The new IBM Power 780 system utilizes the latest POWER7 processor technology designed to deliver unprecedented performance, scalability, reliability, and manageability for demanding commercial workloads

Table of contents

At a glance

The Power® 780 enterprise server is designed to deliver outstanding price/performance, mainframe-inspired reliability and availability features, flexible capacity upgrades, and innovative virtualization technologies. The Power 780 features:

- Up to 64 POWER7 cores with four processor cards per server

- One POWER7 processor card per CEC enclosure: 16-core at 3.86 GHz or 8-core at 4.14 GHz (TurboCore)
- Up to 2.0 TB of DDR3 memory with frequencies up to 1,066 MHz, augmented with the optional 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 780 server (9179-MHB) utilizes the latest POWER7 processor technology designed to deliver unprecedented performance, scalability, reliability, and manageability for demanding commercial workloads.

The innovative IBM Power 780 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, comprised of two single-chip module processors. Each of the POWER7 processors in this server has 64-bit architecture and includes up to eight cores on a single-chip module (SCM), 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 3.86 GHz with eight cores and 4.14 GHz with four cores. This new model server is available starting as low as four active cores and incrementing one core at a time through built-in Capacity on Demand (CoD) functions.

What makes the Power 780 truly unique is the ability to switch between its standard throughput optimized mode and its unique TurboCore mode, where performance per core is boosted with access to both additional cache and additional clock speed. Based on the user's configuration option, any Power 780 system can be booted in standard mode, enabling up to a maximum of 64 processor cores running at 3.86 GHz, or in TurboCore mode, enabling up to 32 processor cores running at 4.14 GHz and twice the cache per core.

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 general availability of large DIMMs). Memory can be augmented with the optional 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 servers:

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, for IBM Power 780 server and all features, including the following MES orderable features:
  - Processor activation (#5469)
  - Memory activations (#8212, #8213)
  - COD (#7633, #7634, #7635, and #7636)
  - Secondary Operating System (#0265, #0266, and #0267)
- June 4, 2010, for model conversion (9117-MMA to 9179-MHB), upgrades, and all additional MES orderable features
- June 18, 2010, for the Base Customer Specified Placement feature (#8453)
- November 19, 2010, for Hot-node Add, memory upgrade, Hot-node Repair, and 128 GB memory feature (#5602)

Description

Summary of features

The following features are available on the Power 780:

- 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):
  - 0/16 way, 3.86 GHz or 0/8 way, 4.14 GHz (TurboCore) processor card (#4982)
- POWER7 DDR3 Memory DIMMs (16 DIMM slots per processor card):
  - 0/32 GB (4 X 8 GB), 1,066 MHz (#5600)

  - 0/64 GB (4 X 16 GB), 1,066 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 (maximum nine per system)
- Two HMC ports per enclosure (maximum four per system)
- Eight I/O expansion slots per enclosure (32 maximum 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 EXP 12S SAS DASD/SSD I/O drawers on SAS PCI controllers (#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

- SMP and FSP cable features are required when connecting the processors together for 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.

- Processor #4982 can run in standard or TurboCore mode. TurboCore mode restricts the system from utilizing all of the processor cores in the system. A maximum of half of the physical cores can be utilized when in TurboCore mode. To utilize more than 50% of the processors present in the system, switch the system out of TurboCore mode and reboot the system. The entire system must operate in either standard or TurboCore mode.

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 features 5600, 5601, and 5602 can be mixed on the same POWER7 processor module. Frequencies must be the same across the memory controller (four 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 your 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 Drawer 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 either by 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 780 using any operating systems.
- It is recommended that any attached remote I/O drawers be located in the same rack as the Power 780 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 780, 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 Drwr	Supported	SCSI	60
5796	PCI-X DDR 12X I/O Drwr	Available	12X	32
5802	PCIe 12X I/O Drwr (disk bays)	Available	12X	16
5877	PCIe 12X I/O Drwr (No disk bays)	Available	12X	16
5886	EXP 12S SAS Disk Drwr	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 I/O drawer features are available on the Power 780:

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 #7314 drawer mounting enclosure. The 4 EIA tall enclosure can hold up to two #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 #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 #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 ten PCIe-based I/O adapter slots and eighteen 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 #5802 as the SAS drives. A maximum of two #5802 drawers can be placed on the same 12X loop. Mixing #5802 and #5796/7314-G30 on the same loop is not supported. Feature #5877 is the same as #5802 except it does not support any disk bays. Feature #5877 can be on the same loop as #5802. Feature #5877 can not be upgraded to #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 configuration of two 12X DDR cables, two DC 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 SSDs. 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, or ESM). Each ESM has an independent SCSI Enclosure Services (SES) diagnostic processor.

The SAS disk drives or SSDs contained in the EXP 12S are controlled by one or two PCIe SAS adapters connected to the EXP 12S via SAS cables. The SAS cable will vary depending on 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 EXP 12S. 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 #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 EXP 12S. A SAS X-cable is used for AIX/Linux environments when a pair of adapters are used for controller redundancy.

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

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

The #5886 can also be directly attached to the SAS port on the rear of the Power 780, providing a very-low-cost disk storage solution. When used this way, the embedded SAS RAID controllers augmented by the 175 MB Cache RAID (#5662) in the system unit control the disk drives in EXP 12S. A second unit can not be cascaded to a #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 #5802 and #5877 I/O drawers and 12X SDR and/or DDR cables for the #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-X DDR 12X cable choices: Each 5796 drawer requires one Dual-Port PCI-X 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-X 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 with 12X Short Run adapter (#6446) in both drawers	Yes	Yes	No	No
5796 with 12X Short Run adapter (#6446) to 5796 with 12X Long Run adapter (#6457)	Yes	Yes	Yes	No
5796 to 5796 with 12X Long Run adapter (#6457) in both drawers	Yes	Yes	Yes	Yes
5796 with 12X Short Run adapter (#6446) to system unit	No	Yes	Yes	No

5796 with 12X Long Run adapter (#6457) to system unit	No	Yes	Yes	Yes

[1] The PCI-X DDR 12X cable (#1829 or #1861 or #1862) is limited to connecting two drawers or server 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 two modules located one beneath the other in a 7014 rack.

[2] The PCI-X 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 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-X DDR 12X cable (#1834 or #1864) is limited to connecting CEC to drawer if in different racks. It is intended for use when connecting 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 9179-MHB and its I/O drawer features are designed to mount in the 7014-T00, -T42, #0551, and #0553 racks. These are built to the 19-inch EIA standard. When ordering a new 9179 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 9179-MHB when you order additional I/O drawer hardware for an existing system (MES order). The rack feature #0551 and #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 9179-MHB has the following rack requirements:

- The Power 780 may be ordered without a rack.
- The Power 780 consists of one to four CEC enclosures. Each enclosure occupies 4U of vertical rack space. The Power 780 is designed to be installed in a 7014-T00 or -T42 rack and shipped from IBM to the client. An existing 7014-T00, -T42, #0551, or #0553 rack can be used for the Power 780 if sufficient space and power are available.
- 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 or T42.
- For Power 780 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 780 server is installed in a 7014-T00 or -T42 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 is feature number 6263. The required trim kit for the 7014-T42 rack is feature number 6272. When upgrading from a 9117-MMA, trim kit 6246 or 6247 may be used for one drawer enclosure only.
- The design of the Power 780 is optimized for use in a 7014-T00, -T42, #0551, or #0553 rack. Both the front cover and the processor flex cables occupy space on the front left and right sides 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, -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, T42, #0551,

and #0553 racks or ordered for the T00, T42, #0551, and #0553 racks that clients already own.
- A Power 780 door (#6250) is available on the 7014-T42 rack.

1.8 Meter Rack (#0551)

The 1.8 Meter Rack (#0551) is a 36 EIA unit rack. The rack that is delivered as #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 #0551. Order the #0551 only when required to support rack integration of MES orders prior to shipment from IBM.

2.0 Meter Rack (#0553)

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

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.

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 a 12X I/O drawer attached to a 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 and 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 enclosure.
- The model MHB supports only the SAS SFF DASD hard disks internally. The 3.5-inch DASD hard files can be attached to the model MHB but must be located in a #5886 EXP 12S I/O drawer.
- When ordering feature #1819, you must also order #5662. This applies to MES orders of #1819 unless #5662 is already present in the same CEC drawer. Feature #1815 and #5662 cannot be installed in the same drawer. Feature #1819 must not be installed in a drawer unless #5662 is also installed.

I/O slots and adapters

- Each Power 780 CEC enclosure has six full-length, 8X, PCIe slots and two GX++ slots.
- There is a maximum of eight I/O expansion slots per enclosure (32 maximum 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 780 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 780 server 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 features 7188 and 7109 when using power cord feature 6654, 6655, 6656, 6657, or 6658: Each pair of PDUs can power up to three Power 780 CEC enclosures.
- For PDU features 7188 and 7109 when using power cord feature 6489, 6491, 6492, or 6653: Each pair of PDUs can power up to seven Power 780 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.
- Up to 10 partitions per processor are 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 Power 780 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 175 MB Cache RAID - Dual IOA Enablement Card (#5662) 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 upon the controller options and the operating system selected. The controllers for the six-bay (3/3) configurations are always the two 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 that 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 controls all six SFF bays and both see all six drives. The 3/3 and 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 (#5662) causes the pair of embedded controllers in that CEC drawer to be configured as dual controllers, accessing all six SAS drive bays. Without the #5662, each of the two controllers can access only two or three SAS drive 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 the 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 are 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 175 MB Cache RAID - Dual IOA Enablement Card (#5662) is required if IBM i is to access any of the SAS bays in that CEC drawer. AIX and Linux support configurations using two sets of three bays (3/3) or three sets of two bays (2/2/2) without #5662. With #5662, they support dual controllers running one set of six bays.

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 780 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 it 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 780 server uses the IBM i operating system in addition to any other supported operating system on the same server, you 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 780:

IBM i Model	Processor Feature	On/Off CoD Processor Enablement Feature	On/Off CoD Processor Billing Feature	On/Off CoD Processor Billing Feature
MHB	4982	7951	7635	7636

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

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

1. 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: The 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: The 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: The client initiates the request for On/Off CoD use by asking the sales channel to enable the machine for temporary capacity.
   - Step 2: The 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 a copy 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: The sales channel places an order for processor or memory enablement features.
   - Step 4: The 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, mails it, and posts it.
   - Step 6: The customer retrieves the enablement code and applies it to the server.

2. 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 how many GB 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 how many GB 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.

3. **On/Off CoD Billing: Description**

   The contract, signed by the client before receiving the enablement code, requires the 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. The 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 9179-MHB.

If a Power 780 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.

```
       Utility
       Billing
       Processor
Model  Feature   Utility CoD Feature Description

MHB    7633      100 Processor Minutes for #4982
MHB    7634      100 Processor Minutes for #4982, IBM i
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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 by visiting

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

IBM Server Product Services offer 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, visit

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 preinstallation
  - Unit personalization
  - Third-party hardware and software installation
  - Customer-specified placement
- Asset tagging: Standard tagging Radio Frequency Item Device (RFID)
- Special packaging: Box consolidation
- System customization: Remote access partitioning of customized operating system or firmware

For more information on Deployment-ready Services, visit

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

PowerCare service

Included with Power 780 systems is a PowerCare services option, which entitles you to choose one of several high-value technical service offerings from IBM to complement and assist in the deployment of a new Power 780 system. This option is provided at no additional charge. By leveraging the skills, experiences, and proven methodology of IBM Services professionals, you can potentially increase the efficiency and quality of your complex data center operations.

The PowerCare option is included with new Power 780 systems and MES upgrades into a Power 780. PowerCare options are reviewed during the Power 780 Technical and Delivery Assessment (formerly known as the Systems Assurance Review). The customer has up to 90 days from the install date of the Power 780 to select a PowerCare service. Delivery of the selected service must be completed within nine months of the install date of the Power 780 system.

For more details on available PowerCare services options, visit

http://www-03.ibm.com/systems/power/support/powercare/

Model upgrades

You can upgrade the 9117-MMA with IBM POWER6™ or POWER6+™ processors to the IBM Power 780 with POWER7 processors. For upgrades from POWER6 or POWER6+ processor-based systems IBM will install new CEC enclosures to replace the enclosures you currently have. Your current CEC enclosures will be returned to IBM in exchange for the financial considerations that are 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 MT-model that were not ordered via feature numbers. Any feature for which a feature conversion is used to obtain a new part must be returned to IBM also. Clients may keep and reuse any features from the CEC enclosures that were not involved in a feature conversion transaction.

Upgrade considerations

Feature conversions have been set up for the following:

- POWER6 and POWER6+ processors to POWER7 processors
- DDR2 memory DIMMs to DDR3 memory DIMMs
- Trim kits (a new trim kit is needed when upgrading to a two-, three-, or four-drawer 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, and #6858)
- Trim kits (#6246 and #6247) - for one-drawer configurations only or for racks holding only I/O and no 780 processor enclosures
- SATA DVD-RAM (#5762)

The Power 780 can support the following 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 EXP 12S SAS Disk Drawer

The model MHB supports only the SAS DASD SFF hard disks internally. The older 3.5-inch DASD hard disks can be attached to the model MHB but must be located in an I/O drawer.

For POWER6 or POWER6+ processor-based servers 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 780 server 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 780 model MHB.

Feature number 8018 is available to support migration of the PowerVM feature 7942 during the initial order and build of the upgrade MES MHB order. Customers may add 8018 to their upgrade orders in a quantity not to exceed the quantity of feature 7942 obtained for the system being upgraded. The 7942 feature number should be migrated to the new configuration report in a quantity that equals 8018. Additional 7942 features can be ordered during the upgrade.

PowerVM

PowerVM is available on the 9179-MHB:

- 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 (VIOS) is a single-function appliance that resides in an 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.
- With 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, to move workloads across a pool of different physical resources as business needs shift, and to move workloads away from underutilized 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 Systems LPARs and virtual I/O.

Capacity BackUp Offering (applies to IBM i only)

The Power 780 server's 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 #4891 is available only as part of a new server purchase or during an MES upgrade from an existing system to a 9179-MHB. 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 780 server can be:

- 9119-FHA
- 9406-595
- 9179-MHB

These systems have IBM i software licenses with an IBM i P50 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 an eight-core Power 780 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 that allows the effective maximum memory capacity to be much larger than the true physical memory maximum. Sophisticated compression/decompression of memory content can allow memory expansion up to 100%. This can allow a partition to do significantly more work or support more users with the same physical amount of memory. Similarly, it can allow a server to run more partitions and do more work for the same physical amount of memory.

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

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

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

A planning tool is included with AIX 6.1 Technology Level 4 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 page

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 that 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 9179-MHB is the same as the four-digit numeric feature number for the processors used in the system. For example, if the processor feature number in a system is 4982, the QPRCFEAT value for the system would be 4982.

- The QPRCFEAT value in a Power 780 server does not change with the addition of more processors or additional CEC enclosures.
- The QPRCFEAT value in a Power 780 server would change only if the feature number 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 780 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, contact Red Hat.

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

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.

All statements regarding IBM's plans, directions, and intent are subject to change or withdrawal without notice. Any reliance on these statements of general direction is at the relying party's sole risk and will not create liability or obligation for IBM.

Reference information

Refer to Hardware Announcement 110-025, dated February 09, 2010, for IBM Power 770 Server.

Product number

The following are newly announced features on the specific models of the IBM Power Systems 9179 machine type:

Description	MT	Model	Feature
IBM Power 780	9179	MHB	
Specify Code for External High Speed Modem	9179	MHB	0032
Mirrored System Disk Level, Specify Code	9179	MHB	0040
Device Parity Protection-All, Specify Code	9179	MHB	0041
Mirrored System IOP Level Specify Code	9179	MHB	0042
Mirrored System Bus Level, Specify Code	9179	MHB	0043
Device Parity RAID-6 All, Specify Code	9179	MHB	0047
RISC-to-RISC Data Migration	9179	MHB	0205
AIX Partition Specify	9179	MHB	0265
Linux Partition Specify	9179	MHB	0266
IBM i Operating System Partition Specify	9179	MHB	0267
CSC Specify	9179	MHB	0275
Ext Tape Attached via #5736	9179	MHB	0290
Specify Custom Data Protection	9179	MHB	0296
Specify EXP24 Attach via Existing Controller	9179	MHB	0302
Mirrored Level System Specify Code	9179	MHB	0308
IPCS Extension Cables for NT	9179	MHB	0325
RAID Hot Spare Specify	9179	MHB	0347
V.24/EIA232 6.1m (20-Ft) PCI Cable	9179	MHB	0348
V.24/EIA232 15.2m (50-Ft) PCI Cable	9179	MHB	0349
V.35 6.1m (20-Ft) PCI Cable	9179	MHB	0353
V.35 15.2m (50-Ft) PCI Cable	9179	MHB	0354
V.36 6.1m (20-Ft) PCI Cable	9179	MHB	0356
X.21 6.1m (20-Ft) PCI Cable	9179	MHB	0359
X.21 15.2m (50-Ft) PCI Cable	9179	MHB	0360
V.24/EIA232 (80-Ft) PCI Cable	9179	MHB	0365
V.24/EIA232 6.1M (20-Ft) PCI Cable	9179	MHB	0367
UPS Factory Integration Specify	9179	MHB	0373
HMC Factory Integration Specify	9179	MHB	0374
Display Factory Integration Specify	9179	MHB	0375
Reserve Rack Space for UPS	9179	MHB	0376
Reserve Rack Space for HMC	9179	MHB	0377
Reserve Rack Space for Display	9179	MHB	0378
MTM Upgrade Indicator	9179	MHB	0395
MMA/MMB/MHB upgrade indicator	9179	MHB	0397
512MB DDR Server Memory	9179	MHB	0446
1GB DDR Server Memory	9179	MHB	0447
Customer Specified Placement	9179	MHB	0453
SSD Placement Indicator - CEC	9179	MHB	0462
SSD Placement Indicator (5802/5803)	9179	MHB	0463
SSD Placement Indicator - 5886	9179	MHB	0464
IBM i 5.4 w/ V5R4M5 Specify Code	9179	MHB	0533
IBM i 6.1 Specify Code	9179	MHB	0534
19 inch, 1.8 meter high rack	9179	MHB	0551
19 inch, 2.0 meter high rack	9179	MHB	0553
19 inch, 1.3 meter high rack	9179	MHB	0555
IBM i 6.1 with 6.1.1 Machine Code Specify Code	9179	MHB	0566
PCI-X Expansion Unit in Rack	9179	MHB	0588
PCI/SCSI Disk Expansion Drawer	9179	MHB	0595
Rack Filler Panel Kit	9179	MHB	0599
#5094 Equivalent	9179	MHB	0694

#5096 Equivalent	9179	MHB	0696
Balanced Warehouse Solution Indicator	9179	MHB	0710
Load Source Not in CEC	9179	MHB	0719
Load Source in #0595	9179	MHB	0720
Load Source in #5094/5294	9179	MHB	0721
Specify Load Source in #5786	9179	MHB	0725
Specify Load Source in #5802/5803	9179	MHB	0726
Specify #5886 Load Source placement	9179	MHB	0727
#4319 Load Source Specify	9179	MHB	0830
#4326 Load Source Specify	9179	MHB	0834
#4327 Load Source Specify	9179	MHB	0835
#4328 Load Source Specify	9179	MHB	0836
SAN Load Source Specify	9179	MHB	0837
#3676 Load Source Specify	9179	MHB	0838
#3677 Load Source Specify	9179	MHB	0839
#3678 Load Source Specify	9179	MHB	0840
#4329 Load Source Specify	9179	MHB	0841
#3658 Load Source Specify	9179	MHB	0844
#1884 Load Source Specify	9179	MHB	0851
#1888 Load Source Specify	9179	MHB	0853
#1909 Load Source Specify	9179	MHB	0854
#3587 Load Source Specify	9179	MHB	0855
US TAA Compliance Indicator	9179	MHB	0983
Modem Cable - US/Canada and General Use	9179	MHB	1025
USB External Docking Station for Removable Disk Drive	9179	MHB	1104
USB 160 GB Removable Disk Drive	9179	MHB	1106
USB 500 GB Removable Disk Drive	9179	MHB	1107
Decline Electronic Service Agent™ Install Indicator	9179	MHB	1120
System Unique Identifier	9179	MHB	1311
200V 16A 4.3m (14-Ft) TL Line Cord	9179	MHB	1406
125V 4.3m (14-Ft) Line Cord	9179	MHB	1413
200V 1.8m (6-Ft) Locking Line Cord	9179	MHB	1414200V 1.8m (6-Ft) Watertight Line Cord
4.3m 200V/16A Power Cord S. Africa	9179	MHB	1418
4.3m 200V/16A Power Cord Israel	9179	MHB	1419
4.3m 200V/16A Power Cord EU/Asia	9179	MHB	1420
4.3m 200V/16A Power Cord CH/DK	9179	MHB	1421
200V 1.8m (6-Ft) Locking Line Cord	9179	MHB	1424
200V 1.8m (6-Ft) Watertight Line Cord	9179	MHB	1425
200V 4.3m (14-Ft) Locking Line Cord	9179	MHB	1426
200V 4.3m (14-Ft) Watertight Line Cord	9179	MHB	1427
4.3m 200V/10A Power Cord EU/Asia	9179	MHB	1439
4.3m 200V/10A Power Cord Denmark	9179	MHB	1440
4.3m 200V/10A Power Cord S. Africa	9179	MHB	1441
4.3m 200V/10A Power Cord Swiss	9179	MHB	1442
4.3m 200V/10A Power Cord UK	9179	MHB	1443
4.3m 200V/10A Power Cord Israel	9179	MHB	1445
4.3m 200V/32A Power Cord EU 1-PH	9179	MHB	1449
4.3m 200V/16A Power Cord EU 2-PH	9179	MHB	1450
200V (6-Ft) 1.8m Line Cord	9179	MHB	1451
200V (14-Ft) 4.3m Line Cord	9179	MHB	1452
200V (6-Ft) 1.8m Locking Line Cord	9179	MHB	1453
200V 12A (14-Ft) 4.3m TL Line Cord	9179	MHB	1454200V (6-Ft) 1.8m Watertight Line Cord
200V (6-Ft) 1.8m Upper Locking Cord	9179	MHB	1458
200V (6-Ft) 1.8m Upper Locking Cord	9179	MHB	1459
3m Copper RIO Cable	9179	MHB	1460
6m Copper RIO Cable	9179	MHB	1461
15m RIO Cable	9179	MHB	1462
30m SPCN Cable	9179	MHB	1466
6m RIO to RIO-2 Cable	9179	MHB	1474
10m RIO to RIO-2 Cable	9179	MHB	1475
4.3m 200V/12A Pwr Cd UK	9179	MHB	1476
4.3m 200V/16A Pwr Cd	9179	MHB	1477
Remote I/O Cable, 15M	9179	MHB	1485
3m RIO to RIO-2 Cable	9179	MHB	1487
IPCS Keyboard/Mouse for NT	9179	MHB	1700
GX Dual Port- RIO-2 Attach	9179	MHB	1800
GX Dual Port- 12X Channel Attach	9179	MHB	1802

Integrated, 4 Port- 1Gb Virtual Ethernet, I/O ports	9179	MHB	1803
Integrated, 4 Port (2x1Gb and 2x10Gb SFP+ Optical ports)	9179	MHB	1804
GX++ 12X DDR Adapter, Dual-port	9179	MHB	1808
Integrated, 4 Port (2x1Gb and 2x10Gb SFP+ Copper twinax ports)	9179	MHB	1813
SAS Cable for triple split DASD backplane	9179	MHB	1815
SAS Cable Assembly for SAS Port	9179	MHB	1819
System port/UPS Conversion Cable	9179	MHB	1827
1.5 Meter 12X to 4X Channel Conversion Cable	9179	MHB	1828
0.6 Meter 12X Cable	9179	MHB	1829
1.5 Meter 12X cable	9179	MHB	1830
8.0 Meter 12X Cable	9179	MHB	1834
3.0 Meter 12X Cable	9179	MHB	1840
3 Meter 12X to 4X Channel Conversion Cable	9179	MHB	1841
10 Meter 12X to 4X Channel Conversion Cable	9179	MHB	1842
Operator Panel	9179	MHB	1845
Operator Panel	9179	MHB	1846
Operator Panel	9179	MHB	1853
10 Meter 12X to 4X Enhanced Channel Conversion Cable	9179	MHB	1854
0.6 Meter 12X DDR Cable	9179	MHB	1861
1.5 Meter 12X DDR Cable	9179	MHB	1862
8.0 Meter 12X DDR Cable	9179	MHB	1864
3.0 Meter 12X DDR Cable	9179	MHB	1865
146.8GB 10K RPM SAS SFF Disk Drive	9179	MHB	1882
73.4 GB 15K RPM SAS SFF Disk Drive	9179	MHB	1883
69.7 GB 15K RPM SAS SFF Disk Drive	9179	MHB	1884
300GB 10K RPM SFF SAS Disk Drive	9179	MHB	1885
146GB 15K RPM SFF SAS Disk Drive	9179	MHB	1886
139GB 15K RPM SFF SAS Disk Drive	9179	MHB	1888
69GB SFF SAS Solid State Drive	9179	MHB	1890
Quantity 150 of #1883	9179	MHB	1891
Quantity 150 of #1882	9179	MHB	1899
69GB SFF SAS Solid State Drive	9179	MHB	1909
PCI-X DDR Dual Channel Ultra320 SCSI Adapter	9179	MHB	1912
PCI SCSI Adapter 16-Bit Differential External Y Cable	9179	MHB	2114
Converter Cable, VHDCI to P, Mini-68 pin to 68 pin, 0.3M	9179	MHB	2118
Ultra 320 SCSI Cable 1 Meter	9179	MHB	2124
Ultra 320 SCSI Cable 3 Meter	9179	MHB	2125
Ultra 320 SCSI Cable 5 Meter	9179	MHB	2126
Ultra 320 SCSI Cable 10 Meter	9179	MHB	2127
Ultra 320 SCSI Cable 20 Meter	9179	MHB	2128
0.55 Meter Ultra 320 SCSI Cable	9179	MHB	2138
Primary OS - IBM i	9179	MHB	2145
Primary OS - AIX	9179	MHB	2146
Primary OS - Linux	9179	MHB	2147
0.6M 16-bit SCSI-2 System-to-System Cable	9179	MHB	2424
2.5M 16-bit SCSI-2 System-to-System Cable	9179	MHB	2425
2M LC-SC 50 Micron Fiber Converter Cable	9179	MHB	2456
2M LC-SC 62.5 Micron Fiber Converter Cable	9179	MHB	2459
External USB 1.44 MB Diskette Drive	9179	MHB	2591
4 port USB PCIe Adapter	9179	MHB	2728
2-Port USB PCI Adapter	9179	MHB	2738
PCI Ultra Mag Media Controller	9179	MHB	2749
PCI-X Ultra RAID Disk Controller	9179	MHB	2757
PCI-X Ultra4 RAID Disk Controller	9179	MHB	2780
PCI-X Fibre Chan Disk Controller	9179	MHB	2787
PCI IOP	9179	MHB	2844
PCI IOP for SAN Load Source	9179	MHB	2847
POWER GXT135P Graphics Accelerator with Digital Support	9179	MHB	2849
ARTIC960Hx 4-Port EIA-232 Cable	9179	MHB	2861
ARTIC960Hx 4-Port X.21 Cable	9179	MHB	2863
ARTIC960Hx 4-Port V.35 (DTE) Cable	9179	MHB	2864
PCIe 2-Line WAN w/Modem	9179	MHB	2893
3M Asynchronous Terminal/Printer Cable EIA-232	9179	MHB	2934
Asynchronous Cable EIA-232/V.24 3M	9179	MHB	2936
8-Port Asynchronous Adapter EIA-232/RS-422, PCI bus	9179	MHB	2943

IBM ARTIC960Hx 4-Port Multiprotocol PCI Adapter	9179	MHB	2947
Cable, V.24 / EIA-232	9179	MHB	2951
Cable, V.35	9179	MHB	2952
Cable, V.36 / EIA-499	9179	MHB	2953
Cable, X.21	9179	MHB	2954
2-Port Multiprotocol PCI Adapter	9179	MHB	2962
Serial-to-Serial Port Cable for Drawer/Drawer-3.7M	9179	MHB	3124
Serial-to-Serial Port Cable for Rack/Rack- 8M	9179	MHB	3125
RIO-2(Remote I/O-2)Cbl, 1.2M	9179	MHB	3146
RIO-2(Remote I/O-2)Cbl, 3.5M	9179	MHB	3147
RIO-2 (Remote I/O-2) Cable, 10M	9179	MHB	3148
RIO-2 (Remote I/O-2) Cable, 1.75M	9179	MHB	3156
RIO-2 (Remote I/O-2) Cbl, 2.5M	9179	MHB	3168
36.4 GB 10,000 RPM Ultra320 SCSI Disk Drive Assembly	9179	MHB	3273
73.4 GB 10,000 RPM Ultra320 SCSI Disk Drive Assembly	9179	MHB	3274
146.8 GB 10,000 RPM Ultra320 SCSI Disk Drive Assembly	9179	MHB	3275
36.4 GB 15,000 RPM Ultra320 SCSI Disk Drive Assembly	9179	MHB	3277
73.4 GB 15,000 RPM Ultra320 SCSI Disk Drive Assembly	9179	MHB	3278
146.8 GB 15,000 RPM Ultra320 SCSI Disk Drive Assembly	9179	MHB	3279
300 GB 10,000 RPM Ultra320 SCSI Disk Drive Assembly	9179	MHB	3578
300 GB 15K RPM SCSI Disk Drive	9179	MHB	3585
69GB 3.5" SAS Solid State Drive	9179	MHB	3586
69GB 3.5" SAS Solid State Drive	9179	MHB	3587
Widescreen LCD Monitor	9179	MHB	3632
T210 Flat-Panel Monitor	9179	MHB	3635
L200P Flat Panel Monitor	9179	MHB	3636
IBM T541H /L150p 15" TFT Color Monitor	9179	MHB	3637
IBM ThinkVision® L170p Flat Panel Monitor	9179	MHB	3639
ThinkVision L171p Flat Panel Monitor	9179	MHB	3640
IBM T115 Flat Panel Monitor	9179	MHB	3641
ThinkVision L191p Flat Panel Monitor	9179	MHB	3642
IBM T120 Flat Panel Monitor	9179	MHB	3643
IBM T119 Flat Panel Monitor	9179	MHB	3644
IBM T117 Flat Panel Monitor	9179	MHB	3645
73GB 15K RPM SAS Disk Drive	9179	MHB	3646
146GB 15K RPM SAS Disk Drive	9179	MHB	3647
300GB 15K RPM SAS Disk Drive	9179	MHB	3648
450GB 15K RPM SAS Disk Drive	9179	MHB	3649
External connection for 3 of 6 internal SAS Disk Slots	9179	MHB	3650
External connection for the 6 internal SAS Disk slots.	9179	MHB	3651
SAS Cable (EE) Drawer to Drawer 1M	9179	MHB	3652
SAS Cable (EE) Drawer to Drawer 3M	9179	MHB	3653
SAS Cable (EE) Drawer to Drawer 6M	9179	MHB	3654
428GB 15K RPM SAS Disk Drive	9179	MHB	3658
Processor Fabric Cable, 2 enclosure	9179	MHB	3660
SAS Cable (X) Adapter to SAS Enclosure, Dual Controller/Dual Path 3M:	9179	MHB	3661
SAS Cable (X) Adapter to SAS Enclosure, Dual Controller/Dual Path 6M:	9179	MHB	3662
SAS Cable (X) Adapter to SAS Enclosure, Dual Controller/Dual Path 15M:	9179	MHB	3663
Processor Fabric Cable, 3 enclosure	9179	MHB	3664
Processor Fabric Cable, 4 enclosure	9179	MHB	3665
SAS Cable (YR) -1M	9179	MHB	3667
Serv Interface Cable- 2, 3, and 4 Enclosure	9179	MHB	3671
Serv Interface Cable- 3 and 4 Enclosure	9179	MHB	3672
Serv Interface Cable- 4 Enclosure	9179	MHB	3673
69.7GB 15k rpm SAS Disk Drive	9179	MHB	3676
139.5GB 15k rpm SAS Disk Drive	9179	MHB	3677
283.7GB 15k rpm SAS Disk Drive	9179	MHB	3678
SAS Cable (AI)- Adapter to Internal drive 1M	9179	MHB	3679
3M SAS CABLE, ADPTR TO ADPTR (AA)	9179	MHB	3681
6M SAS CABLE, ADPTR TO ADPTR (AA)	9179	MHB	3682
SAS Cable (AE) Adapter to Enclosure, single			

controller/single path 3M	9179	MHB	3684
SAS Cable (AE) Adapter to Enclosure, single controller/single path 6M	9179	MHB	3685
SAS Cable (YI) System to SAS Enclosure, Single Controller/Dual Path 1.5M	9179	MHB	3686
SAS Cable (YI) System to SAS Enclosure, Single Controller/Dual Path 3M	9179	MHB	3687
SAS Cable (AT®) 0.6 Meter	9179	MHB	3688
SAS Cable (YO) Adapter to SAS Enclosure, Single Controller/Dual Path 1.5 M	9179	MHB	3691
SAS Cable (YO) Adapter to SAS Enclosure, Single Controller/Dual Path 3 M	9179	MHB	3692
SAS Cable (YO) Adapter to SAS Enclosure, Single Controller/Dual Path 6 M	9179	MHB	3693
SAS Cable (YO) Adapter to SAS Enclosure, Single Controller/Dual Path 15 M	9179	MHB	3694
External xSeries® Attach	9179	MHB	3704
PCI IOP	9179	MHB	3705
DVD-ROM	9179	MHB	3706
30GB 1/4-inch Cartridge Tape	9179	MHB	3707
50GB 1/4-inch Cartridge Tape	9179	MHB	3708
PCI 100/10Mbps Ethernet IOA	9179	MHB	3709
Processor Cable, Two-Drawer System	9179	MHB	3711
Processor Cable, Two, Three or Four Drawer System	9179	MHB	3712
Processor Cable, Three or Four Drawer System	9179	MHB	3713
Processor Cable, Four-Drawer System	9179	MHB	3714
0.3M Serial Port Converter Cable, 9-Pin to 25-Pin	9179	MHB	3925
Asynch Printer/Terminal Cable, 9-pin to 25-pin, 4M	9179	MHB	3926
Serial Port Null Modem Cable, 9-pin to 9-pin, 3.7M	9179	MHB	3927
Serial Port Null Modem Cable, 9-pin to 9-pin, 10M	9179	MHB	3928
1.8 M (6-ft) Extender Cable for Displays (15-pin D-shell to 15-pin D-shell)	9179	MHB	4242
Extender Cable - USB Keyboards, 2M	9179	MHB	4256
VGA to DVI Connection Converter	9179	MHB	4276
35.16GB 10k rpm Disk Unit	9179	MHB	4319
35.16GB 15k rpm Disk Unit	9179	MHB	4326
70.56GB 15k rpm Disk Unit	9179	MHB	4327
141.12GB 15k rpm Disk Unit	9179	MHB	4328
282.25GB 15k rpm Disk Unit	9179	MHB	4329
DVD-RAM	9179	MHB	4430
50GB 1/4-inch Cartridge Tape	9179	MHB	4487
4/8GB (4X2GB) DIMMs, 276 PIN 533 MHz, DDR2 SDRAM	9179	MHB	4495
8/16GB (4X4GB) DIMMs, 276 PIN, 533 MHz DDR2 SDRAM	9179	MHB	4496
16GB (4X4GB) DIMMs, 276 PIN, 533 MHz, DDR2 SDRAM	9179	MHB	4497
16GB (4X4GB) DIMMs, 276 pin, 400MHz DDR2 SDRAM	9179	MHB	4499
DVD-RAM	9179	MHB	4630
DVD-RAM	9179	MHB	4633
Rack Indicator- Not Factory Integrated	9179	MHB	4650
Rack Indicator, Rack #1	9179	MHB	4651
Rack Indicator, Rack #2	9179	MHB	4652
Rack Indicator, Rack #3	9179	MHB	4653
Rack Indicator, Rack #4	9179	MHB	4654
Rack Indicator, Rack #5	9179	MHB	4655
Rack Indicator, Rack #6	9179	MHB	4656
Rack Indicator, Rack #7	9179	MHB	4657
Rack Indicator, Rack #8	9179	MHB	4658
Rack Indicator, Rack #9	9179	MHB	4659
Rack Indicator, Rack #10	9179	MHB	4660
Rack Indicator, Rack #11	9179	MHB	4661
Rack Indicator, Rack #12	9179	MHB	4662
Rack Indicator, Rack #13	9179	MHB	4663
Rack Indicator, Rack #14	9179	MHB	4664
Rack Indicator, Rack #15	9179	MHB	4665
Rack Indicator, Rack #16	9179	MHB	4666
PCI Twinaxial Workstn IOA	9179	MHB	4746
PCI-X Cryptographic Coprocessor (FIPS 4)	9179	MHB	4764
ACTIVE MEMORY EXPANSION ENABLEMENT	9179	MHB	4791
PCI Crypto Coprocessor	9179	MHB	4801
PCI Crypto Accelerator	9179	MHB	4805
PCI Integ xSeries Server	9179	MHB	4812
PCI Integ xSeries Server	9179	MHB	4813
CBU SPECIFY	9179	MHB	4891

3.86 GHz / 4.14 GHz TurboCore Proc Card, 0/16 Core POWER7, 16 DDR3 Memory Slots	9179	MHB	4982
Single 5250 Enterprise Enablement	9179	MHB	4990
Full 5250 Enterprise Enablement	9179	MHB	4991
Single 5250 Enterprise Enablement	9179	MHB	4992
Full 5250 Enterprise Enablement	9179	MHB	4997
Software Preload Required	9179	MHB	5000
Custom Service Specify, Off-Site	9179	MHB	5001Customer Solution Center - Rochester Mfg
Software Preinstall	9179	MHB	5005
PCI-X Expansion Unit	9179	MHB	5088
PCI-X Expansion Tower	9179	MHB	5094
PCI-X Exp Tower (no disk)	9179	MHB	5096
30-Disk Expansion Feature	9179	MHB	5108
Dual Line Cords - Tower	9179	MHB	5115
Dual Line Cords - 5294 Tower	9179	MHB	5116
Redundant Power and Cooling	9179	MHB	5138
Power Dist Unit 1 Phase NEMA	9179	MHB	5160
Power Dist Unit 1 Phase IEC	9179	MHB	5161
Power Dist Unit 2 of 3 Phase	9179	MHB	5162
Power Dist Unit - 3 Phase	9179	MHB	5163
1.8m I/O Tower	9179	MHB	5294
1.8m I/O Tower (no disk)	9179	MHB	5296
One Processor Activation for Processor Feature #7380	9179	MHB	5403
Utility Billing for FC# 7380- 100 processor minutes	9179	MHB	5404
One Processor Activation for Processor Feature #4982	9179	MHB	5469
Utility Billing for FC# 7380 with IBM i - 100 processor minutes	9179	MHB	5480
Utility Billing for FC# 5620 with IBM i - 100 processor minutes	9179	MHB	5481
Utility Billing for FC# 5621 or #5622 with IBM i - 100 processor minutes	9179	MHB	5482
On/Off Processor Billing for FC#5620 with IBM i - 1 processor day	9179	MHB	5483
On/Off Processor Billing for FC#7380 with IBM i - 1 processor day	9179	MHB	5485
RFID TAGS FOR SERVERS, BLADES, BLADECENTERS, RACKS, AND HMCS	9179	MHB	5524
Sys Console on OP Console	9179	MHB	5544
Sys Console 100Mbps Ethernet	9179	MHB	5548
Sys Console On HMC	9179	MHB	5550
Sys Console-Ethernet No IOP	9179	MHB	5553
Mirror 35GB Disk/Controller Pkg	9179	MHB	5554
Mirror 70GB Disk/Controller Pkg	9179	MHB	5555
Mirror 141GB Disk/Controller Pkg	9179	MHB	5556
Mirror 35GB Drawer Package	9179	MHB	5560
Mirror 70GB Drawer Package	9179	MHB	5561
2780 Controller w/Aux Write Cache	9179	MHB	5580
2757 Controller w/Aux Write Cache	9179	MHB	5581
5777 Controller w/Aux Write Cache	9179	MHB	5583
2780 Controller w/Aux Write Cache	9179	MHB	5590
2757 Controller w/Aux Write Cache	9179	MHB	5591
System CEC Enclosure with IBM BEZEL, I/O Backplane, and System Midplane	9179	MHB	5597
System CEC Enclosure with OEM BEZEL, I/O Backplane, and System Midplane	9179	MHB	5598
0/32GB DDR3 Memory (4X8GB) DIMMs - 1066 MHz - POWER7 CoD Memory	9179	MHB	5600
0/64GB DDR3 Memory (4X16GB) DIMMs - 1066 MHz - POWER7 CoD Memory	9179	MHB	5601
0/128GB DDR3 Memory (4X32GB) DIMMs - 800 MHz - POWER7 CoD Memory	9179	MHB	5602
Processor Power Regulator	9179	MHB	5617
3.5 GHz Proc Card, 0/2 Core POWER6, 12 DDR2 Memory Slots	9179	MHB	5620
4.2 GHz Proc Card, 0/2 Core POWER6, 8 DDR2 Memory Slots	9179	MHB	5621
4.2 GHz Proc Card, 0/2 Core POWER6, 12 DDR2 Memory Slots	9179	MHB	5622
Proc Power Regulator	9179	MHB	5625
System CEC Enclosure with IBM Bezel	9179	MHB	5626
System CEC Enclosure with OEM Bezel + Labels	9179	MHB	5627

Sys AC Power Supply, 1600 W	9179	MHB	5628
Media Enclosure and Backplane	9179	MHB	5629
System AC Power Supply, 1725 W	9179	MHB	5632
Integrated, 2 Port- 1Gb Virtual Ethernet, I/O ports	9179	MHB	5636
Integrated, 2 Port- 10Gb (SR) Virtual Ethernet, I/O ports	9179	MHB	5637
Integrated, 4 Port- 1Gb Virtual Ethernet, I/O ports	9179	MHB	5639
Utility Billing for FC# 5620- 100 processor minutes	9179	MHB	5640
Utility Billing for FC# 5621 or #5622 - 100 processor minutes	9179	MHB	5641
Generic IBM Drawer Indicator for Bulk Orders	9179	MHB	5642
Generic OEM Drawer Indicator for Bulk Orders	9179	MHB	5643
Generic IBM Drawer Indicator for Bulk Orders	9179	MHB	5644
Generic OEM Drawer Indicator for Bulk Orders	9179	MHB	5645
Blind Swap Type III Cassette- PCIe, Short Slot	9179	MHB	5646
Blind Swap Type III Cassette- PCI-X or PCIe, Standard Slot	9179	MHB	5647
Service Interface Card	9179	MHB	5648
On/Off Processor Day Billing for Feature #5620	9179	MHB	5650
Disk/Media Backplane	9179	MHB	5652
On/Off Processor Billing for Feature #5621 or #5622 - 1 processor day	9179	MHB	5653
On/Off Processor Day Billing for Feature #7380	9179	MHB	5656
Serv Interface Cable- 2 Enclosure	9179	MHB	5657
Serv Interface Cable- 3 Enclosure	9179	MHB	5658
Serv Interface Cable- 4 Enclosure	9179	MHB	5660
175MB Cache RAID - Dual IOA Enablement Card	9179	MHB	5662
Proc Enclosure and Backplane	9179	MHB	5663
Service Processor	9179	MHB	5664
FSP/Clock Pass Through Card	9179	MHB	5665
I/O Backplane	9179	MHB	5666
System Midplane	9179	MHB	5667
SAS Disk Backplane -6 slot	9179	MHB	5668
One Processor Activation for Processor Feature #5620	9179	MHB	5670
One Processor Activation for Processor Feature #5621	9179	MHB	5671
One Processor Activation for Processor Feature #5622	9179	MHB	5672
SATA Media Enclosure and Backplane	9179	MHB	5674
0/4 Core Processor Enclosure and Backplane	9179	MHB	5675
Activation of 1GB DDR2 POWER6 Memory	9179	MHB	5680
Activation of 256 GB DDR2 POWER6 Memory	9179	MHB	5681
Power 570 System Bezel	9179	MHB	5682
System Chassis - 4 EIA	9179	MHB	5683
Activation of 100 GB DDR2 Memory	9179	MHB	5684
Virtual Processor Power Regulator	9179	MHB	5686
0/32GB DDR2 Memory (4X8GB) DIMMs- 400® MHz- POWER6 CoD Memory	9179	MHB	5690
On/Off, 1GB-1Day, Memory Billing POWER6 Memory	9179	MHB	5691
0/2GB DDR2 Memory (4X0.5GB) DIMMs- 667 MHz- POWER6 Memory	9179	MHB	5692
0/4GB DDR2 Memory (4X1GB) DIMMs- 667 MHz- POWER6 CoD Memory	9179	MHB	5693
0/8GB DDR2 Memory (4X2GB) DIMMs- 667 MHz- POWER6 CoD Memory	9179	MHB	5694
0/32GB DDR2 Memory (4X8GB) DIMMs- 400 MHz- POWER6 CoD Memory	9179	MHB	5696
System Ship Group	9179	MHB	5699
IBM Gigabit Ethernet-SX PCI-X Adapter	9179	MHB	5700
IBM 10/100/1000 Base-TX Ethernet PCI-X Adapter	9179	MHB	5701
PCI-X Ultra Tape Controller	9179	MHB	5702
PCI-X Fibre Channel Tape Controller	9179	MHB	5704
IBM 2-Port 10/100/1000 Base-TX Ethernet PCI-X Adapter	9179	MHB	5706
IBM 2-Port Gigabit Ethernet-SX PCI-X Adapter	9179	MHB	5707
10Gb FCoE PCIe Dual Port Adapter	9179	MHB	5708
PCI-X Dual Channel Ultra320 SCSI Adapter	9179	MHB	5712
1 Gigabit iSCSI TOE PCI-X on Copper Media Adapter	9179	MHB	5713
1 Gigabit iSCSI TOE PCI-X on Optical Media Adapter	9179	MHB	5714

2 Gigabit Fibre Channel PCI-X Adapter	9179	MHB	5716
4-Port 10/100/1000 Base-TX PCI Express Adapter	9179	MHB	5717
10 Gigabit Ethernet -SR PCI-X Adapter	9179	MHB	5718
IBM 10 Gigabit Ethernet-LR PCI-X Adapter	9179	MHB	5719
10 Gb Ethernet-SR PCI-X 2.0 DDR Adapter	9179	MHB	5721
10 Gb Ethernet-LR PCI-X 2.0 DDR Adapter	9179	MHB	5722
2-Port Asynchronous EIA-232 PCI Adapter	9179	MHB	5723
10 Gigabit Ethernet-CX4 PCI Express Adapter	9179	MHB	5732
8 Gigabit PCI Express Dual Port Fibre Channel Adapter	9179	MHB	5735
PCI-X DDR Dual Channel Ultra320 SCSI Adapter	9179	MHB	5736
4-Port 10/100/1000 Base-TX PCI-X Adapter	9179	MHB	5740
IBM Single Bus Ultra 320 SCSI Repeater Card	9179	MHB	5741
IBM Dual Bus Ultra 320 SCSI Repeater Card	9179	MHB	5742
SATA Slimline DVD-ROM Drive	9179	MHB	5743
POWER GXT145 PCI Express Graphics Accelerator	9179	MHB	5748
4Gbps Fibre Channel (2-Port)	9179	MHB	5749
IDE Slimline DVD-ROM Drive	9179	MHB	5756
IBM 4.7 GB IDE Slimline DVD-RAM Drive	9179	MHB	5757
4 GB Single-Port Fibre Channel PCI-X 2.0 DDR Adapter	9179	MHB	5758
4 Gb Dual-Port Fibre Channel PCI-X 2.0 DDR Adapter	9179	MHB	5759
PCI-X Fibre Chan Disk Controller	9179	MHB	5760
PCI-X Fibre Chan Tape Controller	9179	MHB	5761
SATA Slimline DVD-RAM Drive	9179	MHB	5762
2-Port 10/100/1000 Base-TX Ethernet PCI Express Adapter	9179	MHB	5767
2-Port Gigabit Ethernet-SX PCI Express Adapter	9179	MHB	5768
10 Gigabit Ethernet-SR PCI Express Adapter	9179	MHB	5769
10 Gigabit Ethernet-LR PCI Express Adapter	9179	MHB	5772
4 Gigabit PCI Express Single Port Fibre Channel Adapter	9179	MHB	5773
4 Gigabit PCI Express Dual Port Fibre Channel Adapter	9179	MHB	5774
PCI-X Disk Controller-90MB No IOP	9179	MHB	5776
PCI-X Disk Controller-1.5GB No IOP	9179	MHB	5777
PCI-X EXP24 Ctl-1.5GB No IOP	9179	MHB	5778
PCI-X EXP24 Ctl-1.5GB No IOP	9179	MHB	5782
4 Port Async EIA-232 PCIe Adapter	9179	MHB	5785
TotalStorage EXP24 Disk Dwr	9179	MHB	5786
PCI Expansion Drawer	9179	MHB	5790
PCI-DDR 12X Expansion Drawer	9179	MHB	5796
12X I/O Drawer PCIe, SFF disk	9179	MHB	5802
PCI-X DDR Dual Channel Ultra320 SCSI Adapter	9179	MHB	5806
12X I/O Drawer PCIe, No Disk	9179	MHB	5877
SAS Disk Backplane -6 slot	9179	MHB	5878
EXP 12S Expansion Drawer	9179	MHB	5886
PCI-X DDR Dual -x4 SAS Adapter	9179	MHB	5900
PCIe Dual-x4 SAS Adapter	9179	MHB	5901
PCI-X DDR Dual - x4 3Gb SAS RAID Adapter	9179	MHB	5902
PCIe 380MB Cache Dual - x4 3Gb SAS RAID Adapter	9179	MHB	5903
PCI-X DDR 1.5GB Cache SAS RAID Adapter	9179	MHB	5904
PCI-X DDR 1.5GB Cache SAS RAID Adapter (BSC)	9179	MHB	5908
Alternate SAS controller for 3 of 6 internal SAS Disk Slots	9179	MHB	5909
SAS adapter for internal Split DASD option	9179	MHB	5911
PCI-X DDR Dual - x4 SAS Adapter	9179	MHB	5912
Non-paired PCIx SAS RAID Indicator	9179	MHB	5921
Non-paired SAS RAID indicator	9179	MHB	5922
Non-paired PCIe SAS RAID Indicator	9179	MHB	5923
Full Width Keyboard -- USB, US English, #103P	9179	MHB	5951
Full Width Keyboard -- USB, French, #189	9179	MHB	5952
Full Width Keyboard -- USB, Italian, #142	9179	MHB	5953
Full Width Keyboard -- USB, German/Austrian, #129	9179	MHB	5954
Full Width Keyboard -- USB, UK English, #166P	9179	MHB	5955
Full Width Keyboard -- USB, Spanish, #172	9179	MHB	5956
Full Width Keyboard -- USB, Japanese, #194	9179	MHB	5957
Full Width Keyboard -- USB, Brazilian Portuguese, #275	9179	MHB	5958
Full Width Keyboard -- USB, Hungarian, #208	9179	MHB	5959
Full Width Keyboard -- USB, Korean, #413	9179	MHB	5960
Full Width Keyboard -- USB, Chinese, #467	9179	MHB	5961
Full Width Keyboard -- USB, French Canadian, #445	9179	MHB	5962

Full Width Keyboard -- USB, Canadian French, #058	9179	MHB	5963
Full Width Keyboard -- USB, Belgian/UK, #120	9179	MHB	5964
Full Width Keyboard -- USB, Swedish/Finnish, #153	9179	MHB	5965
Full Width Keyboard -- USB, Danish, #159	9179	MHB	5966
Full Width Keyboard -- USB, Bulgarian, #442	9179	MHB	5967
Full Width Keyboard -- USB, Swiss/French/German, #150	9179	MHB	5968
Full Width Keyboard -- USB, Norwegian,#155	9179	MHB	5969
Full Width Keyboard -- USB, Dutch, #143	9179	MHB	5970
Full Width Keyboard -- USB, Portuguese, #163	9179	MHB	5971
Full Width Keyboard -- USB, Greek, #319	9179	MHB	5972
Full Width Keyboard -- USB, Hebrew, #212	9179	MHB	5973
Full Width Keyboard -- USB, Polish, #214	9179	MHB	5974
Full Width Keyboard -- USB, Slovakian, #245	9179	MHB	5975
Full Width Keyboard -- USB, Czech, #243	9179	MHB	5976
Full Width Keyboard -- USB, Turkish, #179	9179	MHB	5977
Full Width Keyboard -- USB, LA Spanish, #171	9179	MHB	5978
Full Width Keyboard -- USB, Arabic, #253	9179	MHB	5979
Full Width Keyboard -- USB, Thai, #191	9179	MHB	5980
Full Width Keyboard -- USB, Russian, #443	9179	MHB	5981
Full Width Keyboard -- USB, Slovenian, #234	9179	MHB	5982
Full Width Keyboard -- USB, US English Euro, #103P	9179	MHB	5983
Power Control Cable (SPCN) - 2 meter	9179	MHB	6001
Power Control Cable (SPCN) - 3 meter	9179	MHB	6006
Power Control Cable (SPCN) - 15 meter	9179	MHB	6007
Power Control Cable (SPCN) - 6 meter	9179	MHB	6008
Power Control Cable (SPCN) - 30 meter	9179	MHB	6029
Opt Front Door for 1.8m Rack	9179	MHB	6068
Opt Front Door for 2.0m Rack	9179	MHB	6069
1.8m Rack Trim Kit	9179	MHB	6246
2.0m Rack Trim Kit	9179	MHB	6247
1.8m Rack Acoustic Doors	9179	MHB	6248
2.0m Rack Acoustic Doors	9179	MHB	6249
1.8m Rack Trim Kit	9179	MHB	6263
2.0m Rack Trim Kit	9179	MHB	6272
RIO-2 Bus Adapter	9179	MHB	6417
RIO-2 Remote I/O Loop Adapter for #5790	9179	MHB	6438
Dual-port 12X Channel Attach- Short Run	9179	MHB	6446
4.3m (14-Ft) 250V/10A Power Cord	9179	MHB	6451
4.3m (14-Ft) 250V/10A Power Cord	9179	MHB	6455
Dual-port 12X Channel Attach- Long Run	9179	MHB	6457
Power Cable -- Drawer to IBM PDU, 14-foot, 250V/ 10A	9179	MHB	6458
3.7m (12-Ft) 250V/10A RA Pwr Cd	9179	MHB	6459
Power Cord 4.3m (14-ft), Drawer To OEM PDU (125V, 15A)	9179	MHB	6460
4.3m (14-Ft) 250V/10A Power Cord	9179	MHB	6461
4.3m (14-Ft) 250V/10A Power Cord	9179	MHB	6462
4.3m (14-Ft) 250V/10A Power Cord	9179	MHB	6463
4.3m (14-Ft) 250V/10A Power Cord	9179	MHB	6464
4.3m (14-Ft) 250V/10A Power Cord	9179	MHB	6465
4.3m (14-Ft) 250V/10A Power Cord	9179	MHB	6466
4.3m (14-Ft) 250V/10A Power Cord	9179	MHB	6467
Power Cord 4.3m (14-foot), Drawer to OEM PDU, (250V, 15A), U. S.	9179	MHB	6469
Power Cord 1.8m(6-foot), To Wall (125V, 15A)	9179	MHB	6470
Power Cord 2.7m (9-foot), To Wall/OEM PDU, (125V, 15A)	9179	MHB	6471
Power Cord 2.7m (9-foot), To Wall/OEM PDU, (250V, 16A)	9179	MHB	6472
Power Cord 2.7m (9-foot), To Wall/OEM PDU, (250V, 10A)	9179	MHB	6473
Power Cord 2.7M (9-foot), To Wall/OEM PDU, (250V, 13A)	9179	MHB	6474
Power Cord 2.7M (9-foot), To Wall/OEM PDU, (250V, 16A)	9179	MHB	6475
Power Cord 2.7M (9-foot), To Wall/OEM PDU, (250V, 10A)	9179	MHB	6476
Power Cord 2.7M (9-foot), To Wall/OEM PDU, (250V, 16A)	9179	MHB	6477
Power Cord 2.7 M(9-foot), To Wall/OEM PDU, (250V, 16A)	9179	MHB	6478

Power Cord (9-foot) , To Wall/OEM PDU, (250V, 10A)	9179	MHB	6479
Power Cord 1.8M (6-foot),To Wall, (250V, 15A), United States	9179	MHB	6487
Power Cord 2.7M (9-foot), To Wall/OEM PDU, (125V, 15A or 250V, 10A)	9179	MHB	6488
4.3m (14-Ft) 3PH/24A Power Cord	9179	MHB	6489
4.3m (14-Ft) 1PH/48A Pwr Cord	9179	MHB	6491
4.3m (14-Ft) 1PH/48-60A Pwr Cord	9179	MHB	6492
Power Cord 2.7M (9-foot), To Wall/OEM PDU, (250V, 10A)	9179	MHB	6493
Power Cord 2.7M (9-foot), To Wall/OEM PDU, (250V, 10A)	9179	MHB	6494
Power Cord (9-foot), To Wall/OEM PDU, (250V, 10A)	9179	MHB	6495
Power Cord 2.7M (9-foot), To Wall/OEM PDU, (250V, 10A)	9179	MHB	6496
Power Cord (6-foot), To Wall/OEM PDU, (250V, 10A)	9179	MHB	6497
Power Cord (6-foot), To Wall/OEM PDU, (250V, 15A)	9179	MHB	6498
Power Cable - Drawer to IBM PDU, 200-240V/10A	9179	MHB	6577
Optional Rack Security Kit	9179	MHB	6580
Modem Tray for 19-inch Rack	9179	MHB	6586
Power Cord 2.7M (9-foot), To Wall/OEM PDU, (125V, 15A)	9179	MHB	6651
4.3m (14-Ft) 1PH/24-30A Pwr Cord	9179	MHB	6654
4.3m (14-Ft) 1PH/24-30A WR Pwr Cord	9179	MHB	6655
4.3m (14-Ft)1PH/24A Power Cord	9179	MHB	6656
Power Cord 2.7M (9-foot), To Wall/OEM PDU, (250V, 15A)	9179	MHB	6659
Power Cord (14-foot), Drawer To OEM PDU (125V, 15A)	9179	MHB	6660
2.1m (7-Ft) 200V PDU Power Cable	9179	MHB	6664
Power Cord 3 M (10 ft), Drawer to IBM PDU, 250V/ 10A	9179	MHB	6665
Power Cord 4.3M (14-foot), Drawer to OEM PDU, (250V, 15A)	9179	MHB	6669
Power Cord (6-foot), To Wall (125V, 15A),	9179	MHB	6670
Power Cord 2.7M (9-foot), Drawer to IBM PDU, 250V/10A	9179	MHB	6671
Power Cord 1.5M (5-foot), Drawer to IBM PDU, 250V/10A	9179	MHB	6672
Power Cord 2.7M (9-foot), To Wall/OEM PDU, (250V, 10A)	9179	MHB	6680
Power Cord (6-foot), To Wall, (250V, 15A)	9179	MHB	6687
RIO-2 Bus Adapter	9179	MHB	6699
PCI 2-Line WAN IOA No IOP	9179	MHB	6805
PCI 4-Modem WAN IOA No IOP	9179	MHB	6808
PCI 2-Line WAN w/Modem NoIOP	9179	MHB	6833
Cable Restraint Hardware- excess Service Interface Cable	9179	MHB	7099
Intelligent PDU+, 1 EIA Unit, Universal UTG0247 Connector	9179	MHB	7109
Environmental Monitoring Probe	9179	MHB	7118
IBM/OEM Rack-mount Drawer Rail Kit- Adjustable Depth	9179	MHB	7164
OEM Rack-mount Drawer Rail Kit	9179	MHB	7165
Power Distribution Unit	9179	MHB	7188
Quantity 150 of #2124	9179	MHB	7204
Quantity 150 of #2125	9179	MHB	7205
Quantity 150 of #2126	9179	MHB	7206
Quantity 150 of #2127	9179	MHB	7207
Quantity 150 of #2128	9179	MHB	7208
Quantity 150 of #2138	9179	MHB	7213
2GB CUoD Memory Activation	9179	MHB	7272
4GB CUoD Memory Activation	9179	MHB	7273
8GB CUoD Memory Activation	9179	MHB	7274
16GB CUoD Memory Activation	9179	MHB	7275
32GB CUoD Memory Activation	9179	MHB	7276

SDI Software Pre-Install Indicator	9179	MHB	7305
One Processor Activation for Processor Feature #7388	9179	MHB	7306
Dual I/O Unit Enclosure	9179	MHB	7307
Dual I/O Unit Enclosure	9179	MHB	7311
I/O Drawer Mounting Enclosure	9179	MHB	7314
Utility Billing for Processor #7388- 100 processor minutes	9179	MHB	7332
On/Off Processor Day Billing for Processor #7388	9179	MHB	7333
Utility Billing for Processor #7388 with IBM i - 100 processor minutes	9179	MHB	7334
On/Off Processor Billing for Processor #7388 with IBM i - 1 processor day	9179	MHB	7346
On/Off, 1GB-1Day, Memory Billing POWER7	9179	MHB	7377
4.7 GHz Proc Card, 0/2 Core POWER6, 12 DDR2 Memory Slots	9179	MHB	7380
4.4GHz Proc Card, 0/2 Core POWER6, 12 DDR2 Memory Slots.	9179	MHB	7387
5.0 GHz Proc Card, 0/2 Core POWER6, 12 DDR2 Memory Slots	9179	MHB	7388
Quantity 150 of #4319	9179	MHB	7504
Quantity 150 of #4326	9179	MHB	7508
Quantity 150 of #4327	9179	MHB	7509
Quantity 150 of #4328	9179	MHB	7510
Quantity 150 of #4329	9179	MHB	7511
Quantity 150 of #5741	9179	MHB	7514
Quantity 150 of #3676	9179	MHB	7517
Quantity 150 of #3677	9179	MHB	7518
Quantity 150 of #3678	9179	MHB	7519
Quantity 150 of #3586	9179	MHB	7535
Quantity 150 of #3587	9179	MHB	7536
Quantity 150 of #3658	9179	MHB	7538
4.2 GHz Proc Card, 0/4 Core POWER6, 12 DDR2 Memory Slots	9179	MHB	7540
Quantity 150 of #1884	9179	MHB	7543
Quantity 150 of #1888	9179	MHB	7544
Quantity 150 of #1890	9179	MHB	7545
Quantity 150 of #1909	9179	MHB	7546
Quantity 150 of #1885	9179	MHB	7547
Quantity 150 of #1886	9179	MHB	7548
Quantity 150 of #3647	9179	MHB	7549
Quantity 150 of #3648	9179	MHB	7564
Quantity 150 of #3649	9179	MHB	7565
PROC COD UTILITY BILLING FOR FC 4982, 100 PROC-MINS	9179	MHB	7633
PROC COD UTILITY BILLING FOR FC 4982, 100 PROC-MINS, FOR IBMi	9179	MHB	7634
1 PROC-DAY ON/OFF BILLING FOR FC 4982	9179	MHB	7635
1 PROC-DAY ON/OFF BILLING FOR FC 4982, FOR IBMi	9179	MHB	7636
1GB DDR2 Memory Activation	9179	MHB	7663
One Processor Activation for Processor Feature #7540	9179	MHB	7700
Utility Billing for Processor #7540- 100 processor minutes	9179	MHB	7701
On/Off Processor Day Billing for Processor #7540	9179	MHB	7702
Utility Billing for Processor #7540 with IBM i - 100 processor minutes	9179	MHB	7706
On/Off Processor Billing for Processor #7540 with IBM i - 1 processor day	9179	MHB	7709
One Processor Activation for Processor Feature #7387	9179	MHB	7719
Utility Billing for Processor #7387 - 100 processor minutes	9179	MHB	7726
Utility Billing for Processor #7387 with IBM i - 100 processor minutes	9179	MHB	7743
On/Off Processor Billing for Processor #7387 with IBM i - 1 processor day	9179	MHB	7744
On/Off Processor Day Billing for Processor #7387	9179	MHB	7745
2.0m Rack Side Attach Kit	9179	MHB	7780
Ethernet Cable, 6M, Hardware Management Console to System Unit	9179	MHB	7801
Ethernet Cable, 15m, Hardware Management Console to System Unit	9179	MHB	7802
Side-by-Side for 1.8m Racks	9179	MHB	7840

Ruggedize Rack Kit	9179	MHB	7841
PCI Blind Swap Cassette Kit, Single Wide Adapters, Type II	9179	MHB	7862
PCI Blind Swap Cassette Kit, Double Wide Adapters, Type II	9179	MHB	7863
Power Distribution Backplane	9179	MHB	7870
AC Power Supply, 1400 W	9179	MHB	7888
2GB (4x512MB) DIMMs, 276-pin, 533MHz DDR2 SDRAM	9179	MHB	7892
4GB (4x1GB) DIMMs, 276-pin, 533MHz DDR2 SDRAM	9179	MHB	7893
8GB (4x2GB) DIMMs, 276-pin, 533 MHz DDR2 SDRAM	9179	MHB	7894
PowerVM -Standard Edition	9179	MHB	7942
On/Off Processor Enablement	9179	MHB	7951
On/Off Memory Enablement	9179	MHB	7954
PowerVM - Enterprise Edition	9179	MHB	7995
570 to MMA CoD Memory Activation Carry Over Indicator	9179	MHB	8017
570 to MMA Advanced POWER® Virtualization Carry Over Indicator	9179	MHB	8018
0/256GB DDR2 Memory (32X8GB) DIMMs- 400 MHz- POWER6 Memory	9179	MHB	8129
RJ-45 to DB-25 Converter Cable	9179	MHB	8133
Linux Software Preinstall	9179	MHB	8143
Linux Software Preinstall (Business Partners)	9179	MHB	8144
Activation of 1 GB DDR3 POWER7 Memory	9179	MHB	8212
Activation of 100 GB DDR3 POWER7 Memory	9179	MHB	8213
Power Cord Carry Over Indicator, #9800, Model Conversion Only	9179	MHB	8430
Power Cord Carry Over Indicator, #9802, Model Conversion Only	9179	MHB	8431
Power Cord Carry Over Indicator, #9820, Model Conversion Only	9179	MHB	8432
Power Cord Carry Over Indicator, #9821, Model Conversion Only	9179	MHB	8433
Power Cord Carry Over Indicator, #9825, Model Conversion Only	9179	MHB	8434
Power Cord Carry Over Indicator, #9827, Model Conversion Only	9179	MHB	8435
Power Cord Carry Over Indicator, #9828, Model Conversion Only	9179	MHB	8436
Power Cord Carry Over Indicator, #9829, Model Conversion Only	9179	MHB	8437
Power Cord Carry Over Indicator, #9830, Model Conversion Only	9179	MHB	8438
Power Cord Carry Over Indicator, #9831, Model Conversion Only	9179	MHB	8439
Power Cord Carry Over Indicator, #9833, Model Conversion Only	9179	MHB	8440
Power Cord Carry Over Indicator, #9834, Model Conversion Only	9179	MHB	8441
Base Customer Spec Plcmnt	9179	MHB	8453
Keyboard - USB, US English, #103P	9179	MHB	8800
Keyboard - USB, French, #189	9179	MHB	8801
Keyboard - USB, Italian, #142	9179	MHB	8802
Keyboard - USB, German/Austrian, #129	9179	MHB	8803
Keyboard - USB, UK English, #166	9179	MHB	8804
Keyboard - USB, Spanish, #172	9179	MHB	8805
Keyboard - USB, Japanese, #194	9179	MHB	8806
Keyboard - USB, Brazilian/Portuguese, #275	9179	MHB	8807
Keyboard - USB, Canadian French, #058	9179	MHB	8808
Keyboard - USB, Belgium/UK, #120	9179	MHB	8810
Keyboard - USB, Swedish/Finnish, #153	9179	MHB	8811
Keyboard - USB, Danish, #159	9179	MHB	8812
Keyboard - USB, Bulgarian, #442	9179	MHB	8813
Keyboard - USB, Swiss/French/German, #150F/G	9179	MHB	8814
Keyboard - USB, Norwegian, #155	9179	MHB	8816
Keyboard - USB, Dutch, #143	9179	MHB	8817
Keyboard - USB, Portuguese, #163	9179	MHB	8818
Keyboard - USB, Greek, #319	9179	MHB	8819
Keyboard - USB, Hebrew, #212	9179	MHB	8820
Keyboard - USB, Hungarian, #208	9179	MHB	8821
Keyboard - USB, Polish, #214	9179	MHB	8823
Keyboard - USB, Slovakian, #245	9179	MHB	8825
Keyboard - USB, Czech, #243	9179	MHB	8826
Keyboard - USB, Turkish, #179	9179	MHB	8827

Keyboard - USB, LA Spanish, #171	9179	MHB	8829
Keyboard - USB, Arabic, #253	9179	MHB	8830
Keyboard - USB, Korean, #413	9179	MHB	8833
Keyboard - USB, Chinese/US, #467	9179	MHB	8834
Keyboard - USB, French Canadian, #445	9179	MHB	8835
Keyboard - USB, Thai, #191	9179	MHB	8836
Keyboard - USB, Russian, #443	9179	MHB	8838
Keyboard - USB, Yugoslavian/Latin, #105	9179	MHB	8839
Keyboard - USB, US English (EMEA), #103P	9179	MHB	8840
Mouse - USB, with Keyboard Attachment Cable	9179	MHB	8841
USB Mouse	9179	MHB	8845
Order Routing Indicator- System Plant	9179	MHB	9169
Language Group Specify - US English	9179	MHB	9300
New AIX License Core Counter	9179	MHB	9440
New IBM i License Core Counter	9179	MHB	9441
New Red Hat License Core Counter	9179	MHB	9442
New SUSE License Core Counter	9179	MHB	9443
Other AIX License Core Counter	9179	MHB	9444
Other Linux License Core Counter	9179	MHB	9445
3rd Party Linux License Core Counter	9179	MHB	9446
VIOS Core Counter	9179	MHB	9447
Month Indicator	9179	MHB	9461
Day Indicator	9179	MHB	9462
Hour Indicator	9179	MHB	9463
Minute Indicator	9179	MHB	9464
Qty Indicator	9179	MHB	9465
Countable Member Indicator	9179	MHB	9466
Reserved Rack Space Indicator - 4U	9179	MHB	9570
Language Group Specify - Dutch	9179	MHB	9700
Language Group Specify - French	9179	MHB	9703
Language Group Specify - German	9179	MHB	9704
Language Group Specify - Polish	9179	MHB	9705
Language Group Specify - Norwegian	9179	MHB	9706
Language Group Specify - Portuguese	9179	MHB	9707
Language Group Specify - Spanish	9179	MHB	9708
Language Group Specify - Italian	9179	MHB	9711
Language Group Specify - Canadian French	9179	MHB	9712
Language Group Specify - Japanese	9179	MHB	9714
Language Group Specify - Traditional Chinese (Taiwan)	9179	MHB	9715
Language Group Specify - Korean	9179	MHB	9716
Language Group Specify - Turkish	9179	MHB	9718
Language Group Specify - Hungarian	9179	MHB	9719
Language Group Specify - Slovakian	9179	MHB	9720
Language Group Specify - Russian	9179	MHB	9721
Language Group Specify - Simplified Chinese (PRC)	9179	MHB	9722
Language Group Specify - Czech	9179	MHB	9724
Language Group Specify -- Romanian	9179	MHB	9725
Language Group Specify - Croatian	9179	MHB	9726
Language Group Specify -- Slovenian	9179	MHB	9727
Language Group Specify - Brazilian Portuguese	9179	MHB	9728
Language Group Specify - Thai	9179	MHB	9729
TurboCore Mode Specify Code	9179	MHB	9982

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

Description	MT	Model	Feature
Rack Content Specify: 9179-MHB, 4U.	7014	T00	0384
		T42	
Rack Content Specify: 9179-MHB, 8U.	7014	T00	0385
		T42	
Rack Content Specify: 9179-MHB, 12U.	7014	T00	0386
		T42	
Rack Content Specify: 9179-MHB, 16U.	7014	T00	0387
		T42	
Power 780 Acoustic Rack Doors, 2.0 M	7014	T42	6250

Type/model conversions

From	To

Type	Model	Type	Model
9117	MMA	9179	MHB

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 9179-MHB 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 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 (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 9179-MHB processor features

From FC:	To FC:	Return parts
5620 - 3.5 GHz Proc Card, 0/2 Core POWER6, 12 DDR2 Memory Slots	4982 - 3.86 GHz / 4.14 GHz TurboCore Proc Card, 0/16 Core POWER7, 16 DDR3 Memory Slots	Yes
5621 - 4.2 GHz Proc Card, 0/2 Core POWER6, 8 DDR2 Memory Slots	4982 - 3.86 GHz / 4.14 GHz TurboCore Proc Card, 0/16 Core POWER7, 16 DDR3 Memory	Yes

	Slots	
5622 - 4.2 GHz Proc Card, 0/ 2 Core POWER6, 12 DDR2 Memory Slots	4982 - 3.86 GHz / 4.14 GHz TurboCore Proc Card, 0/16 Core POWER7, 16 DDR3 Memory Slots	Yes
7380 - 4.7 GHz Proc Card, 0/ 2 Core POWER6, 12 DDR2 Memory Slots	4982 - 3.86 GHz / 4.14 GHz TurboCore Proc Card, 0/16 Core POWER7, 16 DDR3 Memory Slots	Yes
7387 - 4.4GHz Proc Card, 0/ 2 Core POWER6, 12 DDR2 Memory Slots.	4982 - 3.86 GHz / 4.14 GHz TurboCore Proc Card, 0/16 Core POWER7, 16 DDR3 Memory Slots	Yes
7388 - 5.0 GHz Proc Card, 0/ 2 Core POWER6, 12 DDR2 Memory Slots	4982 - 3.86 GHz / 4.14 GHz TurboCore Proc Card, 0/16 Core POWER7, 16 DDR3 Memory Slots	Yes
7540 - 4.2 GHz Proc Card, 0/ 4 Core POWER6, 12 DDR2 Memory Slots	4982 - 3.86 GHz / 4.14 GHz TurboCore Proc Card, 0/16 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	5469 - One Processor Activation for Processor Feature #4982	No
5670 - One Processor Activation for Processor Feature #5620	5469 - One Processor Activation for Processor Feature #4982	No
5671 - One Processor Activation for Processor Feature #5621	5469 - One Processor Activation for Processor Feature #4982	No
5672 - One Processor Activation for Processor Feature #5622	5469 - One Processor Activation for Processor Feature #4982	No
7306 - One Processor Activation for Processor Feature #7388	5469 - One Processor Activation for Processor Feature #4982	No
7700 - One Processor Activation for Processor Feature #7540	5469 - One Processor Activation for Processor Feature #4982	No
7719 - One Processor Activation for Processor Feature #7387	5469 - One Processor Activation for Processor Feature #4982	No

Feature conversions for 9117-MMA to 9179-MHB 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 9179-MHB virtualization engine features

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

Business Partner information

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

https://www.ibm.com/partnerworld/mem/sla.jsp?num=110-023

Reliability, Availability, and Serviceability (RAS)

The reliability of the IBM Power 780 starts with components, devices, and subsystems that are designed to be fault-tolerant. POWER7 uses lower-voltage technology that improves 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 contains 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 are provided by the operating system and RAID 5 and RAID 6 are 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 780 server 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 provide 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 the one that 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 checkstop conditions, 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 nonredundant 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 checkstopping

As in POWER6, POWER7 provides single-processor checkstopping for certain faults that can not be handled by the availability enhancements described 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 correction 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 if 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 checkstop. 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 780 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 780 you can replace service parts (customer replaceable units). To do this, the Power 780 uses Guiding Light LEDs to indicate the parts that need to be replaced.

An HMC attached to the Power 780 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, which 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 9179-MHB 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 partitions or a 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 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 LED and blue system locate LED on the Operator 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. 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 780 continues to support concurrent add or repair of power, cooling, PCI adapters, media devices, I/O drawers, the 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 readme file released with the firmware.

Hot-node Add, memory upgrade, and Hot-node repair

With the proper configuration and required protective measures, the Power 780 server is designed for node add, memory upgrade, or node repair without powering down the system.

Power 780 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 780 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 make it possible to upgrade a server by integrating a second, third, or 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 or memory) 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 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, ensure the system has sufficient inactive or spare processors 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 allows you to migrate an AIX partition running on one POWER7 system to another 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 operating system 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 780, 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 780 (9179-MHB) 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 MHB servers 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 degrees C (41 to 113 F) nonoperating
  - 5 to 35 degrees C (41 to 95 F) operating
- Relative humidity (noncondensing):
  - 8% to 80% nonoperating
  - 20% to 80% operating
- Maximum dew point:
  - 28 degrees C (82 F) nonoperating
  - 29 degrees C (84 F) operating

- Operating voltage: 200 to 240 V ac
- Operating frequency: 50 to 60 +/- 3 Hz
- Power consumption: 1,600 watts maximum (per enclosure with 16 cores active)
- Power source loading: 1.649 kVA maximum (per enclosure with 16 cores active)
- Thermal output: 5,461 Btu/hr maximum (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 (HT&A) organization in LaGaude, France. This Power Systems model and applicable features meet the environmental testing requirements of the country telecom and have been designed and tested in compliance with the Full Quality Assurance Approval (FQAA) process as delivered by the British Approval Board for Telecom (BABT), the U.K. telecom regulatory authority.

Product safety/Country testing/Certification

- UL 60950-1 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 9179-MHB can be installed in a 7014-T00 or -T42 rack that provides:

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

The design of the Power 780 is optimized for use in an IBM 7014-T00 or -T42 rack. Both the front cover and the external processor fabric cables occupy space on the front left and right sides 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 rack, the CEC enclosures need to be loaded 36U or below to allow space for the flex cables.

Minimum system configuration

Each new model MHB system must include a minimum of the following items:

- One CEC enclosure (4U) with the following:
  - 1X System Enclosure with IBM Bezel (#5597) or OEM Bezel (#5598)
  - 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: 3.86 GHz, 16-Core / 4.14 GHz, 8-Core POWER7 Processor Card, 0-core active (#4982).
- 4X Processor Activations for Processor Feature #4982 (#5469).
- 1X DDR3 Memory DIMMs: 0/32 GB (4 X 8 GB), 1,066 MHz, (#5600 or larger).
- 16X Activation of 1 GB DDR3 - POWER7 Memory (#8212).
- For AIX and 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 the customer).
- 1X Removable Media Device (#5762): Optionally orderable, a stand-alone system (not network-attached) would require this feature.
- 1X HMC is required for every 9179-MHB; however, a communal HMC is acceptable.

Note:

- 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 activations 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.

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

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

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, or later model rack-mount HMC or C05, 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 a CR3 model, or later rack-mount or C06, 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 servers:

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

Limitations

The 9179-MHB has the following limitations:

- The POWER GXT145 PCI Express Graphics Accelerator (#5748) and the POWER GXT135P Graphics Accelerator with Digital Support (#2849) are 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 780 and newer technology and must be used to replace it. These include:
  - HSL-2/RIO-2 interface drawers and towers
  - 10K SCSI disks
  - 15K SCSI drives 35 GB or smaller
  - IDE DVD drives in the CEC enclosure (DVD drives: feature #3706, #4430, #4460, #4633, #5756, and #5757)
  - DDR2 memory
  - SCSI adapters: feature #2749, #2757, #2780, #5580, #5581, #5583, #5590, #5591, #5702, #5712, #5776, #5778, and #5706
  - Fibre Channel adapters: feature #2787, #5704, #5760, and #5761
  - Integrated xSeries servers: feature #4812 and #4813
  - Ethernet adapters: feature #1981, #5718, #1982, #5719, #1984, #5707, and #3709
  - IOPs: feature #2844, #2847, and #3705
  - DTTA (telephony): feature #6312
  - Twinax: feature #4746
  - Cryptographic adapters: feature #4801 and #5805
  - Diskette drives: feature #2591
  - Quarter-Inch Cartridge (QIC) tape drives (neither feature number nor machine type model)
- One-step model upgrades from POWER5 or POWER5+™ are not supported. Only model upgrades from the 9117-MMA are 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 host software and application software.

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

IBM Electronic Services

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

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

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

To learn how Electronic Services can work for you, visit

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

Terms and conditions

Volume orders: Contact your IBM representative.

IBM Global Financing

Yes

Warranty period

One year

Warranty service

If required, IBM provides repair or exchange service depending on the types of warranty service specified for the machine. IBM will attempt to resolve your problem over the telephone, or electronically via an IBM 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.

If applicable to your product, parts considered Customer Replaceable Units (CRUs) will be provided as part of the machine's standard warranty service.

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

On-site Service

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

Service level is:

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

Non-IBM parts service

Warranty service

IBM is now shipping machines with selected non-IBM parts that contain an IBM field replaceable unit (FRU) part number label. These parts are to be serviced during the IBM machine warranty period. IBM is covering the service on these selected non-IBM parts as an accommodation to their customers, and normal warranty service procedures for the IBM machine apply.

Warranty service upgrades

During the warranty period, warranty service upgrades provide an enhanced level of On-site Service for an additional charge. Service levels are response-time objectives and are not guaranteed. See 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.

Maintenance service options

Maintenance services

If required, IBM provides repair or exchange service depending on the types of maintenance service specified for the machine. IBM will attempt to resolve your problem over the telephone or electronically, via an IBM Web site. 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. Service levels are response-time objectives and are not guaranteed. The specified level of maintenance service may not be available in all worldwide locations. Additional charges may apply outside IBM's normal service area. Contact your local IBM representative or your reseller for country- and location-specific information. The following service selections are available as maintenance options for your machine type.

On-site Service

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

Service levels are:

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

Customer Replaceable Unit (CRU) Service

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

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

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

Non-IBM parts service

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

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

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

Usage plan machine

No

IBM hourly service rate classification

Two

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

Field-installable features

Yes

Model conversions

Yes

Machine installation

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: Large.

Licensed Machine Code

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

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

Machine using LMC: Type Model 9179-MHB

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.

Pricing

Description	Model number	Feature number
Widescreen LCD Monitor		
	MHB	3632
T210 Flat-Panel Monitor		
	MHB	3635
IBM T541H /L150p 15" TFT Color Monitor		
	MHB	3637
IBM ThinkVision L170p Flat Panel Monitor		
	MHB	3639
ThinkVision L171p Flat Panel Monitor		
	MHB	3640
IBM T115 Flat Panel Monitor		
	MHB	3641

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ThinkVision L191p Flat Panel Monitor
                      MHB     3642
IBM T120 Flat Panel Monitor
                      MHB     3643
IBM T119 Flat Panel Monitor
                      MHB     3644
IBM T117 Flat Panel Monitor
                      MHB     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 9179 machine type:

Description	Model number	Feature number	Initial/ MES/ Both support	CSU	RP MES
IBM Power 780	MHB			No	
Specify Code for External High Speed Modem	MHB	0032	Both	Yes	No
Mirrored System Disk Level, Specify Code	MHB	0040	Both	Yes	No
Device Parity Protection-All, Specify Code	MHB	0041	Both	Yes	No
Mirrored System Bus Level, Specify Code	MHB	0043	Both	Yes	No
Device Parity RAID-6 All, Specify Code	MHB	0047	Both	Yes	No
RISC-to-RISC Data Migration	MHB	0205	Initial	Yes	No
AIX Partition Specify	MHB	0265	Both	Yes	No
Linux Partition Specify	MHB	0266	Both	Yes	No
IBM i Operating System Partition Specify	MHB	0267	Both	Yes	No
CSC Specify	MHB	0275	Both	Yes	No
Ext Tape Attached via #5736	MHB	0290	Both	Yes	No
Specify Custom Data Protection	MHB	0296	Both	Yes	No
Specify EXP24 Attach via Existing Controller	MHB	0302	Support	Yes	No
Mirrored Level System Specify Code	MHB	0308	Both	Yes	No
RAID Hot Spare Specify	MHB	0347	Both	Yes	No
V.24/EIA232 6.1m (20-Ft) PCI Cable	MHB	0348	Both	Yes	No
V.24/EIA232 15.2m (50-Ft) PCI Cable	MHB	0349	Support	Yes	No
V.35 6.1m (20-Ft) PCI Cable	MHB	0353	Both	Yes	No
V.35 15.2m (50-Ft) PCI Cable	MHB	0354	Support	Yes	No
V.36 6.1m (20-Ft) PCI Cable	MHB	0356	Support	Yes	No
X.21 6.1m (20-Ft) PCI Cable	MHB	0359	Both	Yes	No
X.21 15.2m (50-Ft) PCI Cable	MHB	0360	Support	Yes	No
V.24/EIA232 (80-Ft) PCI Cable	MHB	0365	Support	Yes	No
UPS Factory Integration Specify					

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                        MHB     0373                    MES       Yes No
HMC Factory Integration Specify
                        MHB     0374                    MES       Yes No
Display Factory Integration Specify
                        MHB     0375                    MES       Yes No
Reserve Rack Space for UPS
                        MHB     0376                    MES       Yes No
Reserve Rack Space for HMC
                        MHB     0377                    MES       Yes No
Reserve Rack Space for Display
                        MHB     0378                    MES       Yes No
MMA/MMB/MHB upgrade indicator
                        MHB     0397                    MES       Yes No
SSD Placement Indicator - CEC
                        MHB     0462                    Both      Yes No
SSD Placement Indicator (5802/5803)
                        MHB     0463                    Initial   N/A No
SSD Placement Indicator - 5886
                        MHB     0464                    Initial   N/A No
19 inch, 1.8 meter high rack
                        MHB     0551                    MES       Yes No
19 inch, 2.0 meter high rack
                        MHB     0553                    MES       Yes No
19 inch, 1.3 meter high rack
                        MHB     0555                    Support   Yes No
IBM i 6.1 with 6.1.1 Machine Code Specify Code
                        MHB     0566                    Both      Yes No
Rack Filler Panel Kit
                        MHB     0599                    Both      Yes No
Load Source Not in CEC
                        MHB     0719                    Both      Yes No
Specify Load Source in #5786
                        MHB     0725                    Support   Yes No
Specify Load Source in #5802/5803
                        MHB     0726                    Both      Yes No
Specify #5886 Load Source placement
                        MHB     0727                    Both      Yes No
#4327 Load Source Specify
                        MHB     0835                    Support   Yes No
#4328 Load Source Specify
                        MHB     0836                    Support   Yes No
SAN Load Source Specify
                        MHB     0837                    Both      Yes No
#3676 Load Source Specify
                        MHB     0838                    Support   Yes No
#3677 Load Source Specify
                        MHB     0839                    Both      Yes No
#3678 Load Source Specify
                        MHB     0840                    Both      Yes No
#4329 Load Source Specify
                        MHB     0841                    Support   Yes No
#3658 Load Source Specify
                        MHB     0844                    Both      Yes No
#1884 Load Source Specify
                        MHB     0851                    Both      Yes No
#1888 Load Source Specify
                        MHB     0853                    Both      Yes No
#1909 Load Source Specify
                        MHB     0854                    Both      Yes No
#3587 Load Source Specify
                        MHB     0855                    Both      Yes No
US TAA Compliance Indicator
                        MHB     0983                    Initial   N/A No

Modem Cable - US/Canada and General Use
                        MHB     1025                    Both      Yes No
USB External Docking Station for Removable Disk Drive
                        MHB     1104                    Both      Yes No
USB 160 GB Removable Disk Drive
                        MHB     1106                    Both      Yes No
USB 500 GB Removable Disk Drive
                        MHB     1107                    Both      Yes No
Decline Electronic Service Agent Install Indicator
                        MHB     1120                    Initial   N/A No
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200V 16A 4.3m (14-Ft) TL Line Cord
                        MHB     1406                    Support  Yes No
125V 4.3m (14-Ft) Line Cord
                        MHB     1413                    Support  Yes No
200V 1.8m (6-Ft) Locking Line Cord
                        MHB     1414                    Support  Yes No200V 1.8m (6-Ft) Watertight Line Cord
                        MHB     1415                    Support  Yes No200V 4.3m (14-Ft) Locking Line Cord
                        MHB     1416                    Support  Yes No200V 4.3m (14-Ft) Watertight Line Cord
                        MHB     1417                    Support  Yes No
4.3m 200V/16A Power Cord S. Africa
                        MHB     1418                    Support  Yes No
4.3m 200V/16A Power Cord Israel
                        MHB     1419                    Support  Yes No
4.3m 200V/16A Power Cord EU/Asia
                        MHB     1420                    Support  Yes No
4.3m 200V/16A Power Cord CH/DK
                        MHB     1421                    Support  Yes No
200V 1.8m (6-Ft) Locking Line Cord
                        MHB     1424                    Support  Yes No
200V 1.8m (6-Ft) Watertight Line Cord
                        MHB     1425                    Support  Yes No
200V 4.3m (14-Ft) Locking Line Cord
                        MHB     1426                    Support  Yes No
200V 4.3m (14-Ft) Watertight Line Cord
                        MHB     1427                    Support  Yes No
4.3m 200V/10A Power Cord EU/Asia
                        MHB     1439                    Support  Yes No
4.3m 200V/10A Power Cord Denmark
                        MHB     1440                    Support  Yes No
4.3m 200V/10A Power Cord S. Africa
                        MHB     1441                    Support  Yes No
4.3m 200V/10A Power Cord Swiss
                        MHB     1442                    Support  Yes No
4.3m 200V/10A Power Cord UK
                        MHB     1443                    Support  Yes No
4.3m 200V/10A Power Cord Israel
                        MHB     1445                    Support  Yes No

4.3m 200V/32A Power Cord EU 1-PH
                        MHB     1449                    Support  Yes No
4.3m 200V/16A Power Cord EU 2-PH
                        MHB     1450                    Support  Yes No
200V (6-Ft) 1.8m Line Cord
                        MHB     1451                    Support  Yes No
200V (14-Ft) 4.3m Line Cord
                        MHB     1452                    Support  Yes No
200V (6-Ft) 1.8m Locking Line Cord
                        MHB     1453                    Support  Yes No
200V 12A (14-Ft) 4.3m TL Line Cord
                        MHB     1454                    Support  Yes No200V (6-Ft) 1.8m Watertight Line Cord
                        MHB     1455                    Support  Yes No200V (14-Ft) 4.3m Watertight Line Cord
                        MHB     1456                    Support  Yes No200V (6-Ft) 1.8m Upper Line Cord
                        MHB     1457                    Support  Yes No
200V (6-Ft) 1.8m Upper Locking Cord
                        MHB     1458                    Support  Yes No
200V (6-Ft) 1.8m Upper Locking Cord
                        MHB     1459                    Support  Yes No
30m SPCN Cable
                        MHB     1466                    Support  Yes No
4.3m 200V/12A Pwr Cd UK
                        MHB     1476                    Support  Yes No
4.3m 200V/16A Pwr Cd
                        MHB     1477                    Support  Yes No

Integrated, 4 Port- 1Gb Virtual Ethernet, I/O ports
                        MHB     1803                    Both     Yes No
Integrated, 4 Port (2x1Gb and 2x10Gb SFP+ Optical ports)
                        MHB     1804                    Both     Yes No
GX++ 12X DDR Adapter, Dual-port
                        MHB     1808                    Both     Yes No
Integrated, 4 Port (2x1Gb and 2x10Gb SFP+ Copper twinax ports)
                        MHB     1813                    Both     Yes No
SAS Cable for triple split DASD backplane
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                        MHB     1815                    Both     Yes No
SAS Cable Assembly for SAS Port
                        MHB     1819                    Both     Yes No
1.5 Meter 12X to 4X Channel Conversion Cable
                        MHB     1828                    Both     Yes No
0.6 Meter 12X Cable
                        MHB     1829                    Support  Yes No
1.5 Meter 12X cable
                        MHB     1830                    Support  Yes No
8.0 Meter 12X Cable
                        MHB     1834                    Support  Yes No
3.0 Meter 12X Cable
                        MHB     1840                    Support  Yes No
3 Meter 12X to 4X Channel Conversion Cable
                        MHB     1841                    Both     Yes No
10 Meter 12X to 4X Channel Conversion Cable
                        MHB     1842                    Support  Yes No
Operator Panel
                        MHB     1853                    Both     Yes No
10 Meter 12X to 4X Enhanced Channel Conversion Cable
                        MHB     1854                    Both     Yes No
0.6 Meter 12X DDR Cable
                        MHB     1861                    Both     Yes No
1.5 Meter 12X DDR Cable
                        MHB     1862                    Both     Yes No
8.0 Meter 12X DDR Cable
                        MHB     1864                    Both     Yes No
3.0 Meter 12X DDR Cable
                        MHB     1865                    Both     Yes No
146.8GB 10K RPM SAS SFF Disk Drive
                        MHB     1882                    Both     Yes No
73.4 GB 15K RPM SAS SFF Disk Drive
                        MHB     1883                    Both     Yes No
69.7 GB 15K RPM SAS SFF Disk Drive
                        MHB     1884                    Both     Yes No
300GB 10K RPM SFF SAS Disk Drive
                        MHB     1885                    Both     Yes No
146GB 15K RPM SFF SAS Disk Drive
                        MHB     1886                    Both     Yes No
139GB 15K RPM SFF SAS Disk Drive
                        MHB     1888                    Both     Yes No
69GB SFF SAS Solid State Drive
                        MHB     1890                    Both     Yes No
Quantity 150 of #1883
                        MHB     1891                    Both     Yes No
Quantity 150 of #1882
                        MHB     1899                    Both     Yes No
69GB SFF SAS Solid State Drive
                        MHB     1909                    Both     Yes No
PCI-X DDR Dual Channel Ultra320 SCSI Adapter
                        MHB     1912                    Support  Yes No
Converter Cable, VHDCI to P, Mini-68 pin to 68 pin, 0.3M
                        MHB     2118                    Support  Yes No
Ultra 320 SCSI Cable 1 Meter
                        MHB     2124                    Support  Yes No
Ultra 320 SCSI Cable 3 Meter
                        MHB     2125                    Support  Yes No
Ultra 320 SCSI Cable 5 Meter
                        MHB     2126                    Support  Yes No
Ultra 320 SCSI Cable 10 Meter
                        MHB     2127                    Support  Yes No
Ultra 320 SCSI Cable 20 Meter
                        MHB     2128                    Support  Yes No
0.55 Meter Ultra 320 SCSI Cable
                        MHB     2138                    Support  Yes No
Primary OS - IBM i
                        MHB     2145                    Both     Yes No
Primary OS - AIX
                        MHB     2146                    Both     Yes No
Primary OS - Linux
                        MHB     2147                    Both     Yes No
2M LC-SC 50 Micron Fiber Converter Cable
                        MHB     2456                    Both     Yes No
2M LC-SC 62.5 Micron Fiber Converter Cable
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                        MHB     2459                    Both     Yes No
4 port USB PCIe Adapter
                        MHB     2728                    Both     Yes No
2-Port USB PCI Adapter
                        MHB     2738                    Support  Yes No
POWER GXT135P Graphics Accelerator with Digital Support
                        MHB     2849                    Support  Yes No
ARTIC960Hx 4-Port EIA-232 Cable
                        MHB     2861                    Support  Yes No
ARTIC960Hx 4-Port X.21 Cable
                        MHB     2863                    Support  Yes No
ARTIC960Hx 4-Port V.35 (DTE) Cable
                        MHB     2864                    Support  Yes No
PCIe 2-Line WAN w/Modem
                        MHB     2893                    Both     Yes No

3M Asynchronous Terminal/Printer Cable EIA-232
                        MHB     2934                    Both     Yes No
Asynchronous Cable EIA-232/V.24 3M
                        MHB     2936                    Both     Yes No
8-Port Asynchronous Adapter EIA-232/RS-422, PCI bus
                        MHB     2943                    Support  Yes No
IBM ARTIC960Hx 4-Port Multiprotocol PCI Adapter
                        MHB     2947                    Support  Yes No
Cable, V.24 / EIA-232
                        MHB     2951                    Support  Yes No
Cable, V.35
                        MHB     2952                    Support  Yes No
Cable, V.36 / EIA-499
                        MHB     2953                    Support  Yes No
Cable, X.21
                        MHB     2954                    Support  Yes No
2-Port Multiprotocol PCI Adapter
                        MHB     2962                    Support  Yes No
Serial-to-Serial Port Cable for Drawer/Drawer- 3.7M
                        MHB     3124                    Both     Yes No
Serial-to-Serial Port Cable for Rack/Rack- 8M
                        MHB     3125                    Both     Yes No
73.4 GB 15,000 RPM Ultra320 SCSI Disk Drive Assembly
                        MHB     3278                    Support  Yes No
146.8 GB 15,000 RPM Ultra320 SCSI Disk Drive Assembly
                        MHB     3279                    Support  Yes No
300 GB 15K RPM SCSI Disk Drive
                        MHB     3585                    Support  Yes No
69GB 3.5" SAS Solid State Drive
                        MHB     3586                    Both     Yes No
69GB 3.5" SAS Solid State Drive
                        MHB     3587                    Both     Yes No
Widescreen LCD Monitor
                        MHB     3632                    Both     Yes No
T210 Flat-Panel Monitor
                        MHB     3635                    Support  Yes No
IBM T541H /L150p 15" TFT Color Monitor
                        MHB     3637                    Support  Yes No
IBM ThinkVision L170p Flat Panel Monitor
                        MHB     3639                    Support  Yes No
ThinkVision L171p Flat Panel Monitor
                        MHB     3640                    Support  Yes No
IBM T115 Flat Panel Monitor
                        MHB     3641                    Support  Yes No
ThinkVision L191p Flat Panel Monitor
                        MHB     3642                    Support  Yes No
IBM T120 Flat Panel Monitor
                        MHB     3643                    Support  Yes No
IBM T119 Flat Panel Monitor
                        MHB     3644                    Support  Yes No
IBM T117 Flat Panel Monitor
                        MHB     3645                    Support  Yes No
73GB 15K RPM SAS Disk Drive
                        MHB     3646                    Support  Yes No
146GB 15K RPM SAS Disk Drive
                        MHB     3647                    Both     Yes No
300GB 15K RPM SAS Disk Drive
                        MHB     3648                    Both     Yes No
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450GB 15K RPM SAS Disk Drive
                        MHB     3649                    Both     Yes No
SAS Cable (EE) Drawer to Drawer 1M
                        MHB     3652                    Both     Yes No
SAS Cable (EE) Drawer to Drawer 3M
                        MHB     3653                    Both     Yes No
SAS Cable (EE) Drawer to Drawer 6M
                        MHB     3654                    Both     Yes No
428GB 15K RPM SAS Disk Drive
                        MHB     3658                    Both     Yes No
SAS Cable (X) Adapter to SAS Enclosure, Dual Controller/Dual Path 3M:
                        MHB     3661                    Both     Yes No
SAS Cable (X) Adapter to SAS Enclosure, Dual Controller/Dual Path 6M:
                        MHB     3662                    Both     Yes No
SAS Cable (X) Adapter to SAS Enclosure, Dual Controller/Dual Path
15M:
                        MHB     3663                    Both     Yes No
Serv Interface Cable- 2, 3, and 4 Enclosure
                        MHB     3671                    Both     Yes No
Serv Interface Cable- 3 and 4 Enclosure
                        MHB     3672                    Both     Yes No
Serv Interface Cable- 4 Enclosure
                        MHB     3673                    Both     Yes No
69.7GB 15k rpm SAS Disk Drive
                        MHB     3676                    Support  Yes No
139.5GB 15k rpm SAS Disk Drive
                        MHB     3677                    Both     Yes No
283.7GB 15k rpm SAS Disk Drive
                        MHB     3678                    Both     Yes No
SAS Cable (AI)- Adapter to Internal drive 1M
                        MHB     3679                    Both     Yes No
3M SAS CABLE, ADPTR TO ADPTR (AA)
                        MHB     3681                    Both     Yes No
6M SAS CABLE, ADPTR TO ADPTR (AA)
                        MHB     3682                    Both     Yes No
SAS Cable (AE) Adapter to Enclosure, single controller/single path 3M
                        MHB     3684                    Both     Yes No
SAS Cable (AE) Adapter to Enclosure, single controller/single path 6M
                        MHB     3685                    Both     Yes No
SAS Cable (YI) System to SAS Enclosure, Single Controller/Dual Path
1.5M
                        MHB     3686                    Both     Yes No
SAS Cable (YI) System to SAS Enclosure, Single Controller/Dual Path
3M
                        MHB     3687                    Both     Yes No
SAS Cable (AT) 0.6 Meter
                        MHB     3688                    Both     Yes No
SAS Cable (YO) Adapter to SAS Enclosure, Single Controller/Dual Path
1.5 M
                        MHB     3691                    Both     Yes No
SAS Cable (YO) Adapter to SAS Enclosure, Single Controller/Dual Path
3 M
                        MHB     3692                    Both     Yes No
SAS Cable (YO) Adapter to SAS Enclosure, Single Controller/Dual Path
6 M
                        MHB     3693                    Both     Yes No
SAS Cable (YO) Adapter to SAS Enclosure, Single Controller/Dual Path
15 M
                        MHB     3694                    Both     Yes No
Processor Cable, Two-Drawer System
                        MHB     3711                    Both     Yes No
Processor Cable, Two, Three or Four Drawer System
                        MHB     3712                    Both     Yes No
Processor Cable, Three or Four Drawer System
                        MHB     3713                    Both     Yes No
Processor Cable, Four-Drawer System
                        MHB     3714                    Both     Yes No
0.3M Serial Port Converter Cable, 9-Pin to 25-Pin
                        MHB     3925                    Both     Yes No
Asynch Printer/Terminal Cable, 9-pin to 25-pin, 4M
                        MHB     3926                    Both     Yes No
Serial Port Null Modem Cable, 9-pin to 9-pin, 3.7M
                        MHB     3927                    Both     Yes No
Serial Port Null Modem Cable, 9-pin to 9-pin, 10M
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                        MHB     3928                    Both     Yes No
1.8 M (6-ft) Extender Cable for Displays (15-pin D-shell to 15-pin
D-shell)
                        MHB     4242                    Both     Yes No
Extender Cable - USB Keyboards, 2M
                        MHB     4256                    Both     Yes No
VGA to DVI Connection Converter
                        MHB     4276                    Both     Yes No
70.56GB 15k rpm Disk Unit
                        MHB     4327                    Support  Yes No
141.12GB 15k rpm Disk Unit
                        MHB     4328                    Support  Yes No
282.25GB 15k rpm Disk Unit
                        MHB     4329                    Support  Yes No
One and only one rack indicator features is required onall orders (#4650 to #4666).
Rack Indicator- Not Factory Integrated
                        MHB     4650                    Initial  N/A No
Rack Indicator, Rack #1
                        MHB     4651                    Initial  N/A No
Rack Indicator, Rack #2
                        MHB     4652                    Initial  N/A No
Rack Indicator, Rack #3
                        MHB     4653                    Initial  N/A No
Rack Indicator, Rack #4
                        MHB     4654                    Initial  N/A No
Rack Indicator, Rack #5
                        MHB     4655                    Initial  N/A No
Rack Indicator, Rack #6
                        MHB     4656                    Initial  N/A No
Rack Indicator, Rack #7
                        MHB     4657                    Initial  N/A No
Rack Indicator, Rack #8
                        MHB     4658                    Initial  N/A No
Rack Indicator, Rack #9
                        MHB     4659                    Initial  N/A No
Rack Indicator, Rack #10
                        MHB     4660                    Initial  N/A No
Rack Indicator, Rack #11
                        MHB     4661                    Initial  N/A No
Rack Indicator, Rack #12
                        MHB     4662                    Initial  N/A No
Rack Indicator, Rack #13
                        MHB     4663                    Initial  N/A No
Rack Indicator, Rack #14
                        MHB     4664                    Initial  N/A No
Rack Indicator, Rack #15
                        MHB     4665                    Initial  N/A No
Rack Indicator, Rack #16
                        MHB     4666                    Initial  N/A No
PCI-X Cryptographic Coprocessor (FIPS 4)
                        MHB     4764                    Both     Yes No
ACTIVE MEMORY EXPANSION ENABLEMENT
                        MHB     4791                    Both     Yes No
CBU SPECIFY
                        MHB     4891                    Initial  N/A
3.86 GHz / 4.14 GHz TurboCore Proc Card, 0/16 Core POWER7, 16 DDR3
Memory Slots
                        MHB     4982                    Both     No  No
Single 5250 Enterprise Enablement
                        MHB     4992                    Both     Yes No
Full 5250 Enterprise Enablement
                        MHB     4997                    Both     Yes No
Software Preload Required
                        MHB     5000                    Initial  N/A No
Custom Service Specify, Off-Site
                        MHB     5001                    Support  Yes NoCustomer Solution Center - Rochester Mfg
                        MHB     5002                    Initial  N/A No
Power Dist Unit 1 Phase NEMA
                        MHB     5160                    Support  Yes No
Power Dist Unit 1 Phase IEC
                        MHB     5161                    Support  Yes No
Power Dist Unit 2 of 3 Phase
                        MHB     5162                    Support  Yes No
Power Dist Unit - 3 Phase
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                        MHB     5163                    Support  Yes No
One Processor Activation for Processor Feature #4982
                        MHB     5469                    Both     Yes No
RFID TAGS FOR SERVERS, BLADES, BLADECENTERS, RACKS, AND HMCS
                        MHB     5524                    Both     Yes No
Sys Console On HMC
                        MHB     5550                    Both     Yes No
Sys Console-Ethernet No IOP
                        MHB     5553                    Both     Yes No
System CEC Enclosure with IBM BEZEL, I/O Backplane, and System
Midplane
                        MHB     5597                    Both     No  No
System CEC Enclosure with OEM BEZEL, I/O Backplane, and System
Midplane
                        MHB     5598                    Both     No  No
0/32GB DDR3 Memory (4X8GB) DIMMs - 1066 MHz - POWER7 CoD Memory
                        MHB     5600                    Both     No  No
0/64GB DDR3 Memory (4X16GB) DIMMs - 1066 MHz - POWER7 CoD Memory
                        MHB     5601                    Both     No  No
0/128GB DDR3 Memory (4X32GB) DIMMs - 800 MHz - POWER7 CoD Memory
                        MHB     5602                    Both     No  No
System AC Power Supply, 1725 W
                        MHB     5632                    Both     Yes No
Blind Swap Type III Cassette- PCIe, Short Slot
                        MHB     5646                    MES      Yes No
Blind Swap Type III Cassette- PCI-X or PCIe, Standard Slot
                        MHB     5647                    MES      Yes No
Disk/Media Backplane
                        MHB     5652                    Both     No  No
175MB Cache RAID - Dual IOA Enablement Card
                        MHB     5662                    Both     Yes No
Service Processor
                        MHB     5664                    Both     No  No
FSP/Clock Pass Through Card
                        MHB     5665                    Both     Yes No
IBM Gigabit Ethernet-SX PCI-X Adapter
                        MHB     5700                    Support  Yes No
IBM 10/100/1000 Base-TX Ethernet PCI-X Adapter
                        MHB     5701                    Support  Yes No
IBM 2-Port 10/100/1000 Base-TX Ethernet PCI-X Adapter
                        MHB     5706                    Both     Yes No
10Gb FCoE PCIe Dual Port Adapter
                        MHB     5708                    Both     Yes No
1 Gigabit iSCSI TOE PCI-X on Copper Media Adapter
                        MHB     5713                    Both     Yes No
1 Gigabit iSCSI TOE PCI-X on Optical Media Adapter
                        MHB     5714                    Support  Yes No
2 Gigabit Fibre Channel PCI-X Adapter
                        MHB     5716                    Support  Yes No
4-Port 10/100/1000 Base-TX PCI Express Adapter
                        MHB     5717                    Both     Yes No
10 Gb Ethernet-SR PCI-X 2.0 DDR Adapter
                        MHB     5721                    Support  Yes No
10 Gb Ethernet-LR PCI-X 2.0 DDR Adapter
                        MHB     5722                    Support  Yes No
2-Port Asynchronous EIA-232 PCI Adapter
                        MHB     5723                    Support  Yes No
10 Gigabit Ethernet-CX4 PCI Express Adapter
                        MHB     5732                    Both     Yes No
8 Gigabit PCI Express Dual Port Fibre Channel Adapter
                        MHB     5735                    Both     Yes No
PCI-X DDR Dual Channel Ultra320 SCSI Adapter
                        MHB     5736                    Both     Yes No
4-Port 10/100/1000 Base-TX PCI-X Adapter
                        MHB     5740                    Support  Yes No
IBM Single Bus Ultra 320 SCSI Repeater Card
                        MHB     5741                    Support  Yes No
IBM Dual Bus Ultra 320 SCSI Repeater Card
                        MHB     5742                    Support  Yes No
POWER GXT145 PCI Express Graphics Accelerator
                        MHB     5748                    Both     Yes No
4Gbps Fibre Channel (2-Port)
                        MHB     5749                    Both     Yes No
4 GB Single-Port Fibre Channel PCI-X 2.0 DDR Adapter
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                        MHB     5758                    Support  Yes No
4 Gb Dual-Port Fibre Channel PCI-X 2.0 DDR Adapter
                        MHB     5759                    Both     Yes No
SATA Slimline DVD-RAM Drive
                        MHB     5762                    Both     Yes No
2-Port 10/100/1000 Base-TX Ethernet PCI Express Adapter
                        MHB     5767                    Both     Yes No
2-Port Gigabit Ethernet-SX PCI Express Adapter
                        MHB     5768                    Both     Yes No
10 Gigabit Ethernet-SR PCI Express Adapter
                        MHB     5769                    Both     Yes No
10 Gigabit Ethernet-LR PCI Express Adapter
                        MHB     5772                    Both     Yes No
4 Gigabit PCI Express Single Port Fibre Channel Adapter
                        MHB     5773                    Support  Yes No
4 Gigabit PCI Express Dual Port Fibre Channel Adapter
                        MHB     5774                    Both     Yes No
PCI-X EXP24 Ctl-1.5GB No IOP
                        MHB     5782                    Support  Yes No
4 Port Async EIA-232 PCIe Adapter
                        MHB     5785                    Both     Yes No
TotalStorage EXP24 Disk Dwr
                        MHB     5786                    Support  Yes No
PCI-DDR 12X Expansion Drawer
                        MHB     5796                    Both     Yes No
12X I/O Drawer PCIe, SFF disk
                        MHB     5802                    Both     Yes No
12X I/O Drawer PCIe, No Disk
                        MHB     5877                    Both     Yes No
EXP 12S Expansion Drawer
                        MHB     5886                    Both     Yes No
PCI-X DDR Dual -x4 SAS Adapter
                        MHB     5900                    Support  Yes No
PCIe Dual-x4 SAS Adapter
                        MHB     5901                    Both     Yes No
PCI-X DDR Dual - x4 3Gb SAS RAID Adapter
                        MHB     5902                    Support  Yes No
PCIe 380MB Cache Dual - x4 3Gb SAS RAID Adapter
                        MHB     5903                    Both     Yes No
PCI-X DDR 1.5GB Cache SAS RAID Adapter (BSC)
                        MHB     5908                    Both     Yes No
PCI-X DDR Dual - x4 SAS Adapter
                        MHB     5912                    Support  Yes No
Non-paired SAS RAID indicator
                        MHB     5922                    Support  Yes No
Non-paired PCIe SAS RAID Indicator
                        MHB     5923                    Both     Yes No
Full Width Keyboard -- USB, US English, #103P
                        MHB     5951                    Both     Yes No
Full Width Keyboard -- USB, French, #189
                        MHB     5952                    Both     Yes No
Full Width Keyboard -- USB, Italian, #142
                        MHB     5953                    Both     Yes No
Full Width Keyboard -- USB, German/Austrian, #129
                        MHB     5954                    Both     Yes No
Full Width Keyboard -- USB, UK English, #166P
                        MHB     5955                    Both     Yes No
Full Width Keyboard -- USB, Spanish, #172
                        MHB     5956                    Both     Yes No
Full Width Keyboard -- USB, Japanese, #194
                        MHB     5957                    Both     Yes No
Full Width Keyboard -- USB, Brazilian Portuguese, #275
                        MHB     5958                    Both     Yes No
Full Width Keyboard -- USB, Hungarian, #208
                        MHB     5959                    Both     Yes No
Full Width Keyboard -- USB, Korean, #413
                        MHB     5960                    Both     Yes No
Full Width Keyboard -- USB, Chinese, #467
                        MHB     5961                    Both     Yes No
Full Width Keyboard -- USB, French Canadian, #445
                        MHB     5962                    Both     Yes No
Full Width Keyboard -- USB, Belgian/UK, #120
                        MHB     5964                    Both     Yes No
Full Width Keyboard -- USB, Swedish/Finnish, #153
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                        MHB     5965                    Both     Yes No
Full Width Keyboard -- USB, Danish, #159
                        MHB     5966                    Both     Yes No
Full Width Keyboard -- USB, Bulgarian, #442
                        MHB     5967                    Both     Yes No
Full Width Keyboard -- USB, Swiss/French/German, #150
                        MHB     5968                    Both     Yes No
Full Width Keyboard -- USB, Norwegian,#155
                        MHB     5969                    Both     Yes No
Full Width Keyboard -- USB, Dutch, #143
                        MHB     5970                    Both     Yes No
Full Width Keyboard -- USB, Portuguese, #163
                        MHB     5971                    Both     Yes No
Full Width Keyboard -- USB, Greek, #319
                        MHB     5972                    Both     Yes No
Full Width Keyboard -- USB, Hebrew, #212
                        MHB     5973                    Both     Yes No
Full Width Keyboard -- USB, Polish, #214
                        MHB     5974                    Both     Yes No
Full Width Keyboard -- USB, Slovakian, #245
                        MHB     5975                    Both     Yes No
Full Width Keyboard -- USB, Czech, #243
                        MHB     5976                    Both     Yes No
Full Width Keyboard -- USB, Turkish, #179
                        MHB     5977                    Both     Yes No
Full Width Keyboard -- USB, LA Spanish, #171
                        MHB     5978                    Both     Yes No
Full Width Keyboard -- USB, Arabic, #253
                        MHB     5979                    Both     Yes No
Full Width Keyboard -- USB, Thai, #191
                        MHB     5980                    Both     Yes No
Full Width Keyboard -- USB, Russian, #443
                        MHB     5981                    Both     Yes No
Full Width Keyboard -- USB, Slovenian, #234
                        MHB     5982                    Both     Yes No
Full Width Keyboard -- USB, US English Euro, #103P
                        MHB     5983                    Both     Yes No
Power Control Cable (SPCN) - 2 meter
                        MHB     6001                    Support  Yes No
Power Control Cable (SPCN) - 3 meter
                        MHB     6006                    Both     Yes No
Power Control Cable (SPCN) - 15 meter
                        MHB     6007                    Both     Yes No
Power Control Cable (SPCN) - 6 meter
                        MHB     6008                    Support  Yes No
Power Control Cable (SPCN) - 30 meter
                        MHB     6029                    Support  Yes No
Opt Front Door for 1.8m Rack
                        MHB     6068                    MES      Yes No
Opt Front Door for 2.0m Rack
                        MHB     6069                    MES      Yes No
1.8m Rack Trim Kit
                        MHB     6246                    Support  Yes No
2.0m Rack Trim Kit
                        MHB     6247                    Support  Yes No
1.8m Rack Acoustic Doors
                        MHB     6248                    MES      Yes No
2.0m Rack Acoustic Doors
                        MHB     6249                    MES      Yes No
1.8m Rack Trim Kit
                        MHB     6263                    Both     Yes No
2.0m Rack Trim Kit
                        MHB     6272                    Both     Yes No
Dual-port 12X Channel Attach- Short Run
                        MHB     6446                    Both     Yes No
4.3m (14-Ft) 250V/10A Power Cord
                        MHB     6451                    Support  Yes No
4.3m (14-Ft) 250V/10A Power Cord
                        MHB     6455                    Support  Yes No
Dual-port 12X Channel Attach- Long Run
                        MHB     6457                    Both     Yes No
Power Cable -- Drawer to IBM PDU, 14-foot, 250V/10A
                        MHB     6458                    Both     Yes No
3.7m (12-Ft) 250V/10A RA Pwr Cd
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                        MHB     6459                    Both     Yes No
Power Cord 4.3m (14-ft), Drawer To OEM PDU (125V, 15A)
                        MHB     6460                    Both     Yes No
4.3m (14-Ft) 250V/10A Power Cord
                        MHB     6461                    Support  Yes No
4.3m (14-Ft) 250V/10A Power Cord
                        MHB     6462                    Support  Yes No
4.3m (14-Ft) 250V/10A Power Cord
                        MHB     6463                    Support  Yes No
4.3m (14-Ft) 250V/10A Power Cord
                        MHB     6464                    Support  Yes No
4.3m (14-Ft) 250V/10A Power Cord
                        MHB     6465                    Support  Yes No
4.3m (14-Ft) 250V/10A Power Cord
                        MHB     6466                    Support  Yes No
4.3m (14-Ft) 250V/10A Power Cord
                        MHB     6467                    Support  Yes No

Power Cord 4.3m (14-foot), Drawer to OEM PDU, (250V, 15A), U. S.
                        MHB     6469                    Both     Yes No
Power Cord 1.8m(6-foot), To Wall (125V, 15A)
                        MHB     6470                    Support  Yes No
Power Cord 2.7m (9-foot), To Wall/OEM PDU, (125V, 15A)
                        MHB     6471                    Both     Yes No
Power Cord 2.7m (9-foot), To Wall/OEM PDU, (250V, 16A)
                        MHB     6472                    Both     Yes No
Power Cord 2.7m (9-foot), To Wall/OEM PDU, (250V, 10A)
                        MHB     6473                    Both     Yes No
Power Cord 2.7M (9-foot), To Wall/OEM PDU, (250V, 13A)
                        MHB     6474                    Both     Yes No
Power Cord 2.7M (9-foot), To Wall/OEM PDU, (250V, 16A)
                        MHB     6475                    Both     Yes No
Power Cord 2.7M (9-foot), To Wall/OEM PDU, (250V, 10A)
                        MHB     6476                    Both     Yes No
Power Cord 2.7M (9-foot), To Wall/OEM PDU, (250V, 16A)
                        MHB     6477                    Both     Yes No
Power Cord 2.7 M(9-foot), To Wall/OEM PDU, (250V, 16A)
                        MHB     6478                    Both     Yes No
Power Cord (9-foot) , To Wall/OEM PDU, (250V, 10A)
                        MHB     6479                    Support  Yes No
Power Cord 1.8M (6-foot),To Wall, (250V, 15A), United States
                        MHB     6487                    Both     Yes No
Power Cord 2.7M (9-foot), To Wall/OEM PDU, (125V, 15A or 250V, 10A )
                        MHB     6488                    Both     Yes No
4.3m (14-Ft) 3PH/24A Power Cord
                        MHB     6489                    MES      Yes No
4.3m (14-Ft) 1PH/48A Pwr Cord
                        MHB     6491                    MES      Yes No
4.3m (14-Ft) 1PH/48-60A Pwr Cord
                        MHB     6492                    MES      Yes No
Power Cord 2.7M (9-foot), To Wall/OEM PDU, (250V, 10A)
                        MHB     6493                    Both     Yes No
Power Cord 2.7M (9-foot), To Wall/OEM PDU, (250V, 10A)
                        MHB     6494                    Both     Yes No
Power Cord (9-foot), To Wall/OEM PDU, (250V, 10A)
                        MHB     6495                    Support  Yes No
Power Cord 2.7M (9-foot), To Wall/OEM PDU, (250V, 10A)
                        MHB     6496                    Both     Yes No
Power Cord (6-foot), To Wall/OEM PDU, (250V, 10A)
                        MHB     6497                    Both     Yes No
Power Cord (6-foot), To Wall/OEM PDU, (250V, 15A)
                        MHB     6498                    Support  Yes No

Power Cable - Drawer to IBM PDU, 200-240V/10A
                        MHB     6577                    Initial  N/A No
Optional Rack Security Kit
                        MHB     6580                    MES      Yes No
Modem Tray for 19-inch Rack
                        MHB     6586                    MES      Yes No
Power Cord 2.7M (9-foot), To Wall/OEM PDU, (125V, 15A)
                        MHB     6651                    Both     Yes No
4.3m (14-Ft) 1PH/24-30A Pwr Cord
                        MHB     6654                    MES      Yes No
4.3m (14-Ft) 1PH/24-30A WR Pwr Cord
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                        MHB     6655                    MES      Yes No
4.3m (14-Ft)1PH/24A Power Cord
                        MHB     6656                    MES      Yes No

Power Cord 2.7M (9-foot), To Wall/OEM PDU, (250V, 15A)
                        MHB     6659                    Both     Yes No
Power Cord (14-foot), Drawer To OEM PDU (125V, 15A)
                        MHB     6660                    MES      Yes No

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

Power Cord (6-foot), To Wall, (250V, 15A)
                        MHB     6687                    Support  Yes No

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

PCI 2-Line WAN w/Modem NoIOP
                        MHB     6833                    Support  Yes No

Intelligent PDU+, 1 EIA Unit, Universal UTG0247 Connector
                        MHB     7109                    MES      Yes No
Environmental Monitoring Probe
                        MHB     7118                    Both     Yes No
Power Distribution Unit
                        MHB     7188                    MES      Yes No
Quantity 150 of #2124
                        MHB     7204                    Support  Yes No
Quantity 150 of #2125
                        MHB     7205                    Support  Yes No
Quantity 150 of #2126
                        MHB     7206                    Support  Yes No
Quantity 150 of #2127
                        MHB     7207                    Support  Yes No
Quantity 150 of #2128
                        MHB     7208                    Support  Yes No
Quantity 150 of #2138
                        MHB     7213                    Support  Yes No
SDI Software Pre-Install Indicator
                        MHB     7305                    Initial  N/A No
I/O Drawer Mounting Enclosure
                        MHB     7314                    Both     Yes No
On/Off, 1GB-1Day, Memory Billing POWER7
                        MHB     7377                    Both     Yes No
Quantity 150 of #4327
                        MHB     7509                    Support  Yes No
Quantity 150 of #4328
                        MHB     7510                    Support  Yes No
Quantity 150 of #4329
                        MHB     7511                    Support  Yes No
Quantity 150 of #5741
                        MHB     7514                    Support  Yes No
Quantity 150 of #3676
                        MHB     7517                    Support  Yes No
Quantity 150 of #3677
                        MHB     7518                    Both     Yes No
Quantity 150 of #3678
                        MHB     7519                    Both     Yes No
Quantity 150 of #3586
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                        MHB     7535                    Both     Yes No
Quantity 150 of #3587
                        MHB     7536                    Both     Yes No
Quantity 150 of #3658
                        MHB     7538                    Both     Yes No
Quantity 150 of #1884
                        MHB     7543                    Both     Yes No
Quantity 150 of #1888
                        MHB     7544                    Both     Yes No
Quantity 150 of #1890
                        MHB     7545                    Both     Yes No
Quantity 150 of #1909
                        MHB     7546                    Both     Yes No
Quantity 150 of #1885
                        MHB     7547                    Both     Yes No
Quantity 150 of #1886
                        MHB     7548                    Both     Yes No
Quantity 150 of #3647
                        MHB     7549                    Both     Yes No
Quantity 150 of #3648
                        MHB     7564                    Both     Yes No
Quantity 150 of #3649
                        MHB     7565                    Both     Yes No
PROC COD UTILITY BILLING FOR FC 4982, 100 PROC-MINS
                        MHB     7633                    Both     Yes No
PROC COD UTILITY BILLING FOR FC 4982, 100 PROC-MINS, FOR IBMi
                        MHB     7634                    Both     Yes No
1 PROC-DAY ON/OFF BILLING FOR FC 4982
                        MHB     7635                    Both     Yes No
1 PROC-DAY ON/OFF BILLING FOR FC 4982, FOR IBMi
                        MHB     7636                    Both     Yes No
2.0m Rack Side Attach Kit
                        MHB     7780                    Support  Yes No
Ethernet Cable, 6M, Hardware Management Console to System Unit
                        MHB     7801                    Support  Yes No
Ethernet Cable, 15m, Hardware Management Console to System Unit
                        MHB     7802                    Both     Yes No
Side-by-Side for 1.8m Racks
                        MHB     7840                    Support  Yes No
Ruggedize Rack Kit
                        MHB     7841                    Support  Yes No
PCI Blind Swap Cassette Kit, Single Wide Adapters, Type II
                        MHB     7862                    Support  Yes No
PCI Blind Swap Cassette Kit, Double Wide Adapters, Type II
                        MHB     7863                    MES      Yes No
PowerVM -Standard Edition
                        MHB     7942                    Both     Yes No
On/Off Processor Enablement
                        MHB     7951                    MES      Yes No
On/Off Memory Enablement
                        MHB     7954                    MES      Yes No
PowerVM - Enterprise Edition
                        MHB     7995                    Both     Yes No
570 to MMA Advanced POWER Virtualization Carry Over Indicator
                        MHB     8018                    MES      Yes No
RJ-45 to DB-25 Converter Cable
                        MHB     8133                    Support  Yes No
Linux Software Preinstall
                        MHB     8143                    Initial  N/A No
Linux Software Preinstall (Business Partners)
                        MHB     8144                    Initial  N/A No
Activation of 1 GB DDR3 POWER7 Memory
                        MHB     8212                    Both     Yes No
Activation of 100 GB DDR3 POWER7 Memory
                        MHB     8213                    Both     Yes No
Power Cord Carry Over Indicator, #9800, Model Conversion Only
                        MHB     8430                    Support  Yes No
Power Cord Carry Over Indicator, #9802, Model Conversion Only
                        MHB     8431                    Support  Yes No
Power Cord Carry Over Indicator, #9820, Model Conversion Only
                        MHB     8432                    Support  Yes No
Power Cord Carry Over Indicator, #9821, Model Conversion Only
                        MHB     8433                    Support  Yes No
Power Cord Carry Over Indicator, #9825, Model Conversion Only
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                      MHB     8434                  Support  Yes No
Power Cord Carry Over Indicator, #9827, Model Conversion Only
                      MHB     8435                  Support  Yes No
Power Cord Carry Over Indicator, #9828, Model Conversion Only
                      MHB     8436                  Support  Yes No
Power Cord Carry Over Indicator, #9829, Model Conversion Only
                      MHB     8437                  Support  Yes No
Power Cord Carry Over Indicator, #9830, Model Conversion Only
                      MHB     8438                  Support  Yes No
Power Cord Carry Over Indicator, #9831, Model Conversion Only
                      MHB     8439                  Support  Yes No
Power Cord Carry Over Indicator, #9833, Model Conversion Only
                      MHB     8440                  Support  Yes No
Power Cord Carry Over Indicator, #9834, Model Conversion Only
                      MHB     8441                  Support  Yes No
Base Customer Spec Plcmnt
                      MHB     8453                  Initial  N/A No
Mouse - USB, with Keyboard Attachment Cable
                      MHB     8841                  Support  Yes No
USB Mouse
                      MHB     8845                  Both     Yes No
Order Routing Indicator- System Plant
                      MHB     9169                  Initial  N/A No
Language Group Specify - US English
                      MHB     9300                  Initial  N/A No
New AIX License Core Counter
                      MHB     9440                  Initial  N/A No
New IBM i License Core Counter
                      MHB     9441                  Initial  N/A No
New Red Hat License Core Counter
                      MHB     9442                  Initial  N/A No
New SUSE License Core Counter
                      MHB     9443                  Initial  N/A No
Other AIX License Core Counter
                      MHB     9444                  Initial  N/A No
Other Linux License Core Counter
                      MHB     9445                  Initial  N/A No
3rd Party Linux License Core Counter
                      MHB     9446                  Initial  N/A No
VIOS Core Counter
                      MHB     9447                  Initial  N/A No
Month Indicator
                      MHB     9461                  Initial  N/A No
Day Indicator
                      MHB     9462                  Initial  N/A No
Hour Indicator
                      MHB     9463                  Initial  N/A No
Minute Indicator
                      MHB     9464                  Initial  N/A No
Qty Indicator
                      MHB     9465                  Initial  N/A No
Countable Member Indicator
                      MHB     9466                  Initial  N/A No
Reserved Rack Space Indicator - 4U
                      MHB     9570                  Initial  N/A No
Language Group Specify - Dutch
                      MHB     9700                  Initial  N/A No
Language Group Specify - French
                      MHB     9703                  Initial  N/A No
Language Group Specify - German
                      MHB     9704                  Initial  N/A No
Language Group Specify - Polish
                      MHB     9705                  Initial  N/A No
Language Group Specify - Norwegian
                      MHB     9706                  Initial  N/A No
Language Group Specify - Portuguese
                      MHB     9707                  Initial  N/A No
Language Group Specify - Spanish
                      MHB     9708                  Initial  N/A No
Language Group Specify - Italian
                      MHB     9711                  Initial  N/A No
Language Group Specify - Canadian French
                      MHB     9712                  Initial  N/A No
Language Group Specify - Japanese
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                        MHB     9714                    Initial  N/A No
Language Group Specify - Traditional Chinese (Taiwan)
                        MHB     9715                    Initial  N/A No
Language Group Specify - Korean
                        MHB     9716                    Initial  N/A No
Language Group Specify - Turkish
                        MHB     9718                    Initial  N/A No
Language Group Specify - Hungarian
                        MHB     9719                    Initial  N/A No
Language Group Specify - Slovakian
                        MHB     9720                    Initial  N/A No
Language Group Specify - Russian
                        MHB     9721                    Initial  N/A No
Language Group Specify - Simplified Chinese (PRC)
                        MHB     9722                    Initial  N/A No
Language Group Specify - Czech
                        MHB     9724                    Initial  N/A No
Language Group Specify -- Romanian
                        MHB     9725                    Initial  N/A No
Language Group Specify - Croatian
                        MHB     9726                    Initial  N/A No
Language Group Specify -- Slovenian
                        MHB     9727                    Initial  N/A No
Language Group Specify - Brazilian Portuguese
                        MHB     9728                    Initial  N/A No
Language Group Specify - Thai
                        MHB     9729                    Initial  N/A No
TurboCore Mode Specify Code
                        MHB     9982                    Both     Yes No
```

Type/model conversions

```
   From          To         Parts
Type    Model Type    Model returned

9117    MMA   9179    MHB    Yes
```

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

```
                                                  Initial/
                                                  MES/
Description             Model   Feature           Both         RP
Machine Type 7014       number  number            support  CSU MES

Rack Content Specify: 9179-MHB, 4U.
                        T00     0384              Initial  N/A No
                        T42                       Initial  N/A No
Rack Content Specify: 9179-MHB, 8U.
                        T00     0385              Initial  N/A No
                        T42                       Initial  N/A No
Rack Content Specify: 9179-MHB, 12U.
                        T00     0386              Initial  N/A No
                        T42                       Initial  N/A No
Rack Content Specify: 9179-MHB, 16U.
                        T00     0387              Initial  N/A No
                        T42                       Initial  N/A No
Power 780 Acoustic Rack Doors, 2.0 M
                        T42     6250              Both     Yes
```

Feature conversions

Feature conversions for 9117-MMA to 9179-MHB memory features

```
                                                  Parts
From FC:                To FC:                    returned

4495 - 4/8GB (4X2GB)    5600 - 0/32GB DDR3        Yes
DIMMs, 276 PIN 533 MHz, Memory (4X8GB) DIMMs -
DDR2 SDRAM              1066 MHz - POWER7 CoD
                        Memory
```

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 (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-	5601 - 0/64GB DDR3 Memory (4X16GB) DIMMs -	Yes

400 MHz- POWER6 CoD Memory	1066 MHz - POWER7 CoD Memory	
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 9179-MHB processor features

From FC:	To FC:	Parts returned
5620 - 3.5 GHz Proc Card, 0/2 Core POWER6, 12 DDR2 Memory Slots	4982 - 3.86 GHz / 4.14 GHz TurboCore Proc Card, 0/16 Core POWER7, 16 DDR3 Memory Slots	Yes

5621 - 4.2 GHz Proc Card, 0/2 Core POWER6, 8 DDR2 Memory Slots	4982 - 3.86 GHz / 4.14 GHz TurboCore Proc Card, 0/16 Core POWER7, 16 DDR3 Memory Slots	Yes
5622 - 4.2 GHz Proc Card, 0/2 Core POWER6, 12 DDR2 Memory Slots	4982 - 3.86 GHz / 4.14 GHz TurboCore Proc Card, 0/16 Core POWER7, 16 DDR3 Memory Slots	Yes
7380 - 4.7 GHz Proc Card, 0/2 Core POWER6, 12 DDR2 Memory Slots	4982 - 3.86 GHz / 4.14 GHz TurboCore Proc Card, 0/16 Core POWER7, 16 DDR3 Memory Slots	Yes
7387 - 4.4GHz Proc Card, 0/2 Core POWER6, 12 DDR2 Memory Slots.	4982 - 3.86 GHz / 4.14 GHz TurboCore Proc Card, 0/16 Core POWER7, 16 DDR3 Memory Slots	Yes
7388 - 5.0 GHz Proc Card, 0/2 Core POWER6, 12 DDR2 Memory Slots	4982 - 3.86 GHz / 4.14 GHz TurboCore Proc Card, 0/16 Core POWER7, 16 DDR3 Memory Slots	Yes
7540 - 4.2 GHz Proc Card, 0/4 Core POWER6, 12 DDR2 Memory Slots	4982 - 3.86 GHz / 4.14 GHz TurboCore Proc Card, 0/16 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	5469 - One Processor Activation for Processor Feature #4982	No
5670 - One Processor Activation for Processor Feature #5620	5469 - One Processor Activation for Processor Feature #4982	No
5671 - One Processor Activation for Processor Feature #5621	5469 - One Processor Activation for Processor Feature #4982	No
5672 - One Processor Activation for Processor Feature #5622	5469 - One Processor Activation for Processor Feature #4982	No
7306 - One Processor Activation for Processor Feature #7388	5469 - One Processor Activation for Processor Feature #4982	No
7700 - One Processor Activation for Processor Feature #7540	5469 - One Processor Activation for Processor Feature #4982	No
7719 - One Processor Activation for Processor Feature #7387	5469 - One Processor Activation for Processor Feature #4982	No

Feature conversions for 9117-MMA to 9179-MHB 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 9179-MHB virtualization engine features

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

Type/model conversions

From Type	From Model	To Type	To Model
9117	MMA	9179	MHB

	MT	Mod	Feat	List price
IBM 9179-MHB	9179	MHB		10195
Solution Delivery Integratio	9179	MHB	0002	0
Solution Delivery Integratio	9179	MHB	0003	0
SDI Billing Adjustment Indic	9179	MHB	0005	0
OEM Light Manufacturing Orde	9179	MHB	0006	0
Solution Delivery Integratio	9179	MHB	0009	0
Specify Code for External Hi	9179	MHB	0032	680
Mirrored System Disk Level,	9179	MHB	0040	0
Device Parity Protection-All	9179	MHB	0041	0
Mirrored System Bus Level, S	9179	MHB	0043	0
Device Parity RAID-6 All, Sp	9179	MHB	0047	0
RISC-to-RISC Data Migration	9179	MHB	0205	0
AIX Partition Specify	9179	MHB	0265	0
Linux Partition Specify	9179	MHB	0266	0
IBM i Operating System Parti	9179	MHB	0267	0
CSC Specify	9179	MHB	0275	0
Ext Tape Attached via #5736	9179	MHB	0290	0
Specify Custom Data Protecti	9179	MHB	0296	0
Specify EXP24 Attach via Exi	9179	MHB	0302	0
Mirrored Level System Specif	9179	MHB	0308	0
RAID Hot Spare Specify	9179	MHB	0347	0
V.24/EIA232 6.1m (20-Ft) PCI	9179	MHB	0348	162
V.24/EIA232 15.2m (50-Ft) PC	9179	MHB	0349	229
V.35 6.1m (20-Ft) PCI Cable	9179	MHB	0353	162
V.35 15.2m (50-Ft) PCI Cable	9179	MHB	0354	229
V.36 6.1m (20-Ft) PCI Cable	9179	MHB	0356	164
X.21 6.1m (20-Ft) PCI Cable	9179	MHB	0359	486

X.21 15.2m (50-Ft) PCI Cable	9179	MHB	0360	229
V.24/EIA232 (80-Ft) PCI Cabl	9179	MHB	0365	262
UPS Factory Integration Spec	9179	MHB	0373	0
HMC Factory Integration Spec	9179	MHB	0374	0
Display Factory Integration	9179	MHB	0375	0
Reserve Rack Space for UPS	9179	MHB	0376	0
Reserve Rack Space for HMC	9179	MHB	0377	0
Reserve Rack Space for Displ	9179	MHB	0378	0
MMA/MMB/ MHB upgrade indicato	9179	MHB	0397	0
SSD Placement Indicator - CE	9179	MHB	0462	0
SSD Placement Indicator (580	9179	MHB	0463	0
SSD Placement Indicator - 58	9179	MHB	0464	0
19 inch, 1.8 meter high rack	9179	MHB	0551	3463
19 inch, 2.0 meter high rack	9179	MHB	0553	4696
19 inch, 1.3 meter high rack	9179	MHB	0555	2592
IBM i 6.1 with 6.1.1 Machine	9179	MHB	0566	0
Rack Filler Panel Kit	9179	MHB	0599	97
Load Source Not in CEC	9179	MHB	0719	0
Specify Load Source in #5786	9179	MHB	0725	0
Specify Load Source in #5802	9179	MHB	0726	0
Specify #5886 Load Source pl	9179	MHB	0727	0
#4327 Load Source Specify	9179	MHB	0835	0
#4328 Load Source Specify	9179	MHB	0836	0
SAN Load Source Specify	9179	MHB	0837	0
#3676 Load Source Specify	9179	MHB	0838	0
#3677 Load Source Specify	9179	MHB	0839	0
#3678 Load Source Specify	9179	MHB	0840	0
#4329 Load Source Specify	9179	MHB	0841	0
#3658 Load Source Specify	9179	MHB	0844	0

#1884 Load Source Specify	9179	MHB	0851	0
#1888 Load Source Specify	9179	MHB	0853	0
#1909 Load Source Specify	9179	MHB	0854	0
#3587 Load Source Specify	9179	MHB	0855	0
US TAA Compliance Indicator	9179	MHB	0983	0
Modem Cable - US/Canada and	9179	MHB	1025	17
USB External Docking Station	9179	MHB	1104	361
USB 160 GB Removable Disk Dr	9179	MHB	1106	413
USB 500 GB Removable Disk Dr	9179	MHB	1107	928
Decline Electronic Service A	9179	MHB	1120	0
200V 16A 4.3m (14-Ft) TL Lin	9179	MHB	1406	0
125V 4.3m (14-Ft) Line Cord	9179	MHB	1413	0
200V 1.8m (6-Ft) Locking Lin	9179	MHB	1414	0
200V 1.8m (6-Ft) Watertight	9179	MHB	1415	0
200V 4.3m (14-Ft) Locking Li	9179	MHB	1416	0
200V 4.3m (14-Ft) Watertight	9179	MHB	1417	0
4.3m 200V/16A Power Cord S.	9179	MHB	1418	18
4.3m 200V/16A Power Cord Isr	9179	MHB	1419	18
4.3m 200V/16A Power Cord EU/	9179	MHB	1420	18
4.3m 200V/16A Power Cord CH/	9179	MHB	1421	18
200V 1.8m (6-Ft) Locking Lin	9179	MHB	1424	0
200V 1.8m (6-Ft) Watertight	9179	MHB	1425	0
200V 4.3m (14-Ft) Locking Li	9179	MHB	1426	0
200V 4.3m (14-Ft) Watertight	9179	MHB	1427	0
4.3m 200V/10A Power Cord EU/	9179	MHB	1439	18
4.3m 200V/10A	9179	MHB	1440	18

Power Cord Den				
4.3m 200V/10A Power Cord S.	9179	MHB	1441	18
4.3m 200V/10A Power Cord Swi	9179	MHB	1442	18
4.3m 200V/10A Power Cord UK	9179	MHB	1443	18
4.3m 200V/10A Power Cord Isr	9179	MHB	1445	18
4.3m 200V/32A Power Cord EU	9179	MHB	1449	314
4.3m 200V/16A Power Cord EU	9179	MHB	1450	18
200V (6-Ft) 1.8m Line Cord	9179	MHB	1451	52
200V (14-Ft) 4.3m Line Cord	9179	MHB	1452	52
200V (6-Ft) 1.8m Locking Lin	9179	MHB	1453	52
200V 12A (14-Ft) 4.3m TL Lin	9179	MHB	1454	262
200V (6-Ft) 1.8m Watertight	9179	MHB	1455	262
200V (14-Ft) 4.3m Watertight	9179	MHB	1456	262
200V (6-Ft) 1.8m Upper Line	9179	MHB	1457	0
200V (6-Ft) 1.8m Upper Locki	9179	MHB	1458	0
200V (6-Ft) 1.8m Upper Locki	9179	MHB	1459	262
30m SPCN Cable	9179	MHB	1466	0
4.3m 200V/12A Pwr Cd UK	9179	MHB	1476	18
4.3m 200V/16A Pwr Cd	9179	MHB	1477	262
Integrated, 4 Port- 1Gb Virt	9179	MHB	1803	699
Integrated, 4 Port (2x1Gb an	9179	MHB	1804	3950
GX++ Dual-port IB Adapter	9179	MHB	1808	1499
Integrated, 4 Port (2x1Gb an	9179	MHB	1813	2100
SAS Cable for triple split D	9179	MHB	1815	250
SAS Cable for dual RAID with	9179	MHB	1819	250
1.5 Meter 12X to 4X Channel	9179	MHB	1828	393
0.6 Meter 12X Cable	9179	MHB	1829	459

1.5 Meter 12X cable	9179	MHB	1830	524
8.0 Meter 12X Cable	9179	MHB	1834	949
3.0 Meter 12X Cable	9179	MHB	1840	623
3 Meter 12X to 4X Channel Co	9179	MHB	1841	492
10 Meter 12X to 4X Channel C	9179	MHB	1842	794
Operator Panel	9179	MHB	1853	1000
10 Meter 12X to 4X Enhanced	9179	MHB	1854	786
0.6 Meter 12X DDR Cable	9179	MHB	1861	459
1.5 Meter 12X DDR Cable	9179	MHB	1862	524
8.0 Meter 12X DDR Cable	9179	MHB	1864	949
3.0 Meter 12X DDR Cable	9179	MHB	1865	623
146.8GB 10K RPM SAS SFF Disk	9179	MHB	1882	852
73.4 GB 15K RPM SAS SFF Disk	9179	MHB	1883	652
69.7 GB 15K RPM SAS SFF Disk	9179	MHB	1884	652
300GB 10K RPM SFF SAS Disk D	9179	MHB	1885	1376
146GB 15K RPM SFF SAS Disk D	9179	MHB	1886	1045
139GB 15K RPM SFF SAS Disk D	9179	MHB	1888	1045
69GB SFF SAS Solid State Dri	9179	MHB	1890	6811
Quantity 150 of #1883	9179	MHB	1891	97800
Quantity 150 of #1882	9179	MHB	1899	127800
69GB SFF SAS Solid State Dri	9179	MHB	1909	6811
PCI-X DDR Dual Channel Ultra	9179	MHB	1912	769
Converter Cable, VHDCI to P,	9179	MHB	2118	66
Ultra 320 SCSI Cable 1 Meter	9179	MHB	2124	163
Ultra 320 SCSI Cable 3 Meter	9179	MHB	2125	183
Ultra 320 SCSI Cable 5 Meter	9179	MHB	2126	204
Ultra 320 SCSI Cable 10 Mete	9179	MHB	2127	275
Ultra 320 SCSI Cable 20 Mete	9179	MHB	2128	432
0.55 Meter Ultra 320 SCSI Ca	9179	MHB	2138	100

Primary OS - IBM i	9179	MHB	2145	0
Primary OS - AIX	9179	MHB	2146	0
Primary OS - Linux	9179	MHB	2147	0
2M LC-SC 50 Micron Fiber Con	9179	MHB	2456	108
2M LC-SC 62.5 Micron Fiber C	9179	MHB	2459	108
4 port USB PCIe Adapter	9179	MHB	2728	197
2-Port USB PCI Adapter	9179	MHB	2738	59
POWER GXT135P Graphics Accel	9179	MHB	2849	449
ARTIC960Hx 4-Port EIA-232 Ca	9179	MHB	2861	469
ARTIC960Hx 4-Port X.21 Cable	9179	MHB	2863	552
ARTIC960Hx 4-Port V.35 (DTE)	9179	MHB	2864	926
PCIe 2-Line WAN w/Modem	9179	MHB	2893	758
3M Asynchronous Terminal/Pri	9179	MHB	2934	48
Asynchronous Cable EIA-232/V	9179	MHB	2936	80
8-Port Asynchronous Adapter	9179	MHB	2943	1538
IBM ARTIC960Hx 4-Port Multip	9179	MHB	2947	3998
Cable, V.24 / EIA-232	9179	MHB	2951	193
Cable, V.35	9179	MHB	2952	353
Cable, V.36 / EIA-499	9179	MHB	2953	281
Cable, X.21	9179	MHB	2954	193
2-Port Multiprotocol PCI Ada	9179	MHB	2962	2205
Serial-to-Serial Port Cable	9179	MHB	3124	87
Serial-to-Serial Port Cable	9179	MHB	3125	87
73.4 GB 15,000 RPM Ultra320	9179	MHB	3278	659
146.8 GB 15,000 RPM Ultra320	9179	MHB	3279	1285
300 GB 15K RPM SCSI Disk Dri	9179	MHB	3585	1999
69GB 3.5" SAS Solid State Dr	9179	MHB	3586	6811
69GB 3.5" SAS Solid State Dr	9179	MHB	3587	6811
Widescreen LCD Monitor	9179	MHB	3632	1308

T210 Flat-Panel Monitor	9179	MHB	3635	7500
IBM T541H / L150p 15" TFT Col	9179	MHB	3637	538
IBM ThinkVision L170p Flat P	9179	MHB	3639	829
ThinkVision L171p Flat Panel	9179	MHB	3640	768
IBM T115 Flat Panel Monitor	9179	MHB	3641	740
ThinkVision L191p Flat Panel	9179	MHB	3642	900
IBM T120 Flat Panel Monitor	9179	MHB	3643	1754
IBM T119 Flat Panel Monitor	9179	MHB	3644	1119
IBM T117 Flat Panel Monitor	9179	MHB	3645	926
73GB 15K RPM SAS Disk Drive	9179	MHB	3646	659
146GB 15K RPM SAS Disk Drive	9179	MHB	3647	652
300GB 15K RPM SAS Disk Drive	9179	MHB	3648	1507
450GB 15K RPM SAS Disk Drive	9179	MHB	3649	2094
SAS Cable (EE) Drawer to Dra	9179	MHB	3652	66
SAS Cable (EE) Drawer to Dra	9179	MHB	3653	92
SAS Cable (EE) Drawer to Dra	9179	MHB	3654	158
428GB 15K RPM SAS Disk Drive	9179	MHB	3658	2094
SAS Cable (X) Adapter to SAS	9179	MHB	3661	197
SAS Cable (X) Adapter to SAS	9179	MHB	3662	394
SAS Cable (X) Adapter to SAS	9179	MHB	3663	800
Serv Interface Cable- 2, 3,	9179	MHB	3671	2000
Serv Interface Cable- 3 and	9179	MHB	3672	3000
Serv Interface Cable- 4 Encl	9179	MHB	3673	4000
69.7GB 15k rpm SAS Disk Driv	9179	MHB	3676	659
139.5GB 15k rpm SAS Disk Dri	9179	MHB	3677	652
283.7GB 15k rpm SAS Disk Dri	9179	MHB	3678	1507
SAS Cable (AI)- Adapter to I	9179	MHB	3679	69

3M SAS CABLE, ADPTR TO ADPTR	9179	MHB	3681	99
6M SAS CABLE, ADPTR TO ADPTR	9179	MHB	3682	197
SAS Cable (AE) Adapter to En	9179	MHB	3684	197
SAS Cable (AE) Adapter to En	9179	MHB	3685	394
SAS Cable (YI) System to SAS	9179	MHB	3686	118
SAS Cable (YI) System to SAS	9179	MHB	3687	144
SAS Cable (AT) 0.6 Meter	9179	MHB	3688	118
SAS Cable (YO) Adapter to SA	9179	MHB	3691	118
SAS Cable (YO) Adapter to SA	9179	MHB	3692	144
SAS Cable (YO) Adapter to SA	9179	MHB	3693	197
SAS Cable (YO) Adapter to SA	9179	MHB	3694	692
Processor Cable, Two-Drawer	9179	MHB	3711	4000
Processor Cable, Two, Three	9179	MHB	3712	5000
Processor Cable, Three or Fo	9179	MHB	3713	10000
Processor Cable, Four-Drawer	9179	MHB	3714	12000
0.3M Serial Port Converter C	9179	MHB	3925	28
Asynch Printer/ Terminal Cabl	9179	MHB	3926	191
Serial Port Null Modem Cable	9179	MHB	3927	87
Serial Port Null Modem Cable	9179	MHB	3928	87
1.8 M (6-ft) Extender Cable	9179	MHB	4242	108
Extender Cable - USB Keyboar	9179	MHB	4256	55
VGA to DVI Connection Conver	9179	MHB	4276	10
70.56GB 15k rpm Disk Unit	9179	MHB	4327	999
141.12GB 15k rpm Disk Unit	9179	MHB	4328	1285
282.25GB 15k rpm Disk Unit	9179	MHB	4329	2799
Rack Indicator-Not Factory	9179	MHB	4650	0
Rack Indicator, Rack #1	9179	MHB	4651	0
Rack Indicator, Rack #2	9179	MHB	4652	0
Rack Indicator, Rack #3	9179	MHB	4653	0

Rack Indicator, Rack #4	9179	MHB	4654	0
Rack Indicator, Rack #5	9179	MHB	4655	0
Rack Indicator, Rack #6	9179	MHB	4656	0
Rack Indicator, Rack #7	9179	MHB	4657	0
Rack Indicator, Rack #8	9179	MHB	4658	0
Rack Indicator, Rack #9	9179	MHB	4659	0
Rack Indicator, Rack #10	9179	MHB	4660	0
Rack Indicator, Rack #11	9179	MHB	4661	0
Rack Indicator, Rack #12	9179	MHB	4662	0
Rack Indicator, Rack #13	9179	MHB	4663	0
Rack Indicator, Rack #14	9179	MHB	4664	0
Rack Indicator, Rack #15	9179	MHB	4665	0
Rack Indicator, Rack #16	9179	MHB	4666	0
PCI-X Cryptographic Coproces	9179	MHB	4764	11789
POWER ACTIVE MEMORY EXPANSIO	9179	MHB	4791	6900
CBU SPECIFY	9179	MHB	4891	0
3.86 GHz / 4.14 GHz TurboCor	9179	MHB	4982	57429
Single 5250 Enterprise Enabl	9179	MHB	4992	50000
Full 5250 Enterprise Enablem	9179	MHB	4997	200000
Software Preload Required	9179	MHB	5000	0
Custom Service Specify, Off-	9179	MHB	5001	0
Customer Solution Center - R	9179	MHB	5002	0
Power Dist Unit 1 Phase NEMA	9179	MHB	5160	1309
Power Dist Unit 1 Phase IEC	9179	MHB	5161	1309
Power Dist Unit 2 of 3 Phase	9179	MHB	5162	1309
Power Dist Unit - 3 Phase	9179	MHB	5163	1309
One Processor Activation for	9179	MHB	5469	8375
RFID TAGS FOR SERVERS, BLADE	9179	MHB	5524	27
Sys Console On HMC	9179	MHB	5550	0

Sys Console-Ethernet No IOP	9179	MHB	5553	0
System CEC Enclosure with IB	9179	MHB	5597	12000
System CEC Enclosure with OE	9179	MHB	5598	12000
0/32GB DDR3 Memory (4X8GB) D	9179	MHB	5600	1960
0/64GB DDR3 Memory (4X16GB)	9179	MHB	5601	7720
0/128GB DDR3 Memory (4X32GB)	9179	MHB	5602	15440
System AC Power Supply, 1725	9179	MHB	5632	1502
Blind Swap Type III Cassette	9179	MHB	5646	49
Standard Slot	9179	MHB	5647	49
Disk/Media Backplane	9179	MHB	5652	4000
175MB Cache RAID Battery Card	9179	MHB	5662	2500
Service Processor	9179	MHB	5664	4000
FSP/Clock Pass Through Card	9179	MHB	5665	900
IBM Gigabit Ethernet-SX PCI-	9179	MHB	5700	1142
IBM 10/100/1000 Base-TX Ethe	9179	MHB	5701	699
IBM 2-Port 10/100/1000 Base-	9179	MHB	5706	989
10Gb FCoE PCIe Dual Port Ada	9179	MHB	5708	5441
1 Gigabit iSCSI TOE PCI-X on	9179	MHB	5713	1179
1 Gigabit iSCSI TOE PCI-X on	9179	MHB	5714	1853
2 Gigabit Fibre Channel PCI-	9179	MHB	5716	1999
4-Port 10/100/1000 Base-TX P	9179	MHB	5717	1087
10 Gb Ethernet-SR PCI-X 2.0	9179	MHB	5721	6276
10 Gb Ethernet-LR PCI-X 2.0	9179	MHB	5722	10587
2-Port Asynchronous EIA-232	9179	MHB	5723	171
10 Gigabit Ethernet-CX4 PCI	9179	MHB	5732	4749

8 Gigabit PCI Express Dual P	9179	MHB	5735	4583
PCI-X DDR Dual Channel Ultra	9179	MHB	5736	769
4-Port 10/100/1000 Base-TX P	9179	MHB	5740	1099
IBM Single Bus Ultra 320 SCS	9179	MHB	5741	654
IBM Dual Bus Ultra 320 SCSI	9179	MHB	5742	1307
POWER GXT145 PCI Express Gra	9179	MHB	5748	496
4Gbps Fibre Channel (2-Port)	9179	MHB	5749	3273
4 GB Single-Port Fibre Chann	9179	MHB	5758	1999
4 Gb Dual-Port Fibre Channel	9179	MHB	5759	3273
SATA Slimline DVD-RAM Drive	9179	MHB	5762	392
2-Port 10/100/1000 Base-TX E	9179	MHB	5767	692
2-Port Gigabit Ethernet-SX P	9179	MHB	5768	1731
10 Gigabit Ethernet-SR PCI E	9179	MHB	5769	5244
10 Gigabit Ethernet-LR PCI E	9179	MHB	5772	6211
Adapter	9179	MHB	5773	1977
4 Gigabit PCI Express Dual P	9179	MHB	5774	3273
PCI-X EXP24 Ctl-1.5GB No IOP	9179	MHB	5782	11077
4 Port Async EIA-232 PCIe Ad	9179	MHB	5785	915
TotalStorage EXP24 Disk Dwr	9179	MHB	5786	7125
PCI-DDR 12X Expansion Drawer	9179	MHB	5796	6477
12X I/O Drawer PCIe, SFF dis	9179	MHB	5802	14277
12X I/O Drawer PCIe, No Disk	9179	MHB	5877	12968
EXP 12S Expansion Drawer	9179	MHB	5886	5894
PCI-X DDR Dual -x4 SAS Adapt	9179	MHB	5900	777
PCIe Dual-x4 SAS Adapter	9179	MHB	5901	982
PCI-X DDR Dual - x4 3Gb SAS	9179	MHB	5902	2475

PCIe 380MB Cache Dual - x4 3	9179	MHB	5903	2880
PCI-X DDR 1.5GB Cache SAS RA	9179	MHB	5908	11134
PCI-X DDR Dual - x4 SAS Adap	9179	MHB	5912	1080
Non-paired SAS RAID indicato	9179	MHB	5922	0
Non-paired PCIe SAS RAID Ind	9179	MHB	5923	0
Full Width Keyboard -- USB,	9179	MHB	5951	108
Full Width Keyboard -- USB,	9179	MHB	5952	108
Full Width Keyboard -- USB,	9179	MHB	5953	108
Full Width Keyboard -- USB,	9179	MHB	5954	108
Full Width Keyboard -- USB,	9179	MHB	5955	108
Full Width Keyboard -- USB,	9179	MHB	5956	108
Full Width Keyboard -- USB,	9179	MHB	5957	108
Full Width Keyboard -- USB,	9179	MHB	5958	108
Full Width Keyboard -- USB,	9179	MHB	5959	108
Full Width Keyboard -- USB,	9179	MHB	5960	108
Full Width Keyboard -- USB,	9179	MHB	5961	108
Full Width Keyboard -- USB,	9179	MHB	5962	108
Full Width Keyboard -- USB,	9179	MHB	5964	108
Full Width Keyboard -- USB,	9179	MHB	5965	108
Full Width Keyboard -- USB,	9179	MHB	5966	108
Full Width Keyboard -- USB,	9179	MHB	5967	108
Full Width Keyboard -- USB,	9179	MHB	5968	108
Full Width Keyboard -- USB,	9179	MHB	5969	108

Full Width Keyboard -- USB,	9179	MHB	5970	108
Full Width Keyboard -- USB,	9179	MHB	5971	108
Full Width Keyboard -- USB,	9179	MHB	5972	108
Full Width Keyboard -- USB,	9179	MHB	5973	108
Full Width Keyboard -- USB,	9179	MHB	5974	108
Full Width Keyboard -- USB,	9179	MHB	5975	108
Full Width Keyboard -- USB,	9179	MHB	5976	108
Full Width Keyboard -- USB,	9179	MHB	5977	108
Full Width Keyboard -- USB,	9179	MHB	5978	108
Full Width Keyboard -- USB,	9179	MHB	5979	108
Full Width Keyboard -- USB,	9179	MHB	5980	108
Full Width Keyboard -- USB,	9179	MHB	5981	108
Full Width Keyboard -- USB,	9179	MHB	5982	108
Full Width Keyboard -- USB,	9179	MHB	5983	108
Power Control Cable (SPCN) -	9179	MHB	6001	32
Power Control Cable (SPCN) -	9179	MHB	6006	52
Power Control Cable (SPCN) -	9179	MHB	6007	104
Power Control Cable (SPCN) -	9179	MHB	6008	66
Power Control Cable (SPCN) -	9179	MHB	6029	119
Opt Front Door for 1.8m Rack	9179	MHB	6068	445
Opt Front Door for 2.0m Rack	9179	MHB	6069	545
1.8m Rack Trim Kit	9179	MHB	6246	296
2.0m Rack Trim Kit	9179	MHB	6247	296
1.8m Rack Acoustic Doors	9179	MHB	6248	4601
2.0m Rack Acoustic Doors	9179	MHB	6249	4601
1.8m Rack Trim Kit	9179	MHB	6263	523
2.0m Rack Trim Kit	9179	MHB	6272	523

Dual-port 12X Channel Attach	9179	MHB	6446	755
4.3m (14-Ft) 250V/10A Power	9179	MHB	6451	7
4.3m (14-Ft) 250V/10A Power	9179	MHB	6455	0
Dual-port 12X Channel Attach	9179	MHB	6457	3275
Power Cable -- Drawer to IBM	9179	MHB	6458	19
3.7m (12-Ft) 250V/10A RA Pwr	9179	MHB	6459	7
Power Cord 4.3m (14-ft), Dra	9179	MHB	6460	19
4.3m (14-Ft) 250V/10A Power	9179	MHB	6461	7
4.3m (14-Ft) 250V/10A Power	9179	MHB	6462	7
4.3m (14-Ft) 250V/10A Power	9179	MHB	6463	7
4.3m (14-Ft) 250V/10A Power	9179	MHB	6464	7
4.3m (14-Ft) 250V/10A Power	9179	MHB	6465	7
4.3m (14-Ft) 250V/10A Power	9179	MHB	6466	7
4.3m (14-Ft) 250V/10A Power	9179	MHB	6467	7
Power Cord 4.3m (14-foot), D	9179	MHB	6469	18
Power Cord 1.8m(6-foot), To	9179	MHB	6470	18
Power Cord 2.7m (9-foot), To	9179	MHB	6471	18
Power Cord 2.7m (9-foot), To	9179	MHB	6472	18
Power Cord 2.7m (9-foot), To	9179	MHB	6473	18
Power Cord 2.7m (9-foot), To	9179	MHB	6474	18
Power Cord 2.7m (9-foot), To	9179	MHB	6475	18
Power Cord 2.7m (9-foot), To	9179	MHB	6476	18
Power Cord 2.7m (9-foot), To	9179	MHB	6477	18
Power Cord 2.7 M(9-foot), To	9179	MHB	6478	18

Power Cord (9-foot) , To Wal	9179	MHB	6479	14
Power Cord 1.8M (6-foot),To	9179	MHB	6487	18
Power Cord 2.7m (9-foot), To	9179	MHB	6488	52
4.3m (14-Ft) 3PH/24A Power C	9179	MHB	6489	360
4.3m (14-Ft) 1PH/48A Pwr Cor	9179	MHB	6491	396
4.3m (14-Ft) 1PH/48-60A Pwr	9179	MHB	6492	396
Power Cord 2.7M (9-foot), To	9179	MHB	6493	18
Power Cord 2.7M (9-foot), To	9179	MHB	6494	18
Power Cord (9-foot), To Wall	9179	MHB	6495	19
Power Cord 2.7M (9-foot), To	9179	MHB	6496	18
Power Cord (6-foot), To Wall	9179	MHB	6497	33
Power Cord (6-foot), To Wall	9179	MHB	6498	239
Power Cable - Drawer to IBM	9179	MHB	6577	19
Optional Rack Security Kit	9179	MHB	6580	177
Modem Tray for 19-Inch Rack	9179	MHB	6586	248
Power Cord 2.7M (9-foot), To	9179	MHB	6651	18
4.3m (14-Ft) 1PH/24-30A Pwr	9179	MHB	6654	237
4.3m (14-Ft) 1PH/24-30A WR P	9179	MHB	6655	524
4.3m (14-Ft)1PH/24A Power Co	9179	MHB	6656	237
Power Cord 2.7M (9-foot), To	9179	MHB	6659	18
Power Cord (14-foot), Drawer	9179	MHB	6660	19
2.1m (7-Ft) 200V PDU Power C	9179	MHB	6664	19
Power Cord 3 M (10 ft), Draw	9179	MHB	6665	18
Power Cord 4.3M (14-foot), D	9179	MHB	6669	18
Power Cord (6-foot), To Wall	9179	MHB	6670	19

Power Cord 2.7M (9-foot), Dr	9179	MHB	6671	18
Power Cord 1.5M (5-foot), Dr	9179	MHB	6672	18
Power Cord 2.7M (9-foot), To	9179	MHB	6680	18
Power Cord (6-foot), To Wall	9179	MHB	6687	19
PCI 2-Line WAN IOA No IOP	9179	MHB	6805	551
PCI 4-Modem WAN IOA No IOP	9179	MHB	6808	2073
PCI 2-Line WAN w/Modem NoIOP	9179	MHB	6833	766
Intelligent PDU +, 1 EIA Unit	9179	MHB	7109	1439
Environmental Monitoring Pro	9179	MHB	7118	366
Power Distribution Unit	9179	MHB	7188	990
Quantity 150 of #2124	9179	MHB	7204	24450
Quantity 150 of #2125	9179	MHB	7205	27450
Quantity 150 of #2126	9179	MHB	7206	30600
Quantity 150 of #2127	9179	MHB	7207	41250
Quantity 150 of #2128	9179	MHB	7208	64800
Quantity 150 of #2138	9179	MHB	7213	15000
SDI Software Pre-Install Ind	9179	MHB	7305	0
I/O Drawer Mounting Enclosur	9179	MHB	7314	687
On/Off 1GB-Day, Mem Bill P7	9179	MHB	7377	1
Quantity 150 of #4327	9179	MHB	7509	149850
Quantity 150 of #4328	9179	MHB	7510	192750
Quantity 150 of #4329	9179	MHB	7511	419850
Quantity 150 of #5741	9179	MHB	7514	98100
Quantity 150 of #3676	9179	MHB	7517	98850
Quantity 150 of #3677	9179	MHB	7518	97800
Quantity 150 of #3678	9179	MHB	7519	226050
Quantity 150 of #3586	9179	MHB	7535	1021650
Quantity 150 of #3587	9179	MHB	7536	1021650
Quantity 150 of #3658	9179	MHB	7538	314100

Quantity 150 of #1884	9179	MHB	7543	97800
Quantity 150 of #1888	9179	MHB	7544	156750
Quantity 150 of #1890	9179	MHB	7545	1021650
Quantity 150 of #1909	9179	MHB	7546	1021650
Quantity 150 of #1885	9179	MHB	7547	206400
Quantity 150 of #1886	9179	MHB	7548	156750
Quantity 150 of #3647	9179	MHB	7549	97800
Quantity 150 of #3648	9179	MHB	7564	226050
Quantity 150 of #3649	9179	MHB	7565	314100
PROC COD UTILITY BILLING FOR	9179	MHB	7633	4
PROC COD UTILITY BILLING FOR	9179	MHB	7634	26
1 PROC-DAY ON/OFF BILLING FO	9179	MHB	7635	26
1 PROC-DAY ON/OFF BILLING FO	9179	MHB	7636	187
OEM (Generic) Indicator	9179	MHB	7770	0
OEM (GROUPE BULL) Indicator	9179	MHB	7773	0
OEM (Hitachi) Indicator	9179	MHB	7775	0
OEM Publications for IBM Log	9179	MHB	7779	0
2.0m Rack Side Attach Kit	9179	MHB	7780	196
Ethernet Cable, 6M, Hardware	9179	MHB	7801	15
Ethernet Cable, 15m, Hardwar	9179	MHB	7802	34
Side-by-Side for 1.8m Racks	9179	MHB	7840	655
Ruggedize Rack Kit	9179	MHB	7841	1964
PCI Blind Swap Cassette Kit,	9179	MHB	7862	46
PCI Blind Swap Cassette Kit,	9179	MHB	7863	66
PowerVM - Standard Edition	9179	MHB	7942	0
On/Off Processor Enablement	9179	MHB	7951	0
On/Off Memory Enablement	9179	MHB	7954	0
PowerVM - Enterprise Edition	9179	MHB	7995	0
570 to MMA Advanced POWER Vi	9179	MHB	8018	0

RJ-45 to DB-25 Converter Cab	9179	MHB	8133	131
Linux Software Preinstall	9179	MHB	8143	60
Linux Software Preinstall (S	9179	MHB	8144	60
Activation of 1 GB DDR3 POWE	9179	MHB	8212	245
Activation of 100 GB DDR3 PO	9179	MHB	8213	24500
Power Cord Carry Over Indica	9179	MHB	8430	0
Power Cord Carry Over Indica	9179	MHB	8431	0
Power Cord Carry Over Indica	9179	MHB	8432	0
Power Cord Carry Over Indica	9179	MHB	8433	0
Power Cord Carry Over Indica	9179	MHB	8434	0
Power Cord Carry Over Indica	9179	MHB	8435	0
Power Cord Carry Over Indica	9179	MHB	8436	0
Power Cord Carry Over Indica	9179	MHB	8437	0
Power Cord Carry Over Indica	9179	MHB	8438	0
Power Cord Carry Over Indica	9179	MHB	8439	0
Power Cord Carry Over Indica	9179	MHB	8440	0
Power Cord Carry Over Indica	9179	MHB	8441	0
Base Customer Spec Plcmnt	9179	MHB	8453	0
Mouse - USB, with Keyboard A	9179	MHB	8841	82
USB Mouse	9179	MHB	8845	39
Order Routing Indicator- Sys	9179	MHB	9169	0
Language Group Specify - US	9179	MHB	9300	0
New AIX License Core Counter	9179	MHB	9440	0
New IBM i License Core Count	9179	MHB	9441	0
New Red Hat License Core Cou	9179	MHB	9442	0

New SUSE License Core Counte	9179	MHB	9443	0
Other AIX License Core Count	9179	MHB	9444	0
Other Linux License Core Cou	9179	MHB	9445	0
3rd Party Linux License Core	9179	MHB	9446	0
VIOS Core Counter	9179	MHB	9447	0
Other IBM i License Core Cou	9179	MHB	9448	0
Month Indicator	9179	MHB	9461	0
Day Indicator	9179	MHB	9462	0
Hour Indicator	9179	MHB	9463	0
Minute Indicator	9179	MHB	9464	0
Qty Indicator	9179	MHB	9465	0
Countable Member Indicator	9179	MHB	9466	0
Reserved Rack Space Indicato	9179	MHB	9570	0
Language Group Specify - Dut	9179	MHB	9700	0
Language Group Specify - Fre	9179	MHB	9703	0
Language Group Specify - Ger	9179	MHB	9704	0
Language Group Specify - Pol	9179	MHB	9705	0
Language Group Specify - Nor	9179	MHB	9706	0
Language Group Specify - Por	9179	MHB	9707	0
Language Group Specify - Spa	9179	MHB	9708	0
Language Group Specify - Ita	9179	MHB	9711	0
Language Group Specify - Can	9179	MHB	9712	0
Language Group Specify - Jap	9179	MHB	9714	0
Language Group Specify - Tra	9179	MHB	9715	0
Language Group Specify - Kor	9179	MHB	9716	0
Language Group Specify - Tur	9179	MHB	9718	0

Language Group Specify - Hun	9179	MHB	9719	0
Language Group Specify - Slo	9179	MHB	9720	0
Language Group Specify - Rus	9179	MHB	9721	0
Language Group Specify - Sim	9179	MHB	9722	0
Language Group Specify - Cze	9179	MHB	9724	0
Language Group Specify -- Ro	9179	MHB	9725	0
Language Group Specify - Cro	9179	MHB	9726	0
Language Group Specify -- Sl	9179	MHB	9727	0
Language Group Specify - Bra	9179	MHB	9728	0
Language Group Specify - Tha	9179	MHB	9729	0
Customer Install MES	9179	MHB	9742	0
Notify CSO After Install	9179	MHB	9743	0
TurboCore Mode Specify Code	9179	MHB	9982	0
Product Renovated by IBM Ind	9179	MHB	9993	0
Racl Content Spec 9179 4u	7014	T00	0384	0
Racl Content Spec 9179 4u	7014	T42	0384	0
Racl Content Spec 9179 8u	7014	T00	0385	0
Racl Content Spec 9179 8u	7014	T42	0385	0
Racl Content Spec 9179 12u	7014	T00	0386	0
Racl Content Spec 9179 12u	7014	T42	0386	0
Racl Content Spec 9179 16u	7014	T00	0387	0
Racl Content Spec 9179 16u	7014	T42	0387	0
Power 780 Acoustic Rack Door	7014	T42	6250	4650

MT	Mod	Partnumber	Description	Price
9179	MMB		Model Conv MMA to MHB	$2,039
9179	MHB	911744955600	Feat Conv 4495 to 5600	$1,764
9179	MHB	911744965600	Feat Conv 4496 to 5600	$1,764
9179	MHB	911744975600		$1,764

			Feat Conv 4497 to 5600	
9179	MHB	911744995600	Feat Conv 4499 to 5600	$1,764
9179	MHB	911756935600	Feat Conv 5693 to 5600	$1,764
9179	MHB	911756945600	Feat Conv 5694 to 5600	$1,764
9179	MHB	911756955600	Feat Conv 5695 to 5600	$1,764
9179	MHB	911778925600	Feat Conv 7892 to 5600	$1,764
9179	MHB	911778935600	Feat Conv 7893 to 5600	$1,764
9179	MHB	911778945600	Feat Conv 7894 to 5600	$1,764
9179	MHB	911744955601	Feat Conv 4495 to 5601	$6,948
9179	MHB	911744965601	Feat Conv 4496 to 5601	$6,948
9179	MHB	911744975601	Feat Conv 4497 to 5601	$6,948
9179	MHB	911744985601	Feat Conv 4498 to 5601	$6,948
9179	MHB	911744995601	Feat Conv 4499 to 5601	$6,948
9179	MHB	911756905601	Feat Conv 5690 to 5601	$6,948
9179	MHB	911756935601	Feat Conv 5693 to 5601	$6,948
9179	MHB	911756945601	Feat Conv 5694 to 5601	$6,948
9179	MHB	911756955601	Feat Conv 5695 to 5601	$6,948
9179	MHB	911756965601	Feat Conv 5696 to 5601	$6,948
9179	MHB	911778925601	Feat Conv 7892 to 5601	$6,948
9179	MHB	911778935601	Feat Conv 7893 to 5601	$6,948
9179	MHB	911778945601	Feat Conv 7894 to 5601	$6,948
9179	MHB	911744965602	Feat Conv 4496 to 5602	$13,896
9179	MHB	911744975602	Feat Conv 4497 to 5602	$13,896
9179	MHB	911744985602	Feat Conv 4498 to 5602	$13,896
9179	MHB	911744995602	Feat Conv 4499 to 5602	$13,896
9179	MHB	911756905602	Feat Conv 5690 to 5602	$13,896
9179	MHB	911756955602	Feat Conv 5695 to 5602	$13,896
9179	MHB	911756965602	Feat Conv 5696 to 5602	$13,896
9179	MHB	911756808212	Feat Conv 5680 to 8212	$221
9179	MHB	911772728212	Feat Conv 7272 to 8212	$221
9179	MHB	911772738212	Feat Conv 7273 to 8212	$221
9179	MHB	911772748212	Feat Conv 7274 to 8212	$221
9179	MHB	911772758212	Feat Conv 7275 to 8212	$221

9179	MHB	911772768212	Feat Conv 7276 to 8212	$221
9179	MHB	911776638212	Feat Conv 7663 to 8212	$221
9179	MHB	911780178212	Feat Conv 8017 to 8212	$221
9179	MHB	911756818213	Feat Conv 5681 to 8213	$22,050
9179	MHB	911756848213	Feat Conv 5684 to 8213	$22,050
9179	MHB	911756204982	Feat Conv 5620 to 4982	$30,437
9179	MHB	911756214982	Feat Conv 5621 to 4982	$30,437
9179	MHB	911756224982	Feat Conv 5622 to 4982	$30,437
9179	MHB	911773804982	Feat Conv 7380 to 4982	$30,437
9179	MHB	911773874982	Feat Conv 7387 to 4982	$30,437
9179	MHB	911773884982	Feat Conv 7388 to 4982	$30,437
9179	MHB	911775404982	Feat Conv 7540 to 4982	$30,437
9179	MHB	911749904992	Feat Conv 4990 to 4992	$0
9179	MHB	911749914997	Feat Conv 4991 to 4997	$0
9179	MHB	911754035469	Feat Conv 5403 to 5469	$4,439
9179	MHB	911756705469	Feat Conv 5670 to 5469	$4,439
9179	MHB	911756715469	Feat Conv 5671 to 5469	$4,439
9179	MHB	911756725469	Feat Conv 5672 to 5469	$4,439
9179	MHB	911773065469	Feat Conv 7306 to 5469	$4,439
9179	MHB	911777005469	Feat Conv 7700 to 5469	$4,439
9179	MHB	911777195469	Feat Conv 7719 to 5469	$4,439
9179	MHB	911762466263	Feat Conv 6246 to 6263	$471
9179	MHB	911762476272	Feat Conv 6247 to 6272	$471
9179	MHB	917979427995	Feat Conv 7942 to 7995	$0

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