Rack Acoustic Doors	9117	MMB	6249
RIO-2 Bus Adapter	9117	MMB	6417
RIO-2 Remote I/O Loop Adapter for #5790	9117	MMB	6438
Dual-port 12X Channel Attach- Short Run	9117	MMB	6446
4.3m (14-Ft) 250V/10A Power Cord	9117	MMB	6451
4.3m (14-Ft) 250V/10A Power Cord	9117	MMB	6455
Dual-port 12X Channel Attach- Long Run	9117	MMB	6457
Power Cable -- Drawer to IBM PDU, 14-foot, 250V/ 10A	9117	MMB	6458
3.7m (12-Ft) 250V/10A RA Pwr Cd	9117	MMB	6459
Power Cord 4.3m (14-ft), Drawer To OEM PDU (125V, 15A)	9117	MMB	6460
4.3m (14-Ft) 250V/10A Power Cord	9117	MMB	6461
4.3m (14-Ft) 250V/10A Power Cord	9117	MMB	6462
4.3m (14-Ft) 250V/10A Power Cord	9117	MMB	6463
4.3m (14-Ft) 250V/10A Power Cord	9117	MMB	6464
4.3m (14-Ft) 250V/10A Power Cord	9117	MMB	6465
4.3m (14-Ft) 250V/10A Power Cord	9117	MMB	6466
4.3m (14-Ft) 250V/10A Power Cord	9117	MMB	6467
Power Cord 4.3m (14-foot), Drawer to OEM PDU, (250V, 15A), U. S.	9117	MMB	6469
Power Cord 1.8m(6-foot), To Wall (125V, 15A)	9117	MMB	6470
Power Cord 2.7m (9-foot), To Wall/OEM PDU, (125V, 15A)	9117	MMB	6471
Power Cord 2.7m (9-foot), To Wall/OEM PDU, (250V, 16A)	9117	MMB	6472
Power Cord 2.7m (9-foot), To Wall/OEM PDU,			

(250V, 10A)	9117	MMB	6473
Power Cord 2.7M (9-foot), To Wall/OEM PDU, (250V, 13A)	9117	MMB	6474
Power Cord 2.7M (9-foot), To Wall/OEM PDU, (250V, 16A)	9117	MMB	6475
Power Cord 2.7M (9-foot), To Wall/OEM PDU, (250V, 10A)	9117	MMB	6476
Power Cord 2.7M (9-foot), To Wall/OEM PDU, (250V, 16A)	9117	MMB	6477
Power Cord 2.7 M(9-foot), To Wall/OEM PDU, (250V, 16A)	9117	MMB	6478
Power Cord (9-foot) , To Wall/OEM PDU, (250V, 10A)	9117	MMB	6479
Power Cord 1.8M (6-foot),To Wall, (250V, 15A), United States	9117	MMB	6487
Power Cord 2.7M (9-foot), To Wall/OEM PDU, (125V, 15A or 250V, 10A)	9117	MMB	6488
4.3m (14-Ft) 3PH/24A Power Cord	9117	MMB	6489
4.3m (14-Ft) 1PH/48A Pwr Cord	9117	MMB	6491
4.3m (14-Ft) 1PH/48-60A Pwr Cord	9117	MMB	6492
Power Cord 2.7M (9-foot), To Wall/OEM PDU, (250V, 10A)	9117	MMB	6493
Power Cord 2.7M (9-foot), To Wall/OEM PDU, (250V, 10A)	9117	MMB	6494
Power Cord (9-foot), To Wall/OEM PDU, (250V, 10A)	9117	MMB	6495
Power Cord 2.7M (9-foot), To Wall/OEM PDU, (250V, 10A)	9117	MMB	6496
Power Cord (6-foot), To Wall/OEM PDU, (250V, 10A)	9117	MMB	6497
Power Cord (6-foot), To Wall/OEM PDU, (250V, 15A)	9117	MMB	6498
Optional Rack Security Kit	9117	MMB	6580
Modem Tray for 19-Inch Rack	9117	MMB	6586
Power Cord 2.7M (9-foot), To Wall/OEM PDU, (125V, 15A)	9117	MMB	6651
4.3m (14-Ft) 1PH/24-30A Pwr Cord	9117	MMB	6654
4.3m (14-Ft) 1PH/24-30A WR Pwr Cord	9117	MMB	6655
4.3m (14-Ft)1PH/24A Power Cord	9117	MMB	6656
Power Cord 2.7M (9-foot), To Wall/OEM PDU, (250V, 15A)	9117	MMB	6659
Power Cord (14-foot), Drawer To OEM PDU (125V, 15A)	9117	MMB	6660
2.1m (7-Ft) 200V PDU Power Cable	9117	MMB	6664
Power Cord 3 M (10 ft), Drawer to IBM PDU, 250V/ 10A	9117	MMB	6665
Power Cord 4.3M (14-foot), Drawer to OEM PDU, (250V, 15A)	9117	MMB	6669
Power Cord (6-foot), To Wall (125V, 15A),	9117	MMB	6670
Power Cord 2.7M (9-foot), Drawer to IBM PDU, 250V/10A	9117	MMB	6671
Power Cord 1.5M (5-foot), Drawer to IBM PDU, 250V/10A	9117	MMB	6672
Power Cord 2.7M (9-foot), To Wall/OEM PDU, (250V, 10A)	9117	MMB	6680
Power Cord (6-foot), To Wall, (250V, 15A)	9117	MMB	6687
RIO-2 Bus Adapter	9117	MMB	6699
PCI 2-Line WAN IOA No IOP	9117	MMB	6805
PCI 4-Modem WAN IOA No IOP	9117	MMB	6808
PCI 2-Line WAN w/Modem NoIOP	9117	MMB	6833

Cable Restraint Hardware- excess Service

Interface Cable	9117	MMB	7099
Intelligent PDU+, 1 EIA Unit, Universal UTG0247 Connector	9117	MMB	7109
IBM/OEM Rack-mount Drawer Rail Kit- Adjustable Depth	9117	MMB	7164
OEM Rack-mount Drawer Rail Kit	9117	MMB	7165
Power Distribution Unit	9117	MMB	7188
Quantity 150 of #2124	9117	MMB	7204
Quantity 150 of #2125	9117	MMB	7205
Quantity 150 of #2126	9117	MMB	7206
Quantity 150 of #2127	9117	MMB	7207
Quantity 150 of #2128	9117	MMB	7208
Quantity 150 of #2138	9117	MMB	7213
2GB CUoD Memory Activation	9117	MMB	7272
4GB CUoD Memory Activation	9117	MMB	7273
8GB CUoD Memory Activation	9117	MMB	7274
16GB CUoD Memory Activation	9117	MMB	7275
32GB CUoD Memory Activation	9117	MMB	7276
SDI Software Pre-Install Indicator	9117	MMB	7305
One Processor Activation for Processor Feature #7388	9117	MMB	7306
Dual I/O Unit Enclosure	9117	MMB	7307
Dual I/O Unit Enclosure	9117	MMB	7311
I/O Drawer Mounting Enclosure	9117	MMB	7314
Utility Billing for Processor #7388- 100 processor minutes	9117	MMB	7332
On/Off Processor Day Billing for Processor #7388	9117	MMB	7333
Utility Billing for Processor #7388 with IBM i - 100 processor minutes	9117	MMB	7334
On/Off Processor Billing for Processor #7388 with IBM i - 1 processor day	9117	MMB	7346
4.7 GHz Proc Card, 0/2 Core POWER6, 12 DDR2 Memory Slots	9117	MMB	7380
4.4GHz Proc Card, 0/2 Core POWER6, 12 DDR2 Memory Slots.	9117	MMB	7387
5.0 GHz Proc Card, 0/2 Core POWER6, 12 DDR2 Memory Slots	9117	MMB	7388
Quantity 150 of #4319	9117	MMB	7504
Quantity 150 of #4326	9117	MMB	7508
Quantity 150 of #4327	9117	MMB	7509
Quantity 150 of #4328	9117	MMB	7510
Quantity 150 of #4329	9117	MMB	7511
Quantity 150 of #5741	9117	MMB	7514
Quantity 150 of #3676	9117	MMB	7517
Quantity 150 of #3677	9117	MMB	7518
Quantity 150 of #3678	9117	MMB	7519
Quantity 150 of #3586	9117	MMB	7535
Quantity 150 of #3587	9117	MMB	7536
Quantity 150 of #3658	9117	MMB	7538
4.2 GHz Proc Card, 0/4 Core POWER6, 12 DDR2 Memory Slots	9117	MMB	7540
Quantity 150 of #1884	9117	MMB	7543
Quantity 150 of #1888	9117	MMB	7544
Quantity 150 of #1885	9117	MMB	7547
Quantity 150 of #1886	9117	MMB	7548
Quantity 150 of #3647	9117	MMB	7549
Quantity 150 of #3648	9117	MMB	7564
Quantity 150 of #3649	9117	MMB	7565
1GB DDR2 Memory Activation	9117	MMB	7663
One Processor Activation for Processor Feature #7540	9117	MMB	7700
Utility Billing for Processor #7540- 100 processor minutes	9117	MMB	7701
On/Off Processor Day Billing for Processor #7540	9117	MMB	7702
Utility Billing for Processor #7540 with IBM i - 100 processor minutes	9117	MMB	7706
On/Off Processor Billing for Processor #7540 with IBM i - 1 processor day	9117	MMB	7709
One Processor Activation for Processor Feature #7387	9117	MMB	7719
Utility Billing for Processor #7387 - 100 processor minutes	9117	MMB	7726

Utility Billing for Processor #7387 with IBM i - 100 processor minutes	9117	MMB	7743
On/Off Processor Billing for Processor #7387 with IBM i - 1 processor day	9117	MMB	7744
On/Off Processor Day Billing for Processor #7387	9117	MMB	7745
2.0m Rack Side Attach Kit	9117	MMB	7780
Ethernet Cable, 6M, Hardware Management Console to System Unit	9117	MMB	7801
Ethernet Cable, 15m, Hardware Management Console to System Unit	9117	MMB	7802
Side-by-Side for 1.8m Racks	9117	MMB	7840
Ruggedize Rack Kit	9117	MMB	7841
PCI Blind Swap Cassette Kit, Single Wide Adapters, Type II	9117	MMB	7862
PCI Blind Swap Cassette Kit, Double Wide Adapters, Type II	9117	MMB	7863
Power Distribution Backplane	9117	MMB	7870
AC Power Supply, 1400 W	9117	MMB	7888
2GB (4x512MB) DIMMs, 276-pin, 533MHz DDR2 SDRAM	9117	MMB	7892
4GB (4x1GB) DIMMs, 276-pin, 533MHz DDR2 SDRAM	9117	MMB	7893
8GB (4x2GB) DIMMs, 276-pin, 533 MHz DDR2 SDRAM	9117	MMB	7894
PowerVM -Standard Edition	9117	MMB	7942
On/Off Processor Enablement	9117	MMB	7951
On/Off Memory Enablement	9117	MMB	7954
PowerVM - Enterprise Edition	9117	MMB	7995
570 to MMA CoD Memory Activation Carry Over Indicator	9117	MMB	8017
570 to MMA Advanced POWER® Virtualization Carry Over Indicator	9117	MMB	8018
0/256GB DDR2 Memory (32X8GB) DIMMS- 400 MHz- POWER6 Memory	9117	MMB	8129
RJ-45 to DB-25 Converter Cable	9117	MMB	8133
Linux Software Preinstall	9117	MMB	8143
Linux Software Preinstall (Business Partners)	9117	MMB	8144
Power Cord Carry Over Indicator, #9800, Model Conversion Only	9117	MMB	8430
Power Cord Carry Over Indicator, #9802, Model Conversion Only	9117	MMB	8431
Power Cord Carry Over Indicator, #9820, Model Conversion Only	9117	MMB	8432
Power Cord Carry Over Indicator, #9821, Model Conversion Only	9117	MMB	8433
Power Cord Carry Over Indicator, #9825, Model Conversion Only	9117	MMB	8434
Power Cord Carry Over Indicator, #9827, Model Conversion Only	9117	MMB	8435
Power Cord Carry Over Indicator, #9828, Model Conversion Only	9117	MMB	8436
Power Cord Carry Over Indicator, #9829, Model Conversion Only	9117	MMB	8437
Power Cord Carry Over Indicator, #9830, Model Conversion Only	9117	MMB	8438
Power Cord Carry Over Indicator, #9831, Model Conversion Only	9117	MMB	8439
Power Cord Carry Over Indicator, #9833, Model Conversion Only	9117	MMB	8440
Power Cord Carry Over Indicator, #9834, Model Conversion Only	9117	MMB	8441
Base Customer Spec Plcmnt	9117	MMB	8453
Keyboard - USB, US English, #103P	9117	MMB	8800
Keyboard - USB, French, #189	9117	MMB	8801
Keyboard - USB, Italian, #142	9117	MMB	8802
Keyboard - USB, German/Austrian, #129	9117	MMB	8803
Keyboard - USB, UK English, #166	9117	MMB	8804
Keyboard - USB, Spanish, #172	9117	MMB	8805
Keyboard - USB, Japanese, #194	9117	MMB	8806
Keyboard - USB, Brazilian/Portuguese, #275	9117	MMB	8807
Keyboard - USB, Canadian French, #058	9117	MMB	8808
Keyboard - USB, Belgium/UK, #120	9117	MMB	8810
Keyboard - USB, Swedish/Finnish, #153	9117	MMB	8811
Keyboard - USB, Danish, #159	9117	MMB	8812
Keyboard - USB, Bulgarian, #442	9117	MMB	8813
Keyboard - USB, Swiss/French/German, #150F/G	9117	MMB	8814

Keyboard - USB, Norwegian, #155	9117	MMB	8816
Keyboard - USB, Dutch, #143	9117	MMB	8817
Keyboard - USB, Portuguese, #163	9117	MMB	8818
Keyboard - USB, Greek, #319	9117	MMB	8819
Keyboard - USB, Hebrew, #212	9117	MMB	8820
Keyboard - USB, Hungarian, #208	9117	MMB	8821
Keyboard - USB, Polish, #214	9117	MMB	8823
Keyboard - USB, Slovakian, #245	9117	MMB	8825
Keyboard - USB, Czech, #243	9117	MMB	8826
Keyboard - USB, Turkish, #179	9117	MMB	8827
Keyboard - USB, LA Spanish, #171	9117	MMB	8829
Keyboard - USB, Arabic, #253	9117	MMB	8830
Keyboard - USB, Korean, #413	9117	MMB	8833
Keyboard - USB, Chinese/US, #467	9117	MMB	8834
Keyboard - USB, French Canadian, #445	9117	MMB	8835
Keyboard - USB, Thai, #191	9117	MMB	8836
Keyboard - USB, Russian, #443	9117	MMB	8838
Keyboard - USB, Yugoslavian/Latin, #105	9117	MMB	8839
Keyboard - USB, US English (EMEA), #103P	9117	MMB	8840
Mouse - USB, with Keyboard Attachment Cable	9117	MMB	8841
USB Mouse	9117	MMB	8845
Order Routing Indicator- System Plant	9117	MMB	9169
Language Group Specify - US English	9117	MMB	9300
New AIX License Core Counter	9117	MMB	9440
New IBM i License Core Counter	9117	MMB	9441
New Red Hat License Core Counter	9117	MMB	9442
New SUSE License Core Counter	9117	MMB	9443
Other AIX License Core Counter	9117	MMB	9444
Other Linux License Core Counter	9117	MMB	9445
3rd Party Linux License Core Counter	9117	MMB	9446
VIOS Core Counter	9117	MMB	9447
Month Indicator	9117	MMB	9461
Day Indicator	9117	MMB	9462
Hour Indicator	9117	MMB	9463
Minute Indicator	9117	MMB	9464
Qty Indicator	9117	MMB	9465
Countable Member Indicator	9117	MMB	9466
Reserved Rack Space Indicator - 4U	9117	MMB	9570
Language Group Specify - Dutch	9117	MMB	9700
Language Group Specify - French	9117	MMB	9703
Language Group Specify - German	9117	MMB	9704
Language Group Specify - Polish	9117	MMB	9705
Language Group Specify - Norwegian	9117	MMB	9706
Language Group Specify - Portuguese	9117	MMB	9707
Language Group Specify - Spanish	9117	MMB	9708
Language Group Specify - Italian	9117	MMB	9711
Language Group Specify - Canadian French	9117	MMB	9712
Language Group Specify - Japanese	9117	MMB	9714
Language Group Specify - Traditional Chinese (Taiwan)	9117	MMB	9715
Language Group Specify - Korean	9117	MMB	9716
Language Group Specify - Turkish	9117	MMB	9718
Language Group Specify - Hungarian	9117	MMB	9719
Language Group Specify - Slovakian	9117	MMB	9720
Language Group Specify - Russian	9117	MMB	9721
Language Group Specify - Simplified Chinese (PRC)	9117	MMB	9722
Language Group Specify - Czech	9117	MMB	9724
Language Group Specify -- Romanian	9117	MMB	9725
Language Group Specify - Croatian	9117	MMB	9726
Language Group Specify -- Slovenian	9117	MMB	9727
Language Group Specify - Brazilian Portuguese	9117	MMB	9728
Language Group Specify - Thai	9117	MMB	9729

The following are newly announced features on the specific models of the IBM Power Systems 7014, 8203, 8204, 8234, 9117, 9119 machine type:

Description	MT	Model	Feature
1.8m Rack Trim Kit	7014	T00	6263
	8203	E4A	
	8204	E8A	

	8234	EMA	
	9117	MMA	
	9119	FHA	
2.0m Rack Trim Kit	7014	B42	6272
		T42	
	8203	E4A	
	8204	E8A	
	8234	EMA	
	9117	MMA	
	9119	FHA	

Type/Model conversions

From Type	From Model	To Type	To Model
9117	MMA	9117	MMB

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 9117-MMA to 9117-MMB memory features

From FC:	To FC:	Return Parts
4495 - 4/8GB (4X2GB) DIMMS, 276 PIN 533 MHz, DDR2 SDRAM	5600 - 0/32GB DDR3 Memory (4X8GB) DIMMS - 1066 MHz - POWER7 CoD Memory	Yes
4496 - 8/16GB (4X4GB) DIMMs, 276 PIN, 533 MHz DDR2 SDRAM	5600 - 0/32GB DDR3 Memory (4X8GB) DIMMS - 1066 MHz - POWER7 CoD Memory	Yes
4497 - 16GB (4X4GB) DIMMs, 276 PIN, 533 MHz, DDR2 SDRAM	5600 - 0/32GB DDR3 Memory (4X8GB) DIMMS - 1066 MHz - POWER7 CoD Memory	Yes
4499 - 16GB (4X4GB) DIMMs, 276 pin, 400MHz DDR2 SDRAM	5600 - 0/32GB DDR3 Memory (4X8GB) DIMMS - 1066 MHz - POWER7 CoD Memory	Yes
5693 - 0/4GB DDR2 Memory (4X1GB) DIMMS- 667 MHz- POWER6 CoD Memory	5600 - 0/32GB DDR3 Memory (4X8GB) DIMMS - 1066 MHz - POWER7 CoD Memory	Yes
5694 - 0/8GB DDR2 Memory (4X2GB) DIMMS- 667 MHz- POWER6 CoD Memory	5600 - 0/32GB DDR3 Memory (4X8GB) DIMMS - 1066 MHz - POWER7 CoD Memory	Yes
5695 - 0/16GB DDR2 Memory (4X4GB) DIMMS- 533 MHz- POWER6 CoD Memory	5600 - 0/32GB DDR3 Memory (4X8GB) DIMMS - 1066 MHz - POWER7 CoD Memory	Yes
7892 - 2GB (4x512MB) DIMMs, 276-pin, 533MHz DDR2 SDRAM	5600 - 0/32GB DDR3 Memory (4X8GB) DIMMS - 1066 MHz - POWER7 CoD Memory	Yes
7893 - 4GB (4x1GB) DIMMs, 276-pin, 533MHz DDR2 SDRAM	5600 - 0/32GB DDR3 Memory (4X8GB) DIMMS - 1066 MHz - POWER7 CoD Memory	Yes
7894 - 8GB (4x2GB) DIMMs, 276-pin, 533 MHz DDR2 SDRAM	5600 - 0/32GB DDR3 Memory (4X8GB) DIMMS - 1066 MHz - POWER7 CoD Memory	Yes
4495 - 4/8GB (4X2GB) DIMMS, 276 PIN 533 MHz, DDR2 SDRAM	5601 - 0/64GB DDR3 Memory (4X16GB) DIMMS - 1066 MHz - POWER7 CoD Memory	Yes
4496 - 8/16GB (4X4GB) DIMMs, 276 PIN, 533 MHz	5601 - 0/64GB DDR3 Memory (4X16GB) DIMMS - 1066 MHz -	Yes

DDR2 SDRAM	POWER7 CoD Memory	
4497 - 16GB (4X4GB) DIMMs, 276 PIN, 533 MHz, DDR2 SDRAM	5601 - 0/64GB DDR3 Memory (4X16GB) DIMMS - 1066 MHz - POWER7 CoD Memory	Yes
4498 - 32GB (4X8GB) DIMMs, 276 pin, 400MHz DDR2 SDRAM	5601 - 0/64GB DDR3 Memory (4X16GB) DIMMS - 1066 MHz - POWER7 CoD Memory	Yes
4499 - 16GB (4X4GB) DIMMs, 276 pin, 400MHz DDR2 SDRAM	5601 - 0/64GB DDR3 Memory (4X16GB) DIMMS - 1066 MHz - POWER7 CoD Memory	Yes
5690 - 0/32GB DDR2 Memory (4X8GB) DIMMS- 400 MHz- POWER6 CoD Memory	5601 - 0/64GB DDR3 Memory (4X16GB) DIMMS - 1066 MHz - POWER7 CoD Memory	Yes
5693 - 0/4GB DDR2 Memory (4X1GB) DIMMS- 667 MHz- POWER6 CoD Memory	5601 - 0/64GB DDR3 Memory (4X16GB) DIMMS - 1066 MHz - POWER7 CoD Memory	Yes
5694 - 0/8GB DDR2 Memory (4X2GB) DIMMS- 667 MHz- POWER6 CoD Memory	5601 - 0/64GB DDR3 Memory (4X16GB) DIMMS - 1066 MHz - POWER7 CoD Memory	Yes
5695 - 0/16GB DDR2 Memory (4X4GB) DIMMS- 533 MHz- POWER6 CoD Memory	5601 - 0/64GB DDR3 Memory (4X16GB) DIMMS - 1066 MHz - POWER7 CoD Memory	Yes
5696 - 0/32GB DDR2 Memory (4X8GB) DIMMS- 400 MHz- POWER6 CoD Memory	5601 - 0/64GB DDR3 Memory (4X16GB) DIMMS - 1066 MHz - POWER7 CoD Memory	Yes
7892 - 2GB (4x512MB) DIMMs, 276-pin, 533MHz DDR2 SDRAM	5601 - 0/64GB DDR3 Memory (4X16GB) DIMMS - 1066 MHz - POWER7 CoD Memory	Yes
7893 - 4GB (4x1GB) DIMMs, 276-pin, 533MHz DDR2 SDRAM	5601 - 0/64GB DDR3 Memory (4X16GB) DIMMS - 1066 MHz - POWER7 CoD Memory	Yes
7894 - 8GB (4x2GB) DIMMs, 276-pin, 533 MHz DDR2 SDRAM	5601 - 0/64GB DDR3 Memory (4X16GB) DIMMS - 1066 MHz - POWER7 CoD Memory	Yes
4496 - 8/16GB (4X4GB) DIMMs, 276 PIN, 533 MHz DDR2 SDRAM	5602 - 0/128GB DDR3 Memory (4X32GB) DIMMS - 800 MHz - POWER7 CoD Memory	Yes
4497 - 16GB (4X4GB) DIMMs, 276 PIN, 533 MHz, DDR2 SDRAM	5602 - 0/128GB DDR3 Memory (4X32GB) DIMMS - 800 MHz - POWER7 CoD Memory	Yes
4498 - 32GB (4X8GB) DIMMs, 276 pin, 400MHz DDR2 SDRAM	5602 - 0/128GB DDR3 Memory (4X32GB) DIMMS - 800 MHz - POWER7 CoD Memory	Yes
4499 - 16GB (4X4GB) DIMMs, 276 pin, 400MHz DDR2 SDRAM	5602 - 0/128GB DDR3 Memory (4X32GB) DIMMS - 800 MHz - POWER7 CoD Memory	Yes
5690 - 0/32GB DDR2 Memory (4X8GB) DIMMS- 400 MHz- POWER6 CoD Memory	5602 - 0/128GB DDR3 Memory (4X32GB) DIMMS - 800 MHz - POWER7 CoD Memory	Yes
5695 - 0/16GB DDR2 Memory (4X4GB) DIMMS- 533 MHz- POWER6 CoD Memory	5602 - 0/128GB DDR3 Memory (4X32GB) DIMMS - 800 MHz - POWER7 CoD Memory	Yes
5696 - 0/32GB DDR2 Memory (4X8GB) DIMMS- 400 MHz- POWER6 CoD Memory	5602 - 0/128GB DDR3 Memory (4X32GB) DIMMS - 800 MHz - POWER7 CoD Memory	Yes
5680 - Activation of 1GB DDR2 POWER6 Memory	8212 - Activation of 1 GB DDR3 POWER7 Memory	No
7272 - 2GB CUoD Memory Activation	8212 - Activation of 1 GB DDR3 POWER7 Memory	No
7273 - 4GB CUoD Memory Activation	8212 - Activation of 1 GB DDR3 POWER7 Memory	No
7274 - 8GB CUoD Memory Activation	8212 - Activation of 1 GB DDR3 POWER7 Memory	No
7275 - 16GB CUoD Memory Activation	8212 - Activation of 1 GB DDR3 POWER7 Memory	No
7276 - 32GB CUoD Memory Activation	8212 - Activation of 1 GB DDR3 POWER7 Memory	No
7663 - 1GB DDR2 Memory Activation	8212 - Activation of 1 GB DDR3 POWER7 Memory	No
8017 - 570 to MMA CoD Memory Activation Carry Over Indicator	8212 - Activation of 1 GB DDR3 POWER7 Memory	No
5681 - Activation of 256 GB DDR2 POWER6 Memory	8213 - Activation of 100 GB DDR3 POWER7 Memory	No

5684 - Activation of 100 GB DDR2 Memory	8213 - Activation of 100 GB DDR3 POWER7 Memory	No

Feature conversions for 9117-MMA to 9117-MMB processor features

From FC:	To FC:	Return parts
5620 - 3.5 GHz Proc Card, 0/ 2 Core POWER6, 12 DDR2 Memory Slots	4980 - 3.5 GHz Proc Card, 0/ 12 Core POWER7, 16 DDR3 Memory Slots	Yes
5621 - 4.2 GHz Proc Card, 0/ 2 Core POWER6, 8 DDR2 Memory Slots	4980 - 3.5 GHz Proc Card, 0/ 12 Core POWER7, 16 DDR3 Memory Slots	Yes
5622 - 4.2 GHz Proc Card, 0/ 2 Core POWER6, 12 DDR2 Memory Slots	4980 - 3.5 GHz Proc Card, 0/ 12 Core POWER7, 16 DDR3 Memory Slots	Yes
7380 - 4.7 GHz Proc Card, 0/ 2 Core POWER6, 12 DDR2 Memory Slots	4980 - 3.5 GHz Proc Card, 0/ 12 Core POWER7, 16 DDR3 Memory Slots	Yes
7387 - 4.4GHz Proc Card, 0/ 2 Core POWER6, 12 DDR2 Memory Slots.	4980 - 3.5 GHz Proc Card, 0/ 12 Core POWER7, 16 DDR3 Memory Slots	Yes
7388 - 5.0 GHz Proc Card, 0/ 2 Core POWER6, 12 DDR2 Memory Slots	4980 - 3.5 GHz Proc Card, 0/ 12 Core POWER7, 16 DDR3 Memory Slots	Yes
7540 - 4.2 GHz Proc Card, 0/ 4 Core POWER6, 12 DDR2 Memory Slots	4980 - 3.5 GHz Proc Card, 0/ 12 Core POWER7, 16 DDR3 Memory Slots	Yes
4990 - Single 5250 Enterprise Enablement	4992 - Single 5250 Enterprise Enablement	No
4991 - Full 5250 Enterprise Enablement	4997 - Full 5250 Enterprise Enablement	No
5403 - One Processor Activation for Processor Feature #7380	5459 - One Processor Activation for Processor Feature #4980	No
5670 - One Processor Activation for Processor Feature #5620	5459 - One Processor Activation for Processor Feature #4980	No
5671 - One Processor Activation for Processor Feature #5621	5459 - One Processor Activation for Processor Feature #4980	No
5672 - One Processor Activation for Processor Feature #5622	5459 - One Processor Activation for Processor Feature #4980	No
7306 - One Processor Activation for Processor Feature #7388	5459 - One Processor Activation for Processor Feature #4980	No
7700 - One Processor Activation for Processor Feature #7540	5459 - One Processor Activation for Processor Feature #4980	No
7719 - One Processor Activation for Processor Feature #7387	5459 - One Processor Activation for Processor Feature #4980	No

Feature conversions for 9117-MMA to 9117-MMB 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 9117-MMB virtualization engine features

From FC:	To FC:	Return parts
7942 - PowerVM -Standard Edition	7995 - PowerVM - Enterprise Edition	No

Reliability, Availability, and Serviceability (RAS)

The reliability of the IBM Power 770 starts with components, devices, and subsystems that are designed to be fault-tolerant. POWER7 uses lower voltage technology improving reliability with stacked latches to reduce soft error (SER) susceptibility. During the design and development process, subsystems go through rigorous verification and integration testing processes. During system manufacturing, systems go through a thorough testing process to help ensure high product quality levels.

The processor and memory subsystem contain a number of features designed to avoid or correct environmentally induced, single-bit, intermittent failures as well as handle solid faults in components, including selective redundancy to tolerate certain faults without requiring an outage or parts replacement.

The AIX operating system supports disk mirroring (RAID 1) and disk controller duplexing. The Linux operating system supports disk drive mirroring (RAID 1). The adapter provides RAID 0, RAID 5, RAID 6, and RAID 10 for AIX and Linux. Under IBM i OS, mirroring and data spreading is provided by the operating system and RAID 5 and RAID 6 is provided by the adapter.

Memory error-correction extensions

POWER7 memory has error detection and correction code circuitry designed to detect and correct faults that extend across multiple memory modules (DRAMs). This includes tolerating a complete DRAM chip failure (Chipkill™ recovery). POWER7 memory used in the Power 770 system also contains a spare memory (DRAM) per rank of memory which can be substituted for a failed DRAM module (DRAM sparing). The spares can be used when a DRAM fault is detected and provides additional protection beyond that provided by the error detection and correction circuitry. In addition, the POWER7 memory subsystem provides scrubbing of memory to detect and correct intermittent errors.

The bus transferring data between the processor and the memory uses CRC error detection with a failed operation retry mechanism and the ability to dynamically retune bus parameters when a fault occurs. In addition, the memory bus has spare capacity to substitute a spare data bit-line for which is determined to be faulty.

Fault monitoring functions

On POWER7 processor-based servers, hardware failures and software detected hardware failures are recorded in the system log. An error Log Analysis (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 check stop conditions and forwards them to the SFP application and notifies the system administrator.

After the information is logged, if the system is properly configured, a call home service request is initiated, and the pertinent failure data with service parts information and part locations is sent to an IBM Service organization. Customer contact information and specific system-related data, such as the machine type, model, and serial number along with engineering data related to the failure, are sent to IBM service. The call home feature enables IBM service representatives to preemptively bring the most-probable replacement parts when a service call is placed, reducing repair time.

Disk drive fault tracking can alert the system administrator of an impending disk failure before it affects customer operation.

Mutual surveillance

The service processor monitors the operation of 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 or initiating a failover operation to the alternate service processor if present.

Environmental monitoring functions

POWER7 processor-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 non-redundant fan fails, the system shuts down immediately.

POWER7 processor availability enhancements

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

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

POWER7 single processor check stopping

As in POWER6, POWER7 provides single processor check stopping for certain faults that cannot be handled by the availability enhancements in the preceding section. This significantly reduces the probability of any one processor affecting total system availability.

POWER7 cache availability

The L2 and L3 caches in the POWER7 processor are protected with double-bit detect single-bit correct error detection code (ECC). In addition, the caches maintain a cache line delete capability. A threshold of correctable errors detected on a cache line can result in the data in the cache line being purged and the cache line removed from further operation without requiring a reboot. An ECC uncorrectable error detected in the cache can also trigger a purge and delete of the cache line. This results in no loss of operation of the cache line contained data unmodified from what was stored in system memory. Modified data would be handled through Special Uncorrectable Error handling. L1 data and instruction caches also have a retry capability for intermittent error and a cache set delete mechanism for handling solid failures.

Special Uncorrectable Error handling

Special Uncorrectable Error (SUE) handling, prevents an uncorrectable error in memory or cache from immediately causing 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 check stop. If the data is used, termination may be limited to the program/kernel or hypervisor owning the data; or freeze of the I/O adapters controlled by an I/O hub controller if data would be transferred to an I/O device.

PCI Extended Error handling

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

Predictive failure and dynamic component deallocation

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

Uncorrectable Error recovery

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

Serviceability

The IBM Power 770 is designed with both IBM and customer serviceability in mind.

Advancements such as Guiding Light LED architecture are used to control a system of integrated LEDs that lead the individual servicing the machine to the correct part as quickly as possible. With the Power 770 you can replace service parts (customer replaceable unit). To do this, the Power 770 uses Guiding Light LEDs to indicate the parts that need to be replaced.

An HMC attached to the Power 770 enables support personnel (with your authorization) to remotely log in to review error logs and perform remote maintenance if required.

The I/O device and adapter diagnostics consist of stand-alone diagnostics, that are loaded from the DVD-RAM drive, and online diagnostics. Online diagnostics, when installed, are resident with the AIX operating system on the disk or system. They can be booted in single-user mode (service mode), run in maintenance mode, or run concurrently (concurrent mode) with other applications. They have access to the AIX error log and the AIX configuration data.

- Service mode enables checking of system devices and features.
- Concurrent mode allows the normal system functions to continue while selected resources are being checked.
- Maintenance mode enables checking of devices and adapters.

Note: Because the 9117-MMB system has an optional DVD-RAM (#5762), alternative methods for maintaining and servicing the system need to be available if the DVD-RAM is not ordered; an external Internet connection must be available to maintain or update system microcode to the latest required level. Concurrent maintenance guided service procedures will continue to be supported by the Repair and Verify (R&V) component of the Service Focal Point application running on the HMC. Repair procedures that are not covered by the guided R&V component will be documented and available for display on any Web browser-enabled system as well as on the HMC. These procedures are available through the InfoCenter application.

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.

Service Interface

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

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

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

In the Guiding Light LED implementation, when a fault condition is detected on the POWER7 system, an amber System fault LED will be illuminated on the operator panel. The Guiding Light system pinpoints the exact part by blinking the amber field replaceable unit (FRU) identify LED associated with the part to be replaced when selected by the servicer as part of the repair procedure. This action will roll up to the enclosure locate and blue system locate LED on the Op Panel to provide a path from the system level to the enclosure and down to the individual component to be serviced. The enclosure and system identify LEDs will turn on solid and can be used to follow the path from the system to the enclosure and down to the specific FRU.

First failure data capture and error data analysis

First Failure Data Capture (FFDC) is a technique that helps ensure that when a fault is detected in a system, the root cause of the fault will be captured without the need to re-create the problem or run any sort of extended 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. First Failure Data Capture (FFDC) information, error data analysis, and fault isolation are necessary to implement the advanced serviceability techniques that enable efficient service of the systems and to help determine the failing items.

Error handling and reporting

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

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

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

Service Processor

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

The Service Processor supports surveillance of the connection to the HMC and to the system firmware (Hypervisor). It also provides several remote power control options, environmental monitoring, reset, restart, remote maintenance, and diagnostic functions, including console mirroring. The Service Processors menus

(ASMI) can be accessed concurrently with system operation allowing nondisruptive abilities to change system default parameters.

Concurrent Maintenance

The Power 770 continues to support concurrent add or repair of power, cooling, PCI adapters, media devices, I/O drawers, GX adapter and the operator panel. In addition, it continues to support concurrent firmware fixpack updates when possible. The determination of whether a firmware fixpack release can be updated concurrently is identified in the read me file released with the firmware.

Hot-node add, Memory Upgrade, Hot-Node Repair

With the proper configuration, and required protective measures, the Power 770 server is designed for node add, memory upgrade or node repair without powering down the system. Power 770 servers support the adding of an additional CEC enclosure (node) to a system (Hot-node Add) or adding additional memory (memory upgrade) to an existing node. The additional Power 770 enclosure or memory would be ordered as a system upgrade (MES order) and added to the original system. The additional resources of the newly added CEC enclosure (node) or memory can then be assigned to existing OS partitions or new partitions as required. Hot-node Add and memory upgrade makes it possible to upgrade a server by integrating a second, third, fourth CEC enclosure or additional memory into the server with reduced impact to the system operation.

In an unlikely event that CEC hardware (for example, processor, memory, and so on) experienced a failure, the hardware can be repaired by freeing up the processors and memory in the node and its attached I/O resources (node evacuation).

To guard against any potential of any impact to system operation during Hot-Node Add, Memory Upgrade or Node Repair, customers must comply with the following protective measures:

1. For memory upgrade and node repair, the system should have sufficient inactive or spare processor and memory. Critical I/O resources must be configured with redundant paths.
2. Schedule upgrades or repairs during "non-peak" operational hours.
3. Move business-applications to another server using the Live Partition Mobility feature or quiesce them.
4. Back up critical application and system state information.
5. Checkpoint databases.

Live partition mobility

Live Partition Mobility, available only with PowerVM-Enterprise Editions, allows a customer to migrate an AIX partition running on one POWER7 system to other POWER6 or POWER7 system without disrupting services. The migration transfers the entire system environment, including processor state, memory, attached virtual devices, and connected users. It provides continuous OS and application availability during planned partition outages for repair of hardware and firmware faults, or continuous availability during a concurrent repair that requires freeing up CEC resources.

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

Product documentation is available on a DVD (SK5T-7087), which is shipped with the Power 770, or you can access the product documentation on the Web at

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

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

IBM Power 770 Model MMB CEC enclosure

```
Width:  483 mm (19.0 in.)
Depth:  863 mm (32.0 in.)
Height: 174 mm (6.85 in) 4 EIA units
Weight: 70.3 kg (155 lb)
```

Dimensions and specifications shown are for a single drawer. Model MMB systems can have one to four CEC enclosures.

To help assure installability and serviceability in non-IBM, industry-standard racks, review the vendor's installation planning information for any product-specific installation requirements.

Operating environment

- Temperature:
  - 5° to 45° C (41° to 113° F) nonoperating
  - 5° to 35° C (41° to 95° F) operating
- Relative humidity: (noncondensing)

  - 8% to 80% nonoperating
  - 20% to 80% operating
- Maximum dew point:
  - 28° C (82° F) nonoperating
  - 29° C (84° F) operating
- Operating voltage: 200 to 240 V ac
- Operating frequency:.50 to 60 +/- 3 Hz
- Power consumption: 1600 watts max. (per enclosure with 16 cores active)
- Power source loading: 1.649 kVA max.(per enclosure with 16 cores active)
- Thermal output: 5,461 BTU/hr max. (per enclosure with 16 cores active)
- Maximum altitude: 3,048 m (10,000 ft)
- Noise level

  One enclosure with 16 active cores:

  - 6.8 bels (operating/idle)
  - 6.3 bels (operating/idle) with acoustic rack doors

    Four enclosures with 64 active cores:

  - 7.4 bels (operating/idle)
  - 6.9 bels (operating/idle) with acoustic rack doors

EMC conformance classification

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

- U.S.: FCC CFR, Title 47, Part 15, EMI Class A
- EEA, Turkey: EU Council Directive 2004/108/EC, EMI Class A
- Japan: VCCI Council, EMI Class A
- Korea: KCC, EMI Class A
- China (PRC): CPCS, EMI Class A
- Taiwan (RoC): Taiwan BSMI, EMI Class A
- Australia\New Zealand: ACMA™, EMI Class A
- Canada: ICES-003, EMI Class A
- Russia: GOST R, EMI Class A
- Saudi Arabia: MoCI, EMI Class A
- Vietnam: MPT, EMI Class A

Homologation - Telecom Environmental Testing (Safety and EMC)

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

Product safety/Country testing/Certification

- UL 60950-1 1st Edition Underwriters Laboratory, Safety Information
- CAN/CSA22.2 No. 60950-1 1st Edition
- EN60950-1:2001 European Norm
- GS Mark (Safety, TUV, EN60950)- Germany, Europe
- IEC 60950-1 1st Edition, 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

The 9117-MMB can be installed in a 7014-T00, 7014-T42, 7014-B42, or 7014-S25 rack which provides:

- Proper dimensions
- Mounting surfaces
- Power distribution
- Ventilation
- Stability
- Other functional requirements

The design of the Power 770 is optimized for use in an IBM 7014-T00 or 7014-T42 rack. Both the front cover and the external processor fabric cables occupy space on the front left and right side of an IBM 7014 rack that may not be available in non-IBM racks. If loading two or more CEC enclosures in a 7014-T42 or 7014-B42 rack, the CEC enclosures need to be loaded 36U or below to allow space for the flex cables.

Minimum system configuration

Each new Model MMB system must include a minimum of the following items:

- One CEC enclosure (4U) with the following:
  - 1X System Enclosure with IBM Bezel (#5659) or OEM Bezel (#5669)
  - 1X Service Processor (#5664)
  - 1X DASD Backplane (#5652)
  - 2X Power Cords (two selected by customer)
  - 2X A/C Power Supply (#5632)
  - 1X Operator Panel (#1853)
  - 1X HEA Adapters (one of these):
    - Quad 4 X 1 GB (#1803)
    - Quad 2 X 1 GB and 2 X 10 GB Optical (#1804)
    - Quad 2 X 1 GB and 2 X 10 GB Copper (#1813)
- 1X Primary Operating System (one of these):
  - AIX (#2146)
  - Linux (#2147)
  - IBM i (#2145) plus IBM i 6.1.1 (#0566)
- 1X Processor Card (one of these):
  - 3.5 GHz, 12-Core POWER7 Processor Card, 0-core active (#4980)
  - 3.1 GHz, 16-Core POWER7 Processor Card, 0-core active (#4981)
- 4X Processor Activations (quantity of four for one of these):
  - One Processor Activation for Processor Feature #4980 (#5459)
  - One Processor Activation for Processor Feature #4981 (#5468)
- 1X DDR3 Memory DIMMS:
  - 0/32 GB (4 x 8 GB), 1066 MHz, (#5600, or larger)
- 16X Activation of 1 GB DDR3 - POWER7 Memory (#8212)

- For AIX/Linux 1X Disk Drive and for IBM i 2X disk drive: formatted to match the system Primary O/S indicator selected, or if using a Fibre Channel attached SAN (indicated by #0837) a disk drive is not required
- 1X Language Group (selected by customer)
- 1X Removable Media Device (#5762): optionally orderable, a stand-alone system (not network attached) would required this feature
- 1X HMC is required for every 9117-MMB; however, a communal HMC is acceptable

Notes:

- Additional optional features can be added, as desired
- Feature coded racks are allowed for I/O expansion only
- A machine type/model rack, if desired, should be ordered as the primary rack
- A minimum number of four processor activations must be order per system
- The minimum number of memory activation must enable at least 50% of the ordered memory

Hardware Management Console (HMC) Machine Code

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

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

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

If a single HMC is attached to multiple servers, the HMC machine code level must be updated to the server with the most recent firmware level. All prior levels of server firmware are supported with the latest HMC machine code level. An HMC is required to manage POWER7 processor-based servers implementing partitioning. Multiple POWER7 processor-based servers can be supported by a single HMC. If an HMC is used to manage any POWER7 processor based server, the HMC must be a CR3 model, or later, rack-mount HMC or C05 model, or later, deskside HMC. When IBM Systems Director is used to manage an HMC or if the HMC manages more than 254 partitions, the HMC should have 3 GB of RAM minimum and be CR3 model, or later, rack-mount or C06 model, or later, deskside.

Software requirements

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

- AIX 5.3 with the 5300-11 Technology Level and Service Pack 2, or later
- AIX 5.3 with the 5300-10 Technology Level and Service Pack 4, or later, available May 28, 2010
- AIX 5.3 with the 5300-09 Technology Level and Service Pack 7, or later, available May 28, 2010
- AIX 6.1 with the 6100-04 Technology Level and Service Pack 3, or later
- AIX 6.1 with the 6100-03 Technology Level and Service Pack 5, or later, available June 25, 2010
- AIX 6.1 with the 6100-02 Technology Level and Service Pack 8, or later, available June 25, 2010

If installing the IBM i operating system:

- IBM i 6.1 with 6.1.1 machine code, or later

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

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

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

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

If installing VIOS:

- VIOS 2.1.2.12 with Fix Pack 22.1 and Service Pack 2, or later

If installing Java 1.4.2 on POWER7, there are unique considerations when running Java 1.4.2 on POWER7. For more information, refer to the following Web site

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

Limitations

The 9117-MMB has the following limitations:

- The POWER GXT145 PCI Express Graphics Accelerator (#5748) and the POWER GXT135P Graphics Accelerator with Digital Support (#2849) is not hot-plug capable.
- The 3.5-inch DASD disk drives are not supported in the CEC enclosure.
- A number of older I/O devices, adapters, and memory which were supported on the Power 570 9117-MMA are not supported on the Power 770 and newer technology must be used to replace it.
- These include:
  - The HSL-2/RIO-2 interface drawers and towers
  - The 10K SCSI disks
  - The 15K SCSI drives 35 GB or smaller
  - IDE DVD drives in the CEC enclosure (DVD drives: feature 3706, 4430, 4460, 4633, 5756, 5757)
  - DDR2 memory
  - SCSI adapters: feature number 2749, 2757, 2780, 5580, 5581, 5583, 5590, 5591, 5702, 5712, 5776, 5778, 5706
  - Fibre Channel adapters: feature number 2787, 5704, 5760, 5761
  - Integrated xSeries Servers: feature number 4812, 4813
  - Ethernet adapters: feature code 1981, 5718, 1982, 5719, 1984, 5707, 3709
  - IOPs: feature 2844, 2847, 3705
  - DTTA (telephony): feature number 6312
  - Twinax: feature 4746
  - Cryptographic adapters: features 4801, 5805
  - Diskette drives: Feature 2591
  - Quarter Inch Cartridge (QIC) tape drives (neither feature code or machine type model)
- One-step model upgrades from POWER5 or POWER5+™ are not supported. Only model upgrades from the 9117-MMA is supported. A 9406-MMA must first be converted to a 9117-MMA.
- UPS attachment to the system CEC via the Serial to SPCN feature (#1827) is no longer supported. UPS support may be added by using an existing attached #5802 or #5877 drawer, plus the necessary DDR IB cables, SPCN cable and GX+ + adapter (#1808).

Planning information

Cable orders

No additional cables are required.

Security, auditability, and control

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

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

IBM Electronic Services

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

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

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

To learn how Electronic Services can work for you, visit

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

Terms and conditions

Volume orders: Contact your IBM representative.

IBM Global Financing

Yes

Warranty period

One year

Warranty service

If required, IBM provides repair or exchange service. An IBM technician will attempt to resolve your problem over the telephone. You must follow IBM's problem determination and resolution procedures. Scheduling of service will depend upon the time of your call and is subject to parts availability. Service levels are response time objectives and are not guaranteed. The specified level of warranty service may not be available in all worldwide locations. Additional charges may apply outside

IBM's normal service area. Contact your local IBM representative or your reseller for country- and location-specific information.

Customer replaceable unit (CRU) service

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

- Tier 1 CRUs

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

  For machines with On-site same-day response service, IBM will replace a Tier 1 CRU part at your request, at no additional charge.

- Tier 2 CRUs

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

Based upon availability, CRUs will be shipped for next-business-day delivery. IBM specifies, in the materials shipped with a replacement CRU, whether a defective CRU must be returned to IBM. When return is required, return instructions and a container are shipped with the replacement CRU. You may be charged for the replacement CRU if IBM does not receive the defective CRU within 30 days of receipt of the replacement.

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

- Keyboard
- Mouse
- Display
- Mounting hardware
- Fans
- Line power cord
- Operator panel
- Power supply
- DASD
- ALL HEA and IB adapters
- RAID battery card and battery
- Slim line DVD

On-site service

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

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

Non-IBM parts support

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. Service levels are response-time objectives and are not guaranteed. Refer to the Warranty service section for additional details.

IBM will attempt to resolve your problem over the telephone or electronically by access to an IBM Web site. 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.

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

Maintenance services

If required, IBM provides repair or exchange service depending on the types of warranty service specified for the machine. IBM will attempt to resolve your problem over the telephone or electronically, via an IBM Web site. You must follow the problem determination and resolution procedures that IBM specifies. Scheduling of service will depend upon the time of your call and is subject to parts availability. If applicable to your product, parts considered Customer Replaceable Units (CRUs) will be provided as part of the machine's standard maintenance service. Service levels are response time objectives and are not guaranteed. The specified level of warranty service may not be available in all worldwide locations. Additional charges may apply outside IBM's normal service area. Contact your local IBM representative or your reseller for country and location-specific information.

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

Customer Replaceable Unit Service

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

- Tier 1 CRUs Installation of Tier 1 CRUs is your responsibility. If IBM installs a Tier 1 CRU at your request, you will be charged for the installation. For Machines with On-site Same-day Response Service IBM will replace a Tier 1 CRU part at your request, at no additional charge.
- Tier 2 CRUs You may install a Tier 2 CRU yourself or request IBM to install it, at no additional charge.

Based upon availability, CRUs will be shipped for next-business-day delivery. IBM specifies, in the materials shipped with a replacement CRU, whether a defective CRU must be returned to IBM. When return is required, (1) return instructions and a container is shipped with the replacement CRU, and (2) you may be charged for the replacement CRU if IBM does not receive the defective CRU within 30 days of your receipt of the replacement.

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

- Keyboard
- Mouse
- Display
- Mounting hardware

- Fans
- Line power cord
- Operator panel
- Power supply
- DASD
- ALL HEA and IB adapters
- RAID battery card and battery
- Slim line DVD

On-site service

IBM will repair the failing machine at your location and verify its operation. You must provide a suitable working area to allow disassembly and reassembly of the IBM machine. The area must be clean, well-lit, and suitable for the purpose. The following service selections are available as warranty upgrades for your machine type.

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

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

Non-IBM parts support

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

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

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

Warranty service upgrades

Usage plan machine

No

IBM hourly service rate classification

Two

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

Field-installable features

Yes

Model conversions

Yes

Machine installation

Installation is performed by IBM. IBM will install the machine in accordance with the IBM installation procedures for the machine. In the United States, contact IBM at 1-800-IBM-SERV (426-7378) and in other countries contact the local IBM office.

The *Machine Installation Guide* specifies site preparation, physical requirements and installation (operating) environment and any cabling included in the installation along with the approximate installation time in hours. Customer requests for installation of items not covered in the installation guide may be performed at IBM's hourly service rate designated for the machine.

Graduated program license charges apply

Yes.

The applicable processor tier is Medium.

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 for which the customer has acquired. You can obtain the agreement by contacting your IBM representative or at:

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

IBM may release changes to the machine code. IBM plans to make the machine code changes available for download from the IBM technical support Web site

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

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

Educational allowance

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

The educational allowance is 13% for the products in this announcement.

Prices

Product charges

Description	Model Number	Feature Number
Widescreen LCD Monitor	MMB	3632
T210 Flat-Panel Monitor	MMB	3635
IBM T541H /L150p 15" TFT Color Monitor	MMB	3637
IBM ThinkVision L170p Flat Panel Monitor		

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                      MMB     3639
ThinkVision L171p Flat Panel Monitor
                      MMB     3640
IBM T115 Flat Panel Monitor
                      MMB     3641
ThinkVision L191p Flat Panel Monitor
                      MMB     3642
IBM T120 Flat Panel Monitor
                      MMB     3643
IBM T119 Flat Panel Monitor
                      MMB     3644
IBM T117 Flat Panel Monitor
                      MMB     3645
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Note: these features are subject to a $16.00 electronic waste recycling fee (15-inch to 34-inch video device).

The following are newly announced features on the specific models of the IBM Power Systems 9117 machine type:

Description	Model Number	Feature Numbers	Initial/ MES/ Both/ Support	CSU	RP MES
IBM Power 770					
	MMB			No	
Specify Code for External High Speed Modem					
	MMB	0032	Both	Yes	No
Mirrored System Disk Level, Specify Code					
	MMB	0040	Both	Yes	No
Device Parity Protection-All, Specify Code					
	MMB	0041	Both	Yes	No
Mirrored System Bus Level, Specify Code					
	MMB	0043	Both	Yes	No
Device Parity RAID-6 All, Specify Code					
	MMB	0047	Both	Yes	No
RISC-to-RISC Data Migration					
	MMB	0205	Initial	Yes	No
AIX Partition Specify					
	MMB	0265	Both	Yes	No
Linux Partition Specify					
	MMB	0266	Both	Yes	No
IBM i Operating System Partition Specify					
	MMB	0267	Both	Yes	No
CSC Specify					
	MMB	0275	Both	Yes	No
Ext Tape Attached via #5736					
	MMB	0290	Both	Yes	No
Specify Custom Data Protection					
	MMB	0296	Both	Yes	No
Specify EXP24 Attach via Existing Controller					
	MMB	0302	Support	Yes	No
Mirrored Level System Specify Code					
	MMB	0308	Both	Yes	No
RAID Hot Spare Specify					
	MMB	0347	Both	Yes	No
V.24/EIA232 6.1m (20-Ft) PCI Cable					
	MMB	0348	Both	Yes	No
V.24/EIA232 15.2m (50-Ft) PCI Cable					
	MMB	0349	Support	Yes	No
V.35 6.1m (20-Ft) PCI Cable					
	MMB	0353	Both	Yes	No
V.35 15.2m (50-Ft) PCI Cable					
	MMB	0354	Support	Yes	No
V.36 6.1m (20-Ft) PCI Cable					

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                        MMB     0356                    Support  Yes No
X.21 6.1m (20-Ft) PCI Cable
                        MMB     0359                    Both     Yes No
X.21 15.2m (50-Ft) PCI Cable
                        MMB     0360                    Support  Yes No
V.24/EIA232 (80-Ft) PCI Cable
                        MMB     0365                    Support  Yes No

UPS Factory Integration Specify
                        MMB     0373                    MES      Yes No
HMC Factory Integration Specify
                        MMB     0374                    MES      Yes No
Display Factory Integration Specify
                        MMB     0375                    MES      Yes No
Reserve Rack Space for UPS
                        MMB     0376                    MES      Yes No
Reserve Rack Space for HMC
                        MMB     0377                    MES      Yes No
Reserve Rack Space for Display
                        MMB     0378                    MES      Yes No
MMA/MMB/MHB upgrade indicator
                        MMB     0397                    MES      Yes No
SSD Placement Indicator - CEC
                        MMB     0462                    Both     Yes No
SSD Placement Indicator (5802/5803)
                        MMB     0463                    Initial  N/A No
SSD Placement Indicator - 5886
                        MMB     0464                    Initial  N/A No
19 inch, 1.8 meter high rack
                        MMB     0551                    MES      Yes No
19 inch, 2.0 meter high rack
                        MMB     0553                    MES      Yes No
19 inch, 1.3 meter high rack
                        MMB     0555                    Support  Yes No
IBM i 6.1 with 6.1.1 Machine Code Specify Code
                        MMB     0566                    Both     Yes No
Rack Filler Panel Kit
                        MMB     0599                    Both     Yes No
Load Source Not in CEC
                        MMB     0719                    Both     Yes No
Specify Load Source in #5786
                        MMB     0725                    Support  Yes No
Specify Load Source in #5802/5803
                        MMB     0726                    Both     Yes No
Specify #5886 Load Source placement
                        MMB     0727                    Both     Yes No
#4327 Load Source Specify
                        MMB     0835                    Support  Yes No
#4328 Load Source Specify
                        MMB     0836                    Support  Yes No
SAN Load Source Specify
                        MMB     0837                    Both     Yes No
#3676 Load Source Specify
                        MMB     0838                    Support  Yes No
#3677 Load Source Specify
                        MMB     0839                    Both     Yes No
#3678 Load Source Specify
                        MMB     0840                    Both     Yes No
#4329 Load Source Specify
                        MMB     0841                    Support  Yes No
#3658 Load Source Specify
                        MMB     0844                    Both     Yes No
#1884 Load Source Specify
                        MMB     0851                    Both     Yes No
#1888 Load Source Specify
                        MMB     0853                    Both     Yes No
#1909 Load Source Specify
                        MMB     0854                    Both     Yes No
#3587 Load Source Specify
                        MMB     0855                    Both     Yes No
US TAA Compliance Indicator
                        MMB     0983                    Initial  N/A No
Modem Cable - US/Canada and General Use
                        MMB     1025                    Both     Yes No
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USB External Docking Station for Removable Disk Drive
                        MMB     1104                    Both     Yes No
USB 160 GB Removable Disk Drive
                        MMB     1106                    Both     Yes No
USB 500 GB Removable Disk Drive
                        MMB     1107                    Both     Yes No
Decline Electronic Service Agent Install Indicator
                        MMB     1120                    Initial  N/A No
200V 16A 4.3m (14-Ft) TL Line Cord
                        MMB     1406                    Support  Yes No
125V 4.3m (14-Ft) Line Cord
                        MMB     1413                    Support  Yes No
200V 1.8m (6-Ft) Locking Line Cord
                        MMB     1414                    Support  Yes No200V 1.8m (6-Ft) Watertight Line Cord
                        MMB     1415                    Support  Yes No200V 4.3m (14-Ft) Locking Line Cord
                        MMB     1416                    Support  Yes No200V 4.3m (14-Ft) Watertight Line Cord
                        MMB     1417                    Support  Yes No

4.3m 200V/16A Power Cord S. Africa
                        MMB     1418                    Support  Yes No
4.3m 200V/16A Power Cord Israel
                        MMB     1419                    Support  Yes No
4.3m 200V/16A Power Cord EU/Asia
                        MMB     1420                    Support  Yes No
4.3m 200V/16A Power Cord CH/DK
                        MMB     1421                    Support  Yes No

200V 1.8m (6-Ft) Locking Line Cord
                        MMB     1424                    Support  Yes No
200V 1.8m (6-Ft) Watertight Line Cord
                        MMB     1425                    Support  Yes No
200V 4.3m (14-Ft) Locking Line Cord
                        MMB     1426                    Support  Yes No
200V 4.3m (14-Ft) Watertight Line Cord
                        MMB     1427                    Support  Yes No

4.3m 200V/10A Power Cord EU/Asia
                        MMB     1439                    Support  Yes No
4.3m 200V/10A Power Cord Denmark
                        MMB     1440                    Support  Yes No
4.3m 200V/10A Power Cord S. Africa
                        MMB     1441                    Support  Yes No
4.3m 200V/10A Power Cord Swiss
                        MMB     1442                    Support  Yes No
4.3m 200V/10A Power Cord UK
                        MMB     1443                    Support  Yes No
4.3m 200V/10A Power Cord Israel
                        MMB     1445                    Support  Yes No


4.3m 200V/32A Power Cord EU 1-PH
                        MMB     1449                    Support  Yes No
4.3m 200V/16A Power Cord EU 2-PH
                        MMB     1450                    Support  Yes No

200V (6-Ft) 1.8m Line Cord
                        MMB     1451                    Support  Yes No
200V (14-Ft) 4.3m Line Cord
                        MMB     1452                    Support  Yes No
200V (6-Ft) 1.8m Locking Line Cord
                        MMB     1453                    Support  Yes No
200V 12A (14-Ft) 4.3m TL Line Cord
                        MMB     1454                    Support  Yes No200V (6-Ft) 1.8m Watertight Line Cord
                        MMB     1455                    Support  Yes No200V (14-Ft) 4.3m Watertight Line Cord
                        MMB     1456                    Support  Yes No200V (6-Ft) 1.8m Upper Line Cord
                        MMB     1457                    Support  Yes No
200V (6-Ft) 1.8m Upper Locking Cord
                        MMB     1458                    Support  Yes No
200V (6-Ft) 1.8m Upper Locking Cord
                        MMB     1459                    Support  Yes No
30m SPCN Cable
                        MMB     1466                    Support  Yes No
4.3m 200V/12A Pwr Cd UK
                        MMB     1476                    Support  Yes No
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4.3m 200V/16A Pwr Cd
MMB 1477 Support Yes No

Integrated, 4 Port- 1Gb Virtual Ethernet, I/O ports
MMB 1803 Both Yes No
Integrated, 4 Port (2x1Gb and 2x10Gb SFP+ Optical ports)
MMB 1804 Both Yes No
GX++ 12X DDR Adapter, Dual-port
MMB 1808 Both Yes No
Integrated, 4 Port (2x1Gb and 2x10Gb SFP+ Copper twinax ports)
MMB 1813 Both Yes No
SAS Cable for triple split DASD backplane
MMB 1815 Both Yes No
SAS Cable Assembly for SAS Port
MMB 1819 Both Yes No
1.5 Meter 12X to 4X Channel Conversion Cable
MMB 1828 Both Yes No
0.6 Meter 12X Cable
MMB 1829 Support Yes No
1.5 Meter 12X cable
MMB 1830 Support Yes No
8.0 Meter 12X Cable
MMB 1834 Support Yes No
3.0 Meter 12X Cable
MMB 1840 Support Yes No
3 Meter 12X to 4X Channel Conversion Cable
MMB 1841 Both Yes No
10 Meter 12X to 4X Channel Conversion Cable
MMB 1842 Support Yes No
Operator Panel
MMB 1853 Both Yes No
10 Meter 12X to 4X Enhanced Channel Conversion Cable
MMB 1854 Both Yes No
0.6 Meter 12X DDR Cable
MMB 1861 Both Yes No
1.5 Meter 12X DDR Cable
MMB 1862 Both Yes No
8.0 Meter 12X DDR Cable
MMB 1864 Both Yes No
3.0 Meter 12X DDR Cable
MMB 1865 Both Yes No
146.8GB 10K RPM SAS SFF Disk Drive
MMB 1882 Both Yes No
73.4 GB 15K RPM SAS SFF Disk Drive
MMB 1883 Both Yes No
69.7 GB 15K RPM SAS SFF Disk Drive
MMB 1884 Both Yes No
300GB 10K RPM SFF SAS Disk Drive
MMB 1885 Both Yes No
146GB 15K RPM SFF SAS Disk Drive
MMB 1886 Both Yes No
139GB 15K RPM SFF SAS Disk Drive
MMB 1888 Both Yes No
69GB SFF SAS Solid State Drive
MMB 1890 Both Yes No
Quantity 150 of #1883
MMB 1891 Both Yes No
Quantity 150 of #1882
MMB 1899 Both Yes No
69GB SFF SAS Solid State Drive
MMB 1909 Both Yes No
PCI-X DDR Dual Channel Ultra320 SCSI Adapter
MMB 1912 Support Yes No
Converter Cable, VHDCI to P, Mini-68 pin to 68 pin, 0.3M
MMB 2118 Support Yes No
Ultra 320 SCSI Cable 1 Meter
MMB 2124 Support Yes No
Ultra 320 SCSI Cable 3 Meter
MMB 2125 Support Yes No
Ultra 320 SCSI Cable 5 Meter
MMB 2126 Support Yes No
Ultra 320 SCSI Cable 10 Meter
MMB 2127 Support Yes No
Ultra 320 SCSI Cable 20 Meter

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                        MMB     2128                    Support  Yes No
0.55 Meter Ultra 320 SCSI Cable
                        MMB     2138                    Support  Yes No
Primary OS - IBM i
                        MMB     2145                    Both     Yes No
Primary OS - AIX
                        MMB     2146                    Both     Yes No
Primary OS - Linux
                        MMB     2147                    Both     Yes No
2M LC-SC 50 Micron Fiber Converter Cable
                        MMB     2456                    Both     Yes No
2M LC-SC 62.5 Micron Fiber Converter Cable
                        MMB     2459                    Both     Yes No
4 port USB PCIe Adapter
                        MMB     2728                    Both     Yes No
2-Port USB PCI Adapter
                        MMB     2738                    Support  Yes No
POWER GXT135P Graphics Accelerator with Digital Support
                        MMB     2849                    Support  Yes No
ARTIC960Hx 4-Port EIA-232 Cable
                        MMB     2861                    Support  Yes No
ARTIC960Hx 4-Port X.21 Cable
                        MMB     2863                    Support  Yes No
ARTIC960Hx 4-Port V.35 (DTE) Cable
                        MMB     2864                    Support  Yes No
PCIe 2-Line WAN w/Modem
                        MMB     2893                    Both     Yes No
3M Asynchronous Terminal/Printer Cable EIA-232
                        MMB     2934                    Both     Yes No
Asynchronous Cable EIA-232/V.24 3M
                        MMB     2936                    Both     Yes No
8-Port Asynchronous Adapter EIA-232/RS-422, PCI bus
                        MMB     2943                    Support  Yes No
IBM ARTIC960Hx 4-Port Multiprotocol PCI Adapter
                        MMB     2947                    Support  Yes No
Cable, V.24 / EIA-232
                        MMB     2951                    Support  Yes No
Cable, V.35
                        MMB     2952                    Support  Yes No
Cable, V.36 / EIA-499
                        MMB     2953                    Support  Yes No
Cable, X.21
                        MMB     2954                    Support  Yes No
2-Port Multiprotocol PCI Adapter
                        MMB     2962                    Support  Yes No
Serial-to-Serial Port Cable for Drawer/Drawer- 3.7M
                        MMB     3124                    Both     Yes No
Serial-to-Serial Port Cable for Rack/Rack- 8M
                        MMB     3125                    Both     Yes No
73.4 GB 15,000 RPM Ultra320 SCSI Disk Drive Assembly
                        MMB     3278                    Support  Yes No
146.8 GB 15,000 RPM Ultra320 SCSI Disk Drive Assembly
                        MMB     3279                    Support  Yes No
300 GB 15K RPM SCSI Disk Drive
                        MMB     3585                    Support  Yes No
69GB 3.5" SAS Solid State Drive
                        MMB     3586                    Both     Yes No
69GB 3.5" SAS Solid State Drive
                        MMB     3587                    Both     Yes No
Widescreen LCD Monitor
                        MMB     3632                    Both     Yes No
T210 Flat-Panel Monitor
                        MMB     3635                    Support  Yes No
IBM T541H /L150p 15" TFT Color Monitor
                        MMB     3637                    Support  Yes No
IBM ThinkVision L170p Flat Panel Monitor
                        MMB     3639                    Support  Yes No
ThinkVision L171p Flat Panel Monitor
                        MMB     3640                    Support  Yes No
IBM T115 Flat Panel Monitor
                        MMB     3641                    Support  Yes No
ThinkVision L191p Flat Panel Monitor
                        MMB     3642                    Support  Yes No
IBM T120 Flat Panel Monitor
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                        MMB     3643                    Support  Yes No
IBM T119 Flat Panel Monitor
                        MMB     3644                    Support  Yes No
IBM T117 Flat Panel Monitor
                        MMB     3645                    Support  Yes No
73GB 15K RPM SAS Disk Drive
                        MMB     3646                    Support  Yes No
146GB 15K RPM SAS Disk Drive
                        MMB     3647                    Both     Yes No
300GB 15K RPM SAS Disk Drive
                        MMB     3648                    Both     Yes No
450GB 15K RPM SAS Disk Drive
                        MMB     3649                    Both     Yes No
SAS Cable (EE) Drawer to Drawer 1M
                        MMB     3652                    Both     Yes No
SAS Cable (EE) Drawer to Drawer 3M
                        MMB     3653                    Both     Yes No
SAS Cable (EE) Drawer to Drawer 6M
                        MMB     3654                    Both     Yes No
428GB 15K RPM SAS Disk Drive
                        MMB     3658                    Both     Yes No
SAS Cable (X) Adapter to SAS Enclosure, Dual Controller/Dual Path 3M:
                        MMB     3661                    Both     Yes No
SAS Cable (X) Adapter to SAS Enclosure, Dual Controller/Dual Path 6M:
                        MMB     3662                    Both     Yes No
SAS Cable (X) Adapter to SAS Enclosure, Dual Controller/Dual Path
15M:
                        MMB     3663                    Both     Yes No
Serv Interface Cable- 2, 3, and 4 Enclosure
                        MMB     3671                    Both     Yes No
Serv Interface Cable- 3 and 4 Enclosure
                        MMB     3672                    Both     Yes No
Serv Interface Cable- 4 Enclosure
                        MMB     3673                    Both     Yes No
69.7GB 15k rpm SAS Disk Drive
                        MMB     3676                    Support  Yes No
139.5GB 15k rpm SAS Disk Drive
                        MMB     3677                    Both     Yes No
283.7GB 15k rpm SAS Disk Drive
                        MMB     3678                    Both     Yes No
SAS Cable (AI)- Adapter to Internal drive 1M
                        MMB     3679                    Both     Yes No
3M SAS CABLE, ADPTR TO ADPTR (AA)
                        MMB     3681                    Both     Yes No
6M SAS CABLE, ADPTR TO ADPTR (AA)
                        MMB     3682                    Both     Yes No
SAS Cable (AE) Adapter to Enclosure, single controller/single path 3M
                        MMB     3684                    Both     Yes No
SAS Cable (AE) Adapter to Enclosure, single controller/single path 6M
                        MMB     3685                    Both     Yes No
SAS Cable (YI) System to SAS Enclosure, Single Controller/Dual Path
1.5M
                        MMB     3686                    Both     Yes No
SAS Cable (YI) System to SAS Enclosure, Single Controller/Dual Path
3M
                        MMB     3687                    Both     Yes No
SAS Cable (AT®) 0.6 Meter
                        MMB     3688                    Both     Yes No
SAS Cable (YO) Adapter to SAS Enclosure, Single Controller/Dual Path
1.5 M
                        MMB     3691                    Both     Yes No
SAS Cable (YO) Adapter to SAS Enclosure, Single Controller/Dual Path
3 M
                        MMB     3692                    Both     Yes No
SAS Cable (YO) Adapter to SAS Enclosure, Single Controller/Dual Path
6 M
                        MMB     3693                    Both     Yes No
SAS Cable (YO) Adapter to SAS Enclosure, Single Controller/Dual Path
15 M
                        MMB     3694                    Both     Yes No
Processor Cable, Two-Drawer System
                        MMB     3711                    Both     Yes No
Processor Cable, Two, Three or Four Drawer System
                        MMB     3712                    Both     Yes No
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Processor Cable, Three or Four Drawer System
MMB 3713 Both Yes No
Processor Cable, Four-Drawer System
MMB 3714 Both Yes No
0.3M Serial Port Converter Cable, 9-Pin to 25-Pin
MMB 3925 Both Yes No
Asynch Printer/Terminal Cable, 9-pin to 25-pin, 4M
MMB 3926 Both Yes No
Serial Port Null Modem Cable, 9-pin to 9-pin, 3.7M
MMB 3927 Both Yes No
Serial Port Null Modem Cable, 9-pin to 9-pin, 10M
MMB 3928 Both Yes No
1.8 M (6-ft) Extender Cable for Displays (15-pin D-shell to 15-pin D-shell)
MMB 4242 Both Yes No
Extender Cable - USB Keyboards, 2M
MMB 4256 Both Yes No
VGA to DVI Connection Converter
MMB 4276 Both Yes No
70.56GB 15k rpm Disk Unit
MMB 4327 Support Yes No
141.12GB 15k rpm Disk Unit
MMB 4328 Support Yes No
282.25GB 15k rpm Disk Unit
MMB 4329 Support Yes No
One and only one rack indicator features is required onall orders (#4650 to #4666).
Rack Indicator- Not Factory Integrated
MMB 4650 Initial N/A No
Rack Indicator, Rack #1
MMB 4651 Initial N/A No
Rack Indicator, Rack #2
MMB 4652 Initial N/A No
Rack Indicator, Rack #3
MMB 4653 Initial N/A No
Rack Indicator, Rack #4
MMB 4654 Initial N/A No
Rack Indicator, Rack #5
MMB 4655 Initial N/A No
Rack Indicator, Rack #6
MMB 4656 Initial N/A No
Rack Indicator, Rack #7
MMB 4657 Initial N/A No
Rack Indicator, Rack #8
MMB 4658 Initial N/A No
Rack Indicator, Rack #9
MMB 4659 Initial N/A No
Rack Indicator, Rack #10
MMB 4660 Initial N/A No
Rack Indicator, Rack #11
MMB 4661 Initial N/A No
Rack Indicator, Rack #12
MMB 4662 Initial N/A No
Rack Indicator, Rack #13
MMB 4663 Initial N/A No
Rack Indicator, Rack #14
MMB 4664 Initial N/A No
Rack Indicator, Rack #15
MMB 4665 Initial N/A No
Rack Indicator, Rack #16
MMB 4666 Initial N/A No
PCI-X Cryptographic Coprocessor (FIPS 4)
MMB 4764 Both Yes No
ACTIVE MEMORY EXPANSION ENABLEMENT
MMB 4791 Both Yes No
CBU SPECIFY
MMB 4891 Initial N/A No
3.5 GHz Proc Card, 0/12 Core POWER7, 16 DDR3 Memory Slots
MMB 4980 Both No No
3.1 GHz Proc Card, 0/16 Core POWER7, 16 DDR3 Memory Slots
MMB 4981 Both No No
Single 5250 Enterprise Enablement
MMB 4992 Both Yes No
Full 5250 Enterprise Enablement
MMB 4997 Both Yes No

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Software Preload Required
                        MMB     5000                    Initial  N/A No
Custom Service Specify, Off-Site
                        MMB     5001                    Support  Yes NoCustomer Solution Center - Rochester Mfg
                        MMB     5002                    Initial  N/A No
Power Dist Unit 1 Phase NEMA
                        MMB     5160                    Support  Yes No
Power Dist Unit 1 Phase IEC
                        MMB     5161                    Support  Yes No
Power Dist Unit 2 of 3 Phase
                        MMB     5162                    Support  Yes No
Power Dist Unit - 3 Phase
                        MMB     5163                    Support  Yes No
One Processor Activation for Processor Feature #4980
                        MMB     5459                    Both     Yes No
One Processor Activation for Processor Feature #4981
                        MMB     5468                    Both     Yes No
RFID TAGS FOR SERVERS, BLADES, BLADECENTERS, RACKS, AND HMCS
                        MMB     5524                    Both     Yes No
Sys Console On HMC
                        MMB     5550                    Both     Yes No
Sys Console-Ethernet No IOP
                        MMB     5553                    Both     Yes No
0/32GB DDR3 Memory (4X8GB) DIMMS - 1066 MHz - POWER7 CoD Memory
                        MMB     5600                    Both     No  No
0/64GB DDR3 Memory (4X16GB) DIMMS - 1066 MHz - POWER7 CoD Memory
                        MMB     5601                    Both     No  No
0/128GB DDR3 Memory (4X32GB) DIMMS - 800 MHz - POWER7 CoD Memory
                        MMB     5602                    Both     No  No
System AC Power Supply, 1725 W
                        MMB     5632                    Both     Yes No
Blind Swap Type III Cassette- PCIe, Short Slot
                        MMB     5646                    MES      Yes No
Blind Swap Type III Cassette- PCI-X or PCIe, Standard Slot
                        MMB     5647                    MES      Yes No
Disk/Media Backplane
                        MMB     5652                    Both     No  No
System CEC Enclosure with IBM BEZEL, I/O Backplane, and System
Midplane
                        MMB     5659                    Both     No  No
175MB Cache RAID - Dual IOA Enablement Card
                        MMB     5662                    Both     Yes No
Service Processor
                        MMB     5664                    Both     No  No
FSP/Clock Pass Through Card
                        MMB     5665                    Both     Yes No
System CEC Enclosure with OEM BEZEL, I/O Backplane, and System
Midplane
                        MMB     5669                    Both     No  No
IBM Gigabit Ethernet-SX PCI-X Adapter
                        MMB     5700                    Support  Yes No
IBM 10/100/1000 Base-TX Ethernet PCI-X Adapter
                        MMB     5701                    Support  Yes No
IBM 2-Port 10/100/1000 Base-TX Ethernet PCI-X Adapter
                        MMB     5706                    Both     Yes No
10Gb FCoE PCIe Dual Port Adapter
                        MMB     5708                    Both     Yes No
1 Gigabit iSCSI TOE PCI-X on Copper Media Adapter
                        MMB     5713                    Both     Yes No
1 Gigabit iSCSI TOE PCI-X on Optical Media Adapter
                        MMB     5714                    Support  Yes No
2 Gigabit Fibre Channel PCI-X Adapter
                        MMB     5716                    Support  Yes No
4-Port 10/100/1000 Base-TX PCI Express Adapter
                        MMB     5717                    Both     Yes No
10 Gb Ethernet-SR PCI-X 2.0 DDR Adapter
                        MMB     5721                    Support  Yes No
10 Gb Ethernet-LR PCI-X 2.0 DDR Adapter
                        MMB     5722                    Support  Yes No
2-Port Asynchronous EIA-232 PCI Adapter
                        MMB     5723                    Support  Yes No
10 Gigabit Ethernet-CX4 PCI Express Adapter
                        MMB     5732                    Both     Yes No
8 Gigabit PCI Express Dual Port Fibre Channel Adapter
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                        MMB     5735                    Both     Yes No
PCI-X DDR Dual Channel Ultra320 SCSI Adapter
                        MMB     5736                    Both     Yes No
4-Port 10/100/1000 Base-TX PCI-X Adapter
                        MMB     5740                    Support  Yes No
IBM Single Bus Ultra 320 SCSI Repeater Card
                        MMB     5741                    Support  Yes No
IBM Dual Bus Ultra 320 SCSI Repeater Card
                        MMB     5742                    Support  Yes No
POWER GXT145 PCI Express Graphics Accelerator
                        MMB     5748                    Both     Yes No
4Gbps Fibre Channel (2-Port)
                        MMB     5749                    Both     Yes No
4 GB Single-Port Fibre Channel PCI-X 2.0 DDR Adapter
                        MMB     5758                    Support  Yes No
4 Gb Dual-Port Fibre Channel PCI-X 2.0 DDR Adapter
                        MMB     5759                    Both     Yes No
SATA Slimline DVD-RAM Drive
                        MMB     5762                    Both     Yes No
2-Port 10/100/1000 Base-TX Ethernet PCI Express Adapter
                        MMB     5767                    Both     Yes No
2-Port Gigabit Ethernet-SX PCI Express Adapter
                        MMB     5768                    Both     Yes No
10 Gigabit Ethernet-SR PCI Express Adapter
                        MMB     5769                    Both     Yes No
10 Gigabit Ethernet-LR PCI Express Adapter
                        MMB     5772                    Both     Yes No
4 Gigabit PCI Express Single Port Fibre Channel Adapter
                        MMB     5773                    Support  Yes No
4 Gigabit PCI Express Dual Port Fibre Channel Adapter
                        MMB     5774                    Both     Yes No
PCI-X EXP24 Ctl-1.5GB No IOP
                        MMB     5782                    Support  Yes No
4 Port Async EIA-232 PCIe Adapter
                        MMB     5785                    Both     Yes No
TotalStorage EXP24 Disk Dwr
                        MMB     5786                    Support  Yes No
PCI-DDR 12X Expansion Drawer
                        MMB     5796                    Both     Yes No
12X I/O Drawer PCIe, SFF disk
                        MMB     5802                    Both     Yes No
12X I/O Drawer PCIe, No Disk
                        MMB     5877                    Both     Yes No
EXP 12S Expansion Drawer
                        MMB     5886                    Both     Yes No
PCI-X DDR Dual -x4 SAS Adapter
                        MMB     5900                    Support  Yes No
PCIe Dual-x4 SAS Adapter
                        MMB     5901                    Both     Yes No
PCI-X DDR Dual - x4 3Gb SAS RAID Adapter
                        MMB     5902                    Support  Yes No
PCIe 380MB Cache Dual - x4 3Gb SAS RAID Adapter
                        MMB     5903                    Both     Yes No
PCI-X DDR 1.5GB Cache SAS RAID Adapter (BSC)
                        MMB     5908                    Both     Yes No
PCI-X DDR Dual - x4 SAS Adapter
                        MMB     5912                    Support  Yes No
Non-paired SAS RAID indicator
                        MMB     5922                    Support  Yes No
Non-paired PCIe SAS RAID Indicator
                        MMB     5923                    Both     Yes No
Full Width Keyboard -- USB, US English, #103P
                        MMB     5951                    Both     Yes No
Full Width Keyboard -- USB, French, #189
                        MMB     5952                    Both     Yes No
Full Width Keyboard -- USB, Italian, #142
                        MMB     5953                    Both     Yes No
Full Width Keyboard -- USB, German/Austrian, #129
                        MMB     5954                    Both     Yes No
Full Width Keyboard -- USB, UK English, #166P
                        MMB     5955                    Both     Yes No
Full Width Keyboard -- USB, Spanish, #172
                        MMB     5956                    Both     Yes No
Full Width Keyboard -- USB, Japanese, #194
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                        MMB     5957                    Both     Yes No
Full Width Keyboard -- USB, Brazilian Portuguese, #275
                        MMB     5958                    Both     Yes No
Full Width Keyboard -- USB, Hungarian, #208
                        MMB     5959                    Both     Yes No
Full Width Keyboard -- USB, Korean, #413
                        MMB     5960                    Both     Yes No
Full Width Keyboard -- USB, Chinese, #467
                        MMB     5961                    Both     Yes No
Full Width Keyboard -- USB, French Canadian, #445
                        MMB     5962                    Both     Yes No
Full Width Keyboard -- USB, Belgian/UK, #120
                        MMB     5964                    Both     Yes No
Full Width Keyboard -- USB, Swedish/Finnish, #153
                        MMB     5965                    Both     Yes No
Full Width Keyboard -- USB, Danish, #159
                        MMB     5966                    Both     Yes No
Full Width Keyboard -- USB, Bulgarian, #442
                        MMB     5967                    Both     Yes No
Full Width Keyboard -- USB, Swiss/French/German, #150
                        MMB     5968                    Both     Yes No
Full Width Keyboard -- USB, Norwegian,#155
                        MMB     5969                    Both     Yes No
Full Width Keyboard -- USB, Dutch, #143
                        MMB     5970                    Both     Yes No
Full Width Keyboard -- USB, Portuguese, #163
                        MMB     5971                    Both     Yes No
Full Width Keyboard -- USB, Greek, #319
                        MMB     5972                    Both     Yes No
Full Width Keyboard -- USB, Hebrew, #212
                        MMB     5973                    Both     Yes No
Full Width Keyboard -- USB, Polish, #214
                        MMB     5974                    Both     Yes No
Full Width Keyboard -- USB, Slovakian, #245
                        MMB     5975                    Both     Yes No
Full Width Keyboard -- USB, Czech, #243
                        MMB     5976                    Both     Yes No
Full Width Keyboard -- USB, Turkish, #179
                        MMB     5977                    Both     Yes No
Full Width Keyboard -- USB, LA Spanish, #171
                        MMB     5978                    Both     Yes No
Full Width Keyboard -- USB, Arabic, #253
                        MMB     5979                    Both     Yes No
Full Width Keyboard -- USB, Thai, #191
                        MMB     5980                    Both     Yes No
Full Width Keyboard -- USB, Russian, #443
                        MMB     5981                    Both     Yes No
Full Width Keyboard -- USB, Slovenian, #234
                        MMB     5982                    Both     Yes No
Full Width Keyboard -- USB, US English Euro, #103P
                        MMB     5983                    Both     Yes No
Power Control Cable (SPCN) - 2 meter
                        MMB     6001                    Support  Yes No
Power Control Cable (SPCN) - 3 meter
                        MMB     6006                    Both     Yes No
Power Control Cable (SPCN) - 15 meter
                        MMB     6007                    Both     Yes No
Power Control Cable (SPCN) - 6 meter
                        MMB     6008                    Support  Yes No
Power Control Cable (SPCN) - 30 meter
                        MMB     6029                    Support  Yes No
Opt Front Door for 1.8m Rack
                        MMB     6068                    MES      Yes No
Opt Front Door for 2.0m Rack
                        MMB     6069                    MES      Yes No
1.8m Rack Trim Kit
                        MMB     6246                    Support  Yes No
2.0m Rack Trim Kit
                        MMB     6247                    Support  Yes No
1.8m Rack Acoustic Doors
                        MMB     6248                    MES      Yes No
2.0m Rack Acoustic Doors
                        MMB     6249                    MES      Yes No
1.8m Rack Trim Kit
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                        MMB     6263                    Both     Yes No
2.0m Rack Trim Kit
                        MMB     6272                    Both     Yes No
Dual-port 12X Channel Attach- Short Run
                        MMB     6446                    Both     Yes No
4.3m (14-Ft) 250V/10A Power Cord
                        MMB     6451                    Support  Yes No
4.3m (14-Ft) 250V/10A Power Cord
                        MMB     6455                    Support  Yes No

Dual-port 12X Channel Attach- Long Run
                        MMB     6457                    Both     Yes No
Power Cable -- Drawer to IBM PDU, 14-foot, 250V/10A
                        MMB     6458                    Both     Yes No
3.7m (12-Ft) 250V/10A RA Pwr Cd
                        MMB     6459                    Both     Yes No
Power Cord 4.3m (14-ft), Drawer To OEM PDU (125V, 15A)
                        MMB     6460                    Both     Yes No
4.3m (14-Ft) 250V/10A Power Cord
                        MMB     6461                    Support  Yes No
4.3m (14-Ft) 250V/10A Power Cord
                        MMB     6462                    Support  Yes No
4.3m (14-Ft) 250V/10A Power Cord
                        MMB     6463                    Support  Yes No
4.3m (14-Ft) 250V/10A Power Cord
                        MMB     6464                    Support  Yes No
4.3m (14-Ft) 250V/10A Power Cord
                        MMB     6465                    Support  Yes No
4.3m (14-Ft) 250V/10A Power Cord
                        MMB     6466                    Support  Yes No
4.3m (14-Ft) 250V/10A Power Cord
                        MMB     6467                    Support  Yes No
Power Cord 4.3m (14-foot), Drawer to OEM PDU, (250V, 15A), U. S.
                        MMB     6469                    Both     Yes No
Power Cord 1.8m(6-foot), To Wall (125V, 15A)
                        MMB     6470                    Support  Yes No
Power Cord 2.7m (9-foot), To Wall/OEM PDU, (125V, 15A)
                        MMB     6471                    Both     Yes No
Power Cord 2.7m (9-foot), To Wall/OEM PDU, (250V, 16A)
                        MMB     6472                    Both     Yes No
Power Cord 2.7m (9-foot), To Wall/OEM PDU, (250V, 10A)
                        MMB     6473                    Both     Yes No
Power Cord 2.7M (9-foot), To Wall/OEM PDU, (250V, 13A)
                        MMB     6474                    Both     Yes No
Power Cord 2.7M (9-foot), To Wall/OEM PDU, (250V, 16A)
                        MMB     6475                    Both     Yes No
Power Cord 2.7M (9-foot), To Wall/OEM PDU, (250V, 10A)
                        MMB     6476                    Both     Yes No
Power Cord 2.7M (9-foot), To Wall/OEM PDU, (250V, 16A)
                        MMB     6477                    Both     Yes No
Power Cord 2.7 M(9-foot), To Wall/OEM PDU, (250V, 16A)
                        MMB     6478                    Both     Yes No
Power Cord (9-foot) , To Wall/OEM PDU, (250V, 10A)
                        MMB     6479                    Support  Yes No
Power Cord 1.8M (6-foot),To Wall, (250V, 15A), United States
                        MMB     6487                    Both     Yes No
Power Cord 2.7M (9-foot), To Wall/OEM PDU, (125V, 15A or 250V, 10A )
                        MMB     6488                    Both     Yes No
4.3m (14-Ft) 3PH/24A Power Cord
                        MMB     6489                    MES      Yes No
4.3m (14-Ft) 1PH/48A Pwr Cord
                        MMB     6491                    MES      Yes No
4.3m (14-Ft) 1PH/48-60A Pwr Cord
                        MMB     6492                    MES      Yes NoPower Cord 2.7M (9-foot), To Wall/OEM PDU,
                        MMB     6493                    Both     Yes No
Power Cord 2.7M (9-foot), To Wall/OEM PDU, (250V, 10A)
                        MMB     6494                    Both     Yes No
Power Cord (9-foot), To Wall/OEM PDU, (250V, 10A)
                        MMB     6495                    Support  Yes No
Power Cord 2.7M (9-foot), To Wall/OEM PDU, (250V, 10A)
                        MMB     6496                    Both     Yes No
Power Cord (6-foot), To Wall/OEM PDU, (250V, 10A)
                        MMB     6497                    Both     Yes No
Power Cord (6-foot), To Wall/OEM PDU, (250V, 15A)
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                        MMB     6498                    Support  Yes No
Power Cable - Drawer to IBM PDU, 200-240V/10A
                        MMB     6577                    Initial  N/A No
Optional Rack Security Kit
                        MMB     6580                    MES      Yes No
Modem Tray for 19-Inch Rack
                        MMB     6586                    MES      Yes No
Power Cord 2.7M (9-foot), To Wall/OEM PDU, (125V, 15A)
                        MMB     6651                    Both     Yes No
4.3m (14-Ft) 1PH/24-30A Pwr Cord
                        MMB     6654                    MES      Yes No
4.3m (14-Ft) 1PH/24-30A WR Pwr Cord
                        MMB     6655                    MES      Yes No
4.3m (14-Ft)1PH/24A Power Cord
                        MMB     6656                    MES      Yes No

Power Cord 2.7M (9-foot), To Wall/OEM PDU, (250V, 15A)
                        MMB     6659                    Both     Yes No
Power Cord (14-foot), Drawer To OEM PDU (125V, 15A)
                        MMB     6660                    MES      Yes No
2.1m (7-Ft) 200V PDU Power Cable
                        MMB     6664                    Support  Yes No
Power Cord 3 M (10 ft), Drawer to IBM PDU, 250V/10A
                        MMB     6665                    Both     Yes No
Power Cord 4.3M (14-foot), Drawer to OEM PDU, (250V, 15A)
                        MMB     6669                    Both     Yes No
Power Cord (6-foot), To Wall (125V, 15A),
                        MMB     6670                    Support  Yes No
Power Cord 2.7M (9-foot), Drawer to IBM PDU, 250V/10A
                        MMB     6671                    Both     Yes No
Power Cord 1.5M (5-foot), Drawer to IBM PDU, 250V/10A
                        MMB     6672                    Both     Yes No
Power Cord 2.7M (9-foot), To Wall/OEM PDU, (250V, 10A)
                        MMB     6680                    Both     Yes No
Power Cord (6-foot), To Wall, (250V, 15A)
                        MMB     6687                    Support  Yes No

PCI 2-Line WAN IOA No IOP
                        MMB     6805                    Support  Yes No
PCI 4-Modem WAN IOA No IOP
                        MMB     6808                    Both     Yes No


PCI 2-Line WAN w/Modem NoIOP
                        MMB     6833                    Support  Yes No
Intelligent PDU+, 1 EIA Unit, Universal UTG0247 Connector
                        MMB     7109                    MES      Yes No
Environmental Monitoring Probe
                        MMB     7118                    Both     Yes No
Power Distribution Unit
                        MMB     7188                    MES      Yes No
Quantity 150 of #2124
                        MMB     7204                    Support  Yes No
Quantity 150 of #2125
                        MMB     7205                    Support  Yes No
Quantity 150 of #2126
                        MMB     7206                    Support  Yes No
Quantity 150 of #2127
                        MMB     7207                    Support  Yes No
Quantity 150 of #2128
                        MMB     7208                    Support  Yes No
Quantity 150 of #2138
                        MMB     7213                    Support  Yes No
SDI Software Pre-Install Indicator
                        MMB     7305                    Initial  N/A NoI/O Drawer Mounting Enclosure
                        MMB     7314                    Both     Yes No
On/Off, 1GB-1Day, Memory Billing POWER7
                        MMB     7377                    Both     Yes No
Quantity 150 of #4327
                        MMB     7509                    Support  Yes No
Quantity 150 of #4328
                        MMB     7510                    Support  Yes No
Quantity 150 of #4329
                        MMB     7511                    Support  Yes No
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Quantity 150 of #5741
                        MMB     7514                    Support  Yes No
Quantity 150 of #3676
                        MMB     7517                    Support  Yes No
Quantity 150 of #3677
                        MMB     7518                    Both     Yes No
Quantity 150 of #3678
                        MMB     7519                    Both     Yes No
Quantity 150 of #3586
                        MMB     7535                    Both     Yes No
Quantity 150 of #3587
                        MMB     7536                    Both     Yes No
Quantity 150 of #3658
                        MMB     7538                    Both     Yes No
Quantity 150 of #1884
                        MMB     7543                    Both     Yes No
Quantity 150 of #1888
                        MMB     7544                    Both     Yes No
Quantity 150 of #1890
                        MMB     7545                    Both     Yes No
Quantity 150 of #1909
                        MMB     7546                    Both     Yes No
Quantity 150 of #1885
                        MMB     7547                    Both     Yes No
Quantity 150 of #1886
                        MMB     7548                    Both     Yes No
Quantity 150 of #3647
                        MMB     7549                    Both     Yes No
Quantity 150 of #3648
                        MMB     7564                    Both     Yes No
Quantity 150 of #3649
                        MMB     7565                    Both     Yes No
PROC COD UTILITY BILLING FOR FC 4980, 100 PROC-MINS
                        MMB     7642                    Both     Yes No
PROC COD UTILITY BILLING FOR FC 4980. 100 PROC-MINS, FOR IBM i
                        MMB     7643                    Both     Yes No
1 PROC-DAY ON/OFF BILLING FOR FC 4980
                        MMB     7644                    Both     Yes No
1 PROC-DAY ON/OFF BILLING FOR FC 4980, FOR IBM i
                        MMB     7645                    Both     Yes No
PROC COD UTILITY BILLING FOR FC 4981, 100 PROC-MINS
                        MMB     7646                    Both     Yes No
PROC COD UTILITY BILLING FOR FC 4981, 100 PROC-MINS, FOR IBM i
                        MMB     7647                    Both     Yes No
1 PROC-DAY ON/OFF BILLING FOR FC 4981
                        MMB     7648                    Both     Yes No
1 PROC-DAY ON/OFF BILLING FOR FC 4981, FOR IBM i
                        MMB     7649                    Both     Yes No
2.0m Rack Side Attach Kit
                        MMB     7780                    Support  Yes No
Ethernet Cable, 6M, Hardware Management Console to System Unit
                        MMB     7801                    Support  Yes No
Ethernet Cable, 15m, Hardware Management Console to System Unit
                        MMB     7802                    Both     Yes No
Side-by-Side for 1.8m Racks
                        MMB     7840                    Support  Yes No
Ruggedize Rack Kit
                        MMB     7841                    Support  Yes No
PCI Blind Swap Cassette Kit, Single Wide Adapters, Type II
                        MMB     7862                    Support  Yes No
PCI Blind Swap Cassette Kit, Double Wide Adapters, Type II
                        MMB     7863                    MES      Yes No
PowerVM -Standard Edition
                        MMB     7942                    Both     Yes No
On/Off Processor Enablement
                        MMB     7951                    MES      Yes No
On/Off Memory Enablement
                        MMB     7954                    MES      Yes No
PowerVM - Enterprise Edition
                        MMB     7995                    Both     Yes No
570 to MMA Advanced POWER Virtualization Carry Over Indicator
                        MMB     8018                    MES      Yes No
RJ-45 to DB-25 Converter Cable
                        MMB     8133                    Support  Yes No
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Linux Software Preinstall
                        MMB     8143                    Initial  N/A No
Linux Software Preinstall (Business Partners)
                        MMB     8144                    Initial  N/A No
Activation of 1 GB DDR3 POWER7 Memory
                        MMB     8212                    Both     Yes No
Activation of 100 GB DDR3 POWER7 Memory
                        MMB     8213                    Both     Yes No
Power Cord Carry Over Indicator, #9800, Model Conversion Only
                        MMB     8430                    Support  Yes No
Power Cord Carry Over Indicator, #9802, Model Conversion Only
                        MMB     8431                    Support  Yes No
Power Cord Carry Over Indicator, #9820, Model Conversion Only
                        MMB     8432                    Support  Yes No
Power Cord Carry Over Indicator, #9821, Model Conversion Only
                        MMB     8433                    Support  Yes No
Power Cord Carry Over Indicator, #9825, Model Conversion Only
                        MMB     8434                    Support  Yes No
Power Cord Carry Over Indicator, #9827, Model Conversion Only
                        MMB     8435                    Support  Yes No
Power Cord Carry Over Indicator, #9828, Model Conversion Only
                        MMB     8436                    Support  Yes No
Power Cord Carry Over Indicator, #9829, Model Conversion Only
                        MMB     8437                    Support  Yes No
Power Cord Carry Over Indicator, #9830, Model Conversion Only
                        MMB     8438                    Support  Yes No
Power Cord Carry Over Indicator, #9831, Model Conversion Only
                        MMB     8439                    Support  Yes No
Power Cord Carry Over Indicator, #9833, Model Conversion Only
                        MMB     8440                    Support  Yes No
Power Cord Carry Over Indicator, #9834, Model Conversion Only
                        MMB     8441                    Support  Yes No
Base Customer Spec Plcmnt
                        MMB     8453                    Initial  N/A No
Mouse - USB, with Keyboard Attachment Cable
                        MMB     8841                    Support  Yes No
USB Mouse
                        MMB     8845                    Both     Yes No
Order Routing Indicator- System Plant
                        MMB     9169                    Initial  N/A No
Language Group Specify - US English
                        MMB     9300                    Initial  N/A No
New AIX License Core Counter
                        MMB     9440                    Initial  N/A No
New IBM i License Core Counter
                        MMB     9441                    Initial  N/A No
New Red Hat License Core Counter
                        MMB     9442                    Initial  N/A No
New SUSE License Core Counter
                        MMB     9443                    Initial  N/A No
Other AIX License Core Counter
                        MMB     9444                    Initial  N/A No
Other Linux License Core Counter
                        MMB     9445                    Initial  N/A No
3rd Party Linux License Core Counter
                        MMB     9446                    Initial  N/A No
VIOS Core Counter
                        MMB     9447                    Initial  N/A No
Month Indicator
                        MMB     9461                    Initial  N/A No
Day Indicator
                        MMB     9462                    Initial  N/A No
Hour Indicator
                        MMB     9463                    Initial  N/A No
Minute Indicator
                        MMB     9464                    Initial  N/A No
Qty Indicator
                        MMB     9465                    Initial  N/A No
Countable Member Indicator
                        MMB     9466                    Initial  N/A No
Reserved Rack Space Indicator - 4U
                        MMB     9570                    Initial  N/A No
Language Group Specify - Dutch
                        MMB     9700                    Initial  N/A No
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Language Group Specify - French
                      MMB     9703                  Initial  N/A No
Language Group Specify - German
                      MMB     9704                  Initial  N/A No
Language Group Specify - Polish
                      MMB     9705                  Initial  N/A No
Language Group Specify - Norwegian
                      MMB     9706                  Initial  N/A No
Language Group Specify - Portuguese
                      MMB     9707                  Initial  N/A No
Language Group Specify - Spanish
                      MMB     9708                  Initial  N/A No
Language Group Specify - Italian
                      MMB     9711                  Initial  N/A No
Language Group Specify - Canadian French
                      MMB     9712                  Initial  N/A No
Language Group Specify - Japanese
                      MMB     9714                  Initial  N/A No
Language Group Specify - Traditional Chinese (Taiwan)
                      MMB     9715                  Initial  N/A No
Language Group Specify - Korean
                      MMB     9716                  Initial  N/A No
Language Group Specify - Turkish
                      MMB     9718                  Initial  N/A No
Language Group Specify - Hungarian
                      MMB     9719                  Initial  N/A No
Language Group Specify - Slovakian
                      MMB     9720                  Initial  N/A No
Language Group Specify - Russian
                      MMB     9721                  Initial  N/A No
Language Group Specify - Simplified Chinese (PRC)
                      MMB     9722                  Initial  N/A No
Language Group Specify - Czech
                      MMB     9724                  Initial  N/A No
Language Group Specify -- Romanian
                      MMB     9725                  Initial  N/A No
Language Group Specify - Croatian
                      MMB     9726                  Initial  N/A No
Language Group Specify -- Slovenian
                      MMB     9727                  Initial  N/A No
Language Group Specify - Brazilian Portuguese
                      MMB     9728                  Initial  N/A No
Language Group Specify - Thai
                      MMB     9729                  Initial  N/A No
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30 Character Description	Machine type	Model	Feature	HVLP List	2Q-4Q10 Avg BMC
IBM 9117-MMB	9117	MMB	0	$10,195	$13
Specify Code for External High	9117	MMB	0032	$680	$172
Mirrored System Disk Level,	9117	MMB	0040	$0	$0
Device Parity Protection- All	9117	MMB	0041	$0	$0
Mirrored System Bus Level, S	9117	MMB	0043	$0	$0
Device Parity RAID-6 All, Sp	9117	MMB	0047	$0	$0
RISC-to-RISC Data Migration	9117	MMB	0205	$0	$0
	9117	MMB	0265	$0	$0

AIX Partition Specify					
Linux Partition Specify	9117	MMB	0266	$0	$0
IBM i Operating System Partiti	9117	MMB	0267	$0	$0
CSC Specify	9117	MMB	0275	$0	$0
Ext Tape Attached via #5736	9117	MMB	0290	$0	$0
Specify Custom Data Protection	9117	MMB	0296	$0	$0
Specify EXP24 Attach via Exist	9117	MMB	0302	$0	$0
Mirrored Level System Specify	9117	MMB	0308	$0	$0
RAID Hot Spare Specify	9117	MMB	0347	$0	$0
V.24/EIA232 6.1m (20-Ft) PCI C	9117	MMB	0348	$162	$20
V.24/EIA232 15.2m (50-Ft) PCI	9117	MMB	0349	$229	$20
V.35 6.1m (20-Ft) PCI Cable	9117	MMB	0353	$162	$19
V.35 15.2m (50-Ft) PCI Cable	9117	MMB	0354	$229	$50
V.36 6.1m (20-Ft) PCI Cable	9117	MMB	0356	$164	$50
X.21 6.1m (20-Ft) PCI Cable	9117	MMB	0359	$486	$126
X.21 15.2m (50-Ft) PCI Cable	9117	MMB	0360	$229	$50
V.24/EIA232 (80-Ft) PCI Cable	9117	MMB	0365	$262	$50
UPS Factory Integration Specif	9117	MMB	0373	$0	$0
HMC Factory Integration Specif	9117	MMB	0374	$0	$0
Display Factory Integration Sp	9117	MMB	0375	$0	$0
Reserve Rack Space for UPS	9117	MMB	0376	$0	$0
Reserve Rack Space for HMC	9117	MMB	0377	$0	$0

Reserve Rack Space for Display	9117	MMB	0378	$0	$0
MMA/ MMB/MHB upgrade indicator	9117	MMB	0397	$0	$0
SSD Placement Indicator - CEC	9117	MMB	0462	$0	$0
SSD Placement Indicator (5802/	9117	MMB	0463	$0	$0
SSD Placement Indicator - 5886	9117	MMB	0464	$0	$0
19 inch, 1.8 meter high rack	9117	MMB	0551	$3,463	$1,238
19 inch, 2.0 meter high rack	9117	MMB	0553	$4,696	$1,272
19 inch, 1.3 meter high rack	9117	MMB	0555	$2,592	$735
IBM i 6.1 with 6.1.1 Machine C	9117	MMB	0566	$0	$0
Rack Filler Panel Kit	9117	MMB	0599	$97	$17
Load Source Not in CEC	9117	MMB	0719	$0	$0
Specify Load Source in #5786	9117	MMB	0725	$0	$0
Specify Load Source in #5802/5	9117	MMB	0726	$0	$0
Specify #5886 Load Source plac	9117	MMB	0727	$0	$0
#4327 Load Source Specify	9117	MMB	0835	$0	$0
#4328 Load Source Specify	9117	MMB	0836	$0	$0
SAN Load Source Specify	9117	MMB	0837	$0	$0
#3676 Load Source Specify	9117	MMB	0838	$0	$0
#3677 Load Source Specify	9117	MMB	0839	$0	$0
#3678 Load Source Specify	9117	MMB	0840	$0	$0
#4329 Load Source Specify	9117	MMB	0841	$0	$0
#3658 Load Source Specify	9117	MMB	0844	$0	$0

#1884 Load Source Specify	9117	MMB	0851	$0	$0
#1888 Load Source Specify	9117	MMB	0853	$0	$0
#1909 Load Source Specify	9117	MMB	0854	$0	$0
#3587 Load Source Specify	9117	MMB	0855	$0	$0
US TAA Compliance Indicator	9117	MMB	0983	$0	$0
Modem Cable - US/ Canada and Ge	9117	MMB	1025	$17	$6
USB External Docking Station f	9117	MMB	1104	$361	$111
USB 160 GB Removable Disk Driv	9117	MMB	1106	$413	$90
USB 500 GB Removable Disk Driv	9117	MMB	1107	$928	$171
Decline Electronic Service Age	9117	MMB	1120	$0	$0
200V 16A 4.3m (14-Ft) TL Line	9117	MMB	1406	$0	$18
125V 4.3m (14-Ft) Line Cord	9117	MMB	1413	$0	$18
200V 1.8m (6-Ft) Locking Line	9117	MMB	1414	$0	$18
200V 1.8m (6-Ft) Watertight Li	9117	MMB	1415	$0	$18
200V 4.3m (14-Ft) Locking Line	9117	MMB	1416	$0	$18
200V 4.3m (14-Ft) Watertight L	9117	MMB	1417	$0	$18
4.3m 200V/16A Power Cord S. Af	9117	MMB	1418	$18	$3
4.3m 200V/16A Power Cord Israe	9117	MMB	1419	$18	$3
4.3m 200V/16A Power Cord EU/As	9117	MMB	1420	$18	$3
4.3m 200V/16A Power Cord CH/DK	9117	MMB	1421	$18	$14

200V 1.8m (6-Ft) Locking Line	9117	MMB	1424	$0	$18
200V 1.8m (6-Ft) Watertight Li	9117	MMB	1425	$0	$18
200V 4.3m (14-Ft) Locking Line	9117	MMB	1426	$0	$18
200V 4.3m (14-Ft) Watertight L	9117	MMB	1427	$0	$18
4.3m 200V/10A Power Cord EU/As	9117	MMB	1439	$18	$3
4.3m 200V/10A Power Cord Denma	9117	MMB	1440	$18	$18
4.3m 200V/10A Power Cord S. Af	9117	MMB	1441	$18	$2
4.3m 200V/10A Power Cord Swiss	9117	MMB	1442	$18	$18
4.3m 200V/10A Power Cord UK	9117	MMB	1443	$18	$18
4.3m 200V/10A Power Cord Israe	9117	MMB	1445	$18	$18
4.3m 200V/32A Power Cord EU 1-	9117	MMB	1449	$314	$18
4.3m 200V/16A Power Cord EU 2-	9117	MMB	1450	$18	$18
200V (6-Ft) 1.8m Line Cord	9117	MMB	1451	$52	$2
200V (14-Ft) 4.3m Line Cord	9117	MMB	1452	$52	$4
200V (6-Ft) 1.8m Locking Line	9117	MMB	1453	$52	$33
200V 12A (14-Ft) 4.3m TL Line	9117	MMB	1454	$262	$17
200V (6-Ft) 1.8m Watertight Li	9117	MMB	1455	$262	$93
200V (14-Ft) 4.3m Watertight L	9117	MMB	1456	$262	$261
200V (6-Ft) 1.8m Upper Line Co	9117	MMB	1457	$0	$18

200V (6-Ft) 1.8m Upper Locking	9117	MMB	1458	$0	$25
200V (6-Ft) 1.8m Upper Locking	9117	MMB	1459	$262	$126
30m SPCN Cable	9117	MMB	1466	$0	$72
4.3m 200V/12A Pwr Cd UK	9117	MMB	1476	$18	$3
4.3m 200V/16A Pwr Cd	9117	MMB	1477	$262	$25
Integrated, 4 Port- 1Gb Virtua	9117	MMB	1803	$699	$94
Integrated, 4 Port (2x1Gb and	9117	MMB	1804	$3,950	$381
GX++ Dual-port IB Adapter	9117	MMB	1808	$1,499	$364
Integrated, 4 Port (2x1Gb and	9117	MMB	1813	$2,100	$167
SAS Cable for triple split DAS	9117	MMB	1815	$250	$50
SAS Cable for dual RAID with e	9117	MMB	1819	$250	$50
1.5 Meter 12X to 4X Channel Co	9117	MMB	1828	$393	$90
0.6 Meter 12X Cable	9117	MMB	1829	$459	$30
1.5 Meter 12X cable	9117	MMB	1830	$524	$39
8.0 Meter 12X Cable	9117	MMB	1834	$949	$183
3.0 Meter 12X Cable	9117	MMB	1840	$623	$120
3 Meter 12X to 4X Channel Conv	9117	MMB	1841	$492	$101
10 Meter 12X to 4X Channel Con	9117	MMB	1842	$794	$167
Operator Panel	9117	MMB	1853	$1,000	$106
10 Meter 12X to 4X Enhanced Ch	9117	MMB	1854	$786	$221
0.6 Meter 12X DDR Cable	9117	MMB	1861	$459	$30
1.5 Meter 12X DDR Cable	9117	MMB	1862	$524	$39
8.0 Meter 12X DDR Cable	9117	MMB	1864	$949	$170
3.0 Meter 12X DDR Cable	9117	MMB	1865	$623	$53

146.8GB 10K RPM SAS SFF Disk D	9117	MMB	1882	$852	$108
73.4 GB 15K RPM SAS SFF Disk D	9117	MMB	1883	$652	$122
69.7 GB 15K RPM SAS SFF Disk D	9117	MMB	1884	$652	$122
300GB 10K RPM SFF SAS Disk Dri	9117	MMB	1885	$1,376	$162
146GB 15K RPM SFF SAS Disk Dri	9117	MMB	1886	$1,045	$188
139GB 15K RPM SFF SAS Disk Dri	9117	MMB	1888	$1,045	$188
69GB SFF SAS Solid State Drive	9117	MMB	1890	$6,811	$3,625
Quantity 150 of #1883	9117	MMB	1891	$97,800	$18,301
Quantity 150 of #1882	9117	MMB	1899	$127,800	$16,174
69GB SFF SAS Solid State Drive	9117	MMB	1909	$6,811	$3,625
PCI-X DDR Dual Channel Ultra32	9117	MMB	1912	$769	$135
Converter Cable, VHDCI to P, M	9117	MMB	2118	$66	$21
Ultra 320 SCSI Cable 1 Meter	9117	MMB	2124	$163	$19
Ultra 320 SCSI Cable 3 Meter	9117	MMB	2125	$183	$23
Ultra 320 SCSI Cable 5 Meter	9117	MMB	2126	$204	$37
Ultra 320 SCSI Cable 10 Meter	9117	MMB	2127	$275	$48
Ultra 320 SCSI Cable 20 Meter	9117	MMB	2128	$432	$79
0.55 Meter Ultra 320 SCSI Cabl	9117	MMB	2138	$100	$17
Primary OS - IBM i	9117	MMB	2145	$0	$0
Primary OS - AIX	9117	MMB	2146	$0	$0
Primary OS - Linux	9117	MMB	2147	$0	$0

2M LC-SC 50 Micron Fiber Conve	9117	MMB	2456	$108	$11
2M LC-SC 62.5 Micron Fiber Con	9117	MMB	2459	$108	$17
4 port USB PCIe Adapter	9117	MMB	2728	$197	$54
2-Port USB PCI Adapter	9117	MMB	2738	$59	$15
POWER GXT135P Graphics Acceler	9117	MMB	2849	$449	$92
ARTIC960Hx 4-Port EIA-232 Cabl	9117	MMB	2861	$469	$154
ARTIC960Hx 4-Port X.21 Cable	9117	MMB	2863	$552	$158
ARTIC960Hx 4-Port V.35 (DTE) C	9117	MMB	2864	$926	$290
PCIe 2-Line WAN w/ Modem	9117	MMB	2893	$758	$143
3M Asynchronous Terminal/ Print	9117	MMB	2934	$48	$7
Asynchronous Cable EIA-232/V.2	9117	MMB	2936	$80	$20
8-Port Asynchronous Adapter EI	9117	MMB	2943	$1,538	$339
IBM ARTIC960Hx 4-Port Multipro	9117	MMB	2947	$3,998	$1,277
Cable, V.24 / EIA-232	9117	MMB	2951	$193	$40
Cable, V.35	9117	MMB	2952	$353	$66
Cable, V.36 / EIA-499	9117	MMB	2953	$281	$44
Cable, X.21	9117	MMB	2954	$193	$35
2-Port Multiprotocol PCI Adapt	9117	MMB	2962	$2,205	$419
Serial-to-Serial Port Cable fo	9117	MMB	3124	$87	$15
Serial-to-Serial Port Cable fo	9117	MMB	3125	$87	$19
73.4 GB 15,000 RPM Ultra320 SC	9117	MMB	3278	$659	$170
146.8 GB 15,000 RPM Ultra320 S	9117	MMB	3279	$1,285	$205
300 GB 15K RPM SCSI Disk Drive	9117	MMB	3585	$1,999	$350

69GB 3.5 SAS Sol St Dr	9117	MMB	3586	$6,811	$3,623
69GB 3.5 SAS Sol St Dr	9117	MMB	3587	$6,811	$3,639
Widescreen LCD Monitor	9117	MMB	3632	$1,308	$314
T210 Flat-Panel Monitor	9117	MMB	3635	$0	$3,124
IBM T541H / L150p 15 TFT Color	9117	MMB	3637	$538	$234
IBM ThinkVision L170p Flat Pan	9117	MMB	3639	$829	$235
ThinkVision L171p Flat Panel M	9117	MMB	3640	$768	$367
IBM T115 Flat Pan Mon	9117	MMB	3641	$740	$198
ThinkVision L191p Fl Pan Mon	9117	MMB	3642	$900	$489
IBM T120 Flat Panel Monitor	9117	MMB	3643	$1,754	$392
IBM T119 Flat Panel Monitor	9117	MMB	3644	$1,119	$175
IBM T117 Flat Panel Monitor	9117	MMB	3645	$926	$165
73GB 15K RPM SAS Disk Drive	9117	MMB	3646	$659	$126
146GB 15K RPM SAS Disk Drive	9117	MMB	3647	$652	$123
300GB 15K RPM SAS Disk Drive	9117	MMB	3648	$1,507	$159
450GB 15K RPM SAS Disk Drive	9117	MMB	3649	$2,094	$231
SAS Cable (EE) Drawer to Drawe	9117	MMB	3652	$66	$13
SAS Cable (EE) Drawer to Drawe	9117	MMB	3653	$92	$18
SAS Cable (EE) Drawer to Drawe	9117	MMB	3654	$158	$31
428GB 15K RPM SAS Disk Drive	9117	MMB	3658	$2,094	$232
SAS Cable (X) Adapter to SAS E	9117	MMB	3661	$197	$37
SAS Cable (X) Adapter to SAS E	9117	MMB	3662	$394	$83
SAS Cable (X) Adapter to SAS E	9117	MMB	3663	$800	$273

Serv Interface Cable- 2, 3, an	9117	MMB	3671	$2,000	$232
Serv Interface Cable- 3 and 4	9117	MMB	3672	$3,000	$311
Serv Interface Cable- 4 Enclos	9117	MMB	3673	$4,000	$437
39.7GB 15K RPM SAS DISK DR	9117	MMB	3676	$659	$126
139.5GB 15K RPM SAS DISK D	9117	MMB	3677	$652	$124
283.7GB 15k rpm SAS Disk Drive	9117	MMB	3678	$1,507	$160
SAS Cable (AI)- Adapter to Int	9117	MMB	3679	$69	$13
3M SAS CABLE, ADPTR TO ADPTR (	9117	MMB	3681	$99	$20
6M SAS CABLE, ADPTR TO ADPTR (	9117	MMB	3682	$197	$42
SAS Cable (AE) Adapter to Encl	9117	MMB	3684	$197	$19
SAS Cable (AE) Adapter to Encl	9117	MMB	3685	$394	$31
SAS Cable (YI) System to SAS E	9117	MMB	3686	$118	$23
SAS Cable (YI) System to SAS E	9117	MMB	3687	$144	$25
SAS Cable (AT) 0.6 Meter	9117	MMB	3688	$118	$26
SAS Cable (YO) Adapter to SAS	9117	MMB	3691	$118	$23
SAS Cable (YO) Adapter to SAS	9117	MMB	3692	$144	$25
SAS Cable (YO) Adapter to SAS	9117	MMB	3693	$197	$40
SAS Cable (YO) Adapter to SAS	9117	MMB	3694	$692	$161
Processor Cable, Two-Drawer Sy	9117	MMB	3711	$4,000	$402

Processor Cable, Two, Three or	9117	MMB	3712	$5,000	$391
Processor Cable, Three or Four	9117	MMB	3713	$10,000	$1,136
Processor Cable, Four-Drawer S	9117	MMB	3714	$12,000	$2,229
0.3M Serial Port Converter Cab	9117	MMB	3925	$28	$2
Asynch Printer/ Terminal Cable,	9117	MMB	3926	$191	$66
Serial Port Null Modem Cable,	9117	MMB	3927	$87	$12
Serial Port Null Modem Cable,	9117	MMB	3928	$87	$16
1.8 M (6-ft) Extender Cable fo	9117	MMB	4242	$108	$11
Extender Cable - USB Keyboards	9117	MMB	4256	$55	$2
VGA to DVI Connection Converte	9117	MMB	4276	$10	$2
70.56GB 15k rpm Disk Unit	9117	MMB	4327	$999	$169
141.12GB 15k rpm Disk Unit	9117	MMB	4328	$1,285	$206
282.25GB 15k rpm Disk Unit	9117	MMB	4329	$2,799	$350
Rack Indicator-Not Factory In	9117	MMB	4650	$0	$0
Rack Indicator, Rack #1	9117	MMB	4651	$0	$0
Rack Indicator, Rack #2	9117	MMB	4652	$0	$0
Rack Indicator, Rack #3	9117	MMB	4653	$0	$0
Rack Indicator, Rack #4	9117	MMB	4654	$0	$0
Rack Indicator, Rack #5	9117	MMB	4655	$0	$0
Rack Indicator, Rack #6	9117	MMB	4656	$0	$0
Rack Indicator, Rack #7	9117	MMB	4657	$0	$0

Rack Indicator, Rack #8	9117	MMB	4658	$0	$0
Rack Indicator, Rack #9	9117	MMB	4659	$0	$0
Rack Indicator, Rack #10	9117	MMB	4660	$0	$0
Rack Indicator, Rack #11	9117	MMB	4661	$0	$0
Rack Indicator, Rack #12	9117	MMB	4662	$0	$0
Rack Indicator, Rack #13	9117	MMB	4663	$0	$0
Rack Indicator, Rack #14	9117	MMB	4664	$0	$0
Rack Indicator, Rack #15	9117	MMB	4665	$0	$0
Rack Indicator, Rack #16	9117	MMB	4666	$0	$0
PCI-X Cryptographic Coprocesso	9117	MMB	4764	$11,789	$2,685
POWER ACTIVE MEMORY EXPAN	9117	MMB	4791	$6,900	$0
CBU SPECIFY	9117	MMB	4891	$0	$0
3.5 GHz Proc Card, 0/12 Core P	9117	MMB	4980	$17,329	$6,759
3.1 GHz Proc Card, 0/16 Core P	9117	MMB	4981	$9,689	$6,914
Single 5250 Enterprise Enablem	9117	MMB	4992	$50,000	$0
Full 5250 Enterprise Enablemen	9117	MMB	4997	$200,000	$0
Software Preload Required	9117	MMB	5000	$0	$0
Custom Service Specify, Off-Si	9117	MMB	5001	$0	$0
Customer Solution Center - Roc	9117	MMB	5002	$0	$0
Power Dist Unit 1 Phase NEMA	9117	MMB	5160	$1,309	$400
Power Dist Unit 1 Phase IEC	9117	MMB	5161	$1,309	$400
Power Dist Unit 2 of 3 Phase	9117	MMB	5162	$1,309	$400

Power Dist Unit - 3 Phase	9117	MMB	5163	$1,309	$400
One Processor Activation for P	9117	MMB	5459	$5,708	$0
One Processor Activation for P	9117	MMB	5468	$2,490	$0
RFID TAGS FOR SERVERS, BLADES,	9117	MMB	5524	$27	$2
Sys Console On HMC	9117	MMB	5550	$0	$0
Sys Console-Ethernet No IOP	9117	MMB	5553	$0	$0
0/32GB DDR3 Memory (4X8GB) DIM	9117	MMB	5600	$1,960	$2,122
0/64GB DDR3 Memory (4X16GB) DI	9117	MMB	5601	$7,720	$5,584
0/128GB DDR3 Memory (4X32GB) D	9117	MMB	5602	$15,440	$13,412
System AC Power Supply, 1725 W	9117	MMB	5632	$1,502	$154
Blind Swap Type III Cassette-	9117	MMB	5646	$49	$8
Standard Slot	9117	MMB	5647	$49	$8
Disk/Media Backplane	9117	MMB	5652	$4,000	$727
System CEC Enclosure with IBM	9117	MMB	5659	$12,000	$2,126
175MB Cache RAID Battery Card	9117	MMB	5662	$2,500	$192
Service Processor	9117	MMB	5664	$4,000	$403
FSP/ Clock Pass Through Card	9117	MMB	5665	$900	$156
System CEC Enclosure with OEM	9117	MMB	5669	$12,000	$2,125
IBM Gigabit Ethernet-SX PCI-X	9117	MMB	5700	$1,142	$190
IBM 10/100/1000 Base-TX Ethern	9117	MMB	5701	$699	$69

IBM 2-Port 10/100/1000 Base-TX	9117	MMB	5706	$989	$105
10Gb FCoE PCIe Dual Port Adapt	9117	MMB	5708	$5,441	$926
1 Gigabit iSCSI TOE PCI-X on C	9117	MMB	5713	$1,179	$286
1 Gigabit iSCSI TOE PCI-X on O	9117	MMB	5714	$1,853	$460
2 Gigabit Fibre Channel PCI-X	9117	MMB	5716	$1,999	$515
4-Port 10/100/1000 Base-TX PCI	9117	MMB	5717	$1,087	$207
10 Gb Ethernet-SR PCI-X 2.0 DD	9117	MMB	5721	$6,276	$1,699
10 Gb Ethernet-LR PCI-X 2.0 DD	9117	MMB	5722	$10,587	$2,285
2-Port Asynchronous EIA-232 PC	9117	MMB	5723	$171	$53
10 Gigabit Ethernet-CX4 PCI Ex	9117	MMB	5732	$4,749	$572
8 Gigabit PCI Express Dual Por	9117	MMB	5735	$4,583	$610
PCI-X DDR Dual Channel Ultra32	9117	MMB	5736	$769	$135
4-Port 10/100/1000 Base-TX PCI	9117	MMB	5740	$1,099	$255
IBM Single Bus Ultra 320 SCSI	9117	MMB	5741	$654	$135
IBM Dual Bus Ultra 320 SCSI Re	9117	MMB	5742	$1,307	$179
POWER GXT145 PCI Express Graph	9117	MMB	5748	$496	$113
4Gbps Fibre Channel (2-Port)	9117	MMB	5749	$3,273	$432
4 GB Single-Port Fibre Channel	9117	MMB	5758	$1,999	$317
4 Gb Dual-Port Fibre Channel P	9117	MMB	5759	$3,273	$432
SATA Slimline DVD-RAM Drive	9117	MMB	5762	$392	$50

2-Port 10/100/1000 Base-TX Eth	9117	MMB	5767	$692	$77
2-Port Gigabit Ethernet-SX PCI	9117	MMB	5768	$1,731	$222
10 Gigabit Ethernet-SR PCI Exp	9117	MMB	5769	$5,244	$774
10 Gigabit Ethernet-LR PCI Exp	9117	MMB	5772	$6,211	$1,046
Adapter	9117	MMB	5773	$1,977	$317
4 Gigabit PCI Express Dual Por	9117	MMB	5774	$3,273	$432
PCI-X EXP24 Ctl-1.5GB No IOP	9117	MMB	5782	$11,077	$876
4 Port Async EIA-232 PCIe Adap	9117	MMB	5785	$915	$227
TotalStorage EXP24 Disk Dwr	9117	MMB	5786	$7,125	$1,334
PCI-DDR 12X Expansion Drawer	9117	MMB	5796	$6,477	$1,268
12X I/O Drawer PCIe, SFF disk	9117	MMB	5802	$14,277	$4,225
12X I/O Drawer PCIe, No Disk	9117	MMB	5877	$12,968	$3,171
EXP 12S Expansion Drawer	9117	MMB	5886	$5,894	$1,529
PCI-X DDR Dual -x4 SAS Adapter	9117	MMB	5900	$777	$200
PCIe Dual-x4 SAS Adapter	9117	MMB	5901	$982	$166
PCI-X DDR Dual - x4 3Gb SAS RA	9117	MMB	5902	$2,475	$333
PCIe 380MB Cache Dual - x4 3Gb	9117	MMB	5903	$2,880	$492
PCI-X DDR 1.5GB Cache SAS RAID	9117	MMB	5908	$11,134	$755
PCI-X DDR Dual - x4 SAS Adapte	9117	MMB	5912	$1,080	$138
Non-paired SAS RAID indicator	9117	MMB	5922	$0	$0
Non-paired PCIe SAS RAID Indic	9117	MMB	5923	$0	$0

Full Width Keyboard -- USB, US	9117	MMB	5951	$108	$13
Full Width Keyboard -- USB, Fr	9117	MMB	5952	$108	$13
Full Width Keyboard -- USB, It	9117	MMB	5953	$108	$13
Full Width Keyboard -- USB, Ge	9117	MMB	5954	$108	$13
Full Width Keyboard -- USB, UK	9117	MMB	5955	$108	$13
Full Width Keyboard -- USB, Sp	9117	MMB	5956	$108	$13
Full Width Keyboard -- USB, Ja	9117	MMB	5957	$108	$14
Full Width Keyboard -- USB, Br	9117	MMB	5958	$108	$14
Full Width Keyboard -- USB, Hu	9117	MMB	5959	$108	$20
Full Width Keyboard -- USB, Ko	9117	MMB	5960	$108	$14
Full Width Keyboard -- USB, Ch	9117	MMB	5961	$108	$13
Full Width Keyboard -- USB, Fr	9117	MMB	5962	$108	$13
Full Width Keyboard -- USB, Be	9117	MMB	5964	$108	$20
Full Width Keyboard -- USB, Sw	9117	MMB	5965	$108	$13
Full Width Keyboard -- USB, Da	9117	MMB	5966	$108	$18
Full Width Keyboard -- USB, Bu	9117	MMB	5967	$108	$18
Full Width Keyboard -- USB, Sw	9117	MMB	5968	$108	$13
Full Width Keyboard -- USB, No	9117	MMB	5969	$108	$12
Full Width Keyboard -- USB, Du	9117	MMB	5970	$108	$25
Full Width Keyboard -- USB, Po	9117	MMB	5971	$108	$10
Full Width Keyboard -- USB, Gr	9117	MMB	5972	$108	$25
Full Width Keyboard -- USB, He	9117	MMB	5973	$108	$25
Full Width Keyboard -- USB, Po	9117	MMB	5974	$108	$12

Full Width Keyboard -- USB, Sl	9117	MMB	5975	$108	$18
Full Width Keyboard -- USB, Cz	9117	MMB	5976	$108	$18
Full Width Keyboard -- USB, Tu	9117	MMB	5977	$108	$13
Full Width Keyboard -- USB, LA	9117	MMB	5978	$108	$13
Full Width Keyboard -- USB, Ar	9117	MMB	5979	$108	$18
Full Width Keyboard -- USB, Th	9117	MMB	5980	$108	$13
Full Width Keyboard -- USB, Ru	9117	MMB	5981	$108	$13
Full Width Keyboard -- USB, Sl	9117	MMB	5982	$108	$18
Full Width Keyboard -- USB, US	9117	MMB	5983	$108	$13
Power Control Cable (SPCN) - 2	9117	MMB	6001	$32	$9
Power Control Cable (SPCN) - 3	9117	MMB	6006	$52	$13
Power Control Cable (SPCN) - 1	9117	MMB	6007	$104	$36
Power Control Cable (SPCN) - 6	9117	MMB	6008	$66	$12
Power Control Cable (SPCN) - 3	9117	MMB	6029	$119	$72
Opt Front Door for 1.8m Rack	9117	MMB	6068	$445	$161
Opt Front Door for 2.0m Rack	9117	MMB	6069	$545	$165
1.8m Rack Trim Kit	9117	MMB	6246	$296	$93
2.0m Rack Trim Kit	9117	MMB	6247	$296	$97
1.8m Rack Acoustic Doors	9117	MMB	6248	$4,601	$1,465
2.0m Rack Acoustic Doors	9117	MMB	6249	$4,601	$1,307
1.8m Rack Trim Kit	9117	MMB	6263	$523	$148
2.0m Rack Trim Kit	9117	MMB	6272	$523	$154
Dual-port 12X	9117	MMB	6446	$755	$139

Channel Attach-					
4.3m (14-Ft) 250V/10A Power Co	9117	MMB	6451	$7	$2
4.3m (14-Ft) 250V/10A Power Co	9117	MMB	6455	$0	$2
Dual-port 12X Channel Attach-	9117	MMB	6457	$3,275	$401
Power Cable -- Drawer to IBM P	9117	MMB	6458	$19	$8
3.7m (12-Ft) 250V/10A RA Pwr C	9117	MMB	6459	$7	$3
Power Cord 4.3m (14-ft), Drawe	9117	MMB	6460	$19	$5
4.3m (14-Ft) 250V/10A Power Co	9117	MMB	6461	$7	$2
4.3m (14-Ft) 250V/10A Power Co	9117	MMB	6462	$7	$2
4.3m (14-Ft) 250V/10A Power Co	9117	MMB	6463	$7	$2
4.3m (14-Ft) 250V/10A Power Co	9117	MMB	6464	$7	$2
4.3m (14-Ft) 250V/10A Power Co	9117	MMB	6465	$7	$2
4.3m (14-Ft) 250V/10A Power Co	9117	MMB	6466	$7	$2
4.3m (14-Ft) 250V/10A Power Co	9117	MMB	6467	$7	$2
Power Cord 4.3m (14-foot), Dra	9117	MMB	6469	$18	$2
Power Cord 1.8m(6-foot), To Wa	9117	MMB	6470	$18	$2
Power Cord 2.7m (9-foot), To W	9117	MMB	6471	$18	$1
Power Cord 2.7m (9-foot), To W	9117	MMB	6472	$18	$2
Power Cord 2.7m (9-foot), To W	9117	MMB	6473	$18	$2

Power Cord 2.7m (9-foot), To W	9117	MMB	6474	$18	$2
Power Cord 2.7m (9-foot), To W	9117	MMB	6475	$18	$2
Power Cord 2.7m (9-foot), To W	9117	MMB	6476	$18	$2
Power Cord 2.7m (9-foot), To W	9117	MMB	6477	$18	$3
Power Cord 2.7 M(9-foot), To W	9117	MMB	6478	$18	$1
Power Cord (9-foot) , To Wall/	9117	MMB	6479	$14	$19
Power Cord 1.8M (6-foot),To Wa	9117	MMB	6487	$18	$2
Power Cord 2.7m (9-foot), To W	9117	MMB	6488	$52	$1
4.3m (14-Ft) 3PH/24A Power Cor	9117	MMB	6489	$360	$121
4.3m (14-Ft) 1PH/48A Pwr Cord	9117	MMB	6491	$396	$138
4.3m (14-Ft) 1PH/48-60A Pwr Co	9117	MMB	6492	$396	$123
Power Cord 2.7M (9-foot), To W	9117	MMB	6493	$18	$2
Power Cord 2.7M (9-foot), To W	9117	MMB	6494	$18	$3
Power Cord (9-foot), To Wall/O	9117	MMB	6495	$19	$19
Power Cord 2.7M (9-foot), To W	9117	MMB	6496	$18	$2
Power Cord (6-foot), To Wall/O	9117	MMB	6497	$33	$7
Power Cord (6-foot), To Wall/O	9117	MMB	6498	$239	$19
Power Cable - Drawer to IBM PD	9117	MMB	6577	$19	$0
Optional Rack Security Kit	9117	MMB	6580	$177	$61
Modem Tray for 19-Inch Rack	9117	MMB	6586	$248	$82
Power Cord 2.7M (9-foot), To W	9117	MMB	6651	$18	$5
4.3m (14-Ft) 1PH/24-30A Pwr Co	9117	MMB	6654	$237	$58

4.3m (14-Ft) 1PH/24-30A WR Pwr	9117	MMB	6655	$524	$202
4.3m (14-Ft)1PH/24A Power Cord	9117	MMB	6656	$237	$71
Power Cord 2.7M (9-foot), To W	9117	MMB	6659	$18	$4
Power Cord (14-foot), Drawer T	9117	MMB	6660	$19	$6
2.1m (7-Ft) 200V PDU Power Cab	9117	MMB	6664	$19	$10
Power Cord 3 M (10 ft), Drawer	9117	MMB	6665	$18	$6
Power Cord 4.3M (14-foot), Dra	9117	MMB	6669	$18	$4
Power Cord (6-foot), To Wall (	9117	MMB	6670	$19	$1
Power Cord 2.7M (9-foot), Draw	9117	MMB	6671	$18	$5
Power Cord 1.5M (5-foot), Draw	9117	MMB	6672	$18	$3
Power Cord 2.7M (9-foot), To W	9117	MMB	6680	$18	$3
Power Cord (6-foot), To Wall,	9117	MMB	6687	$19	$2
PCI 2-Line WAN IOA No IOP	9117	MMB	6805	$551	$68
PCI 4-Modem WAN IOA No IOP	9117	MMB	6808	$2,073	$431
PCI 2-Line WAN w/ Modem NoIOP	9117	MMB	6833	$766	$109
Intelligent PDU+, 1 EIA Unit,	9117	MMB	7109	$1,439	$444
Environmental Monitoring Probe	9117	MMB	7118	$366	$105
Power Distribution Unit	9117	MMB	7188	$990	$146
Quantity 150 of #2124	9117	MMB	7204	$24,450	$2,901
Quantity 150 of #2125	9117	MMB	7205	$27,450	$3,487
Quantity 150 of #2126	9117	MMB	7206	$30,600	$5,606
Quantity 150 of #2127	9117	MMB	7207	$41,250	$7,255

Quantity 150 of #2128	9117	MMB	7208	$64,800	$11,893
Quantity 150 of #2138	9117	MMB	7213	$15,000	$2,493
SDI Software Pre-Install Indic	9117	MMB	7305	$0	$0
I/O Drawer Mounting Enclosure	9117	MMB	7314	$687	$162
On-Off Memory 1GB 1 Day	9117	MMB	7377	$1	
Quantity 150 of #4327	9117	MMB	7509	$149,850	$25,409
Quantity 150 of #4328	9117	MMB	7510	$192,750	$30,878
Quantity 150 of #4329	9117	MMB	7511	$419,850	$52,499
Quantity 150 of #5741	9117	MMB	7514	$98,100	$20,306
Quantity 150 of #3676	9117	MMB	7517	$98,850	$18,891
Quantity 150 of #3677	9117	MMB	7518	$97,800	$18,548
Quantity 150 of #3678	9117	MMB	7519	$226,050	$24,060
Quantity 150 of #3586	9117	MMB	7535	$1,021,650	$543,399
Quantity 150 of #3587	9117	MMB	7536	$1,021,650	$545,789
Quantity 150 of #3658	9117	MMB	7538	$314,100	$34,736
Quantity 150 of #1884	9117	MMB	7543	$97,800	$18,336
Quantity 150 of #1888	9117	MMB	7544	$156,750	$28,240
Quantity 150 of #1890	9117	MMB	7545	$1,021,650	$543,797
Quantity 150 of #1909	9117	MMB	7546	$1,021,650	$543,797
Quantity 150 of #1885	9117	MMB	7547	$206,400	$24,354
Quantity 150 of #1886	9117	MMB	7548	$156,750	$28,240
Quantity 150 of #3647	9117	MMB	7549	$97,800	$18,415

Quantity 150 of #3648	9117	MMB	7564	$226,050	$23,864
Quantity 150 of #3649	9117	MMB	7565	$314,100	$34,694
PROC COD UTILITY BILLING FOR F	9117	MMB	7642	$2	$0
PROC COD UTILITY BILLING FOR F	9117	MMB	7643	$25	$0
1 PROC-DAY ON/OFF BILLING FOR	9117	MMB	7644	$17	$0
1 PROC-DAY ON/OFF BILLING FOR	9117	MMB	7645	$180	$0
PROC COD UTILITY BILLING FOR F	9117	MMB	7646	$1	$0
PROC COD UTILITY BILLING FOR F	9117	MMB	7647	$24	$0
1 PROC-DAY ON/OFF BILLING FOR	9117	MMB	7648	$8	$0
1 PROC-DAY ON/OFF BILLING FOR	9117	MMB	7649	$171	$0
2.0m Rack Side Attach Kit	9117	MMB	7780	$196	$103
Ethernet Cable, 6M, Hardware M	9117	MMB	7801	$15	$4
Ethernet Cable, 15m, Hardware	9117	MMB	7802	$34	$12
Side-by-Side for 1.8m Racks	9117	MMB	7840	$655	$155
Ruggedize Rack Kit	9117	MMB	7841	$1,964	$554
PCI Blind Swap Cassette Kit, S	9117	MMB	7862	$46	$8
PCI Blind Swap Cassette Kit, D	9117	MMB	7863	$66	$10
PowerVM - Standard Edition	9117	MMB	7942	$0	$0
On/Off Processor Enablement	9117	MMB	7951	$0	$0
On/Off Memory Enablement	9117	MMB	7954	$0	$0

PowerVM - Enterprise Edition	9117	MMB	7995	$0	$0
570 to MMA Advanced POWER Virt	9117	MMB	8018	$0	$0
RJ-45 to DB-25 Converter Cable	9117	MMB	8133	$131	$23
Linux Software Preinstall	9117	MMB	8143	$60	$0
Linux Software Preinstall (SDI	9117	MMB	8144	$60	$0
Activation of 1 GB DDR3 POWER7	9117	MMB	8212	$245	$0
Activation of 100 GB DDR3 POWE	9117	MMB	8213	$24,500	$0
Power Cord Carry Over Indicato	9117	MMB	8430	$0	$2
Power Cord Carry Over Indicato	9117	MMB	8431	$0	$1
Power Cord Carry Over Indicato	9117	MMB	8432	$0	$2
Power Cord Carry Over Indicato	9117	MMB	8433	$0	$2
Power Cord Carry Over Indicato	9117	MMB	8434	$0	$2
Power Cord Carry Over Indicato	9117	MMB	8435	$0	$2
Power Cord Carry Over Indicato	9117	MMB	8436	$0	$2
Power Cord Carry Over Indicato	9117	MMB	8437	$0	$3
Power Cord Carry Over Indicato	9117	MMB	8438	$0	$1
Power Cord Carry Over Indicato	9117	MMB	8439	$0	$3
Power Cord Carry Over Indicato	9117	MMB	8440	$0	$2
Power Cord Carry Over Indicato	9117	MMB	8441	$0	$1
Base Customer Spec Plcmnt	9117	MMB	8453	$0	$0
Mouse - USB, with Keyboard Att	9117	MMB	8841	$82	$3
USB Mouse	9117	MMB	8845	$39	$3

1.8M Rack Trim Kit	7014	T00	6263	$523
2.0M Rack Trim Kit	7014	B42	6272	$523
2.0M Rack Trim Kit	7014	T42	6272	$523
1.8M Rack Trim Kit	8203	E4A	6263	$399
2.0M Rack Trim Kit	8203	E4A	6272	$399
1.8M Rack Trim Kit	8204	E8A	6263	$399
2.0M Rack Trim Kit	8204	E8A	6272	$399
1.8M Rack Trim Kit	8234	EMA	6263	$399
2.0M Rack Trim Kit	8234	EMA	6272	$399
1.8M Rack Trim Kit	9117	MMA	6263	$523
2.0M Rack Trim Kit	9117	MMA	6272	$523
1.8M Rack Trim Kit	9119	FHA	6263	$523
2.0M Rack Trim Kit	9119	FHA	6272	$523

Type/Model conversions

From Type	From Model	To Type	To Model	Parts Returned
9117	MMA	9117	MMB	Yes

The following are newly announced features on the specific models of the IBM Power Systems 7014, 8203, 8204, 8234, 9117, 9119 machine type:

Description Machine Type 7014	Model Number	Feature Number	Initial/ MES/ Both/ Support	CSU
1.8m Rack Trim Kit	T00	6263	Both	Yes
2.0m Rack Trim Kit	B42	6272	Both	Yes
	T42		Both	Yes

Description Machine Type 8203	Model Number	Feature Number	Initial/ MES/ Both/ Support	CSU	RP MES
1.8m Rack Trim Kit	E4A	6263	Both	Yes	No
2.0m Rack Trim Kit	E4A	6272	Both	Yes	No

Description Machine Type 8204	Model Number	Feature Number	Initial/ MES/ Both/ Support	CSU	RP MES
1.8m Rack Trim Kit	E8A	6263	Both	Yes	No
2.0m Rack Trim Kit	E8A	6272	Both	Yes	No

Description Machine Type 8234	Model Number	Feature Number	Initial/ MES/ Both/ Support	CSU	RP MES
1.8m Rack Trim Kit	EMA	6263	Both	Yes	No
2.0m Rack Trim Kit	EMA	6272	Both	Yes	No

Description Machine Type 9117	Model Number	Feature Number	Initial/ MES/ Both/ Support	CSU	RP MES
1.8m Rack Trim Kit	MMA	6263	Both	Yes	No
2.0m Rack Trim Kit	MMA	6272	Both	Yes	No

Description Machine Type 9119	Model Number	Feature Number	Initial/ MES/ Both/ Support	CSU	RP MES
1.8m Rack Trim Kit	FHA	6263	Support	Yes	No
2.0m Rack Trim Kit	FHA	6272	Both	Yes	No

Feature conversions

Feature conversions for 9117-MMA to 9117-MMB memory features:

From FC:	To FC:	Parts Returned
4495 - 4/8GB (4X2GB) DIMMS, 276 PIN 533 MHz, DDR2 SDRAM	5600 - 0/32GB DDR3 Memory (4X8GB) DIMMS - 1066 MHz - POWER7 CoD Memory	Yes
4496 - 8/16GB (4X4GB) DIMMs, 276 PIN, 533 MHz DDR2 SDRAM	5600 - 0/32GB DDR3 Memory (4X8GB) DIMMS - 1066 MHz - POWER7 CoD Memory	Yes
4497 - 16GB (4X4GB) DIMMs, 276 PIN, 533 MHz, DDR2 SDRAM	5600 - 0/32GB DDR3 Memory (4X8GB) DIMMS - 1066 MHz - POWER7 CoD Memory	Yes
4499 - 16GB (4X4GB) DIMMs, 276 pin, 400MHz DDR2 SDRAM	5600 - 0/32GB DDR3 Memory (4X8GB) DIMMS - 1066 MHz - POWER7 CoD Memory	Yes
5693 - 0/4GB DDR2 Memory (4X1GB) DIMMS- 667 MHz- POWER6 CoD Memory	5600 - 0/32GB DDR3 Memory (4X8GB) DIMMS - 1066 MHz - POWER7 CoD Memory	Yes
5694 - 0/8GB DDR2 Memory (4X2GB) DIMMS- 667 MHz- POWER6 CoD Memory	5600 - 0/32GB DDR3 Memory (4X8GB) DIMMS - 1066 MHz - POWER7 CoD Memory	Yes
5695 - 0/16GB DDR2 Memory (4X4GB) DIMMS- 533 MHz- POWER6 CoD Memory	5600 - 0/32GB DDR3 Memory (4X8GB) DIMMS - 1066 MHz - POWER7 CoD Memory	Yes
7892 - 2GB (4x512MB) DIMMs, 276-pin, 533MHz DDR2 SDRAM	5600 - 0/32GB DDR3 Memory (4X8GB) DIMMS - 1066 MHz - POWER7 CoD Memory	Yes
7893 - 4GB (4x1GB) DIMMs, 276-pin, 533MHz DDR2 SDRAM	5600 - 0/32GB DDR3 Memory (4X8GB) DIMMS - 1066 MHz - POWER7 CoD Memory	Yes
7894 - 8GB (4x2GB) DIMMs, 276-pin, 533 MHz DDR2 SDRAM	5600 - 0/32GB DDR3 Memory (4X8GB) DIMMS - 1066 MHz - POWER7 CoD Memory	Yes
4495 - 4/8GB (4X2GB) DIMMS, 276 PIN 533 MHz, DDR2 SDRAM	5601 - 0/64GB DDR3 Memory (4X16GB) DIMMS - 1066 MHz - POWER7 CoD Memory	Yes
4496 - 8/16GB (4X4GB) DIMMs, 276 PIN, 533 MHz DDR2 SDRAM	5601 - 0/64GB DDR3 Memory (4X16GB) DIMMS - 1066 MHz - POWER7 CoD Memory	Yes
4497 - 16GB (4X4GB) DIMMs, 276 PIN, 533 MHz, DDR2 SDRAM	5601 - 0/64GB DDR3 Memory (4X16GB) DIMMS - 1066 MHz - POWER7 CoD Memory	Yes
4498 - 32GB (4X8GB) DIMMs, 276 pin, 400MHz DDR2 SDRAM	5601 - 0/64GB DDR3 Memory (4X16GB) DIMMS - 1066 MHz - POWER7 CoD Memory	Yes
4499 - 16GB (4X4GB) DIMMs, 276 pin, 400MHz DDR2 SDRAM	5601 - 0/64GB DDR3 Memory (4X16GB) DIMMS - 1066 MHz - POWER7 CoD Memory	Yes
5690 - 0/32GB DDR2 Memory (4X8GB) DIMMS- 400 MHz- POWER6 CoD Memory	5601 - 0/64GB DDR3 Memory (4X16GB) DIMMS - 1066 MHz - POWER7 CoD Memory	Yes
5693 - 0/4GB DDR2 Memory	5601 - 0/64GB DDR3	Yes

(4X1GB) DIMMS- 667 MHz-POWER6 CoD Memory	Memory (4X16GB) DIMMS - 1066 MHz - POWER7 CoD Memory	
5694 - 0/8GB DDR2 Memory (4X2GB) DIMMS- 667 MHz-POWER6 CoD Memory	5601 - 0/64GB DDR3 Memory (4X16GB) DIMMS - 1066 MHz - POWER7 CoD Memory	Yes
5695 - 0/16GB DDR2 Memory (4X4GB) DIMMS-533 MHz- POWER6 CoD Memory	5601 - 0/64GB DDR3 Memory (4X16GB) DIMMS - 1066 MHz - POWER7 CoD Memory	Yes
5696 - 0/32GB DDR2 Memory (4X8GB) DIMMS-400 MHz- POWER6 CoD Memory	5601 - 0/64GB DDR3 Memory (4X16GB) DIMMS - 1066 MHz - POWER7 CoD Memory	Yes
7892 - 2GB (4x512MB) DIMMs, 276-pin, 533MHz DDR2 SDRAM	5601 - 0/64GB DDR3 Memory (4X16GB) DIMMS - 1066 MHz - POWER7 CoD Memory	Yes
7893 - 4GB (4x1GB) DIMMs, 276-pin, 533MHz DDR2 SDRAM	5601 - 0/64GB DDR3 Memory (4X16GB) DIMMS - 1066 MHz - POWER7 CoD Memory	Yes
7894 - 8GB (4x2GB) DIMMs, 276-pin, 533 MHz DDR2 SDRAM	5601 - 0/64GB DDR3 Memory (4X16GB) DIMMS - 1066 MHz - POWER7 CoD Memory	Yes
4496 - 8/16GB (4X4GB) DIMMs, 276 PIN, 533 MHz DDR2 SDRAM	5602 - 0/128GB DDR3 Memory (4X32GB) DIMMS - 800 MHz - POWER7 CoD Memory	Yes
4497 - 16GB (4X4GB) DIMMs, 276 PIN, 533 MHz, DDR2 SDRAM	5602 - 0/128GB DDR3 Memory (4X32GB) DIMMS - 800 MHz - POWER7 CoD Memory	Yes
4498 - 32GB (4X8GB) DIMMs, 276 pin, 400MHz DDR2 SDRAM	5602 - 0/128GB DDR3 Memory (4X32GB) DIMMS - 800 MHz - POWER7 CoD Memory	Yes
4499 - 16GB (4X4GB) DIMMs, 276 pin, 400MHz DDR2 SDRAM	5602 - 0/128GB DDR3 Memory (4X32GB) DIMMS - 800 MHz - POWER7 CoD Memory	Yes
5690 - 0/32GB DDR2 Memory (4X8GB) DIMMS-400 MHz- POWER6 CoD Memory	5602 - 0/128GB DDR3 Memory (4X32GB) DIMMS - 800 MHz - POWER7 CoD Memory	Yes
5695 - 0/16GB DDR2 Memory (4X4GB) DIMMS-533 MHz- POWER6 CoD Memory	5602 - 0/128GB DDR3 Memory (4X32GB) DIMMS - 800 MHz - POWER7 CoD Memory	Yes
5696 - 0/32GB DDR2 Memory (4X8GB) DIMMS-400 MHz- POWER6 CoD Memory	5602 - 0/128GB DDR3 Memory (4X32GB) DIMMS - 800 MHz - POWER7 CoD Memory	Yes
5680 - Activation of 1GB DDR2 POWER6 Memory	8212 - Activation of 1 GB DDR3 POWER7 Memory	No
7272 - 2GB CUoD Memory Activation	8212 - Activation of 1 GB DDR3 POWER7 Memory	No
7273 - 4GB CUoD Memory Activation	8212 - Activation of 1 GB DDR3 POWER7 Memory	No
7274 - 8GB CUoD Memory Activation	8212 - Activation of 1 GB DDR3 POWER7 Memory	No
7275 - 16GB CUoD Memory Activation	8212 - Activation of 1 GB DDR3 POWER7 Memory	No
7276 - 32GB CUoD Memory Activation	8212 - Activation of 1 GB DDR3 POWER7 Memory	No
7663 - 1GB DDR2 Memory Activation	8212 - Activation of 1 GB DDR3 POWER7 Memory	No
8017 - 570 to MMA CoD Memory Activation Carry Over Indicator	8212 - Activation of 1 GB DDR3 POWER7 Memory	No
5681 - Activation of 256 GB DDR2 POWER6 Memory	8213 - Activation of 100 GB DDR3 POWER7 Memory	No

5684 - Activation of 100 GB DDR2 Memory	8213 - Activation of 100 GB DDR3 POWER7 Memory	No

Feature conversions for 9117-MMA to 9117-MMB processor features

From FC:	To FC:	Parts Returned
5620 - 3.5 GHz Proc Card, 0/2 Core POWER6, 12 DDR2 Memory Slots	4980 - 3.5 GHz Proc Card, 0/12 Core POWER7, 16 DDR3 Memory Slots	Yes
5621 - 4.2 GHz Proc Card, 0/2 Core POWER6, 8 DDR2 Memory Slots	4980 - 3.5 GHz Proc Card, 0/12 Core POWER7, 16 DDR3 Memory Slots	Yes
5622 - 4.2 GHz Proc Card, 0/2 Core POWER6, 12 DDR2 Memory Slots	4980 - 3.5 GHz Proc Card, 0/12 Core POWER7, 16 DDR3 Memory Slots	Yes
7380 - 4.7 GHz Proc Card, 0/2 Core POWER6, 12 DDR2 Memory Slots	4980 - 3.5 GHz Proc Card, 0/12 Core POWER7, 16 DDR3 Memory Slots	Yes
7387 - 4.4GHz Proc Card, 0/2 Core POWER6, 12 DDR2 Memory Slots.	4980 - 3.5 GHz Proc Card, 0/12 Core POWER7, 16 DDR3 Memory Slots	Yes
7388 - 5.0 GHz Proc Card, 0/2 Core POWER6, 12 DDR2 Memory Slots	4980 - 3.5 GHz Proc Card, 0/12 Core POWER7, 16 DDR3 Memory Slots	Yes
7540 - 4.2 GHz Proc Card, 0/4 Core POWER6, 12 DDR2 Memory Slots	4980 - 3.5 GHz Proc Card, 0/12 Core POWER7, 16 DDR3 Memory Slots	Yes
4990 - Single 5250 Enterprise Enablement	4992 - Single 5250 Enterprise Enablement	No
4991 - Full 5250 Enterprise Enablement	4997 - Full 5250 Enterprise Enablement	No
5403 - One Processor Activation for Processor Feature #7380	5459 - One Processor Activation for Processor Feature #4980	No
5670 - One Processor Activation for Processor Feature #5620	5459 - One Processor Activation for Processor Feature #4980	No
5671 - One Processor Activation for Processor Feature #5621	5459 - One Processor Activation for Processor Feature #4980	No
5672 - One Processor Activation for Processor Feature #5622	5459 - One Processor Activation for Processor Feature #4980	No
7306 - One Processor Activation for Processor Feature #7388	5459 - One Processor Activation for Processor Feature #4980	No
7700 - One Processor Activation for Processor Feature #7540	5459 - One Processor Activation for Processor Feature #4980	No
7719 - One Processor Activation for Processor Feature #7387	5459 - One Processor Activation for Processor Feature #4980	No

Feature conversions for 9117-MMA to 9117-MMB rack related features

From FC:	To FC:	Parts Returned
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 9117-MMB virtualization engine features

From FC:	To FC:	Parts Returned
7942 - PowerVM -Standard Edition	7995 - PowerVM - Enterprise Edition	No

Model conversion purchase price

From	Model To
9117-MMA	9117-MMB

Conversions

Machine type	Model	Part number	Description	Price
9117	MMB		Model Conv MMA to MMB	$2,039
9117	MMB	911744955600	Feat Conv 4495 to 5600	$1,764
9117	MMB	911744965600	Feat Conv 4496 to 5600	$1,764
9117	MMB	911744975600	Feat Conv 4497 to 5600	$1,764
9117	MMB	911744995600	Feat Conv 4499 to 5600	$1,764
9117	MMB	911756935600	Feat Conv 5693 to 5600	$1,764
9117	MMB	911756945600	Feat Conv 5694 to 5600	$1,764
9117	MMB	911756955600	Feat Conv 5695 to 5600	$1,764
9117	MMB	911778925600	Feat Conv 7892 to 5600	$1,764
9117	MMB	911778935600	Feat Conv 7893 to 5600	$1,764
9117	MMB	911778945600	Feat Conv 7894 to 5600	$1,764
9117	MMB	911744955601	Feat Conv 4495 to 5601	$6,948
9117	MMB	911744965601	Feat Conv 4496 to 5601	$6,948
9117	MMB	911744975601	Feat Conv 4497 to 5601	$6,948
9117	MMB	911744985601	Feat Conv 4498 to 5601	$6,948
9117	MMB	911744995601	Feat Conv 4499 to 5601	$6,948
9117	MMB	911756905601	Feat Conv 5690 to 5601	$6,948
9117	MMB	911756935601	Feat Conv 5693 to 5601	$6,948
9117	MMB	911756945601	Feat Conv 5694 to 5601	$6,948
9117	MMB	911756955601	Feat Conv 5695 to 5601	$6,948
9117	MMB	911756965601	Feat Conv 5696 to 5601	$6,948
9117	MMB	911778925601	Feat Conv 7892 to 5601	$6,948
9117	MMB	911778935601	Feat Conv 7893 to 5601	$6,948
9117	MMB	911778945601	Feat Conv 7894 to 5601	$6,948
9117	MMB	911744965602	Feat Conv 4496 to 5602	$13,896
9117	MMB	911744975602	Feat Conv 4497 to 5602	$13,896
9117	MMB	911744985602	Feat Conv 4498 to 5602	$13,896
9117	MMB	911744995602	Feat Conv 4499 to 5602	$13,896
9117	MMB	911756905602		$13,896

			Feat Conv 5690 to 5602	
9117	MMB	911756955602	Feat Conv 5695 to 5602	$13,896
9117	MMB	911756965602	Feat Conv 5696 to 5602	$13,896
9117	MMB	911756808212	Feat Conv 5680 to 8212	$221
9117	MMB	911772728212	Feat Conv 7272 to 8212	$221
9117	MMB	911772738212	Feat Conv 7273 to 8212	$221
9117	MMB	911772748212	Feat Conv 7274 to 8212	$221
9117	MMB	911772758212	Feat Conv 7275 to 8212	$221
9117	MMB	911772768212	Feat Conv 7276 to 8212	$221
9117	MMB	911776638212	Feat Conv 7663 to 8212	$221
9117	MMB	911780178212	Feat Conv 8017 to 8212	$221
9117	MMB	911756818213	Feat Conv 5681 to 8213	$22,050
9117	MMB	911756848213	Feat Conv 5684 to 8213	$22,050
9117	MMB	911756204980	Feat Conv 5620 to 4980	$9,184
9117	MMB	911756214980	Feat Conv 5621 to 4980	$9,184
9117	MMB	911756224980	Feat Conv 5622 to 4980	$9,184
9117	MMB	911773804980	Feat Conv 7380 to 4980	$9,184
9117	MMB	911773874980	Feat Conv 7387 to 4980	$9,184
9117	MMB	911773884980	Feat Conv 7388 to 4980	$9,184
9117	MMB	911775404980	Feat Conv 7540 to 4980	$9,184
9117	MMB	911749904992	Feat Conv 4990 to 4992	$0
9117	MMB	911749914997	Feat Conv 4991 to 4997	$0
9117	MMB	911754035459	Feat Conv 5403 to 5459	$5,137
9117	MMB	911756705459	Feat Conv 5670 to 5459	$5,137
9117	MMB	911756715459	Feat Conv 5671 to 5459	$5,137
9117	MMB	911756725459	Feat Conv 5672 to 5459	$5,137
9117	MMB	911773065459	Feat Conv 7306 to 5459	$5,137
9117	MMB	911777005459	Feat Conv 7700 to 5459	$5,137
9117	MMB	911777195459	Feat Conv 7719 to 5459	$5,137
9117	MMB	911762466263	Feat Conv 6246 to 6263	$471
9117	MMB	911762476272	Feat Conv 6247 to 6272	$471
9117	MMB	911779427995	Feat Conv 7942 to 7995	$0

MMB Conversions (Machine type 9117, Model MMA)

From Feature number	To Feature number	Description	Part number			
		Power System 770		$10,195	20%	$2,039
Memory Feature Conversions						
4495	5600	0/32GB DDR3 Memory (4X8GB) DIM	911744955600	$1,960	90%	$1,764
4496	5600	0/32GB DDR3 Memory (4X8GB) DIM	911744965600	$1,960	90%	$1,764
4497	5600	0/32GB DDR3 Memory (4X8GB) DIM	911744975600	$1,960	90%	$1,764
4499	5600	0/32GB DDR3 Memory (4X8GB) DIM	911744995600	$1,960	90%	$1,764
5693	5600	0/32GB DDR3 Memory (4X8GB) DIM	911756935600	$1,960	90%	$1,764
5694	5600	0/32GB DDR3 Memory (4X8GB) DIM	911756945600	$1,960	90%	$1,764
5695	5600	0/32GB DDR3 Memory (4X8GB) DIM	911756955600	$1,960	90%	$1,764
7892	5600	0/32GB DDR3 Memory (4X8GB) DIM	911778925600	$1,960	90%	$1,764
7893	5600	0/32GB DDR3 Memory (4X8GB) DIM	911778935600	$1,960	90%	$1,764
7894	5600	0/32GB DDR3 Memory (4X8GB) DIM	911778945600	$1,960	90%	$1,764
4495	5601	0/64GB DDR3 Memory (4X16GB) DI	911744955601	$7,720	90%	$6,948
4496	5601	0/64GB DDR3 Memory	911744965601	$7,720	90%	$6,948

		(4X16GB) DI				
4497	5601	0/64GB DDR3 Memory (4X16GB) DI	911744975601	$7,720	90%	$6,948
4498	5601	0/64GB DDR3 Memory (4X16GB) DI	911744985601	$7,720	90%	$6,948
4499	5601	0/64GB DDR3 Memory (4X16GB) DI	911744995601	$7,720	90%	$6,948
5690	5601	0/64GB DDR3 Memory (4X16GB) DI	911756905601	$7,720	90%	$6,948
5693	5601	0/64GB DDR3 Memory (4X16GB) DI	911756935601	$7,720	90%	$6,948
5694	5601	0/64GB DDR3 Memory (4X16GB) DI	911756945601	$7,720	90%	$6,948
5695	5601	0/64GB DDR3 Memory (4X16GB) DI	911756955601	$7,720	90%	$6,948
5696	5601	0/64GB DDR3 Memory (4X16GB) DI	911756965601	$7,720	90%	$6,948
7892	5601	0/64GB DDR3 Memory (4X16GB) DI	911778925601	$7,720	90%	$6,948
7893	5601	0/64GB DDR3 Memory (4X16GB) DI	911778935601	$7,720	90%	$6,948
7894	5601	0/64GB DDR3 Memory (4X16GB) DI	911778945601	$7,720	90%	$6,948
4496	5602	0/128GB DDR3 Memory (4X32GB) D	911744965602	$15,440	90%	$13,896
4497	5602	0/128GB DDR3 Memory (4X32GB) D	911744975602	$15,440	90%	$13,896
4498	5602	0/128GB DDR3 Memory	911744985602	$15,440	90%	$13,896

		(4X32GB) D				
4499	5602	0/128GB DDR3 Memory (4X32GB) D	911744995602	$15,440	90%	$13,896
5690	5602	0/128GB DDR3 Memory (4X32GB) D	911756905602	$15,440	90%	$13,896
5695	5602	0/128GB DDR3 Memory (4X32GB) D	911756955602	$15,440	90%	$13,896
5696	5602	0/128GB DDR3 Memory (4X32GB) D	911756965602	$15,440	90%	$13,896
5680	8212	Activation of 1 GB DDR3 POWER7	911756808212	$245	90%	$221
7272	8212	Activation of 1 GB DDR3 POWER7	911772728212	$245	90%	$221
7273	8212	Activation of 1 GB DDR3 POWER7	911772738212	$245	90%	$221
7274	8212	Activation of 1 GB DDR3 POWER7	911772748212	$245	90%	$221
7275	8212	Activation of 1 GB DDR3 POWER7	911772758212	$245	90%	$221
7276	8212	Activation of 1 GB DDR3 POWER7	911772768212	$245	90%	$221
7663	8212	Activation of 1 GB DDR3 POWER7	911776638212	$245	90%	$221
5681	8213	Activation of 100 GB DDR3 POWE	911756818213	$24,500	90%	$22,050
5684	8213	Activation of 100 GB DDR3 POWE	911756848213	$24,500	90%	$22,050
5620	4980	3.5 GHz Proc Card, 0/12 Core P	911756204980	$17,329	53%	$9,184
5621	4980	3.5 GHz Proc Card, 0/12 Core P	911756214980	$17,329	53%	$9,184
5622	4980	3.5 GHz Proc	911756224980	$17,329	53%	$9,184

		Card, 0/12 Core P				
7380	4980	3.5 GHz Proc Card, 0/12 Core P	911773804980	$17,329	53%	$9,184
7387	4980	3.5 GHz Proc Card, 0/12 Core P	911773874980	$17,329	53%	$9,184
7388	4980	3.5 GHz Proc Card, 0/12 Core P	911773884980	$17,329	53%	$9,184
7540	4980	3.5 GHz Proc Card, 0/12 Core P	911775404980	$17,329	53%	$9,184
4990	4992	Single 5250 Enterprise Enablem	911749904992	$50,000		-
4991	4997	Full 5250 Enterprise Enablemen	911749914997	$200,000		-
5403	5459	One Processor Activation for P	911754035459	$5,708	90%	$5,137
5670	5459	One Processor Activation for P	911756705459	$5,708	90%	$5,137
5671	5459	One Processor Activation for P	911756715459	$5,708	90%	$5,137
5672	5459	One Processor Activation for P	911756725459	$5,708	90%	$5,137
7306	5459	One Processor Activation for P	911773065459	$5,708	90%	$5,137
7700	5459	One Processor Activation for P	911777005459	$5,708	90%	$5,137
7719	5459	One Processor Activation for P	911777195459	$5,708	90%	$5,137
6246	6263	1.8m Rack Trim Kit	911762466263	$523	90%	$471
6247	6272	2.0m Rack Trim Kit	911762476272	$523	90%	$471
7942	7995	PowerVM - Enterprise Edition	911779427995	-	90%	-

Maintenance charges

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