



IBM Power 780 model MHD and new Power 795 model FHB features deliver unprecedented performance, scalability, reliability, and manageability for demanding commercial workloads

Table of contents

2 Overview	55 Publications
3 Key prerequisites	55 Technical information
3 Planned availability date	61 Terms and conditions
3 Description	64 Prices
28 Statement of general direction	91 Order now
28 Product number	92 Corrections

At a glance

The Power® 780 model MHD and Power 795 enterprise servers are designed to deliver outstanding price/performance, mainframe-inspired reliability and availability features, flexible capacity upgrades, and innovative virtualization technologies. The new Power 780 model MHD features:

- Up to 128 IBM® POWER7+ cores with four processor drawers per server
- One POWER7+ processor card per processor drawer: 16-core at 4.42
- Up to 4 TB of memory using 4 Gb DDR3 memory DIMMs with frequencies up to 1066 MHz, augmented with standard Active Memory™ Mirroring and optional Active Memory Expansion
- Dynamic Platform Optimizer -- a new option for adjusting workload placement of processor and memory resources
- Elastic CoD On/Off processor day -- no-charge, temporary usage of inactive, On/Off CoD resources on initial orders only
- Elastic CoD On/Off GB-days -- no-charge, temporary usage of inactive, on/off CoD resources on initial orders only
- Logical partitions, up to 1000 per system
- Active Memory Expansion -- optimized onto the processor chip
- EXP30 Ultra SSD I/O Drawer with integrated, high-performance, SAS controllers
- Power Systems™ Pools offering

New Power 795 features:

- Up to 16 TB of DDR3 memory using 4 Gb DDR3 memory DIMMs with frequencies up to 1066 MHz, augmented with standard Active Memory Mirroring and optional Active Memory Expansion
- Dynamic Platform Optimizer
- Elastic CoD On/Off no-charge processor days
- Elastic CoD On/Off no-charge memory GB-days
- 90-days On/Off CoD temporary memory enablement
- 90-days On/Off CoD temporary processor enablement
- Power Systems Pools offering

Overview

The new IBM Power 780 server (9179-MHD) uses the latest POWER7+ processor and the next-generation I/O technology to deliver unprecedented performance, scalability, reliability, and manageability for demanding commercial workloads.

The innovative Power 780 model MHD server is a symmetric multiprocessing (SMP), rack-mounted server. This modular system uses one to four enclosures that are four EIA units tall and housed in a 19-inch rack. Each enclosure contains four powerful POWER7+ processors and high density memory DIMMs using 4Gb technology. IBM continues to use a high-performance PCIe Gen2, I/O backplane introduced with model MHC.

The new POWER7+ processors are designed as single chip modules (SCMs), each with 64-bit architecture. L3 cache on POWER7+ 780 processor chips has been increased 2.5X compared to previous POWER7® processor chips. Each POWER7+ SCM enables either four or eight active processor cores with up to 10 MB per core of L3 cache and 256 KB per core of L2 cache. Power 780 systems are available at frequencies of 3.72 GHz with 128 cores, or 4.42 GHz with 64 cores. This new model server is available with as few as four active cores and incrementing one core at a time through built-in Capacity on Demand (CoD) functions to the full capacity of the system.

New high-density memory DIMMs using 4 Gb technology are now available for the Power 780 model MHD. This includes new memory DIMMs for 32 GB, 64 GB, 128 GB, and 256 GB DDR3 memory features. Existing memory features are supported for model upgrades.

The EXP30 Ultra SSD I/O Drawer (#EDR1) gives the Power 770+ and Power 780+ up to 30 solid state drives (SSDs) in just 1U of rack space without PCIe slots. The drawer provides up to 480,000 IOPS and up to 12.6 TB of capacity for AIX® or Linux™ clients. Up to 48 additional HDDs can be directly attached to the Ultra Drawer (still without using any PCIe slots), enabling up to 43.2 TB additional capacity in only 4U additional rack space for AIX clients. This ultradense SSD option is attached to the 770+ or 780+ using a new GX++ 2-port, PCIe2 x8 Adapter (#1914).

POWER7+ processor chips imbed new hardware accelerators for AIX memory expansion and AIX Encrypted File System and IPSec network security protocol. This can offload work from processor cores from doing these tasks and improve performance of those functions. Combined with the increased POWER7+ clock speeds this helps Power Systems be a continued workhorse for critical workloads. Applications may run faster and be more responsive, which may result in competitive advantages and higher customer satisfaction.

The POWER7+ hardware accelerator for Active Memory Expansion delivers 25% higher levels of memory expansion than available with POWER7 processor chips. While POWER7 systems offer up to 100% memory expansion which can effectively double the server's maximum memory, POWER7+ servers offer up to 125% memory expansion for AIX partitions. Thus, a system memory maximum of 4 TB could effectively become 9 TB effective memory capacity.

A new firmware feature called Dynamic Platform Optimizer is available on both Power 770 model MMD and Power 780 model MHD. This feature monitors processor and memory affinity and adjusts workload placement to optimize performance in a virtualized consolidated environment.

As part of the IBM commitment to delivering the most flexible and resilient Power high-end systems, all new Power 780 (9179-MHD) and 795 servers come standard with a specific number of Elastic On/Off CoD processor and memory days depending on the configuration of the system at initial ship or upgrade time. For every new

Power 780 or 795, 15 Elastic CoD On/Off processor days and 240 GB memory days will be included at no charge for every processor core initially shipped with the system. These Elastic CoD On/Off processor and memory days must be used in accordance with the Temporary Capacity on Demand terms and conditions.

The new Power Systems Pools offering is a multisystem IBM Power 780 and 795 infrastructure offering designed to enable a highly resilient and flexible IT environment in support of large-scale server consolidation and your most demanding business application requirements. Power Systems Pools allows for the aggregation of On/Off and Elastic CoD compute resources, including processors and memory, across a number of Power 780 and 795 servers. It delivers greater flexibility to respond to critical application workload requirements as well as to enhance the availability of your applications.

As part of the offering, those Power 780 and 795 servers that participate in an IBM Power Systems Pools environment are provided with regularly planned maintenance events (up to eight in a calendar year) that enables you to turn on inactive processors and memory in another participating system in the pool in the event that a system may need to be brought down for some type of maintenance occurrence. In addition, all On/Off and Elastic CoD processor and memory days, including those that now come standard with all new Power 780 and 795 servers, can be accumulated and managed at a pool level to effectively and efficiently manage and balance application workload peak requirements. Power Systems Pools can consist of up to 10 Power 780 or Power 795 systems to support large-scale application, database, and infrastructure requirements.

New to both Power 780 model MHD and Power 795 model FHB are 90-day temporary On/Off CoD processor and memory enablement features. These features enable a system to temporarily activate all inactive processor and memory CoD resources for a maximum of 90 days before you must order another temporary On/Off enablement feature number. Also new for Power 780 model MHD are high-density memory DIMMs that use 4 Gb technology. These memory DIMMs are for 64 GB, 128 GB, and 256 GB DDR3 memory features. This enables a new 256 GB DDR3 memory feature increase the model FHB maximum memory capacity from 8 TB to 16 TB. IBM continues to offer the 32 GB, 2 Gb memory feature.

Key prerequisites

Refer to the [Hardware requirements](#) and [Software requirements](#) sections.

Planned availability date

- October 12, 2012, for feature EDAN
- October 19, 2012, for model 9179-MHD and features 5899, EC28, EFD9, EMJ0, EMJ1, EPJ0, and EPJ1
- November 16, 2012, for model upgrade to 9179-MHD and features 0469, 5564, 6577, EB33,, EM9T, EP9T, ER00, ER03, ER04, ER07, ER08, ER09, ER0A , ERG1, ERG2, ERG3, ERG4, ERG5, ERG6, and ERG7
- February 14, 2013, for 9179-MHD CEC hot-node add and repair maintenance: memory upgrade, hot-node add and repair, GX adapter add and repair

Description

Summary of features

The following features are available on the Power 780:

- 4U 19-inch rack-mount system drawer
- One to four system drawers: 16U maximum system drawer size
- One processor card feature per drawer (includes the voltage regulator):

- 0/16 core, 4.42 GHz processor card (#EPH0)
- 0/32 core, 3.72 GHz processor card (#EPH2)
- POWER7/7+ DDR3 memory DIMMs (16 DIMM slots per processor card):
 - 0/32 GB (4 X 8 GB), 1066 MHz (#EM40)
 - 0/32 GB (4 X 8 GB), 1066 MHz (#5600)
 - Only ordered with model upgrade from MMB
 - Carries forward with model upgrades from MMB/MMC
 - 0/64 GB (4 X 16 GB), 1066 MHz (#EM41)
 - 0/64 GB (4 X 16 GB), 1066 MHz (#5601)
 - Only ordered with model upgrade from MMB
 - Carries forward with model upgrades from MMB/MMC
 - 0/128 GB (4 X 32 GB), 1066 MHz (#EM42)
 - 0/128 GB (4 X 32 GB), 1066 MHz (#5602)
 - Only ordered with model upgrade from MMB
 - Carries forward with model upgrades from MMB/MMC
 - 0/256 GB (4 X 64 GB), 1066 MHz (#EM44)
 - 0/256 GB (4 X 64 GB), 1066 MHz (#5564)
 - Carries forward with model upgrades
 - Can not be ordered on MMD
- Dynamic Platform Optimizer -- a new option for adjusting workload placement of processor and memory resources (#EB33)
- Active Memory Expansion -- optimized onto the processor chip (#4791)
- Elastic CoD On/Off Processor Day -- no-charge, temporary usage of inactive, on/off CoD resources on initial orders only (#EPJ0 or #EPJ2)
- Elastic CoD On/Off GB-Days -- no-charge, temporary usage of inactive, on/off CoD resources on initial orders only (#EMJ0 or #EMJ2)
- 90 Days On/Off CoD Temporary Memory Enablement (#EM9T)
- 90 Days On/Off CoD Temporary Processor Enablement (#EP9T)
- 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 Multifunction Card options (maximum one per enclosure):
 - Dual 10 Gb Optical + Dual 1 Gb Ethernet (#1769)
 - Dual 10 Gb Copper + Dual 1 Gb Ethernet (#1768)
- One serial port per each Integrated Multifunction Card
- Two USB ports per each Integrated Multifunction Card plus another USB port on each enclosure (maximum nine usable per system)
- Two HMC ports per enclosure (maximum four per system)
- Eight I/O expansion slots per enclosure (maximum 32 per system):
 - Six Gen2 PCIe 8x slots plus two GX++ slots per enclosure
- Dynamic logical partition (LPAR) support and processor and memory CUoD
- PowerVM® (optional):
 - Micro-Partitioning®
 - Virtual I/O Server (VIOS)
 - Automated CPU and memory reconfiguration
 - Support for dedicated and shared processor 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 #5796)
- Disk-only I/O drawers:
 - Up to 56 EXP24S SFF SAS I/O drawers on external SAS controller (#5887)
 - Up to 110 EXP12S SAS DASD/SSD I/O drawers on SAS PCI controllers (#5886)
 - Up to eight EXP30 Ultra SSD I/O drawers with integrated, high-performance, SAS controllers (#EDR1)
- 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.

	MHB/MHC(5003) SMP cables	MHD/MHC(EP24) SMP cables	MHB/MHC/MHD FSP cables
Two-drawer	3711, 3712	3715, 3716	3671
Three-drawer	3712, 3713	3715, 3716, 3717	3671, 3672
Four-drawer	3712, 3713, 3714	3716, 3717, 3718	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 four 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 CoD activations will activate processor hardware only in the system serial number they are purchased for. If you move processor hardware to another system, the processor may not be functional in that system until arrangements are made to move the processor activations or purchase additional processor activations. Contact your IBM representative or IBM Business Partner for more information.

Memory

- All processor cards have 16 memory DIMM slots (eight per processor) and are populated with POWER7 or POWER7+ DDR3 memory DIMMs.
- Each processor card feature must have a minimum of two identical memory features (eight DIMMs per card) installed. This includes inactive processor card features present in the system.
- Each system must contain a minimum of 32 GB of active system memory. 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.
- The minimum activations ordered with all initial orders of memory features EM40, EM41, EM42, and EM44 must be 50% of their installed capacity.
- The minimum activations ordered with MES orders of memory features EM40, EM41, EM42, and EM44 will depend on the total installed capacity of features EM40, EM41, EM42, and EM44. This enables you to purchase newly ordered memory with less than 50% activations when the currently installed capacity exceeds 50% of the existing features EM40, EM41, EM42, and EM44 capacity.
- The minimum activations ordered with all initial orders of memory feature 5564 must be 192 GB or 256 GB per each feature 5564 ordered. That is 75% of the installed feature 5564 capacity.
- Memory activations are distributed equally across all memory features by the same activation features EMA2 (1 GB) or EMA3 (100 GB).
- Each system must contain a minimum of 32 GB of active system memory.

- Memory features EM40, EM41, EM42, EM44,5600, 5601, 5602, and 5564 can be mixed on the same POWER7+ processor card. However, they cannot be mixed in the first 8 DIMM slots of each processor card.
- All processor cards have 16 memory DIMM slots (eight per processor) and are populated with POWER7/7+ DDR3 memory DIMMs.
- Memory CoD 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 by either pairing the disk controllers (write cache replication or IOA-level mirroring) or by using an auxiliary write cache IOA. This is true for all partitions in the Power 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 list shows 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
5796	PCI-X DDR 12X I/O Drwr	Supported	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	Supported	SAS	110
5887	EXP24S SFF Gen2-bay Drawer	Available	SAS	56
EDR1	EXP30 Ultra SSD I/O Drawer	Available	SAS	8
7314-G30	PCI-X DDR 12X I/O Drawer	Supported	12X	32

The following I/O drawers are available on the Power 780:

- The PCI-X DDR 12X Expansion Drawer (#5796) is a 4 EIA unit tall drawer and mounts in a 19-inch rack. The drawer is 22.35 cm (8.8 in) wide and takes up half the width of the 4 EIA rack space. It requires the use of a feature 7314 drawer mounting enclosure. The 4 EIA tall enclosure can hold up to two feature 5796 drawers mounted side by side in the enclosure. The drawer is 80 cm (31.5 in) deep and can weigh up to 20 kg (44 lb). The PCI-X DDR 12X Expansion Drawer has six 64-bit, 3.3 V, PCI-X DDR slots running at 266 MHz that use blind swap cassettes and support hot plugging of adapter cards. The drawer includes redundant hot-plug power and cooling. You must select one of the two available interface adapters for use in the feature 5796 drawer: the Dual-Port 12X Channel Attach Adapter -- Long Run (#6457) or the Dual-Port 12X Channel Attach Adapter -- Short Run (#6446). The adapter selection is based on how close the host system or the next I/O drawer in the loop is physically located. Feature 5796 attaches to a host system CEC enclosure with a 12X adapter in a GX++ slot via SDR or DDR cables. A maximum of four feature 5796 drawers can be placed on the same 12X loop. Mixing features 5802 or 5877 and 5796 on the same loop is not supported. Mixing feature 5796 and 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.

- The PCIe 12X I/O drawer is a 19-inch I/O and storage drawer. It provides a 4 EIA unit tall drawer, containing 10 PCIe-based I/O adapter slots and 18 SAS hot-swap, small form-factor disk bays, which can be used for either disk drives or SSDs, organized into two groups of nine. Each group of disk slots is controlled by one or two PCIe SAS storage adapters located in a PCIe slot in the same feature 5802 as the SAS drives. A maximum of two feature 5802 drawers can be placed on the same 12X loop.

Mixing feature 5802 and feature 5796 or 7314-G30 on the same loop is not supported. Feature 5877 is the same as feature 5802, except it does not support any disk bays. Feature 5877 can be on the same loop as feature 5802. Feature 5877 cannot be upgraded to feature 5802. The physical dimensions of the drawer measure 444.5 mm (17.5 in) wide by 177.8 mm (7.0 in) high by 711.2 mm (28.0 in) 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.

- 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 0.511 meters (20.12 in) long and can weigh up to 18.14 kg (40 lb) 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 EXP12S are controlled by one or two PCIe SAS adapters connected to the EXP12S via SAS cables. The SAS cable will vary depending on the adapter and operating system being used, and the protection that you need.

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

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

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

The feature 5886 can also be directly attached to the SAS port on the rear of the Power 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 EXP12S. A second unit cannot be cascaded to a feature 5886 attached in this way.

- EXP30 Ultra SSD I/O Drawer (#EDR1) is a 1U high I/O drawer providing 30 hot-swap SSD bays and a pair of integrated large write cache, high-performance SAS controllers. Ultra-high levels of performance are provided without using any PCIe slots on the POWER7 server in an ultra-dense packaging design. The two high-performance, integrated SAS controllers each physically provides 3.1 GB write cache. Working as a pair, they offer mirrored write cache data and controller redundancy. The cache contents are designed to be protected by built-in flash

memory in case of power failure. If the pairing is broken, write cache is not used after existing cache content is written out to the drive and performance will probably be slowed until the controller pairing is re-established. Each controller is connected to a GX++ PCIe adapters in a server (for example, #1914) over a PCIe x8 cable (example: #EN05 or #EN07 or #EN08). Usually both controllers are attached to one server, but each controller can be assigned to a different server or partition or VIOS. Active/Active capability is supported assuming at least two RAID arrays. The controller enables RAID 0, RAID 5, RAID 6, and RAID 10 for AIX, Linux, and VIOS. AIX/Linux/VIOS also enable OS mirroring (LVM). The adapters' CCIN is 57C3. Also used are eMLC SSD designed to fit in the Ultra drawer bays such as the 387GB #ES02 SSD. A minimum of six SSD are required in each Ultra drawer. Each controller can access all 30 SSD bays. The bays can be configured as one set of bays run by a pair of controllers working together. Or the bays can be divided into two logical sets where each of the two controller "owns" one of the logical sets. With proper software if one of the controller fails, the other controller can run both sets of bays.

- The EXP24S SFF Gen2-bay Drawer (#5887) is an expansion drawer with twenty-four 2.5-inch form-factor SAS bays. Slot filler panels are included for empty bays when initially shipped. A feature 5887 supports up to 24 hot-swap SFF SAS hard disk drives (HDDs). It uses only 2 EIA of space in a 19-inch rack. The EXP24S includes redundant ac power supplies and two power cords. The EXP24S SFF bays use Gen2 or SFF-2 SAS bays that are not compatible with CEC SFF Gen1 SAS bays or with feature 5802 or 5803 SFF SAS bays.

With AIX, Linux, and VIOS, you can order the EXP24S with four sets of six bays, two sets of 12 bays, or one set of 24 bays (mode 4, 2, or 1). With IBM i, you can order the EXP24S as one set of 24 bays (mode 1).

The EXP24S SAS ports are attached to a SAS controller that can be a SAS PCI-X or PCIe adapter or pair of adapters. The EXP24S can also be attached to an imbedded SAS controller in a server with an imbedded SAS port or to the integrated SAS controllers in the EXP30 Ultra SSD I/O Drawer. Attachment between the SAS controller and the EXP24S SAS ports is via the appropriate SAS Y or X cables.

12X I/O drawer cables

- I/O drawers are connected to the adapters in the CEC enclosure with the following cables: data transfer cables (12X DDR cables for the feature 5802 and feature 5877 I/O drawers and 12X SDR or DDR cables for the feature 5796 and 7314-G30 I/O drawers) and power control cables.
- The first 12X I/O drawer attached in any I/O drawer loop requires two data transfer cables. Each additional drawer in the loop (up to the maximum allowed) requires one additional data transfer cable.
- The first 12X I/O drawer attached to a system unit requires two power control cables. Each additional I/O drawer added to a system requires one additional power control cable. Each system has one power control loop. All I/O drawers attached to a system are included in the same power control loop. Power control cable loops are different in this regard from data transfer cable loops.
- PCIe 12X cable choices: The PCIe 12x drawer attaches to the host CEC enclosure with a 12x adapter in a GX++ slot via 12X DDR cables available in different cable lengths: 1.5 (#1862), 3.0 (#1865), or 8 meters (#1864).
- PCI-X DDR 12X cable choices: Each feature 5796 drawer requires one Dual-Port PCI-X DDR 12X Channel Adapter, either Short Run (#6446) or Long Run (#6457). The choice of adapters depends 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 (#1829)(1)	1.5 M (#1830)	3.0 M (#1840)(2)	8.0 M (#1834)(3)
12X SDR				
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

Note: The PCI-X DDR 12X Cable (#1829, #1861, or #1862) is limited to connecting two drawers or a server to the 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 feature 7014 rack.

Note: The PCI-X DDR 12X Cable (#1840 or #1865) is limited to connecting the CEC to a drawer if in the same rack and further than 20 EIA. In some limited configurations you can 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).

Note: The PCI-X DDR 12X cable (#1834 or #1864) is limited to connecting a CEC to a 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-MHD and its I/O drawers are designed to mount in the 7014-T00, 7014-T42, feature 0551, and feature 0553 racks. These are built to the 19-inch EIA standard. When ordering a new 9179 system, you can order the appropriate 7014 rack model with the system hardware on the same initial order. IBM also makes the racks available as features of the 9179-MHD when you order additional I/O drawer hardware for an existing system (MES order). The rack features 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-MHD has the following rack requirements:

- The Power 780 can 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 7014-T42 rack and shipped from IBM to the client. An existing 7014-T00, 7014-T42, feature 0551, or feature 0553 rack can be used for the Power 780 if sufficient space and power are available.

- The 7014-S25 and feature 0555 rack can support only one Power 770 CEC enclosure.
- 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-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 7014-T42 rack that has no front door, you must order a Thin Profile Front Trim Kit 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 can be used for one drawer enclosure only.
- The design of the Power 780 is optimized for use in a 7014-T00 (feature 0551) or 7014-T42 (feature 0553) racks. Both the front cover and the processor flex cables occupy space on the front left and right sides of an IBM 7014 or feature 055x rack that may not be available in typical non-IBM racks.
- Acoustic door features are available with the 7014-T00 (feature 0551) and 7014-T42 (feature 0553) racks to meet the lower acoustic levels identified in the Physical specifications section. You can order the acoustic door feature on new 7014-T00 (feature 0551) or 7014-T42 (feature 0553) racks or for the 7014-T00 (feature 0551) or 7014-T42 (feature 0553) racks that you already own.
- A Power 780 door (#6250 or #ERG7) 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 feature 0551 is the same rack delivered when you order the 7014-T00 rack; the included features may be different. Some features that are delivered as part of the 7014-T00 must be ordered separately with the feature 0551. Order the feature 0551 only when required to support rack integration of MES orders prior to shipment from IBM .

2.0 Meter Rack (#0553)

The 2.0 Meter Rack (#0553) is a 42 EIA unit rack. The rack that is delivered as feature 0553 is the same rack delivered when you order the 7014-T42 rack; the included features may be different. Some features that are delivered as part of the 7014-T42 must be ordered separately with the feature 0553. Order feature 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

- Each CEC enclosure must contain one Integrated Multifunction Card (#1768 or #1769).
- The Integrated Multifunction Card's Ethernet ports cannot be used for an IBM i console. Separate Ethernet adapters that can be directly controlled by IBM i without VIOS should be used for IBM i LAN consoles, if you want. Alternatively, you can also use an HMC for an IBM i console.
- The first CEC enclosure must contain one Integrated Multifunction Card (#1768 or #1769). It is optional for the second, third, or fourth CEC enclosure.

- Each Integrated Multifunction Card has four Ethernet ports, two USB ports, and one serial port. Use of the serial port by AIX/Linux is supported for MODEM call home, TTY console, and snooping even if an HMC or SDMC is attached to the server, unlike the earlier Power 780 model MHB. Like the model MHB, use by the serial port to communicate with a UPS is not supported.
- The first and second CEC enclosures each have two HMC or SDMC ports on the Service Processor-2 (#EU09). If there are two CEC enclosures, the HMC must be connected to both service processor 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, 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 you are 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 MHD supports both 2.5- and 3.5-inch SAS SFF DASD hard disks. The 3.5-inch DASD hard disks can be attached to the model MHD but must be located in a feature 5886 EXP12S I/O drawer, whereas 2.5-inch DASD hard disks may be either mounted internally or in the EXP24S SFF Gen2-bay Drawer (#5887).
- When ordering feature 1819, you must also order feature 5662. This applies to MES orders of feature 1819 unless feature 5662 is already present in the same CEC drawer. Feature 1815 and 5662 cannot be installed in the same drawer. Feature 1819 must not be installed in a drawer unless feature 5662 is also installed.

I/O slots and adapters

- Each Power 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 ECOMPWR configurator may create orders that cannot be built, resulting in possible order rejection or delayed delivery.
- The maximum feature 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 feature 055x racks, the following power distribution unit (PDU) rules apply (not all PDUs are available in all models of the 7014 or feature 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 enable 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 at <http://pic.dhe.ibm.com/infocenter/powersys/v3r1m5/topic/p7hbm/p7hbm.pdf>
- 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 disks or SSDs. The six SFF bays can be configured in three different ways to match your business needs. Two built-in SAS controllers can be optionally augmented with a 175 MB cache RAID battery card. Two embedded SAS disk/SSD controllers are offered 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 feature 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.
- To have both SSDs and HDDs within a 3/3 split configuration, you must use the same type of drive within each set of three. You cannot mix SSDs and HDDs within a subset of three bays.
- To have both SSDs and HDDs within a 2/2/2 split configuration, you must use the same type of drive within each set of two. You cannot mix SSDs and HDDs within a subset of two bays. The feature 5901 PCIe SAS adapter that controls the remaining two bays in a 2/2/2 configuration does not support SSDs.

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. This enables additional performance capability as well as redundancy. If configured as a pair, the pair controls all six SFF bays and both recognize 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 feature 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 an SAS expansion port. The SAS expansion port can add more SAS bays to the six bays in the system unit. A feature 5886 SAS disk drawer is attached using an SAS port on the rear of the processor drawer and its 12 SAS bays are run by the pair of embedded controllers. The pair of embedded controllers is 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 an SAS YI cable and the embedded controllers are connected to the port using a feature 1819 cable assembly. In this 18-bay configuration, all drives must be HDDs.

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 feature 5662. With feature 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. Because the controller is independent from the two SAS disk/SSD controllers, it enables the DVD to be switched between multiple partitions without affecting the assignment of disks or SSDs in the CEC drawer.

Capacity on Demand

Several types of Capacity on Demand (CoD) processors are optionally available on the Power 780 server. They help meet changing resource requirements in an on demand environment by using resources installed on the system but not activated.

Capacity Upgrade On Demand (CUoD) enables 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 can be activated and turned off an unlimited number of times, whenever you want additional processing resources. With this offering system administrators have 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.

Use the following features to order enablement features and support billing charges on the Power 780:

Model	Processor feature	On/off CoD processor enablement feature	On/Off CoD AIX/Linux processor billing feature	On/Off CoD IBM i processor billing feature
MHD	EPH0	EP9T	EPHE	EPHF : 1 Proc-Day
MHD	EPH2	EP9T	EPHJ	EPHK : 1 Proc-Day
MHD	EPH0	EP9T	EPHN	EPHP : 100 Proc-Days
MHD	EPH2	EP9T	EPHS	EPHT : 100 Proc-Days

Model	Memory feature	On/off CoD memory enablement feature	On/Off CoD memory billing feature
MHD	5600, EM40	EM9T	7377, 4710
MHD	5601, EM41	EM9T	7377, 4710
MHD	5602, EM42	EM9T	7377, 4710
MHD	5564, EM44	EM9T	7377, 4710

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 a no-charge 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 90 processor days of temporary unused CoD processor capacity for all your processor cores which have not been permanently activated. For example, if you have 20 processor cores which are not permanently activated, the processor enablement code allows up to 1,800 processor days (20 x 90). If you have reached or are about to reach the limit of 90 processor days per unactivated processor core, place an order for another processor enablement code to reset the number of days

you can request. Similarly, a memory enablement code lets you request up to 90 days of temporary unused CoD memory capacity for all your GB of memory which have not been permanently activated. For example if you had 100 GB of memory which was not permanently activated, the memory enablement code allows up to 9,000 GB memory days (100 x 90). If you have reached the limit of 90 memory days per unactivated memory, place an order for another memory enablement code to reset the number of days you can request. Before ordering a new enablement code for either memory or processor temporary CoD, you must first process a MES delete order, deleting the current enablement code installed in the server configuration file.

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

<http://www.ibm.com/servers/eserver/series/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 email 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 website registration data (see prerequisite 2 above) with information about the client 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 client 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 gigabytes 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).

3. On/Off CoD billing: Description

The contract, signed by the client before receiving the enablement feature, 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 client 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 client of billing actions) to the ship-to address on the order as part of the fulfillment process. The client 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 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 enable the additional Utility CoD processors to be used. The system 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 website 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-MHD.

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
MHD	EPHU	100 Processor minutes for #EPH0
MHD	EPHV	100 Processor minutes for #EPH0, IBM i
MHD	EPHY	100 Processor minutes for #EPH2
MHD	EPHZ	100 Processor minutes for #EPH2, IBM i

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

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

Trial Capacity on Demand (Trial CoD)

You 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 Systems 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. The goal is to continually enhance these offers to give you a comprehensive selection of services. To see what IBM can do for you, visit

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

Power Systems Deployment-ready Services

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

- Integration
 - Component integration
 - Rack integration
 - Operating system preinstallation
 - Unit personalization
 - Third-party hardware and software installation
 - Client-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/>

Model upgrades

You can upgrade the 9117-MMA, 9179-MHB, or 9179-MHC with 9179-MHD processors. For upgrades from 9117-MMA, 9179-MHB, or 9179-MHC 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 9117-MMA, 9179-MHB, or 9179-MHC 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. You 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:

- 9117-MMA, 9179-MHB, or 9179-MHC processors to 9179-MHD processors

- DDR2 memory DIMMs to DDR3 memory DIMMs
- New trim kits upgrading from 9117-MMA or 9179-MHB to 9179-MHD (existing trim kits are only functional for one-drawer configurations or for racks holding only I/O and no Power 780 processor enclosures)
- PowerVM (Standard to Enterprise)
- Drawer/Bezel
- PCIe Crypto Gen3
- PCIx 1.5 GB RAID

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

- DDR3 memory DIMMs (#5600, #5601, #5602, #5564)
- Active Memory Expansion Enablement (#4791)
- FSP/Clock Pass Through Card (#5665)
- 175 MB Cache RAID - Dual IOA Enablement Card (#5662)
- Operator Panel (#1853)
- Disk/Media Backplane (#5652)
- 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)
- SATA DVD-RAM (#5762)

The Power 780 can support the following drawers:

- Feature 5802 and 5877 PCIe 12X I/O drawers
- Feature 5797 and 7413-G30 PCI-X, 12X I/O Drawer
- Feature 5886 EXP12S SAS Disk Drawer
- Feature EDR1 EXP30 Ultra SSD I/O Drawer

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

For a 9179-MHD system that has the On/Off CoD function enabled, you must reorder the On/Off enablement features (#EM9T and #EP9T) 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 MHD.

Features 8018 and 8030 are available to support migration of the PowerVM features 7942 or 7995 during the initial order and build of the MHD upgrade MES order. You can add 8018 or 8030 to your upgrade orders in a quantity not to exceed the quantity of feature 7942 or 7995 obtained for the system being upgraded. The feature 7942 or 7995 should be migrated to the new configuration report in a quantity that equals feature 8018 or 8030. Additional 7942 or 7995 features can be ordered during the upgrade.

Features 8527 and 8528 are available to support migration of DDR3 memory activations 1812 or 1813 during the initial order and build of the MHD upgrade MES order. You can add features 8527 and 8528 to your upgrade orders in a quantity not to exceed the quantity of feature 1812 or 1813 obtained for the system being upgraded. The 1812 or 1813 features should be migrated to the new configuration

report in a quantity that equals feature 1812 and 1813. Additional 1812 or 1813 features can be ordered during the upgrade.

PowerVM

PowerVM is available on the 9179-MHD:

- PowerVM Editions are available as a hardware feature (#7942 for Standard Edition, #7995 for Enterprise Edition). Select the feature that provides the level of virtualization appropriate for your workloads.
- 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 image.
- System Planning Tool simplifies the process of planning and deploying Power Systems LPARs and virtual I/O.
- Virtual I/O Server is a single-function appliance that resides in an IBM POWER5, POWER6®, POWER7, or POWER7+ processor-based partition. It facilitates the sharing of physical I/O resources between client partitions (AIX 7.1, AIX 6.1 with the 6100-07 Technology Level and Service Pack 6, or later, IBM i 6.1 with machine code 6.1.1, or later, or Linux) within the server. VIOS provides shared Ethernet adapter (SEA) virtual I/O to client LPARs.
- Virtual SCSI (VSCSI) enables the sharing of physical storage adapters (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.
- With Live Partition Mobility, available only with PowerVM Enterprise Edition, you can move a running AIX or Linux LPAR from one physical server to another with no downtime if both servers are using POWER6, POWER7, or POWER7+ processors. Also, IBM i and Linux partitions in Power 770 and Power 780 systems are enabled to migrate to another Power 770 or Power 780 system without disrupting services. Use this capability to:
 - Evacuate workloads from a system before performing scheduled maintenance
 - Move workloads across a pool of different physical resources as business needs shift
 - Move workloads away from underutilized machines so that they can be powered off to save on energy and cooling costs
- With Active Memory Sharing, memory is dynamically moved between running partitions for optimal resource usage.

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-MHD. 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
- 9119-FHB
- 9406-595
- 9117-MMA
- 9406-MMA
- 9406-570
- 9117-MMB
- 9117-MMC
- 9117-MMD
- 9179-MHB
- 9179-MHC
- 9179-MHD

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 8-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.

You 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 Systems model can run the planning tool. In addition, a one-time, 60-day trial of Active Memory Expansion is available to provide more exact memory expansion and CPU measurements. You can request the trial from the Capacity on Demand web page at

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

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

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

IBM i operating system

For clients loading the IBM i operating system, the four-digit numeric QPRCFEAT value used on the 9179-MHD 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 EPH0, the QPRCFEAT value for the system would be EPH0.

- 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.

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 can scrub 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. Client 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 client 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 notifies 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 can extract the failing instruction from the faulty core and retry it elsewhere in the system for a number of faults. Afterwards, 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 cannot be handled by the availability enhancements described in the preceding section. This significantly reduces the probability of any one processor affecting total system availability.

Dynamic fabric bus repair

For fabric busses connecting CEC drawers, this feature allows a faulty line on the fabric bus to be replaced by a spare dynamically, without the need to take down the system.

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. In addition, the POWER7+ processors also have the ability to dynamically substitute a faulty bit-line in an L3 cache dedicated to a processor with a spare bit-line.

Active Memory Mirroring

Active Memory Mirroring (AMM) for Hypervisor is standard on the MHD. AMM for Hypervisor mirrors the main memory used by the Hypervisor firmware. With AMM, an uncorrectable error in one copy of the mirrored memory will be corrected by use of the mirrored pair. AMM efficiently guards against system-wide outages due to any such uncorrectable error associated with firmware. With AMM, uncorrectable errors in data owned by a partition or application will be handled by the existing Special Uncorrectable Error handling methods in the hardware, firmware, and operating system.

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 examines the affected bus, allows the device driver to reset it, and continues 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 client 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, reside 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.
- In concurrent mode the normal system functions continues while selected resources are being checked.
- Maintenance mode enables checking of devices and adapters.

Note: Because the 9179-MHD 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

Using the Service Interface, support personnel can 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 enables 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 service 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 runtime error capture capability systematically analyzes the hardware error signature to determine the cause of failure. The analysis result will be stored in system NVRAM. When the system can be successfully restarted either manually or automatically, the error will be reported to the operating system. Error log analysis (ELA) can be used to display the failure cause and the physical location of the failing hardware.

With the integrated service processor, the system can 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 turns on solid. The amber system fault LED is 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. After the information is logged in the SFP application, 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. Client contact information and specific system-related data such as the machine type, model, and serial number, along with error log data related to the failure, are sent to IBM Service.

Service processor

The service processor diagnoses, checks the status of, and senses 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 processor 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, 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.

Memory upgrade, Hot-node add and repair, GX adapter (I/O hub) add and repair

With the proper configuration and required protective measures, the Power 780 server is designed for node add, memory upgrade, GX adapter add and repair, 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 or adding additional GX adapter to an existing node. The additional Power 780 enclosure or memory or GX adapter 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 or GX adapter can then be assigned to existing operating system partitions or new partitions as required. Hot-node add, GX adapter add, and memory upgrade make it possible to upgrade a server by integrating a second, third, or fourth CEC enclosure or add additional memory or additional GX adapters into the server with reduced impact to the system operation.

In the unlikely event that CEC hardware (for example, processor or memory) experiences 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). GX adapter can be repaired by freeing up its attached I/O resources but without node evacuation.

To guard against any potential impact to system operation during hot-node add, memory upgrade, GX adapter repair, or node repair, you must comply with the following protective measures:

- 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.
- For GX adapter repair, attached I/O must be freed up or configured with redundant paths.
- Schedule upgrades or repairs during nonpeak operational hours.
- Move business applications to another server using the Live Partition Mobility feature or quiesce them.
- Back up critical application and system state information.
- Set up checkpoint databases.

Live Partition Mobility

With Live Partition Mobility you can migrate an AIX or Linux partition running on one POWER7 or POWER7+ system to another POWER6 , POWER7 , or POWER7+ system without disrupting services. Also, IBM i and Linux partitions on Power 770 and Power 780 systems are enabled to migrate to another Power 770 or Power 780 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.

Accessibility by people with disabilities

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

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

Section 508 of the US Rehabilitation Act

IBM Power 780 is capable as of October 19, 2012, when used in accordance with associated IBM documentation, of satisfying the applicable requirements of Section

508 of the Rehabilitation Act, provided that any assistive technology used with the product properly interoperates with it. A US Section 508 Voluntary Product Accessibility Template (VPAT) can be requested via the IBM website

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

Statement of general direction

AIX 5.3 support for Power 770 (9117-MHD) and Power 780 (9179-MHD)

IBM intends to provide to those clients with AIX 5.3 Technology Level 12 (and the associated service extension offering) the ability to run that environment on the new Power 770 (9117-MMD) and Power 780 (9179-MHD).

Standard Disclaimer

IBM's statements regarding its plans, directions, and intent are subject to change or withdrawal without notice at IBM's sole discretion. Information regarding potential future products is intended to outline our general product direction and it should not be relied on in making a purchasing decision. The information mentioned regarding potential future products is not a commitment, promise, or legal obligation to deliver any material, code or functionality. Information about potential future products may not be incorporated into any contract. The development, release, and timing of any future features or functionality described for our products remains at our sole discretion.

Reference information

Refer to Hardware Announcement [112-174](#), dated October 03, 2012

Product number

The following are newly announced features on the specific models:

Description	MT	Model	Feature
IBM Power 780	9179	MHD	
Manufacturing Routing Code for CSC	9179	MHD	0712
Specify EXP30 Load Source placement	9179	MHD	0729
#1737 Load Source Specify (856GB SFF-1 disk)	9179	MHD	0879
#1738 Load Source Specify (856GB SFF-2 disk)	9179	MHD	0880
CAT5E Ethernet Cable, 25M YELLOW	9179	MHD	1121
856GB 10k RPM SAS SFF Disk Drive (IBM i)	9179	MHD	1737
856GB 10k RPM SAS SFF-2 Disk Drive (IBM i)	9179	MHD	1738
900GB 10K RPM SAS SFF Disk Drive (AIX/Linux)	9179	MHD	1751
900GB 10k RPM SAS SFF-2 Disk Drive (AIX/Linux)	9179	MHD	1752
GX++ 2-port PCIe2 x8 Adapter	9179	MHD	1914
SAS EX Cable 3m - Drawer to Drawer	9179	MHD	3675
SAS EX Cable 6m - Drawer to Drawer	9179	MHD	3680
SATA Slimline DVD-RAM Drive	9179	MHD	5771
Shared EXP30 Indicator	9179	MHD	5925
SAS EX Cable 1.5m - Drawer to Drawer	9179	MHD	5926
Remote EXP30 Indicator	9179	MHD	5927
Specify Mode-1 & EXP30 for 1 EXP24S #5887	9179	MHD	9388
Dynamic Platform Optimizer	9179	MHD	EB33
System CEC Enclosure with IBM BEZEL, I/O Backplane, and System Midplane	9179	MHD	EB95
System CEC Enclosure with OEM BEZEL, I/O Backplane, and System Midplane	9179	MHD	EB96
PCIe2 2-Port 10GbE RoCE SR Adapter	9179	MHD	EC30
Operator Panel	9179	MHD	EC53
EXP30 Ultra SSD I/O Drawer	9179	MHD	EDR1
Carry-over Indicator for 0/32 GB DDR3 #5600 (MDL)			

Upgrade Only)	9179	MHD	EH04
Carry-over Indicator for 0/64 GB DDR3 #5601 (MDL Upgrade Only)	9179	MHD	EH05
Carry-over Indicator for 0/128 GB DDR3 #5602 (MDL Upgrade Only)	9179	MHD	EH06
Carry-over Indicator for 0/256 GB DDR3 #5564 (MDL Upgrade Only)	9179	MHD	EH07
Carry-over Indicator for SMP Processor Cable #3715 (MDL Upgrade Only)	9179	MHD	EH08
Carry-over Indicator for SMP Processor Cable #3716 (MDL Upgrade Only)	9179	MHD	EH09
Carry-over Indicator for SMP Processor Cable #3717 (MDL Upgrade Only)	9179	MHD	EH0A
Carry-over Indicator for SMP Processor Cable #3718 (MDL Upgrade Only)	9179	MHD	EH0B
0/32GB DDR3 Memory (4X8GB) DIMMS - 1066 MHZ - POWER7+ CoD Memory	9179	MHD	EM40
0/64GB DDR3 Memory (4X8GB) DIMMS - 1066 MHZ - POWER7+ CoD Memory	9179	MHD	EM41
0/128GB DDR3 Memory (4X8GB) DIMMS - 1066 MHZ - POWER7+ CoD Memory	9179	MHD	EM42
0/256GB DDR3 Memory (4X64GB) DIMMS - 1066 MHZ - POWER7+ CoD Memory	9179	MHD	EM44
90 Days On/Off CoD Temporary Memory Enablement	9179	MHD	EM9T
Activation of 1 GB DDR3 POWER7+ Memory	9179	MHD	EMA2
Activation of 100 GB DDR3 POWER7+ Memory	9179	MHD	EMA3
\$0 768 GB-Days of On/Off CoD Temporary Memory Resources	9179	MHD	EMJ0
\$0 384 GB-Days of On/Off CoD Temporary Memory Resources	9179	MHD	EMJ2
PCIe x8 Cable 1.5m	9179	MHD	EN05
PCIe x8 Cable 3m	9179	MHD	EN07
PCIe x8 Cable 8m	9179	MHD	EN08
90 Days On/Off CoD Temporary Processor Core Enablement	9179	MHD	EP9T
4.42 GHz Proc Card, 0/16 Core POWER7+, 16 DDR3 Memory Slots	9179	MHD	EPH0
3.72 GHz Proc Card, 0/32 Core POWER7+, 16 DDR3 Memory Slots	9179	MHD	EPH2
1-Core Activation for Processor Feature EPH0	9179	MHD	EPHA
1-Core Activation for Processor Feature EPH2	9179	MHD	EPHC
1 Proc-Day On/Off Billing for #EPH0, AIX/Linux	9179	MHD	EPHE
1 Proc-Day On/Off Billing for #EPH0, IBM I	9179	MHD	EPHF
1 Proc-Day On/Off Billing for #EPH2, AIX/Linux	9179	MHD	EPHJ
1 Proc-Day On/Off Billing for #EPH2, IBM I	9179	MHD	EPHK
100 On/Off Proc-Days of CoD Billing for Processor #EPH0. AIX/Linux	9179	MHD	EPHN
100 On/Off Proc-Days of CoD Billing for Processor #EPH2. IBM i	9179	MHD	EPHP
100 On/Off Proc-Days of CoD Billing for Processor #EPH2. AIX/Linux	9179	MHD	EPHS
100 On/Off Proc-Days of CoD Billing for Processor #EPH2. IBM i	9179	MHD	EPHT
Proc CoD Utility Billing, 100 Proc-mins. for #EPH0, AIX/Linux	9179	MHD	EPHU
Proc CoD Utility Billing, 100 Proc-mins. for #EPH0, IBM i	9179	MHD	EPHV
Proc CoD Utility Billing, 100 Proc-mins. for #EPH2, AIX/Linux	9179	MHD	EPHY
Proc CoD Utility Billing, 100 Proc-mins. for #EPH2, IBM i	9179	MHD	EPHZ
\$0 48 Proc-Days of On/Off CoD Temporary Processor Resources	9179	MHD	EPJ0
\$0 24 Proc-Days of On/Off CoD Temporary Processor Resources	9179	MHD	EPJ2
Quantity 150 of #1737 (856GB SFF-1 disk)	9179	MHD	EQ37
Quantity 150 of #1738 (856GB SFF-2 disk)	9179	MHD	EQ38
Quantity 150 of #1751 (900GB SFF-1 disk)	9179	MHD	EQ51
Quantity 150 of #1752 (900GB SFF-2 disk)	9179	MHD	EQ52
Optional Front Door for Power 770 & 780 2.0m Rack	9179	MHD	ERG7
387GB 1.8" SAS SSD for AIX/Linux with eMLC	9179	MHD	ES02
RDX USB External Docking Station for Removable Disk Cartridge	9179	MHD	EU04
Service Processor-3	9179	MHD	EU09

10G Base T Wrap 9179 MHD EU20

The following are features already announced for the IBM Power Systems 9179 machine type:

Description	MT	Model	Feature
One CSC Billing Unit	9179	MHD	0010
Ten CSC Billing Units	9179	MHD	0011
Specify Code for External High Speed Modem	9179	MHD	0032
Mirrored System Disk Level, Specify Code	9179	MHD	0040
Device Parity Protection-All, Specify Code	9179	MHD	0041
Mirrored System IOP Level Specify Code	9179	MHD	0042
Mirrored System Bus Level, Specify Code	9179	MHD	0043
Device Parity RAID-6 All, Specify Code	9179	MHD	0047
RISC-to-RISC Data Migration	9179	MHD	0205
1Gbps Ethernet Specify	9179	MHD	0226
AIX Partition Specify	9179	MHD	0265
Linux Partition Specify	9179	MHD	0266
IBM i Operating System Partition Specify	9179	MHD	0267
CSC Specify	9179	MHD	0275
Ext Tape Attached via #5736	9179	MHD	0290
Specify Custom Data Protection	9179	MHD	0296
Specify EXP24 Attach via Existing Controller	9179	MHD	0302
Mirrored Level System Specify Code	9179	MHD	0308
IPCS Extension Cables for NT	9179	MHD	0325
RAID Hot Spare Specify	9179	MHD	0347
V.24/EIA232 6.1m (20-Ft) PCI Cable	9179	MHD	0348
V.24/EIA232 15.2m (50-Ft) PCI Cable	9179	MHD	0349
V.35 6.1m (20-Ft) PCI Cable	9179	MHD	0353
V.35 15.2m (50-Ft) PCI Cable	9179	MHD	0354
V.36 6.1m (20-Ft) PCI Cable	9179	MHD	0356
X.21 6.1m (20-Ft) PCI Cable	9179	MHD	0359
X.21 15.2m (50-Ft) PCI Cable	9179	MHD	0360
V.24/EIA232 (80-Ft) PCI Cable	9179	MHD	0365
V.24/EIA232 6.1M (20-Ft) PCI Cable	9179	MHD	0367
UPS Factory Integration Specify	9179	MHD	0373
HMC Factory Integration Specify	9179	MHD	0374
Display Factory Integration Specify	9179	MHD	0375
Reserve Rack Space for UPS	9179	MHD	0376
Reserve Rack Space for HMC	9179	MHD	0377
Reserve Rack Space for Display	9179	MHD	0378
MTM Upgrade Indicator	9179	MHD	0395
MMA/MMB/MHB upgrade indicator	9179	MHD	0397
512MB DDR Server Memory	9179	MHD	0446
1GB DDR Server Memory	9179	MHD	0447
Customer Specified Placement	9179	MHD	0453
SSD Placement Indicator - CEC	9179	MHD	0462
SSD Placement Indicator (5802/5803)	9179	MHD	0463
SSD Placement Indicator - 5886	9179	MHD	0464
SSD Placement Indicator - 5887	9179	MHD	0465
IBM i 5.4 w/ V5R4M5 Specify Code	9179	MHD	0533
IBM i 6.1 Specify Code	9179	MHD	0534
19 inch, 1.8 meter high rack	9179	MHD	0551
19 inch, 2.0 meter high rack	9179	MHD	0553
19 inch, 1.3 meter high rack	9179	MHD	0555
IBM i 6.1 with 6.1.1 Machine Code Specify Code	9179	MHD	0566
IBM i 7.1 Specify Code	9179	MHD	0567
PCI-X Expansion Unit in Rack	9179	MHD	0588
PCI/SCSI Disk Expansion Drawer	9179	MHD	0595

Rack Filler Panel Kit	9179	MHD	0599
#5094 Equivalent	9179	MHD	0694
#5096 Equivalent	9179	MHD	0696
Balanced Warehouse Solution Indicator	9179	MHD	0710
Load Source Not in CEC	9179	MHD	0719
Load Source in #0595	9179	MHD	0720
Load Source in #5094/5294	9179	MHD	0721
#1787 Load Source Specify	9179	MHD	0722
#1996 Load Source Specify	9179	MHD	0724
Specify Load Source in #5786	9179	MHD	0725
Specify Load Source in #5802/#5803/#5877	9179	MHD	0726
Specify #5886 Load Source placement	9179	MHD	0727
Specify #5887 Load Source placement	9179	MHD	0728
#4319 Load Source Specify	9179	MHD	0830
#4326 Load Source Specify	9179	MHD	0834
#4327 Load Source Specify	9179	MHD	0835
#4328 Load Source Specify	9179	MHD	0836
SAN Load Source Specify	9179	MHD	0837
#3676 Load Source Specify	9179	MHD	0838
#3677 Load Source Specify	9179	MHD	0839
#3678 Load Source Specify	9179	MHD	0840
#4329 Load Source Specify	9179	MHD	0841
#3658 Load Source Specify	9179	MHD	0844
#1884 Load Source Specify	9179	MHD	0851
#1888 Load Source Specify	9179	MHD	0853
#1909 Load Source Specify	9179	MHD	0854
#3587 Load Source Specify	9179	MHD	0855
#1911 Load Source Specify	9179	MHD	0856
#1916 Load Source Specify	9179	MHD	0857
#1879 Load Source Specify	9179	MHD	0870
#1947 Load Source Specify	9179	MHD	0871
#1948 Load Source Specify	9179	MHD	0872
#1956 Load Source Specify	9179	MHD	0874
#1962 Load Source Specify	9179	MHD	0875
#1794 Load Source Specify	9179	MHD	0876
#ES0B Load Source Specify	9179	MHD	0893
#ES0D Load Source Specify	9179	MHD	0894
US TAA Compliance Indicator	9179	MHD	0983
Modem Cable - US/Canada and General Use	9179	MHD	1025
USB External Docking Station for Removable Disk Drive	9179	MHD	1104
USB 160 GB Removable Disk Drive	9179	MHD	1106
USB 500 GB Removable Disk Drive	9179	MHD	1107
3m, Blue Cat5e Cable	9179	MHD	1111
10m, Blue Cat5e Cable	9179	MHD	1112
25m, Blue Cat5e Cable	9179	MHD	1113
Decline Electronic Service Agent™ Install Indicator	9179	MHD	1120
Custom Service Specify, Rochester Minn, USA	9179	MHD	1140
System Unique Identifier	9179	MHD	1311
200V 16A 4.3m (14-Ft) TL Line Cord	9179	MHD	1406
4.3m 200V/16A Pwr Cd Italy	9179	MHD	1408
125V 4.3m (14-Ft) Line Cord	9179	MHD	1413
200V 1.8m (6-Ft) Locking Line Cord	9179	MHD	1414
200V 1.8m (6-Ft) Watertight Line Cord	9179	MHD	1415
200V 4.3m (14-Ft) Locking Line Cord	9179	MHD	1416
200V 4.3m (14-Ft) Watertight Line Cord	9179	MHD	1417
4.3m 200V/16A Power Cord EU/Asia	9179	MHD	1420

4.3m 200V/16A Power Cord CH/DK	9179	MHD	1421
200V 1.8m (6-Ft) Locking Line Cord	9179	MHD	1424
200V 1.8m (6-Ft) Watertight Line Cord	9179	MHD	1425
200V 4.3m (14-Ft) Locking Line Cord	9179	MHD	1426
200V 4.3m (14-Ft) Watertight Line Cord	9179	MHD	1427
4.3m 200V/10A Power Cord EU/Asia	9179	MHD	1439
4.3m 200V/10A Power Cord Denmark	9179	MHD	1440
4.3m 200V/10A Power Cord S. Africa	9179	MHD	1441
4.3m 200V/10A Power Cord Swiss	9179	MHD	1442
4.3m 200V/10A Power Cord UK	9179	MHD	1443
4.3m 200V/10A Power Cord Israel	9179	MHD	1445
4.3m 200V/32A Power Cord EU 1-PH	9179	MHD	1449
4.3m 200V/16A Power Cord EU 2-PH	9179	MHD	1450
200V (6-Ft) 1.8m Line Cord	9179	MHD	1451
Power Cord (4.3 M), To Wall (250V/15A)	9179	MHD	1452
200V (6-Ft) 1.8m Locking Line Cord	9179	MHD	1453
200V 12A (14-Ft) 4.3m TL Line Cord	9179	MHD	1454
200V (6-Ft) 1.8m Watertight Line Cord	9179	MHD	1455
200V (14-Ft) 4.3m Watertight Line Cord	9179	MHD	1456
200V (6-Ft) 1.8m Upper Line Cord	9179	MHD	1457
200V (6-Ft) 1.8m Upper Locking Cord	9179	MHD	1458
200V (6-Ft) 1.8m Upper watertight cord	9179	MHD	1459
3m Copper RIO Cable	9179	MHD	1460
6m Copper RIO Cable	9179	MHD	1461
15m RIO Cable	9179	MHD	1462
30m SPCN Cable	9179	MHD	1466
6m RIO to RIO-2 Cable	9179	MHD	1474
10m RIO to RIO-2 Cable	9179	MHD	1475
4.3m 200V/16A Pwr Cd	9179	MHD	1477
Remote I/O Cable, 15M	9179	MHD	1485
3m RIO to RIO-2 Cable	9179	MHD	1487
IPCS Keyboard/Mouse for NT	9179	MHD	1700
Integrated Multifunction card with Copper SFP+	9179	MHD	1768
Integrated Multifunction card with SR Optical	9179	MHD	1769
177GB SFF-1 SSD w/ eMLC (AIX/Linux)	9179	MHD	1775
177GB SFF-1 SSD w/ eMLC (IBM i)	9179	MHD	1787
600GB 10K RPM SAS SFF Disk Drive (AIX/Linux)	9179	MHD	1790
177GB SFF-2 SSD w/ eMLC (AIX/Linux)	9179	MHD	1793
177GB SFF-2 SSD w/ eMLC (IBM i)	9179	MHD	1794
GX Dual Port- RIO-2 Attach	9179	MHD	1800
GX Dual Port- 12X Channel Attach	9179	MHD	1802
Integrated, 4 Port- 1Gb Virtual Ethernet, I/O ports	9179	MHD	1803
Integrated, 4 Port (2x1Gb and 2x10Gb SFP+ Optical-SR ports)	9179	MHD	1804
GX++ 12X DDR Adapter, Dual-port	9179	MHD	1808
Integrated, 4 Port (2x1Gb and 2x10Gb SFP+ Copper twinax ports)	9179	MHD	1813
SAS Cable for triple split DASD backplane	9179	MHD	1815
Quantity 150 of #1962	9179	MHD	1817
Quantity 150 of #1964	9179	MHD	1818
SAS Cable Assembly for SAS Port	9179	MHD	1819
System port/UPS Conversion Cable	9179	MHD	1827
1.5 Meter 12X to 4X Channel Conversion Cable	9179	MHD	1828
0.6 Meter 12X Cable	9179	MHD	1829
1.5 Meter 12X cable	9179	MHD	1830
8.0 Meter 12X Cable	9179	MHD	1834
3.0 Meter 12X Cable	9179	MHD	1840
3 Meter 12X to 4X Channel Conversion Cable	9179	MHD	1841
10 Meter 12X to 4X Channel Conversion Cable	9179	MHD	1842
Quantity 150 of #1956	9179	MHD	1844
Operator Panel	9179	MHD	1845

Operator Panel	9179	MHD	1846
Operator Panel	9179	MHD	1853
10 Meter 12X to 4X Enhanced Channel Conversion Cable	9179	MHD	1854
0.6 Meter 12X DDR Cable	9179	MHD	1861
1.5 Meter 12X DDR Cable	9179	MHD	1862
8.0 Meter 12X DDR Cable	9179	MHD	1864
3.0 Meter 12X DDR Cable	9179	MHD	1865
Quantity 150 of #1917	9179	MHD	1866
Quantity 150 of #1947	9179	MHD	1868
Quantity 150 of #1925	9179	MHD	1869
283GB 15K RPM SAS SFF Disk Drive (IBM i)	9179	MHD	1879
300GB 15K RPM SAS SFF Disk Drive (AIX/Linux)	9179	MHD	1880
146.8GB 10K RPM SAS SFF Disk Drive	9179	MHD	1882
73.4 GB 15K RPM SAS SFF Disk Drive	9179	MHD	1883
69.7 GB 15K RPM SAS SFF Disk Drive	9179	MHD	1884
300GB 10K RPM SFF SAS Disk Drive	9179	MHD	1885
146GB 15K RPM SFF SAS Disk Drive (AIX/Linux)	9179	MHD	1886
Quantity 150 of #1793	9179	MHD	1887
139GB 15K RPM SFF SAS Disk Drive (IBM i)	9179	MHD	1888
69GB SFF SAS Solid State Drive	9179	MHD	1890
Quantity 150 of #1883	9179	MHD	1891
Quantity 150 of #1882	9179	MHD	1899
69GB SFF SAS Solid State Drive	9179	MHD	1909
283GB 10K RPM SFF SAS Disk Drive (IBM i)	9179	MHD	1911
PCI-X DDR Dual Channel Ultra320 SCSI Adapter	9179	MHD	1912
571GB 10k RPM SAS SFF Disk Drive (IBM i)	9179	MHD	1916
146GB 15k RPM SAS SFF-2 Disk Drive (AIX/Linux)	9179	MHD	1917
300GB 10k RPM SAS SFF-2 Disk Drive (AIX/Linux)	9179	MHD	1925
Quantity 150 of #1879	9179	MHD	1926
Quantity 150 of #1948	9179	MHD	1927
Quantity 150 of #1880	9179	MHD	1928
Quantity 150 of #1953	9179	MHD	1929
139GB 15k RPM SAS SFF-2 Disk Drive (IBM i)	9179	MHD	1947
283GB 15k RPM SAS SFF-2 Disk Drive (IBM i)	9179	MHD	1948
300GB 15k RPM SAS SFF-2 Disk Drive (AIX/Linux)	9179	MHD	1953
283GB 10k RPM SAS SFF-2 Disk Drive (IBM i)	9179	MHD	1956
Quantity 150 of #1794	9179	MHD	1958
571GB 10k RPM SAS SFF-2 Disk Drive (IBM i)	9179	MHD	1962
600GB 10k RPM SAS SFF-2 Disk Drive (AIX/Linux)	9179	MHD	1964
177GB SSD Module with eMLC (AIX/Linux)	9179	MHD	1995
177GB SSD Module with eMLC (IBM i)	9179	MHD	1996
PCIe RAID & SSD SAS Adapter 3Gb w/ Blind Swap Cassette	9179	MHD	2055
PCI SCSI Adapter 16-Bit Differential External Y Cable	9179	MHD	2114
Converter Cable, VHDCI to P, Mini-68 pin to 68 pin, 0.3M	9179	MHD	2118
Ultra 320 SCSI Cable 1 Meter	9179	MHD	2124
Ultra 320 SCSI Cable 3 Meter	9179	MHD	2125
Ultra 320 SCSI Cable 5 Meter	9179	MHD	2126
Ultra 320 SCSI Cable 10 Meter	9179	MHD	2127
Ultra 320 SCSI Cable 20 Meter	9179	MHD	2128
0.55 Meter Ultra 320 SCSI Cable	9179	MHD	2138
Primary OS - IBM i	9179	MHD	2145
Primary OS - AIX	9179	MHD	2146
Primary OS - Linux	9179	MHD	2147
0.6M 16-bit SCSI-2 System-to-System Cable	9179	MHD	2424
2.5M 16-bit SCSI-2 System-to-System Cable	9179	MHD	2425
2M LC-SC 50 Micron Fiber Converter Cable	9179	MHD	2456
2M LC-SC 62.5 Micron Fiber Converter Cable	9179	MHD	2459
External USB 1.44 MB Diskette Drive	9179	MHD	2591
4 port USB PCIe Adapter	9179	MHD	2728
2-Port USB PCI Adapter	9179	MHD	2738
PCI Ultra Mag Media Controller	9179	MHD	2749
PCI-X Ultra RAID Disk Controller	9179	MHD	2757
PCI-X Ultra4 RAID Disk Controller	9179	MHD	2780
PCI-X Fibre Chan Disk Controller	9179	MHD	2787
PCI IOP	9179	MHD	2844
PCI IOP for SAN Load Source	9179	MHD	2847
POWER GXT135P Graphics Accelerator with Digital Support	9179	MHD	2849
ARTIC960Hx 4-Port EIA-232 Cable	9179	MHD	2861
ARTIC960Hx 4-Port X.21 Cable	9179	MHD	2863

ARTIC960Hx 4-Port V.35 (DTE) Cable	9179	MHD	2864
PCIe 2-Line WAN w/Modem	9179	MHD	2893
3M Asynchronous Terminal/Printer Cable EIA-232	9179	MHD	2934
Asynchronous Cable EIA-232/V.24 3M	9179	MHD	2936
8-Port Asynchronous Adapter EIA-232/RS-422, PCI bus	9179	MHD	2943
IBM ARTIC960Hx 4-Port Multiprotocol PCI Adapter	9179	MHD	2947
Cable, v.24 / EIA-232	9179	MHD	2951
Cable, v.35	9179	MHD	2952
Cable, v.36 / EIA-499	9179	MHD	2953
Cable, X.21	9179	MHD	2954
2-Port Multiprotocol PCI Adapter	9179	MHD	2962
Serial-to-Serial Port Cable for Drawer/Drawer-3.7M	9179	MHD	3124
Serial-to-Serial Port Cable for Rack/Rack- 8M	9179	MHD	3125
RIO-2(Remote I/O-2)Cbl, 1.2M	9179	MHD	3146
RIO-2(Remote I/O-2)Cbl, 3.5M	9179	MHD	3147
RIO-2 (Remote I/O-2) Cable, 10M	9179	MHD	3148
RIO-2 (Remote I/O-2) Cable, 1.75M	9179	MHD	3156
RIO-2 (Remote I/O-2) Cbl, 2.5M	9179	MHD	3168
36.4 GB 10,000 RPM Ultra320 SCSI Disk Drive Assembly	9179	MHD	3273
73.4 GB 10,000 RPM Ultra320 SCSI Disk Drive Assembly	9179	MHD	3274
146.8 GB 10,000 RPM Ultra320 SCSI Disk Drive Assembly	9179	MHD	3275
36.4 GB 15,000 RPM Ultra320 SCSI Disk Drive Assembly	9179	MHD	3277
73.4 GB 15,000 RPM Ultra320 SCSI Disk Drive Assembly	9179	MHD	3278
146.8 GB 15,000 RPM Ultra320 SCSI Disk Drive Assembly	9179	MHD	3279
1m, (3.3-ft) IB 40G Copper Cable QSFP/QSFP	9179	MHD	3287
3m, (9.8-ft.) IB 40G Copper Cable QSFP/QSFP	9179	MHD	3288
5m QDR IB/E'Net Copper Cable QSFP/QSFP	9179	MHD	3289
10 meter Quad Data Rate InfiniBand Optical Cable, QSFP/QSFP	9179	MHD	3290
30 meter Quad Data Rate InfiniBand Optical Cable, QSFP/QSFP	9179	MHD	3293
SAS YO Cable 1.5m - HD 6Gb Adapter to Enclosure	9179	MHD	3450
SAS YO Cable 3m - HD 6Gb Adapter to Enclosure	9179	MHD	3451
SAS YO Cable 6m - HD 6Gb Adapter to Enclosure	9179	MHD	3452
SAS YO Cable 10m - HD 6Gb Adapter to Enclosure	9179	MHD	3453
SAS X Cable 3m - HD 6Gb 2-Adapter to Enclosure	9179	MHD	3454
SAS X Cable 6m - HD 6Gb 2-Adapter to Enclosure	9179	MHD	3455
SAS X Cable 10m - HD 6Gb 2-Adapter to Enclosure	9179	MHD	3456
SAS YO Cable 15m - HD 3Gb Adapter to Enclosure	9179	MHD	3457
SAS X Cable 15m - HD 3Gb 2-Adapter to Enclosure	9179	MHD	3458
300 GB 10,000 RPM Ultra320 SCSI Disk Drive Assembly	9179	MHD	3578
300 GB 15K RPM SCSI Disk Drive (AIX/Linux)	9179	MHD	3585
69GB 3.5" SAS Solid State Drive	9179	MHD	3586
69GB 3.5" SAS Solid State Drive	9179	MHD	3587
Widescreen LCD Monitor	9179	MHD	3632
T210 Flat-Panel Monitor	9179	MHD	3635
L200P Flat Panel Monitor	9179	MHD	3636
IBM T541H /L150p 15" TFT Color Monitor	9179	MHD	3637
IBM ThinkVision L170p Flat Panel Monitor	9179	MHD	3639
ThinkVision L171p Flat Panel Monitor	9179	MHD	3640
IBM T115 Flat Panel Monitor	9179	MHD	3641
ThinkVision L191p Flat Panel Monitor	9179	MHD	3642
IBM T120 Flat Panel Monitor	9179	MHD	3643
IBM T119 Flat Panel Monitor	9179	MHD	3644
IBM T117 Flat Panel Monitor	9179	MHD	3645
73GB 15K RPM SAS Disk Drive	9179	MHD	3646
146GB 15K RPM SAS Disk Drive (AIX/Linux)	9179	MHD	3647
300GB 15K RPM SAS Disk Drive (AIX/Linux)	9179	MHD	3648
450GB 15K RPM SAS Disk Drive (AIX/Linux)	9179	MHD	3649
External connection for 3 of 6 internal SAS Disk Slots	9179	MHD	3650
External connection for the 6 internal SAS Disk slots.	9179	MHD	3651
SAS Cable (EE) Drawer to Drawer 1M	9179	MHD	3652

SAS Cable (EE) Drawer to Drawer 3M	9179	MHD	3653
SAS Cable (EE) Drawer to Drawer 6M	9179	MHD	3654
428GB 15K RPM SAS Disk Drive (IBM i)	9179	MHD	3658
Processor Fabric Cable, 2 enclosure	9179	MHD	3660
SAS Cable (X) Adapter to SAS Enclosure, Dual Controller/Dual Path 3M:	9179	MHD	3661
SAS Cable (X) Adapter to SAS Enclosure, Dual Controller/Dual Path 6M:	9179	MHD	3662
SAS Cable (X) Adapter to SAS Enclosure, Dual Controller/Dual Path 15M:	9179	MHD	3663
Processor Fabric Cable, 3 enclosure	9179	MHD	3664
Processor Fabric Cable, 4 enclosure	9179	MHD	3665
SAS Cable (YR) -1M	9179	MHD	3667
Serv Interface Cable- 2, 3, and 4 Enclosure	9179	MHD	3671
Serv Interface Cable- 3 and 4 Enclosure	9179	MHD	3672
Serv Interface Cable- 4 Enclosure	9179	MHD	3673
69.7GB 15k rpm SAS Disk Drive	9179	MHD	3676
139.5GB 15k rpm SAS Disk Drive (IBM i)	9179	MHD	3677
283.7GB 15k rpm SAS Disk Drive (IBM i)	9179	MHD	3678
SAS Cable (AI)- Adapter to Internal drive 1M	9179	MHD	3679
3M SAS CABLE, ADPTR TO ADPTR (AA)	9179	MHD	3681
6M SAS CABLE, ADPTR TO ADPTR (AA)	9179	MHD	3682
SAS Cable (AE) Adapter to Enclosure, single controller/single path 3M	9179	MHD	3684
SAS Cable (AE) Adapter to Enclosure, single controller/single path 6M	9179	MHD	3685
SAS Cable (YI) System to SAS Enclosure, Single Controller/Dual Path 1.5M	9179	MHD	3686
SAS Cable (YI) System to SAS Enclosure, Single Controller/Dual Path 3M	9179	MHD	3687
SAS Cable (AT) 0.6 Meter	9179	MHD	3688
SAS AT Cable 0.6m - HD 6Gb Adapter to 12X Enclosure (AT)	9179	MHD	3689
SAS Cable (YO) Adapter to SAS Enclosure, Single Controller/Dual Path 1.5 M	9179	MHD	3691
SAS Cable (YO) Adapter to SAS Enclosure, Single Controller/Dual Path 3 M	9179	MHD	3692
SAS Cable (YO) Adapter to SAS Enclosure, Single Controller/Dual Path 6 M	9179	MHD	3693
SAS Cable (YO) Adapter to SAS Enclosure, Single Controller/Dual Path 15 M	9179	MHD	3694
External xSeries® Attach	9179	MHD	3704
PCI IOP	9179	MHD	3705
DVD-ROM	9179	MHD	3706
30GB 1/4-Inch Cartridge Tape	9179	MHD	3707
50GB 1/4-Inch Cartridge Tape	9179	MHD	3708
PCI 100/10Mbps Ethernet IOA	9179	MHD	3709
Processor Cable, Two-Drawer System	9179	MHD	3711
Processor Cable, Two, Three or Four Drawer System	9179	MHD	3712
Processor Cables, Three or Four Drawer System	9179	MHD	3713
Processor Cables, Four-Drawer System	9179	MHD	3714
Processor Cable, Two,Three-Drawer System, 4 socket	9179	MHD	3715
Processor Cable, Two,Three,Four-Drawer System, 4 socket	9179	MHD	3716
Processor Cable, Three,Four-Drawer System, 4 socket	9179	MHD	3717
Processor Cable, Four-Drawer System, 4 socket	9179	MHD	3718
0.3M Serial Port Converter Cable, 9-Pin to 25-Pin	9179	MHD	3925
Asynch Printer/Terminal Cable, 9-pin to 25-pin, 4M	9179	MHD	3926
Serial Port Null Modem Cable, 9-pin to 9-pin, 3.7M	9179	MHD	3927
Serial Port Null Modem Cable, 9-pin to 9-pin, 10M	9179	MHD	3928
System Serial Port Converter Cable	9179	MHD	3930
1.8 M (6-ft) Extender Cable for Displays (15-pin D-shell to 15-pin D-shell)	9179	MHD	4242
Extender Cable - USB Keyboards, 1.8M	9179	MHD	4256
VGA to DVI Connection Converter	9179	MHD	4276
35.16GB 10k rpm Disk Unit	9179	MHD	4319
35.16GB 15k rpm Disk Unit	9179	MHD	4326
70.56GB 15k rpm Disk Unit	9179	MHD	4327
141.12GB 15k rpm Disk Unit	9179	MHD	4328
282.25GB 15k rpm Disk Unit	9179	MHD	4329

Package 5X #2055 & 20X #1995 (AIX/Linux)	9179	MHD	4367
Package 5X #2055 & 20X #1996 (IBM i)	9179	MHD	4377
DVD-RAM	9179	MHD	4430
50GB 1/4-Inch Cartridge Tape	9179	MHD	4487
4/8GB (4X2GB) DIMMS, 276 PIN 533 MHZ, DDR2 SDRAM	9179	MHD	4495
8/16GB (4X4GB) DIMMS, 276 PIN, 533 MHZ DDR2 SDRAM	9179	MHD	4496
16GB (4X4GB) DIMMS, 276 PIN, 533 MHZ, DDR2 SDRAM	9179	MHD	4497
16GB (4X4GB) DIMMS, 276 pin, 400MHZ DDR2 SDRAM	9179	MHD	4499
DVD-RAM	9179	MHD	4630
DVD-RAM	9179	MHD	4633
One and only one rack indicator feature is required on all orders (#4650 to #4666).			
Rack Indicator- Not Factory Integrated	9179	MHD	4650
Rack Indicator, Rack #1	9179	MHD	4651
Rack Indicator, Rack #2	9179	MHD	4652
Rack Indicator, Rack #3	9179	MHD	4653
Rack Indicator, Rack #4	9179	MHD	4654
Rack Indicator, Rack #5	9179	MHD	4655
Rack Indicator, Rack #6	9179	MHD	4656
Rack Indicator, Rack #7	9179	MHD	4657
Rack Indicator, Rack #8	9179	MHD	4658
Rack Indicator, Rack #9	9179	MHD	4659
Rack Indicator, Rack #10	9179	MHD	4660
Rack Indicator, Rack #11	9179	MHD	4661
Rack Indicator, Rack #12	9179	MHD	4662
Rack Indicator, Rack #13	9179	MHD	4663
Rack Indicator, Rack #14	9179	MHD	4664
Rack Indicator, Rack #15	9179	MHD	4665
Rack Indicator, Rack #16	9179	MHD	4666
On/Off 999 GB-Days, Memory Billing POWER7	9179	MHD	4710
PCI Twinaxial workstn IOA	9179	MHD	4746
PCI-X Cryptographic Coprocessor (FIPS 4)	9179	MHD	4764
ACTIVE MEMORY EXPANSION ENABLEMENT	9179	MHD	4791
PCI Crypto Coprocessor	9179	MHD	4801
PCI Crypto Accelerator	9179	MHD	4805
PCIe Crypto Coprocessor Gen3 BSC 4765-001	9179	MHD	4808
PCIe Crypto Coprocessor Gen4 BSC 4765-001	9179	MHD	4809
PCI Integ xSeries Server	9179	MHD	4812
PCI Integ xSeries Server	9179	MHD	4813
CBU SPECIFY	9179	MHD	4891
3.86 GHZ / 4.14 GHZ TurboCore Proc Card, 0/16			
Core POWER7, 16 DDR3 Memory Slots	9179	MHD	4982
Single 5250 Enterprise Enablement	9179	MHD	4990
Full 5250 Enterprise Enablement	9179	MHD	4991
Single 5250 Enterprise Enablement	9179	MHD	4992
Full 5250 Enterprise Enablement	9179	MHD	4997
Software Preload Required	9179	MHD	5000
Custom Service Specify, Off-Site			
	9179	MHD	5001
Customer Solution Center - Rochester Mfg			
	9179	MHD	5002
3.92 GHZ / 4.14 GHZ TurboCore Proc Card, 0/16			
Core POWER7, 16 DDR3 Memory Slots	9179	MHD	5003
Software Preinstall	9179	MHD	5005
PCI-X Expansion Unit	9179	MHD	5088
PCI-X Expansion Tower	9179	MHD	5094
PCI-X Exp Tower (no disk)	9179	MHD	5096
30-Disk Expansion Feature	9179	MHD	5108
Dual Line Cords - Tower	9179	MHD	5115
Dual Line Cords - 5294 Tower	9179	MHD	5116
Redundant Power and Cooling	9179	MHD	5138
Power Dist Unit 1 Phase NEMA	9179	MHD	5160
Power Dist Unit 1 Phase IEC	9179	MHD	5161
Power Dist Unit 2 of 3 Phase	9179	MHD	5162
Power Dist Unit - 3 Phase	9179	MHD	5163
PCIe2 2-Port 4X IB QDR Adapter 40Gb	9179	MHD	5285
PCIe2 2-port 10GbE SR Adapter	9179	MHD	5287
PCIe2 2-Port 10GbE SFP+Copper Adapter	9179	MHD	5288
2 Port Async EIA-232 PCIe Adapter	9179	MHD	5289
1.8m I/O Tower	9179	MHD	5294
1.8m I/O Tower (no disk)	9179	MHD	5296
1-Core Activation for Processor Feature #5003	9179	MHD	5339
Proc CoD Utility Billing, 100 Proc-mins. for #5003, AIX/Linux	9179	MHD	5340

Proc CoD Utility Billing, 100 Proc-mins. for #5003, IBM i	9179	MHD	5341
1 Proc-Day On/Off Billing for #5003, AIX/Linux	9179	MHD	5342
1 Proc-Day On/Off Billing for #5003, IBM i	9179	MHD	5343
One Processor Activation for Processor Feature #7380	9179	MHD	5403
Utility Billing for FC# 7380- 100 processor minutes	9179	MHD	5404
One Processor Activation for Processor Feature #4982	9179	MHD	5469
Utility Billing for FC# 7380 with IBM i - 100 processor minutes	9179	MHD	5480
Utility Billing for FC# 5620 with IBM i - 100 processor minutes	9179	MHD	5481
Utility Billing for FC# 5621 or #5622 with IBM i - 100 processor minutes	9179	MHD	5482
On/Off Processor Billing for FC#5620 with IBM i - 1 processor day	9179	MHD	5483
On/Off Processor Billing for Feature #5621 or #5622 with IBM i - 1 processor day	9179	MHD	5484
On/Off Processor Billing for FC#7380 with IBM i - 1 processor day	9179	MHD	5485
RFID Tags for Servers, Blades, BladeCenters, Racks, and HMCs	9179	MHD	5524
System AC Power Supply, 1925 W	9179	MHD	5532
Sys Console on OP Console	9179	MHD	5544
Sys Console 100Mbps Ethernet	9179	MHD	5548
Sys Console On HMC	9179	MHD	5550
Sys Console-Ethernet No IOP	9179	MHD	5553
Mirror 35GB Disk/Controller Pkg	9179	MHD	5554
Mirror 70GB Disk/Controller Pkg	9179	MHD	5555
Mirror 141GB Disk/Controller Pkg	9179	MHD	5556
Mirror 35GB Drawer Package	9179	MHD	5560
Mirror 70GB Drawer Package	9179	MHD	5561
0/256GB DDR3 Memory (4X64GB) DIMMS - 1066 MHZ - POWER7 CoD Memory	9179	MHD	5564
2780 Controller w/Aux Write Cache	9179	MHD	5580
2757 Controller w/Aux Write Cache	9179	MHD	5581
5777 Controller w/Aux Write Cache	9179	MHD	5583
2780 Controller w/Aux Write Cache	9179	MHD	5590
2757 Controller w/Aux Write Cache	9179	MHD	5591
System CEC Enclosure with IBM BEZEL, I/O Backplane, and System Midplane	9179	MHD	5595
System CEC Enclosure with OEM BEZEL, I/O Backplane, and System Midplane	9179	MHD	5596
System CEC Enclosure with IBM BEZEL, I/O Backplane, and System Midplane	9179	MHD	5597
System CEC Enclosure with OEM BEZEL, I/O Backplane, and System Midplane	9179	MHD	5598
0/32GB DDR3 Memory (4X8GB) DIMMS - 1066 MHZ - POWER7 CoD Memory	9179	MHD	5600
0/64GB DDR3 Memory (4X16GB) DIMMS - 1066 MHZ - POWER7 CoD Memory	9179	MHD	5601
0/128GB DDR3 Memory (4X32GB) DIMMS - 1066 MHZ - POWER7 CoD Memory	9179	MHD	5602
Processor Power Regulator	9179	MHD	5617
3.5 GHz Proc Card, 0/2 Core POWER6, 12 DDR2 Memory Slots	9179	MHD	5620
4.2 GHz Proc Card, 0/2 Core POWER6, 8 DDR2 Memory Slots	9179	MHD	5621
4.2 GHz Proc Card, 0/2 Core POWER6, 12 DDR2 Memory Slots	9179	MHD	5622
Proc Power Regulator	9179	MHD	5625
System CEC Enclosure with IBM Bezel	9179	MHD	5626
Sys AC Power Supply, 1600 W	9179	MHD	5628
Media Enclosure and Backplane	9179	MHD	5629
Integrated, 2 Port- 1Gb Virtual Ethernet, I/O ports	9179	MHD	5636
Integrated, 2 Port- 10Gb (SR) Virtual Ethernet, I/O ports	9179	MHD	5637
Integrated, 4 Port- 1Gb Virtual Ethernet, I/O ports	9179	MHD	5639
Utility Billing for FC# 5620- 100 processor minutes	9179	MHD	5640

Utility Billing for FC# 5621 or #5622 - 100 processor minutes	9179	MHD	5641
Blind Swap Type III Cassette- PCIe, Short Slot	9179	MHD	5646
Blind Swap Type III Cassette- PCI-X or PCIe, Standard Slot	9179	MHD	5647
Service Interface Card	9179	MHD	5648
On/Off Processor Day Billing for Feature #5620	9179	MHD	5650
Disk/Media Backplane	9179	MHD	5652
On/Off Processor Billing for Feature #5621 or #5622 - 1 processor day	9179	MHD	5653
On/Off Processor Day Billing for Feature #7380	9179	MHD	5656
Serv Interface Cable- 2 Enclosure	9179	MHD	5657
Serv Interface Cable- 3 Enclosure	9179	MHD	5658
Serv Interface Cable- 4 Enclosure	9179	MHD	5660
175MB Cache RAID - Dual IOA Enablement Card	9179	MHD	5662
Proc Enclosure and Backplane	9179	MHD	5663
Service Processor	9179	MHD	5664
FSP/Clock Pass Through Card	9179	MHD	5665
I/O Backplane	9179	MHD	5666
System Midplane	9179	MHD	5667
SAS Disk Backplane -6 slot	9179	MHD	5668
One Processor Activation for Processor Feature #5620	9179	MHD	5670
One Processor Activation for Processor Feature #5621	9179	MHD	5671
One Processor Activation for Processor Feature #5622	9179	MHD	5672
SATA Media Enclosure and Backplane	9179	MHD	5674
0/4 Core Processor Enclosure and Backplane	9179	MHD	5675
Activation of 1GB DDR2 POWER6 Memory	9179	MHD	5680
Activation of 256 GB DDR2 POWER6 Memory	9179	MHD	5681
Power 570 System Bezel	9179	MHD	5682
System Chassis - 4 EIA	9179	MHD	5683
Activation of 100 GB DDR2 Memory	9179	MHD	5684
Virtual Processor Power Regulator	9179	MHD	5686
0/32GB DDR2 Memory (4X8GB) DIMMS- 400 MHZ- POWER6 CoD Memory	9179	MHD	5690
On/Off, 1GB-1Day, Memory Billing POWER6 Memory	9179	MHD	5691
0/2GB DDR2 Memory (4X0.5GB) DIMMS- 667 MHZ- POWER6 Memory	9179	MHD	5692
0/4GB DDR2 Memory (4X1GB) DIMMS- 667 MHZ- POWER6 CoD Memory	9179	MHD	5693
0/8GB DDR2 Memory (4X2GB) DIMMS- 667 MHZ- POWER6 CoD Memory	9179	MHD	5694
0/16GB DDR2 Memory (4X4GB) DIMMS- 533 MHZ- POWER6 CoD Memory	9179	MHD	5695
0/32GB DDR2 Memory (4X8GB) DIMMS- 400 MHZ- POWER6 CoD Memory	9179	MHD	5696
System Ship Group	9179	MHD	5699
IBM Gigabit Ethernet-SX PCI-X Adapter	9179	MHD	5700
IBM 10/100/1000 Base-TX Ethernet PCI-X Adapter	9179	MHD	5701
PCI-X Ultra Tape Controller	9179	MHD	5702
PCI-X Fibre Channel Tape Controller	9179	MHD	5704
IBM 2-Port 10/100/1000 Base-TX Ethernet PCI-X Adapter	9179	MHD	5706
IBM 2-Port Gigabit Ethernet-SX PCI-X Adapter	9179	MHD	5707
10Gb FCoE PCIe Dual Port Adapter	9179	MHD	5708
PCI-X Dual Channel Ultra320 SCSI Adapter	9179	MHD	5712
1 Gigabit iSCSI TOE PCI-X on Copper Media Adapter	9179	MHD	5713
1 Gigabit iSCSI TOE PCI-X on Optical Media Adapter	9179	MHD	5714
2 Gigabit Fibre Channel PCI-X Adapter	9179	MHD	5716
4-Port 10/100/1000 Base-TX PCI Express® Adapter	9179	MHD	5717
10 Gigabit Ethernet -SR PCI-X Adapter	9179	MHD	5718
IBM 10 Gigabit Ethernet-LR PCI-X Adapter	9179	MHD	5719
10 Gb Ethernet-SR PCI-X 2.0 DDR Adapter	9179	MHD	5721
10 Gb Ethernet-LR PCI-X 2.0 DDR Adapter	9179	MHD	5722
2-Port Asynchronous EIA-232 PCI Adapter	9179	MHD	5723
PCIe2 8Gb 4-port Fibre Channel Adapter	9179	MHD	5729
10 Gigabit Ethernet-CX4 PCI Express Adapter	9179	MHD	5732
8 Gigabit PCI Express Dual Port Fibre Channel Adapter	9179	MHD	5735
PCI-X DDR Dual Channel Ultra320 SCSI Adapter	9179	MHD	5736
4-Port 10/100/1000 Base-TX PCI-X Adapter	9179	MHD	5740

IBM Single Bus Ultra 320 SCSI Repeater Card	9179	MHD	5741
IBM Dual Bus Ultra 320 SCSI Repeater Card	9179	MHD	5742
SATA Slimline DVD-ROM Drive	9179	MHD	5743
PCIe2 4-Port 10GbE&1GbE SR&RJ45 Adapter	9179	MHD	5744
PCIe2 4-Port 10GbE&1GbE SFP+Copper&RJ45 Adapter	9179	MHD	5745
POWER GXT145 PCI Express Graphics Accelerator	9179	MHD	5748
4Gbps Fibre Channel (2-Port)	9179	MHD	5749
IDE Slimline DVD-ROM Drive	9179	MHD	5756
IBM 4.7 GB IDE Slimline DVD-RAM Drive	9179	MHD	5757
4 GB Single-Port Fibre Channel PCI-X 2.0 DDR Adapter	9179	MHD	5758
4 Gb Dual-Port Fibre Channel PCI-X 2.0 DDR Adapter	9179	MHD	5759
PCI-X Fibre Chan Disk Controller	9179	MHD	5760
PCI-X Fibre Chan Tape Controller	9179	MHD	5761
SATA Slimline DVD-RAM Drive	9179	MHD	5762
2-Port 10/100/1000 Base-TX Ethernet PCI Express Adapter	9179	MHD	5767
2-Port Gigabit Ethernet-SX PCI Express Adapter	9179	MHD	5768
10 Gigabit Ethernet-SR PCI Express Adapter	9179	MHD	5769
10 Gigabit Ethernet-LR PCI Express Adapter	9179	MHD	5772
4 Gigabit PCI Express Single Port Fibre Channel Adapter	9179	MHD	5773
4 Gigabit PCI Express Dual Port Fibre Channel Adapter	9179	MHD	5774
PCI-X Disk Controller-90MB No IOP	9179	MHD	5776
PCI-X Disk Controller-1.5GB No IOP	9179	MHD	5777
PCI-X EXP24 Ctl-1.5GB No IOP	9179	MHD	5778
PCI-X EXP24 Ctl-1.5GB No IOP	9179	MHD	5782
4 Port Async EIA-232 PCIe Adapter	9179	MHD	5785
TotalStorage EXP24 Disk Dwr	9179	MHD	5786
PCI Expansion Drawer	9179	MHD	5790
PCI-DDR 12X Expansion Drawer	9179	MHD	5796
12X I/O Drawer PCIe, SFF disk	9179	MHD	5802
PCIe 380MB Cache Dual - x4 3Gb SAS RAID Adapter	9179	MHD	5805
PCI-X DDR Dual Channel Ultra320 SCSI Adapter	9179	MHD	5806
12X I/O Drawer PCIe, No Disk	9179	MHD	5877
SAS Disk Backplane -6 slot	9179	MHD	5878
EXP 12S Expansion Drawer	9179	MHD	5886
EXP24S SFF Gen2-bay Drawer	9179	MHD	5887
PCIe2 4-port 1GbE Adapter	9179	MHD	5899
PCI-X DDR Dual -x4 SAS Adapter	9179	MHD	5900
PCIe Dual-x4 SAS Adapter	9179	MHD	5901
PCI-X DDR Dual - x4 3Gb SAS RAID Adapter	9179	MHD	5902
PCIe 380MB Cache Dual - x4 3Gb SAS RAID Adapter	9179	MHD	5903
PCI-X DDR 1.5GB Cache SAS RAID Adapter	9179	MHD	5904
PCI-X DDR 1.5GB Cache SAS RAID Adapter (BSC)	9179	MHD	5908
Alternate SAS controller for 3 of 6 internal SAS Disk Slots	9179	MHD	5909
SAS adapter for internal Split DASD option	9179	MHD	5911
PCI-X DDR Dual - x4 SAS Adapter	9179	MHD	5912
PCIe2 1.8GB Cache RAID SAS Adapter Tri-port 6Gb	9179	MHD	5913
SAS AA Cable 3m - HD 6Gb Adapter to Adapter	9179	MHD	5915
SAS AA Cable 6m - HD 6Gb Adapter to Adapter	9179	MHD	5916
SAS AA Cable 1.5m - HD 6Gb Adapter to Adapter	9179	MHD	5917
SAS AA Cable 0.6m - HD 6Gb Adapter to Adapter	9179	MHD	5918
Non-paired PCIx SAS RAID Indicator	9179	MHD	5921
Non-paired SAS RAID indicator	9179	MHD	5922
Non-paired PCIe SAS RAID Indicator	9179	MHD	5923
Non-paired Indicator 5913 PCIe SAS RAID Adapter	9179	MHD	5924
Full width Keyboard -- USB, US English, #103P	9179	MHD	5951
Full width Keyboard -- USB, French, #189	9179	MHD	5952
Full width Keyboard -- USB, Italian, #142	9179	MHD	5953
Full width Keyboard -- USB, German/Austrian, #129	9179	MHD	5954
Full width Keyboard -- USB, UK English, #166P	9179	MHD	5955
Full width Keyboard -- USB, Spanish, #172	9179	MHD	5956
Full width Keyboard -- USB, Japanese, #194	9179	MHD	5957
Full width keyboard -- USB, Brazilian Portuguese, #275	9179	MHD	5958
Full width Keyboard -- USB, Hungarian, #208	9179	MHD	5959
Full width Keyboard -- USB, Korean, #413	9179	MHD	5960
Full width Keyboard -- USB, Chinese, #467	9179	MHD	5961
Full width keyboard -- USB, French Canadian, #445	9179	MHD	5962
Full width keyboard -- USB, Canadian French, #058	9179	MHD	5963

Full width Keyboard -- USB, Belgian/UK, #120	9179	MHD	5964
Full width Keyboard -- USB, Swedish/Finnish, #153	9179	MHD	5965
Full width Keyboard -- USB, Danish, #159	9179	MHD	5966
Full width Keyboard -- USB, Bulgarian, #442	9179	MHD	5967
Full width Keyboard -- USB, Swiss/French/German, #150	9179	MHD	5968
Full width Keyboard -- USB, Norwegian, #155	9179	MHD	5969
Full width Keyboard -- USB, Dutch, #143	9179	MHD	5970
Full width Keyboard -- USB, Portuguese, #163	9179	MHD	5971
Full width Keyboard -- USB, Greek, #319	9179	MHD	5972
Full width Keyboard -- USB, Hebrew, #212	9179	MHD	5973
Full width Keyboard -- USB, Polish, #214	9179	MHD	5974
Full width Keyboard -- USB, Slovakian, #245	9179	MHD	5975
Full width Keyboard -- USB, Czech, #243	9179	MHD	5976
Full width Keyboard -- USB, Turkish, #179	9179	MHD	5977
Full width Keyboard -- USB, LA Spanish, #171	9179	MHD	5978
Full width Keyboard -- USB, Arabic, #253	9179	MHD	5979
Full width Keyboard -- USB, Thai, #191	9179	MHD	5980
Full width Keyboard -- USB, Russian, #443	9179	MHD	5981
Full width Keyboard -- USB, Slovenian, #234	9179	MHD	5982
Full width Keyboard -- USB, US English Euro, #103P	9179	MHD	5983
Power Control Cable (SPCN) - 2 meter	9179	MHD	6001
Power Control Cable (SPCN) - 3 meter	9179	MHD	6006
Power Control Cable (SPCN) - 15 meter	9179	MHD	6007
Power Control Cable (SPCN) - 6 meter	9179	MHD	6008
Power Control Cable (SPCN) - 30 meter	9179	MHD	6029
Opt Front Door for 1.8m Rack	9179	MHD	6068
Opt Front Door for 2.0m Rack	9179	MHD	6069
HIGH-END APPEARAE SIDE COVERS	9179	MHD	6238
1.8m Rack Trim Kit	9179	MHD	6246
2.0m Rack Trim Kit	9179	MHD	6247
1.8m Rack Acoustic Doors	9179	MHD	6248
2.0m Rack Acoustic Doors	9179	MHD	6249
HIGH-END APPEARAE FRONT DOOR	9179	MHD	6250
1.8m Rack Trim Kit	9179	MHD	6263
2.0m Rack Trim Kit	9179	MHD	6272
RIO-2 Bus Adapter	9179	MHD	6417
RIO-2 Remote I/O Loop Adapter for #5790	9179	MHD	6438
Dual-port 12X Channel Interface Attach - Short Run	9179	MHD	6446
4.3m (14-Ft) 250V/10A Power Cord	9179	MHD	6455
Dual-port 12X Channel Interface Attach- Long Run Power Cord 4.3m (14-ft), Drawer to Wall/IBM PDU (250V/10A)	9179	MHD	6457
3.7m (12-Ft) 250V/10A RA Pwr Cd	9179	MHD	6458
Power Cord 4.3m (14-ft), Drawer To OEM PDU (125V, 15A)	9179	MHD	6459
4.3m (14-Ft) 250V/10A Power Cord	9179	MHD	6460
4.3m (14-Ft) 250V/10A Power Cord	9179	MHD	6461
4.3m (14-Ft) 250V/10A Power Cord	9179	MHD	6462
4.3m (14-Ft) 250V/10A Power Cord	9179	MHD	6463
4.3m (14-Ft) 250V/10A Power Cord	9179	MHD	6464
4.3m (14-Ft) 250V/10A Power Cord	9179	MHD	6465
4.3m (14-Ft) 250V/10A Power Cord	9179	MHD	6466
4.3m (14-Ft) 250V/10A Power Cord	9179	MHD	6467
Power Cord 4.3m (14-ft), Drawer to Wall/OEM PDU (250V/15A) U. S.	9179	MHD	6469
Power Cord 1.8m (6-ft), Drawer to Wall (125V/15A)	9179	MHD	6470
Power Cord 2.7m (9-ft), Drawer to Wall/OEM PDU (125V/15A)	9179	MHD	6471
Power Cord 2.7m (9-ft), Drawer to Wall/OEM PDU (250V/16A)	9179	MHD	6472
Power Cord 2.7m (9-ft), Drawer to Wall/OEM PDU (250V/10A)	9179	MHD	6473
Power Cord 2.7m (9-ft), Drawer to Wall/OEM PDU, (250V/13A)	9179	MHD	6474
Power Cord 2.7m (9-ft), Drawer to Wall/OEM PDU, (250V/16A)	9179	MHD	6475
Power Cord 2.7m (9-ft), Drawer to Wall/OEM PDU,	9179	MHD	6475

(250V/10A)	9179	MHD	6476
Power Cord 2.7m (9-ft), Drawer to wall/OEM PDU, (250V/16A)	9179	MHD	6477
Power Cord 2.7 M(9-foot), To wall/OEM PDU, (250V, 16A)	9179	MHD	6478
Power Cord (9-foot) , To wall/OEM PDU, (250V, 10A)	9179	MHD	6479
Power Cord 1.8M (6-foot),To wall, (250V, 15A), United States	9179	MHD	6487
Power Cord 2.7m (9-ft), Drawer to wall/OEM PDU, (125V/15A or 250V/10A)	9179	MHD	6488
4.3m (14-Ft) 3PH/24A 380-415V Power Cord	9179	MHD	6489
4.3m (14-Ft) 1PH/48A 200-240V Power Cord	9179	MHD	6491
4.3m (14-Ft) 1PH/48-60A 200-240V Power Cord	9179	MHD	6492
Power Cord 2.7m (9-ft), Drawer to wall/OEM PDU, (250V/10A)	9179	MHD	6493
Power Cord 2.7m (9-ft), Drawer to wall/OEM PDU, (250V/10A)	9179	MHD	6494
Power Cord (9-foot), To wall/OEM PDU, (250V, 10A)	9179	MHD	6495
Power Cord 2.7M (9-foot), To wall/OEM PDU, (250V, 10A)	9179	MHD	6496
Power Cord (6-foot), To wall/OEM PDU, (250V, 10A)	9179	MHD	6497
Power Cord (6-foot), To wall/OEM PDU, (250V, 15A)	9179	MHD	6498
Power Cable - Drawer to IBM PDU, 200-240V/10A	9179	MHD	6577
Optional Rack Security Kit	9179	MHD	6580
Modem Tray for 19-Inch Rack	9179	MHD	6586
Power Cord 2.7M (9-foot), To wall/OEM PDU, (125V, 15A)	9179	MHD	6651
4.3m (14-Ft) 1PH/24-30A Pwr Cord	9179	MHD	6654
4.3m (14-Ft) 1PH/24-30A WR Pwr Cord	9179	MHD	6655
4.3m (14-Ft)1PH/24A Power Cord	9179	MHD	6656
Power Cord 2.7M (9-foot), To wall/OEM PDU, (250V, 15A)	9179	MHD	6659
Power Cord 4.3m (14-ft), Drawer to wall/OEM PDU (125V/15A)	9179	MHD	6660
2.1m (7-Ft) 200V PDU Power Cable	9179	MHD	6664
Power Cord 2.8m (9.2-ft), Drawer to wall/IBM PDU, (250V/10A)	9179	MHD	6665
Power Cord 4.3M (14-foot), Drawer to OEM PDU, (250V, 15A)	9179	MHD	6669
Power Cord (6-foot), To wall (125V, 15A), PT #59	9179	MHD	6670
Power Cord 2.7M (9-foot), Drawer to IBM PDU, 250V/10A	9179	MHD	6671
Power Cord 1.5M (5-foot), Drawer to IBM PDU, 250V/10A	9179	MHD	6672
Power Cord 2.7m (9-ft), Drawer to wall/OEM PDU, (250V/10A)	9179	MHD	6680
Power Cord (6-foot), To wall, (250V, 15A)	9179	MHD	6687
RIO-2 Bus Adapter	9179	MHD	6699
PCI 2-Line WAN IOA No IOP	9179	MHD	6805
PCI 4-Modem WAN IOA No IOP	9179	MHD	6808
PCI 2-Line WAN w/Modem NoIOP	9179	MHD	6833
Cable Restraint Hardware- excess Service			
Interface Cable	9179	MHD	7099
Intelligent PDU+, 1 EIA Unit, Universal UTG0247 Connector	9179	MHD	7109
Environmental Monitoring Probe	9179	MHD	7118
IBM/OEM Rack-mount Drawer Rail Kit- Adjustable Depth	9179	MHD	7164
OEM Rack-mount Drawer Rail Kit	9179	MHD	7165
Power Distribution Unit	9179	MHD	7188
Quantity 150 of #2124	9179	MHD	7204
Quantity 150 of #2125	9179	MHD	7205

Quantity 150 of #2126	9179	MHD	7206
Quantity 150 of #2127	9179	MHD	7207
Quantity 150 of #2128	9179	MHD	7208
Quantity 150 of #2138	9179	MHD	7213
2GB CUoD Memory Activation	9179	MHD	7272
4GB CUoD Memory Activation	9179	MHD	7273
8GB CUoD Memory Activation	9179	MHD	7274
16GB CUoD Memory Activation	9179	MHD	7275
32GB CUoD Memory Activation	9179	MHD	7276
SDI Software Pre-Install Indicator	9179	MHD	7305
One Processor Activation for Processor Feature #7388	9179	MHD	7306
Dual I/O Unit Enclosure	9179	MHD	7307
Dual I/O Unit Enclosure	9179	MHD	7311
I/O Drawer Mounting Enclosure	9179	MHD	7314
Utility Billing for Processor #7388- 100 processor minutes	9179	MHD	7332
On/Off Processor Day Billing for Processor #7388	9179	MHD	7333
Utility Billing for Processor #7388 with IBM i - 100 processor minutes	9179	MHD	7334
On/Off Processor Billing for Processor #7388 with IBM i - 1 processor day	9179	MHD	7346
On/Off, 1GB-1Day, Memory Billing POWER7	9179	MHD	7377
4.7 GHz Proc Card, 0/2 Core POWER6, 12 DDR2 Memory Slots	9179	MHD	7380
4.4GHz Proc Card, 0/2 Core POWER6, 12 DDR2 Memory Slots.	9179	MHD	7387
5.0 GHz Proc Card, 0/2 Core POWER6, 12 DDR2 Memory Slots	9179	MHD	7388
Quantity 150 of #4319	9179	MHD	7504
Quantity 150 of #4326	9179	MHD	7508
Quantity 150 of #4327	9179	MHD	7509
Quantity 150 of #4328	9179	MHD	7510
Quantity 150 of #4329	9179	MHD	7511
Quantity 150 of #5741	9179	MHD	7514
Quantity 150 of #3676	9179	MHD	7517
Quantity 150 of #3677	9179	MHD	7518
Quantity 150 of #3678	9179	MHD	7519
Quantity 150 of #3586	9179	MHD	7535
Quantity 150 of #3587	9179	MHD	7536
Quantity 150 of #3658	9179	MHD	7538
4.2 GHz Proc Card, 0/4 Core POWER6, 12 DDR2 Memory Slots	9179	MHD	7540
Quantity 150 of #1884	9179	MHD	7543
Quantity 150 of #1888	9179	MHD	7544
Quantity 150 of #1890	9179	MHD	7545
Quantity 150 of #1909	9179	MHD	7546
Quantity 150 of #1885	9179	MHD	7547
Quantity 150 of #1886	9179	MHD	7548
Quantity 150 of #3647	9179	MHD	7549
Quantity 150 of #1790	9179	MHD	7550
Quantity 150 of #1911	9179	MHD	7557
Quantity 150 of #3648	9179	MHD	7564
Quantity 150 of #3649	9179	MHD	7565
Quantity 150 of #1916	9179	MHD	7566
QTY 150, 177GB SFF-1 SSD w/ eMLC (AIX/Linux)	9179	MHD	7578
QTY 150, 177GB SFF-1 SSD w/ eMLC (IBM i)	9179	MHD	7582
PROC COD UTILITY BILLING FOR FC 4982, 100 PROC-MINS	9179	MHD	7633
PROC COD UTILITY BILLING FOR FC 4982, 100 PROC-MINS, FOR IBMi	9179	MHD	7634
1 PROC-DAY ON/OFF BILLING FOR FC 4982	9179	MHD	7635
1 PROC-DAY ON/OFF BILLING FOR FC 4982, FOR IBMi	9179	MHD	7636
1GB DDR2 Memory Activation	9179	MHD	7663
One Processor Activation for Processor Feature #7540	9179	MHD	7700
Utility Billing for Processor #7540- 100 processor minutes	9179	MHD	7701
On/Off Processor Day Billing for Processor #7540	9179	MHD	7702
Utility Billing for Processor #7540 with IBM i - 100 processor minutes	9179	MHD	7706
On/Off Processor Billing for Processor #7540 with IBM i - 1 processor day	9179	MHD	7709

One Processor Activation for Processor Feature #7387	9179	MHD	7719
Utility Billing for Processor #7387 - 100 processor minutes	9179	MHD	7726
Utility Billing for Processor #7387 with IBM i - 100 processor minutes	9179	MHD	7743
On/Off Processor Billing for Processor #7387 with IBM i - 1 processor day	9179	MHD	7744
On/Off Processor Day Billing for Processor #7387	9179	MHD	7745
2.0m Rack Side Attach Kit	9179	MHD	7780
Ethernet Cable, 6M, Hardware Management Console to System Unit	9179	MHD	7801
Ethernet Cable, 15m, Hardware Management Console to System Unit	9179	MHD	7802
Side-by-Side for 1.8m Racks	9179	MHD	7840
Ruggedize Rack Kit	9179	MHD	7841
PCI Blind Swap Cassette Kit, Single Wide Adapters, Type II	9179	MHD	7862
PCI Blind Swap Cassette Kit, Double Wide Adapters, Type III	9179	MHD	7863
Power Distribution Backplane	9179	MHD	7870
AC Power Supply, 1400 W	9179	MHD	7888
2GB (4x512MB) DIMMS, 276-pin, 533MHz DDR2 SDRAM	9179	MHD	7892
4GB (4x1GB) DIMMS, 276-pin, 533MHz DDR2 SDRAM	9179	MHD	7893
8GB (4x2GB) DIMMS, 276-pin, 533 MHz DDR2 SDRAM	9179	MHD	7894
PowerVM -Standard Edition	9179	MHD	7942
On/Off Processor Enablement	9179	MHD	7951
On/Off Memory Enablement	9179	MHD	7954
PowerVM - Enterprise Edition	9179	MHD	7995
570 to MMA CoD Memory Activation Carry Over Indicator	9179	MHD	8017
Advanced POWER Virtualization Carry Over Indicator	9179	MHD	8018
Advanced POWER Virtualization Carry Over Indicator	9179	MHD	8030
0/256GB DDR2 Memory (32X8GB) DIMMS- 400 MHZ- POWER6 Memory	9179	MHD	8129
RJ-45 to DB-25 Converter Cable	9179	MHD	8133
Linux Software Preinstall	9179	MHD	8143
Linux Software Preinstall (Business Partners)	9179	MHD	8144
Activation of 1 GB DDR3 POWER7 Memory	9179	MHD	8212
Activation of 100 GB DDR3 POWER7 Memory	9179	MHD	8213
Power Cord Carry Over Indicator, #9800, Model Conversion Only	9179	MHD	8430
Power Cord Carry Over Indicator, #9802, Model Conversion Only	9179	MHD	8431
Power Cord Carry Over Indicator, #9820, Model Conversion Only	9179	MHD	8432
Power Cord Carry Over Indicator, #9821, Model Conversion Only	9179	MHD	8433
Power Cord Carry Over Indicator, #9825, Model Conversion Only	9179	MHD	8434
Power Cord Carry Over Indicator, #9827, Model Conversion Only	9179	MHD	8435
Power Cord Carry Over Indicator, #9828, Model Conversion Only	9179	MHD	8436
Power Cord Carry Over Indicator, #9829, Model Conversion Only	9179	MHD	8437
Power Cord Carry Over Indicator, #9830, Model Conversion Only	9179	MHD	8438
Power Cord Carry Over Indicator, #9831, Model Conversion Only	9179	MHD	8439
Power Cord Carry Over Indicator, #9833, Model Conversion Only	9179	MHD	8440
Power Cord Carry Over Indicator, #9834, Model Conversion Only	9179	MHD	8441
Base Customer Spec Plcmnt	9179	MHD	8453
MMB/MHB to MMC/MHC #5665 Carry Over Indicator	9179	MHD	8525
MMB/MHB to MMC/MHC #5652 Carry Over Indicator	9179	MHD	8526
MMB/MHB to MMC/MHC CoD Memory Activation Carry Over Indicator	9179	MHD	8527
MMB/MHB to MMC/MHC CoD Memory Activation Carry Over Indicator	9179	MHD	8528
MMB/MHB to MMC/MHC #5662 Carry Over Indicator	9179	MHD	8529

MMB/MHB to MMC/MHC #1853 Carry Over Indicator	9179	MHD	8532
Keyboard - USB, US English, #103P	9179	MHD	8800
Keyboard - USB, French, #189	9179	MHD	8801
Keyboard - USB, Italian, #142	9179	MHD	8802
Keyboard - USB, German/Austrian, #129	9179	MHD	8803
Keyboard - USB, UK English, #166	9179	MHD	8804
Keyboard - USB, Spanish, #172	9179	MHD	8805
Keyboard - USB, Japanese, #194	9179	MHD	8806
Keyboard - USB, Brazilian/Portuguese, #275	9179	MHD	8807
Keyboard - USB, Canadian French, #058	9179	MHD	8808
Keyboard - USB, Belgium/UK, #120	9179	MHD	8810
Keyboard - USB, Swedish/Finnish, #153	9179	MHD	8811
Keyboard - USB, Danish, #159	9179	MHD	8812
Keyboard - USB, Bulgarian, #442	9179	MHD	8813
Keyboard - USB, Swiss/French/German, #150F/G	9179	MHD	8814
Keyboard - USB, Norwegian, #155	9179	MHD	8816
Keyboard - USB, Dutch, #143	9179	MHD	8817
Keyboard - USB, Portuguese, #163	9179	MHD	8818
Keyboard - USB, Greek, #319	9179	MHD	8819
Keyboard - USB, Hebrew, #212	9179	MHD	8820
Keyboard - USB, Hungarian, #208	9179	MHD	8821
Keyboard - USB, Polish, #214	9179	MHD	8823
Keyboard - USB, Slovakian, #245	9179	MHD	8825
Keyboard - USB, Czech, #243	9179	MHD	8826
Keyboard - USB, Turkish, #179	9179	MHD	8827
Keyboard - USB, LA Spanish, #171	9179	MHD	8829
Keyboard - USB, Arabic, #253	9179	MHD	8830
Keyboard - USB, Korean, #413	9179	MHD	8833
Keyboard - USB, Chinese/US, #467	9179	MHD	8834
Keyboard - USB, French Canadian, #445	9179	MHD	8835
Keyboard - USB, Thai, #191	9179	MHD	8836
Keyboard - USB, Russian, #443	9179	MHD	8838
Keyboard - USB, Yugoslavian/Latin, #105	9179	MHD	8839
Keyboard - USB, US English (EMEA), #103P	9179	MHD	8840
Mouse - USB, with Keyboard Attachment Cable	9179	MHD	8841
USB Mouse	9179	MHD	8845
Order Routing Indicator- System Plant	9179	MHD	9169
Language Group Specify - US English	9179	MHD	9300
Specify mode-1 & (1)5901/5278 for EXP24S #5887	9179	MHD	9359
Specify mode-1 & (2)5901/5278 for EXP24S #5887	9179	MHD	9360
Specify mode-2 & (2)5901/5278 for EXP24S #5887	9179	MHD	9361
Specify mode-4 & (4)5901/5278 for EXP24S #5887	9179	MHD	9365
Specify mode-2 & (4)5901/5278 for EXP24S #5887	9179	MHD	9366
Specify mode-1 & (2)5903/5805 for EXP24S #5887	9179	MHD	9367
Specify mode-2 & (4)5903/5805 for EXP24S #5887	9179	MHD	9368
Specify mode-1 & (1)5904/6/8 for EXP24S #5887	9179	MHD	9382
Specify mode-1 & (2) 5904/6/8 for EXP24S #5887	9179	MHD	9383
Specify mode-1 & CEC SAS port for EXP24 #5887	9179	MHD	9384
Specify mode-1 & (2) 5913 for EXP24S #5887	9179	MHD	9385
Specify mode-2 & (4) 5913 for EXP24S #5887	9179	MHD	9386
New AIX License Core Counter	9179	MHD	9440
New IBM i License Core Counter	9179	MHD	9441
New Red Hat License Core Counter	9179	MHD	9442
New SUSE License Core Counter	9179	MHD	9443
Other AIX License Core Counter	9179	MHD	9444
Other Linux License Core Counter	9179	MHD	9445
3rd Party Linux License Core Counter	9179	MHD	9446
VIOS Core Counter	9179	MHD	9447
Month Indicator	9179	MHD	9461
Day Indicator	9179	MHD	9462
Hour Indicator	9179	MHD	9463
Minute Indicator	9179	MHD	9464
Qty Indicator	9179	MHD	9465
Countable Member Indicator	9179	MHD	9466
Reserved Rack Space Indicator - 4U	9179	MHD	9570
Language Group Specify - Dutch	9179	MHD	9700
Language Group Specify - French	9179	MHD	9703
Language Group Specify - German	9179	MHD	9704
Language Group Specify - Polish	9179	MHD	9705
Language Group Specify - Norwegian	9179	MHD	9706
Language Group Specify - Portuguese	9179	MHD	9707
Language Group Specify - Spanish	9179	MHD	9708
Language Group Specify - Italian	9179	MHD	9711
Language Group Specify - Canadian French	9179	MHD	9712

Language Group Specify - Japanese	9179	MHD	9714
Language Group Specify - Traditional Chinese (Taiwan)	9179	MHD	9715
Language Group Specify - Korean	9179	MHD	9716
Language Group Specify - Turkish	9179	MHD	9718
Language Group Specify - Hungarian	9179	MHD	9719
Language Group Specify - Slovakian	9179	MHD	9720
Language Group Specify - Russian	9179	MHD	9721
Language Group Specify - Simplified Chinese (PRC)	9179	MHD	9722
Language Group Specify - Czech	9179	MHD	9724
Language Group Specify -- Romanian	9179	MHD	9725
Language Group Specify - Croatian	9179	MHD	9726
Language Group Specify -- Slovenian	9179	MHD	9727
Language Group Specify - Brazilian Portuguese	9179	MHD	9728
Language Group Specify - Thai	9179	MHD	9729
TurboCore Mode Specify Code	9179	MHD	9982
PCIe2 2-Port 10GbE RoCE SFP+ Adapter	9179	MHD	EC28
0.6m (2.0-ft), Blue CAT5 Ethernet Cable	9179	MHD	ECB0
1.5m (4.9-ft), Blue CAT5 Ethernet Cable	9179	MHD	ECB2
Carry-over Indicator for Single 5250 Enablement #4992 (MDL Upgrade Only)	9179	MHD	EH01
Carry-over Indicator for Full 5250 Enablement #4997 (MDL Upgrade Only)	9179	MHD	EH02
Carry-over Indicator AME #4791 (MDL Upgrade Only)	9179	MHD	EH03
Specify Mode-1 & (1)ESA1/ESA2 for EXP24S #5887	9179	MHD	EJP1
Specify Mode-1 & (2)ESA1/ESA2 for EXP24S #5887	9179	MHD	EJP2
Specify Mode-2 & (2)ESA1/ESA2 for EXP24S #5887	9179	MHD	EJP3
Specify Mode-2 & (4)ESA1/ESA2 for EXP24S #5887	9179	MHD	EJP4
Specify Mode-4 & (4)ESA1/ESA2 for EXP24S #5887	9179	MHD	EJP5
Specify Mode-2 & (1)ESA1/ESA2 for EXP24S #5887	9179	MHD	EJP6
Specify Mode-2 (2)ESA1/ESA2 for EXP24 #5887	9179	MHD	EJP7
Specify mode-2 (1) ESA1/ESA2 for EXP24 #5887	9179	MHD	EJPA
Specify mode-2 (2)ESA1/ESA2 for EXP24#5887	9179	MHD	EJPB
Specify mode-4 (1)ESA1/ESA2 for EXP24 #5887	9179	MHD	EJPC
Specify mode-4 (2)ESA1/ESA2 for EXP24 #5887	9179	MHD	EJPD
Specify mode-4 (3)ESA1/ESA2 for EXP24 #5887	9179	MHD	EJPE
Specify mode-2 (1)5901/5278 for EXP24 #5887	9179	MHD	EJPJ
Specify mode-2 (2)5901/5278 for EXP24 #5887	9179	MHD	EJPK
Specify mode-4 (1)5901/5278 for EXP24 #5887	9179	MHD	EJPL
Specify mode-4 (2)5901/5278 for EXP24 #5887	9179	MHD	EJPM
Specify mode-4 (3)5901/5278 for EXP24 #5887	9179	MHD	EJPN
Specify mode-2 (2)5903/5805 for EXP24 #5887	9179	MHD	EJPR
Specify mode-2 (2)5913 for EXP24 #5887	9179	MHD	EJPT
Specify Left Half 12X I/O Drawer to ESA1/ESA2	9179	MHD	EJPY
Specify Right Half 12X I/O Drawer to ESA1/ESA2	9179	MHD	EJPZ
Full width Keyboard -- USB, US English, #103P	9179	MHD	EK51
Full width Keyboard -- USB, French, #189	9179	MHD	EK52
Full width Keyboard -- USB, Italian, #142	9179	MHD	EK53
Full width Keyboard -- USB, German/Austrian, #129	9179	MHD	EK54
Full width Keyboard -- USB, UK English, #166P	9179	MHD	EK55
Full width Keyboard -- USB, Spanish, #172	9179	MHD	EK56
Full width Keyboard -- USB, Japanese, #194	9179	MHD	EK57
Full width Keyboard -- USB, Brazilian Portuguese, #275	9179	MHD	EK58
Full width Keyboard -- USB, Hungarian, #208	9179	MHD	EK59
Full width Keyboard -- USB, Korean, #413	9179	MHD	EK60
Full width Keyboard -- USB, Chinese, #467	9179	MHD	EK61
Full width Keyboard -- USB, French Canadian, #445	9179	MHD	EK62
Full width Keyboard -- USB, Belgian/UK, #120	9179	MHD	EK64
Full width Keyboard -- USB, Swedish/Finnish, #153	9179	MHD	EK65
Full width Keyboard -- USB, Danish, #159	9179	MHD	EK66
Full width Keyboard -- USB, Bulgarian, #442	9179	MHD	EK67
Full width Keyboard -- USB, Swiss/French/German, #150	9179	MHD	EK68
Full width Keyboard -- USB, Norwegian, #155	9179	MHD	EK69
Full width Keyboard -- USB, Dutch, #143	9179	MHD	EK70
Full width Keyboard -- USB, Portuguese, #163	9179	MHD	EK71
Full width Keyboard -- USB, Greek, #319	9179	MHD	EK72
Full width Keyboard -- USB, Hebrew, #212	9179	MHD	EK73
Full width Keyboard -- USB, Polish, #214	9179	MHD	EK74
Full width Keyboard -- USB, Slovakian, #245	9179	MHD	EK75
Full width Keyboard -- USB, Czech, #243	9179	MHD	EK76
Full width Keyboard -- USB, Turkish, #179	9179	MHD	EK77

Full width Keyboard -- USB, LA Spanish, #171	9179	MHD	EK78
Full width Keyboard -- USB, Arabic, #253	9179	MHD	EK79
Full width Keyboard -- USB, Thai, #191	9179	MHD	EK80
Full width Keyboard -- USB, Russian, #443	9179	MHD	EK81
Full width Keyboard -- USB, Slovenian, #234	9179	MHD	EK82
Full width Keyboard -- USB, US English Euro, #103P	9179	MHD	EK83
Trial PowerVM Live Partition Mobility	9179	MHD	ELPM
1m (3.3-ft), 10GbE Net Cable SFP+ Act Twinax Copper	9179	MHD	EN01
3m (9.8-ft), 10Gb E Net Cable SFP+ Act Twinax Copper	9179	MHD	EN02
5m (16.4-ft), 10Gb E Net Cable SFP+ Act Twinax Copper	9179	MHD	EN03
3.44 GHz Proc Card, 0/24 Core POWER7, 16 DDR3 Memory Slots	9179	MHD	EP24
1-Core Activation for Processor Feature #EP24	9179	MHD	EP25
Proc CoD Utility Billing, 100 Proc-mins. for #EP24, AIX/Linux	9179	MHD	EP26
Proc CoD Utility Billing, 100 Proc-mins. for #EP24, IBM i	9179	MHD	EP27
1 Proc-Day On/Off Billing for #EP24, AIX/Linux	9179	MHD	EP28
1 Proc-Day On/Off Billing for #EP24, IBM I	9179	MHD	EP29
100 On/Off Proc-Days of CoD Billing for Processor #4982, AIX/Linux	9179	MHD	EP2E
100 On/Off Proc-Days of CoD Billing for Processor #4982. IBM i	9179	MHD	EP2F
100 On/Off Proc-Days of CoD Billing for Processor #5003. AIX/Linux	9179	MHD	EP2L
100 On/Off Proc-Days of CoD Billing for Processor #5003. IBM i	9179	MHD	EP2M
100 On/Off Proc-Days of CoD Billing for Processor #EP24. AIX/Linux	9179	MHD	EP2N
100 On/Off Proc-Days of CoD Billing for Processor #EP24. IBM i	9179	MHD	EP2P
Quantity 150 of #3452 SAS YO Cable 6m - HD 6Gb Adapter to Enclosure	9179	MHD	EQ02
Quantity 150 of #3453 SAS YO Cable 10m - HD 6Gb Adapter to Enclosure	9179	MHD	EQ03
Quantity 150 of #ES0A	9179	MHD	EQ0A
Quantity of 150 #ES0B	9179	MHD	EQ0B
Quantity of 150 #ES0C	9179	MHD	EQ0C
Quantity of 150 #ES0D	9179	MHD	EQ0D
Power Cable - Drawer to IBM PDU, 200-240v/10A	9179	MHD	EQ77
RFID Tags for Servers, Compute Nodes, Chassis, Racks, and HMCs	9179	MHD	ERF1
387GB SFF-1 SSD for AIX/Linux with eMLC	9179	MHD	ES0A
387GB SFF-1 SSD for IBM i with eMLC	9179	MHD	ES0B
387GB SFF-2 SSD for AIX/Linux with eMLC	9179	MHD	ES0C
387GB SFF-2 SSD for IBM i with eMLC	9179	MHD	ES0D
PCIe2 RAID SAS Adapter Dual-port 6Gb	9179	MHD	ESA1
S&H - No Charge	9179	MHD	ESC0
S&H	9179	MHD	ESC8
1TB Removable Disk Drive Cartridge	9179	MHD	EU01
Service Processor-2	9179	MHD	EU05
RDX 320 GB Removable Disk Drive	9179	MHD	EU08
12X Cable Performance Specify	9179	MHD	EUC5

The following are newly announced features on the specific models of the IBM Power Systems 1455, 1457, 1611, 7014, 7863, 7893, 7895, 7953, 7955, 9119 machine type:

Planned availability date: October 12, 2012

New feature

Description	MT	Model	Feature
Analytics Data Node Add-on	7014	T42	EDAN

The following are newly announced features on the specific models of the IBM Power Systems 1455, 1457, 1611, 7014, 7863, 7893, 7895, 7953, 7955, 9119 machine type:

Planned availability date: October 19, 2012

New features

Description	MT	Model	Feature
0/256GB DDR3 Memory (4X64GB) DIMMS - 1066 MHZ - POWER7 CoD Memory	9119	FHB	5564
Advanced Rack Integration	7014	B42	ER00
	7014	S25	
	7014	T00	
	7014	T42	
Rack Content Specify: 2076-224 - 2U	7014	T42	ER03
Rack Content Specify: 2076-124 - 2U	7014	T42	ER04
Rack Content Specify: 1611-16E 1EIA (BINGO)	7014	B42	ER07
	7014	S25	
	7014	T00	
	7014	T42	
Rack Content Specify: 1455-24E	7014	B42	ER08
	7014	S25	
	7014	T00	
	7014	T42	
Rack Content Specify: 1455-48E	7014	B42	ER09
	7014	S25	
	7014	T00	
	7014	T42	
Rack Content Specify: 1455-64C	7014	B42	ER0A
	7014	S25	
	7014	T00	
	7014	T42	

The following are newly announced features on the specific models of the IBM Power Systems 1455, 1457, 1611, 7014, 7863, 7893, 7895, 7953, 7955, 9119 machine type:

Planned availability date: November 16, 2012

New features

Description	MT	Model	Feature
Customer Specified Rack Placement	7014	B42	0469
PCIe2 4-port 1GbE Adapter	9119	FHB	5899
Power Cable - Drawer to IBM PDU, 200-240V/10A	1455	24E	6577
	1455	48E	
	1455	64C	
	1611	16E	
Dynamic Platform Optimizer	9119	FHB	EB33
PCIe2 2-Port 10GbE RoCE SFP+ Adapter	9119	FHB	EC28
90 Days On/Off CoD Temporary Memory Enablement	9119	FHA	EM9T
	9119	FHB	
\$0 768 GB-Days of On/Off CoD Temporary Memory Resources	9119	FHB	EMJ0
\$0 576 GB-Days of On/Off CoD Temporary Memory Resources	9119	FHB	EMJ1
90 Days On/Off CoD Temporary Processor Core Enablement	9119	FHA	EP9T
	9119	FHB	
\$0 48 Proc-Days of On/Off CoD Temporary Processor Resources	9119	FHB	EPJ0
\$0 36 Proc-Days of On/Off CoD Temporary Processor Resources	9119	FHB	EPJ1
Advanced Rack Integration	7014	B42	ER00
	7014	S25	
	7014	T00	
	7014	T42	
Rack Content Specify: 2076-224 - 2U	7014	T42	ER03

Rack Content Specify: 2076-124 - 2U	7014	T42	ER04
Rack Content Specify: 1611-16E 1EIA (BINGO)	7014	B42	ER07
	7014	S25	
	7014	T00	
	7014	T42	
Rack Content Specify: 1455-24E	7014	B42	ER08
	7014	S25	
	7014	T00	
	7014	T42	
Rack Content Specify: 1455-48E	7014	B42	ER09
	7014	S25	
	7014	T00	
	7014	T42	
Rack Content Specify: 1455-64C	7014	B42	ER0A
	7014	S25	
	7014	T00	
	7014	T42	
CEC Acoustic Doors, Front & Rear	9119	FHB	ERG1
Self Powered Expansion Rack Acoustic Doors, Front & Rear	9119	FHB	ERG2
Bolt-on Expansion Rack Acoustic Doors, Front & Rear	9119	FHB	ERG3
Front Acoustic Door only for CEC Rack	9119	FHB	ERG4
Front Acoustic Door only for the Self Powered Expansion Rack	9119	FHB	ERG5
Front Acoustic Door only for the Bolt-on Expansion Rack	9119	FHB	ERG6
Front Door for Power 770 & 780 2.0 Meter Rack (High Perforation)	7014	T42	ERG7

Type/model conversions

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

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-MHC memory features

From FC:	To FC:	Return parts
5684 - Activation of 100 GB DDR2 Memory	8213 - Activation of 100 GB DDR3 POWER7 Memory	No

Feature conversions for 9117-MMA to 9179-MHD adapter features

From FC:	To FC:	Return parts
4808 - PCIe Crypto Coprocessor Gen3 BSC 4765-001	4809 - PCIe Crypto Coprocessor Gen4 BSC 4765-001	No
5904 - PCI-X DDR 1.5GB Cache SAS RAID Adapter	5908 - PCI-X DDR 1.5GB Cache SAS RAID Adapter (BSC)	No

5648 - Service Interface Card EU09 - Service Processor-3 Yes

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

From FC:	To FC:	Return parts
4495 - 4/8GB (4X2GB) DIMMS, 276 PIN 533 MHZ, DDR2 SDRAM	EM40 - 0/32GB DDR3 Memory (4X8GB) DIMMS - 1066 MHZ - POWER7+ CoD Memory	Yes
4496 - 8/16GB (4X4GB) DIMMS, 276 PIN, 533 MHZ DDR2 SDRAM	EM40 - 0/32GB DDR3 Memory (4X8GB) DIMMS - 1066 MHZ - POWER7+ CoD Memory	Yes
4497 - 16GB (4X4GB) DIMMS, 276 PIN, 533 MHZ, DDR2 SDRAM	EM40 - 0/32GB DDR3 Memory (4X8GB) DIMMS - 1066 MHZ - POWER7+ CoD Memory	Yes
4499 - 16GB (4X4GB) DIMMS, 276 pin, 400MHZ DDR2 SDRAM	EM40 - 0/32GB DDR3 Memory (4X8GB) DIMMS - 1066 MHZ - POWER7+ CoD Memory	Yes
5693 - 0/4GB DDR2 Memory (4X1GB) DIMMS- 667 MHZ- POWER6 CoD Memory	EM40 - 0/32GB DDR3 Memory (4X8GB) DIMMS - 1066 MHZ - POWER7+ CoD Memory	Yes
5694 - 0/8GB DDR2 Memory (4X2GB) DIMMS- 667 MHZ- POWER6 CoD Memory	EM40 - 0/32GB DDR3 Memory (4X8GB) DIMMS - 1066 MHZ - POWER7+ CoD Memory	Yes
5695 - 0/16GB DDR2 Memory (4X4GB) DIMMS- 533 MHZ- POWER6 CoD Memory	EM40 - 0/32GB DDR3 Memory (4X8GB) DIMMS - 1066 MHZ - POWER7+ CoD Memory	Yes
7892 - 2GB (4x512MB) DIMMS, 276-pin, 533MHZ DDR2 SDRAM	EM40 - 0/32GB DDR3 Memory (4X8GB) DIMMS - 1066 MHZ - POWER7+ CoD Memory	Yes
7893 - 4GB (4x1GB) DIMMS, 276-pin, 533MHZ DDR2 SDRAM	EM40 - 0/32GB DDR3 Memory (4X8GB) DIMMS - 1066 MHZ - POWER7+ CoD Memory	Yes
7894 - 8GB (4x2GB) DIMMS, 276-pin, 533 MHZ DDR2 SDRAM	EM40 - 0/32GB DDR3 Memory (4X8GB) DIMMS - 1066 MHZ - POWER7+ CoD Memory	Yes
4495 - 4/8GB (4X2GB) DIMMS, 276 PIN 533 MHZ, DDR2 SDRAM	EM41 - 0/64GB DDR3 Memory (4X8GB) DIMMS - 1066 MHZ - POWER7+ CoD Memory	Yes
4496 - 8/16GB (4X4GB) DIMMS, 276 PIN, 533 MHZ DDR2 SDRAM	EM41 - 0/64GB DDR3 Memory (4X8GB) DIMMS - 1066 MHZ - POWER7+ CoD Memory	Yes
4497 - 16GB (4X4GB) DIMMS, 276 PIN, 533 MHZ, DDR2 SDRAM	EM41 - 0/64GB DDR3 Memory (4X8GB) DIMMS - 1066 MHZ - POWER7+ CoD Memory	Yes
4498 - 32GB (4X8GB) DIMMS, 276 pin, 400MHZ DDR2 SDRAM	EM41 - 0/64GB DDR3 Memory (4X8GB) DIMMS - 1066 MHZ - POWER7+ CoD Memory	Yes
4499 - 16GB (4X4GB) DIMMS, 276 pin, 400MHZ DDR2 SDRAM	EM41 - 0/64GB DDR3 Memory (4X8GB) DIMMS - 1066 MHZ - POWER7+ CoD Memory	Yes
5690 - 0/32GB DDR2 Memory (4X8GB) DIMMS- 400 MHZ- POWER6 CoD Memory	EM41 - 0/64GB DDR3 Memory (4X8GB) DIMMS - 1066 MHZ - POWER7+ CoD Memory	Yes
5693 - 0/4GB DDR2 Memory (4X1GB) DIMMS- 667 MHZ- POWER6 CoD Memory	EM41 - 0/64GB DDR3 Memory (4X8GB) DIMMS - 1066 MHZ - POWER7+ CoD Memory	Yes
5694 - 0/8GB DDR2 Memory (4X2GB) DIMMS- 667 MHZ- POWER6 CoD Memory	EM41 - 0/64GB DDR3 Memory (4X8GB) DIMMS - 1066 MHZ - POWER7+ CoD Memory	Yes
5695 - 0/16GB DDR2 Memory (4X4GB) DIMMS- 533 MHZ- POWER6 CoD Memory	EM41 - 0/64GB DDR3 Memory (4X8GB) DIMMS - 1066 MHZ - POWER7+ CoD Memory	Yes
5696 - 0/32GB DDR2 Memory (4X8GB) DIMMS- 400 MHZ- POWER6 CoD Memory	EM41 - 0/64GB DDR3 Memory (4X8GB) DIMMS - 1066 MHZ - POWER7+ CoD Memory	Yes
7892 - 2GB (4x512MB) DIMMS, 276-pin, 533MHZ DDR2 SDRAM	EM41 - 0/64GB DDR3 Memory (4X8GB) DIMMS - 1066 MHZ - POWER7+ CoD Memory	Yes
7893 - 4GB (4x1GB) DIMMS,	EM41 - 0/64GB DDR3 Memory	Yes

276-pin, 533MHz DDR2 SDRAM	(4X8GB) DIMMS - 1066 MHZ - POWER7+ CoD Memory	
7894 - 8GB (4x2GB) DIMMS, 276-pin, 533 MHZ DDR2 SDRAM	EM41 - 0/64GB DDR3 Memory (4X8GB) DIMMS - 1066 MHZ - POWER7+ CoD Memory	Yes
4496 - 8/16GB (4X4GB) DIMMS, 276 PIN, 533 MHZ DDR2 SDRAM	EM42 - 0/128GB DDR3 Memory (4X8GB) DIMMS - 1066 MHZ - POWER7+ CoD Memory	Yes
4497 - 16GB (4X4GB) DIMMS, 276 PIN, 533 MHZ, DDR2 SDRAM	EM42 - 0/128GB DDR3 Memory (4X8GB) DIMMS - 1066 MHZ - POWER7+ CoD Memory	Yes
4498 - 32GB (4X8GB) DIMMS, 276 pin, 400MHZ DDR2 SDRAM	EM42 - 0/128GB DDR3 Memory (4X8GB) DIMMS - 1066 MHZ - POWER7+ CoD Memory	Yes
4499 - 16GB (4X4GB) DIMMS, 276 pin, 400MHZ DDR2 SDRAM	EM42 - 0/128GB DDR3 Memory (4X8GB) DIMMS - 1066 MHZ - POWER7+ CoD Memory	Yes
5690 - 0/32GB DDR2 Memory (4X8GB) DIMMS- 400 MHZ- POWER6 CoD Memory	EM42 - 0/128GB DDR3 Memory (4X8GB) DIMMS - 1066 MHZ - POWER7+ CoD Memory	Yes
5695 - 0/16GB DDR2 Memory (4X4GB) DIMMS- 533 MHZ- POWER6 CoD Memory	EM42 - 0/128GB DDR3 Memory (4X8GB) DIMMS - 1066 MHZ - POWER7+ CoD Memory	Yes
5696 - 0/32GB DDR2 Memory (4X8GB) DIMMS- 400 MHZ- POWER6 CoD Memory	EM42 - 0/128GB DDR3 Memory (4X8GB) DIMMS - 1066 MHZ - POWER7+ CoD Memory	Yes
5680 - Activation of 1GB DDR2 POWER6 Memory	EMA2 - Activation of 1 GB DDR3 POWER7+ Memory	No
7272 - 2GB CUoD Memory Activation	EMA2 - Activation of 1 GB DDR3 POWER7+ Memory	No
7273 - 4GB CUoD Memory Activation	EMA2 - Activation of 1 GB DDR3 POWER7+ Memory	No
7274 - 8GB CUoD Memory Activation	EMA2 - Activation of 1 GB DDR3 POWER7+ Memory	No
7275 - 16GB CUoD Memory Activation	EMA2 - Activation of 1 GB DDR3 POWER7+ Memory	No
7276 - 32GB CUoD Memory Activation	EMA2 - Activation of 1 GB DDR3 POWER7+ Memory	No
7663 - 1GB DDR2 Memory Activation	EMA2 - Activation of 1 GB DDR3 POWER7+ Memory	No
5681 - Activation of 256 GB DDR2 POWER6 Memory	EMA3 - Activation of 100 GB DDR3 POWER7+ Memory	No
5684 - Activation of 100 GB DDR2 Memory	EMA3 - Activation of 100 GB DDR3 POWER7+ Memory	No

Feature conversions for 9117-MMA to 9179-MHD miscellaneous features

From FC:	To FC:	Return parts
1845 - Operator Panel	EC53 - Operator Panel	Yes

Feature conversions for 9117-MMA to 9179-MHD processor features

From FC:	To FC:	Return parts
4990 - Single 5250 Enterprise Enablement	4992 - Single 5250 Enterprise Enablement	No
4991 - Full 5250 Enterprise Enablement	4997 - Full 5250 Enterprise Enablement	No
5620 - 3.5 GHz Proc Card, 0/2 Core POWER6, 12 DDR2 Memory Slots	EPH0 - 4.42 GHz 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	EPH0 - 4.42 GHz 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	EPH0 - 4.42 GHz Proc Card, 0/16 Core POWER7+, 16 DDR3 Memory Slots	Yes
7380 - 4.7 GHz Proc Card, 0/	EPH0 - 4.42 GHz Proc Card,	Yes

2 Core POWER6, 12 DDR2 Memory Slots 7387 - 4.4GHZ Proc Card, 0/	0/16 Core POWER7+, 16 DDR3 Memory Slots EPH0 - 4.42 GHz Proc Card,	Yes
2 Core POWER6, 12 DDR2 Memory Slots. 7388 - 5.0 GHz Proc Card, 0/	0/16 Core POWER7+, 16 DDR3 Memory Slots EPH0 - 4.42 GHz Proc Card,	Yes
2 Core POWER6, 12 DDR2 Memory Slots 7540 - 4.2 GHz Proc Card, 0/	0/16 Core POWER7+, 16 DDR3 Memory Slots EPH0 - 4.42 GHz Proc Card,	Yes
4 Core POWER6, 12 DDR2 Memory Slots 5620 - 3.5 GHz Proc Card, 0/	0/16 Core POWER7+, 16 DDR3 Memory Slots EPH2 - 3.72 GHz Proc Card,	Yes
2 Core POWER6, 12 DDR2 Memory Slots 5621 - 4.2 GHz Proc Card, 0/	0/32 Core POWER7+, 16 DDR3 Memory Slots EPH2 - 3.72 GHz Proc Card,	Yes
2 Core POWER6, 8 DDR2 Memory Slots 5622 - 4.2 GHz Proc Card, 0/	0/32 Core POWER7+, 16 DDR3 Memory Slots EPH2 - 3.72 GHz Proc Card,	Yes
2 Core POWER6, 12 DDR2 Memory Slots 7380 - 4.7 GHz Proc Card, 0/	0/32 Core POWER7+, 16 DDR3 Memory Slots EPH2 - 3.72 GHz Proc Card,	Yes
2 Core POWER6, 12 DDR2 Memory Slots 7387 - 4.4GHZ Proc Card, 0/	0/32 Core POWER7+, 16 DDR3 Memory Slots EPH2 - 3.72 GHz Proc Card,	Yes
2 Core POWER6, 12 DDR2 Memory Slots. 7388 - 5.0 GHz Proc Card, 0/	0/32 Core POWER7+, 16 DDR3 Memory Slots EPH2 - 3.72 GHz Proc Card,	Yes
2 Core POWER6, 12 DDR2 Memory Slots 7540 - 4.2 GHz Proc Card, 0/	0/32 Core POWER7+, 16 DDR3 Memory Slots EPH2 - 3.72 GHz Proc Card,	Yes
4 Core POWER6, 12 DDR2 Memory Slots 5403 - One Processor	EPHA - 1-Core Activation	No
Activation for Processor Feature #7380	for Processor Feature EPH0	
5670 - One Processor	EPHA - 1-Core Activation	No
Activation for Processor Feature #5620	for Processor Feature EPH0	
5671 - One Processor	EPHA - 1-Core Activation	No
Activation for Processor Feature #5621	for Processor Feature EPH0	
5672 - One Processor	EPHA - 1-Core Activation	No
Activation for Processor Feature #5622	for Processor Feature EPH0	
7306 - One Processor	EPHA - 1-Core Activation	No
Activation for Processor Feature #7388	for Processor Feature EPH0	
7700 - One Processor	EPHA - 1-Core Activation	No
Activation for Processor Feature #7540	for Processor Feature EPH0	
7719 - One Processor	EPHA - 1-Core Activation	No
Activation for Processor Feature #7387	for Processor Feature EPH0	
5403 - One Processor	EPHC - 1-Core Activation	No
Activation for Processor Feature #7380	for Processor Feature EPH2	
5670 - One Processor	EPHC - 1-Core Activation	No
Activation for Processor Feature #5620	for Processor Feature EPH2	
5671 - One Processor	EPHC - 1-Core Activation	No
Activation for Processor Feature #5621	for Processor Feature EPH2	
5672 - One Processor	EPHC - 1-Core Activation	No
Activation for Processor Feature #5622	for Processor Feature EPH2	
7306 - One Processor	EPHC - 1-Core Activation	No
Activation for Processor Feature #7388	for Processor Feature EPH2	
7700 - One Processor	EPHC - 1-Core Activation	No
Activation for Processor Feature #7540	for Processor Feature EPH2	
7719 - One Processor	EPHC - 1-Core Activation	No
Activation for Processor Feature #7387	for Processor Feature EPH2	

Feature conversions for 9117-MMA to 9179-MHD 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
5626 - System CEC Enclosure with IBM Bezel	EB95 - System CEC Enclosure with IBM BEZEL, I/O Backplane, and System Midplane	Yes
5683 - System Chassis - 4 EIA	EB95 - System CEC Enclosure with IBM BEZEL, I/O Backplane, and System Midplane	Yes
5627 - System CEC Enclosure with OEM Bezel + Labels	EB96 - System CEC Enclosure with OEM BEZEL, I/O Backplane, and System Midplane	Yes

Feature conversions for 9179-MHB to 9179-MHD adapter features

From FC:	To FC:	Return parts
4808 - PCIe Crypto Coprocessor Gen3 BSC 4765-001	4809 - PCIe Crypto Coprocessor Gen4 BSC 4765-001	No
5904 - PCI-X DDR 1.5GB Cache SAS RAID Adapter	5908 - PCI-X DDR 1.5GB Cache SAS RAID Adapter (BSC)	No
5664 - Service Processor	EU09 - Service Processor-3	Yes

Feature conversions for 9179-MHB to 9179-MHD cable features

From FC:	To FC:	Return parts
3711 - Processor Cable, Two-Drawer System	3715 - Processor Cable, Two,Three-Drawer System, 4 socket	Yes
3712 - Processor Cable, Two, Three or Four Drawer System	3716 - Processor Cable, Two,Three,Four-Drawer System, 4 socket	Yes
3713 - Processor Cables, Three or Four Drawer System	3717 - Processor Cable, Three,Four-Drawer System, 4 socket	Yes
3714 - Processor Cables, Four-Drawer System	3718 - Processor Cable, Four-Drawer System, 4 socket	Yes

Feature conversions for 9179-MHB to 9179-MHD memory features

From FC:	To FC:	Return parts
8212 - Activation of 1 GB DDR3 POWER7 Memory	EMA2 - Activation of 1 GB DDR3 POWER7+ Memory	No
8213 - Activation of 100 GB DDR3 POWER7 Memory	EMA3 - Activation of 100 GB DDR3 POWER7+ Memory	No

Feature conversions for 9179-MHB to 9179-MHD processor features

From FC:	To FC:	Return parts
4982 - 3.86 GHz / 4.14 GHz TurboCore Proc Card, 0/16	EPH0 - 4.42 GHz Proc Card, 0/16 Core POWER7+, 16 DDR3	Yes

Core POWER7, 16 DDR3 Memory Slots	Memory Slots	
4982 - 3.86 GHz / 4.14 GHz TurboCore Proc Card, 0/16	EPH2 - 3.72 GHz Proc Card, 0/32 Core POWER7+, 16 DDR3 Memory Slots	Yes
5469 - One Processor Activation for Processor Feature #4982	EPHA - 1-Core Activation for Processor Feature EPH0	No
5469 - One Processor Activation for Processor Feature #4982	EPHC - 1-Core Activation for Processor Feature EPH2	No

Feature conversions for 9179-MHB to 9179-MHD 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 to 9179-MHD system unit base features

From FC:	To FC:	Return parts
5597 - System CEC Enclosure with IBM BEZEL, I/O Backplane, and System Midplane	EB95 - System CEC Enclosure with IBM BEZEL, I/O Backplane, and System Midplane	Yes
5598 - System CEC Enclosure with OEM BEZEL, I/O Backplane, and System Midplane	EB96 - System CEC Enclosure with OEM BEZEL, I/O Backplane, and System Midplane	Yes

Feature conversions for 9179-MHC to 9179-MHD adapter features

From FC:	To FC:	Return parts
4808 - PCIe Crypto Coprocessor Gen3 BSC 4765-001	4809 - PCIe Crypto Coprocessor Gen4 BSC 4765-001	No
5904 - PCI-X DDR 1.5GB Cache SAS RAID Adapter	5908 - PCI-X DDR 1.5GB Cache SAS RAID Adapter (BSC)	No
EU05 - Service Processor-2	EU09 - Service Processor-3	Yes

Feature conversions for 9179-MHC to 9179-MHD cable features

From FC:	To FC:	Return parts
3711 - Processor Cable, Two-Drawer System	3715 - Processor Cable, Two,Three-Drawer System, 4 socket	Yes
3712 - Processor Cable, Two, Three or Four Drawer System	3716 - Processor Cable, Two,Three,Four-Drawer System, 4 socket	Yes
3713 - Processor Cables, Three or Four Drawer System	3717 - Processor Cable, Three,Four-Drawer System, 4 socket	Yes
3714 - Processor Cables, Four-Drawer System	3718 - Processor Cable, Four-Drawer System, 4 socket	Yes

Feature conversions for 9179-MHC to 9179-MHD memory features

From FC:	To FC:	Return parts
8212 - Activation of 1 GB DDR3 POWER7 Memory	EMA2 - Activation of 1 GB DDR3 POWER7+ Memory	No
8213 - Activation of 100 GB DDR3 POWER7 Memory	EMA3 - Activation of 100 GB DDR3 POWER7+ Memory	No

Feature conversions for 9179-MHC to 9179-MHD processor features

From FC:	To FC:	Return parts
5003 - 3.92 GHz / 4.14 GHz TurboCore Proc Card, 0/16 Core POWER7, 16 DDR3 Memory Slots	EPH0 - 4.42 GHz Proc Card, 0/16 Core POWER7+, 16 DDR3 Memory Slots	Yes
EP24 - 3.44 GHz Proc Card, 0/24 Core POWER7, 16 DDR3 Memory Slots	EPH0 - 4.42 GHz Proc Card, 0/16 Core POWER7+, 16 DDR3 Memory Slots	Yes
5003 - 3.92 GHz / 4.14 GHz TurboCore Proc Card, 0/16 Core POWER7, 16 DDR3 Memory Slots	EPH2 - 3.72 GHz Proc Card, 0/32 Core POWER7+, 16 DDR3 Memory Slots	Yes
EP24 - 3.44 GHz Proc Card, 0/24 Core POWER7, 16 DDR3 Memory Slots	EPH2 - 3.72 GHz Proc Card, 0/32 Core POWER7+, 16 DDR3 Memory Slots	Yes
5339 - 1-Core Activation for Processor Feature #5003	EPHA - 1-Core Activation for Processor Feature EPH0	No
EP25 - 1-Core Activation for Processor Feature #EP24	EPHA - 1-Core Activation for Processor Feature EPH0	No
5339 - 1-Core Activation for Processor Feature #5003	EPHC - 1-Core Activation for Processor Feature EPH2	No
EP25 - 1-Core Activation for Processor Feature #EP24	EPHC - 1-Core Activation for Processor Feature EPH2	No

Feature conversions for 9179-MHC to 9179-MHD system unit base features

From FC:	To FC:	Return parts
5595 - System CEC Enclosure with IBM BEZEL, I/O Backplane, and System Midplane	EB95 - System CEC Enclosure with IBM BEZEL, I/O Backplane, and System Midplane	Yes
5596 - System CEC Enclosure with OEM BEZEL, I/O Backplane, and System Midplane	EB96 - System CEC Enclosure with OEM BEZEL, I/O Backplane, and System Midplane	Yes

Feature conversions for 9179-MHD 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).

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 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-MHD) 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 MHD servers can have one to four CEC enclosures.

To assure installability and serviceability in non-IBM industry-standard racks, review the 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 Hz +/- 3 Hz
- Power consumption: 1,900 watts maximum (per enclosure with 24 cores active)
- Power source loading: 1.959 kVA maximum (per enclosure with 24 cores active)
- Thermal output: 6,485 Btu/hr maximum (per enclosure with 24 cores active)
- Maximum altitude: 3,048 m (10,000 ft)
- Noise level:
 - One enclosure with 24 active cores:
 - 7.1 bels (operating/idle)
 - 6.6 bels (operating/idle) with acoustic rack doors
 - Four enclosures with 128 active cores:
 - 7.6 bels (operating/idle)
 - 7.1 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: 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 Type Approval

Homologation approval for specific countries has been initiated with the IBM Homologation and Type Approval (HT&A) organization in LaGaude, France.

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

Product safety/Country testing/Certification

- UL 60950-1 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-MHD can be installed in a 7014-T00 or 7014-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 7014-T42 rack. Both the 7014 front cover and the external processor fabric cables occupy space on the front left and right sides of an IBM 7014 rack and 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 in 36U or below to allow space for the flex cables.

Minimum system configuration

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

- One CEC enclosure (4U) with the following:
 - 1X System Enclosure with IBM Bezel (#EB95) or OEM Bezel (#EB96)
 - 1X Service Processor-2 (#EU09)
 - 1X DASD Backplane (#5652)
 - 2X Power Cords (two selected by client)
 - 2X AC Power Supply (#5532)
 - 1X Operator Panel (#EC53)
 - 1X Integrated Multifunction Card (one of these):
 - Quad 2 X 1 GB and 2 X 10 GB Optical (#1769)
 - Quad 2 X 1 GB and 2 X 10 GB Copper (#1768)
- **Note:** The Integrated Multifunction Card is not natively supported by IBM i.
- 1X Primary operating system (one of these):
 - AIX (#2146)
 - Linux (#2147)
 - IBM i (#2145)

- 1X Processor card (one of these):
 - 3.72 GHz, 32-core POWER7+ Processor card, 0-core active (#EPH2)
 - 4.42 GHz, 16-core POWER7+ Processor card, 0-core active (#EPH0)
- 4X Processor Activations (quantity of four for one of these):
 - One Processor Activation for Processor Feature EPH2 (#EPHC)
 - One Processor Activation for Processor Feature EPH0 (#EPHA)
- The first two DIMM slots of must be 2 identical memory feature codes.
- 2X DDR3 memory DIMMs: 0/32 GB (4 X 8 GB), 1066 MHz, (#EM40 or larger). These must be identical memory features.
- 32X GB memory activation of 1 GB DDR3 - POWER7+ Memory (#EMA2).
- 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 client).
- 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-MHD; however, a communal HMC is acceptable.

Notes :

- Additional optional features can be added, as desired.
- Feature-coded racks are allowed for I/O expansion only.
- A machine type/model rack, if desired, should be ordered as the primary rack.
- A minimum number of four processor activations must be ordered per system.
- The minimum activations ordered with all initial orders of memory features EM40, EM41, EM42, and EM44 must be 50% of their installed capacity.
- The minimum activations ordered with MES orders of memory features EM40, EM41, EM42, and EM44 will depend on the total installed capacity of features EM40, EM41, EM42, and EM44. This allows newly ordered memory to be purchased with less than 50% activations when the currently installed capacity exceeds 50% of the existing features EM40, EM41, EM42, and EM44
- The minimum activations installed for all memory including features 5600, 5601, 5602, and 5564 must be 50% of their installed capacity.
- Memory activations are distributed equally across all memory features by the same activation features EMA2 (1 GB) or EMA3 (100 GB).

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 website 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, desktide HMC.

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

Software requirements

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

- AIX Version 7.1 with the 7100-02 Technology Level, or later
- AIX Version 7.1 with the 7100-01 Technology Level and Service Pack 6, or later (planned availability December 19, 2012)
- AIX Version 7.1 with the 7100-00 Technology Level and Service Pack 8, or later (planned availability December 19, 2012)
- AIX Version 6.1 with the 6100-08 Technology Level, or later
- AIX Version 6.1 with the 6100-07 Technology Level and Service Pack 6, or later (planned availability December 19, 2012)
- AIX Version 6.1 with the 6100-06 Technology Level and Service Pack 10, or later (planned availability December 19, 2012)

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

- IBM i 7.1 TR5, or later; required if an IBM i partition is present with IBM i hardware.
- IBM i 6.1 with machine code 6.1.1, or later
 - All I/O must be virtual,
 - Can not be ordered as the primary OS with feature number 0566.

Visit the IBM Prerequisite website 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):

- Red Hat Enterprise Linux 6.3 for POWER , or later
- Red Hat Enterprise Linux 5.7 for POWER , or later
- SUSE Linux Enterprise Server 11 Service Pack 2, or later, with current maintenance updates available from SUSE to enable all planned functionality

If installing VIOS:

- VIOS 2.2.2.0
- VIOS 2.2.1.5 (planned availability December 19, 2012)

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 7, Java 6, or Java 5 whenever possible. For more information, refer to the following website

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

Limitations

The 9179-MHD has the following limitations:

- Memory rules and restrictions for the Power 780 (9179-MHD)
 - The first eight memory DIMM slots of each enclosure must always be populated and must use equal memory DIMM sizes.
 - The size of the first eight memory DIMM slots will determine the maximum LPAR size that can be supported within the system based on the following table.

DDR3 Memory Feature	Maximum LPAR size with Hypervisor mirroring enabled	Maximum LPAR size with Hypervisor mirroring disabled
#EM40 (8 GB DIMMs)	512 GB	1 TB
#EM41 (16 GB DIMMs)	1 TB	2 TB
#EM42 (32 GB DIMMs)	2 TB	4 TB
#EM44 (64 GB DIMMs)	4 TB	4 TB

- The last eight DIMM slots of each enclosure are populated independently and can have different memory DIMM sizes from the first eight and from each other.
- If the last eight DIMM slots of the first enclosure are populated with identical DIMMS that represent a larger DIMM size than the first eight, then their size will determine the maximum LPAR size.
- The Integrated Multifunction Card's Ethernet ports cannot be used for an IBM i console. Separate Ethernet adapters that can be directly controlled by IBM i without VIOS should be used for IBM i LAN consoles, if needed. Alternatively, an HMC can also be used for an IBM i console.
- 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 that 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
 - 10,000 rpm SCSI drives
 - 15,000 rpm SCSI drives
 - IDE DVD drives in the CEC enclosure (DVD drives: #3706, #4430, #4460, #4633, #5756, and #5757)
 - DDR2 memory
 - SCSI adapters: features 2749, 2757, 2780, 5580, 5581, 5583, 5590, 5591, 5702, 5712, 5776, 5778, and 5706
 - Fibre Channel adapters: features 2787, 5704, 5760, and 5761
 - Integrated System x® servers: features 4812 and 4813
 - Ethernet adapters: features 1981, 5718, 1982, 5719, 1984, 5707, and 3709
 - IOPs: features 2844, 2847, and 3705
 - DTTA (telephony): (#6312)
 - Twinax: (#4746)
 - Cryptographic adapters: (#4801 and #5805)
 - Diskette drives: (#2591)
 - Quarter-Inch Cartridge (QIC) tape drives (neither feature number nor machine type/model)
- Only model upgrades from the 9117-MMA, 9179-MHB, or 9179-MHC is supported. A 9406-MMA must first be converted to a 9117-MMA.
- 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 feature 5802 or 5877 drawer, plus the necessary DDR IB cables, SPCN cable, and GX++ adapter (#1808).

Limitations:

- Live Partition Mobility is optional with Power VM Enterprise Edition.
- Active Memory Sharing is optional with Power VM Enterprise Edition and requires:

- AIX V7.1
- AIX V6.1 with the 6100-06 Technology Level and Service Pack 10, or later (planned availability December 19, 2012)
- IBM i 6.1 with machine code 6.1.1, or later and VIOS 2.2.2.0
- SUSE Linux Enterprise Server 11 Service Pack 1 for Power , or later
- Red Hat Enterprise Linux 6.1 for POWER , or later
- Active Memory Mirroring is standard on 9179-MHD and requires Firmware level 7.4, or later.

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

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

Warranty service

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

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 services 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 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

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.

Warranty service upgrades

Usage plan machine

No

IBM hourly service rate classification

Two

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

Field-installable features

Yes

Model conversions

Yes

Machine installation

Installation is performed by IBM . IBM will install the machine in accordance with the IBM installation procedures for the machine. In the United States, contact IBM at 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

No

Licensed machine code

Access to machine code updates is conditioned on entitlement and license validation in accordance with IBM policy and practice. IBM may verify entitlement through customer number, serial number, electronic restrictions, or any other means or methods employed by IBM in its discretion.

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

Educational allowance

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

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

Prices

Product charges

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

Description	Initial/		MES/ Both/ Support	RP	
	Model Number	Feature Numbers		CSU	MES
IBM Power 780	MHD			No	
One CSC Billing Unit	MHD	0010	Both	Yes	No
Ten CSC Billing Units	MHD	0011	Both	Yes	No
Mirrored System Disk Level, Sp	MHD	0040	Both	Yes	No
Device Parity Protection All					

Mirrored System Bus Level	MHD	0041	Both	Yes	No
Device Parity RAID 6 All	MHD	0043	Both	Yes	No
	MHD	0047	Both	Yes	No
US TAA Compliance Indicator	MHD	0983	Both	N/A	No
Modem Cable US/Canada and GU	MHD	1025	Both	Yes	No
USB External Docking Station R	MHD	1104	Both	Yes	No
USB 160 GB Removable Disk Dr	MHD	1106	Support	Yes	No
USB 500 GB Removable Disk Dr	MHD	1107	Both	Yes	No
3m, Blue Cat5e Cable	MHD	1111	Both	Yes	No
10m, Blue Cat5e Cable	MHD	1112	Both	Yes	No
25m, Blue Cat5e Cable	MHD	1113	Both	Yes	No
Decline ESA Indicator	MHD	1120	Initial	N/A	No
CAT5E Ethernet Cbl 25M YELLOW	MHD	1121	Both	Yes	No
Custom Serv. Specify, Roch	MHD	1140	Both	Yes	No
200V 16A 4.3m (14 Ft) TL Line	MHD	1406	Support	Yes	No
4.3m 200V/16A Pwr Cd Italy	MHD	1408	Support	Yes	No
200V 1.8m (6 Ft) Watertight LC	MHD	1415	Support	Yes	No
200V 4.3m (14 Ft) Locking Line	MHD	1416	Support	Yes	No
200V 4.3m (14 Ft) Watertight L	MHD	1417	Support	Yes	No
200V 1.8m (6 Ft) Locking Line	MHD	1424	Support	Yes	No
200V 1.8m (6 Ft) Watertight Li	MHD	1425	Support	Yes	No
200V 4.3m (14 Ft) Locking Line	MHD	1426	Support	Yes	No
200V 4.3m (14 Ft) Watertight L	MHD	1427	Support	Yes	No
4.3m 200V/32A Power Cord EU 1	MHD	1449	Support	Yes	No
4.3m 200V/16A Power Cord EU 2	MHD	1450	Support	Yes	No
200V (6 Ft) 1.8m Line Cord	MHD	1451	Support	Yes	No
200V (14 Ft) 4.3m Line Cord	MHD	1452	Support	Yes	No
200V (6 Ft) 1.8m Locking Line	MHD	1453	Support	Yes	No
200V 12A (14 Ft) 4.3m TL Line	MHD	1454	Support	Yes	No
200V (6 Ft) 1.8m Watertight Li					

	MHD	1455	Support	Yes	No
200V (14 Ft) 4.3m watertight L	MHD	1456	Support	Yes	No
200V (6 Ft) 1.8m Upper Line Co	MHD	1457	Support	Yes	No
200V (6 Ft) 1.8m Upper Locking	MHD	1458	Support	Yes	No
200V (6 Ft) 1.8m Locking	MHD	1459	Support	Yes	No
30m SPCN Cable	MHD	1466	Support	Yes	No
900GB 10k RPM SAS SFF Disk	MHD	1751	Both	Yes	No
900GB 10k RPM SAS SFF-2 Disk	MHD	1752	Both	Yes	No
Quad ENET Card w Copper SFP+	MHD	1768	Both	Yes	No
Quad ENET Card w SR Optical	MHD	1769	Both	Yes	No
177GB SFF-1 SSD w/ eMLC AIX/Li	MHD	1775	Both	Yes	No
177GB SFF-1 SSD w/ eMLC IBM i	MHD	1787	Both	Yes	No
600GB 10k RPM SAS SFF Disk	MHD	1790	Both	Yes	No
177GB SFF-2 SSD w/ eMLC AIX/Li	MHD	1793	Both	Yes	No
177GB SFF-2 SSD w/ eMLC IBM i	MHD	1794	Both	Yes	No
GX 12X DDR Adapter Dual port	MHD	1808	Both	No	No
SAS Cable for triple split DAS	MHD	1815	Both	Yes	No
Quantity 150 of #1962	MHD	1817	Both	Yes	No
Quantity 150 of #1964	MHD	1818	Both	Yes	No
SAS Cbl Assembly for SAS Port	MHD	1819	Both	Yes	No
1.5 Meter 12X to 4X Channel CC	MHD	1828	Both	Yes	No
0.6 Meter 12X Cable	MHD	1829	Support	Yes	No
1.5 Meter 12X cable	MHD	1830	Support	Yes	No
8.0 Meter 12X Cable	MHD	1834	Support	Yes	No
3.0 Meter 12X Cable	MHD	1840	Support	Yes	No
3 Meter 12X to 4X Channel CC	MHD	1841	Both	Yes	No
12X to 4X Chan conv- 10M	MHD	1842	Support	Yes	No
Quantity 150 of #1956	MHD	1844	Both	Yes	No
Operator Panel	MHD	1853	Support	Yes	No
10 Meter 12X to 4X Enhance CCC	MHD	1854	Both	Yes	No
0.6 Meter 12X DDR Cable	MHD	1861	Both	Yes	No
1.5 Meter 12X DDR Cable	MHD	1862	Both	Yes	No
8 Meter 12X DDR Cable	MHD	1864	Both	Yes	No
3.0 Meter 12X DDR Cable	MHD	1865	Both	Yes	No
Quantity 150 of #1917	MHD	1866	Both	Yes	No
Quantity 150 of #1947	MHD	1868	Both	Yes	No
Quantity 150 of #1925					

	MHD	1869	Both	Yes	No
283GB 15K RPM SAS Disk					
	MHD	1879	Both	Yes	No
300GB 15K RPM SAS Disk					
	MHD	1880	Both	Yes	No
146.8GB 10K RPM SAS SFF Disk D					
	MHD	1882	Support	Yes	No
73.4 GB 15K RPM SAS SFF Disk D					
	MHD	1883	Support	Yes	No
69.7 GB 15K RPM SAS SFF Disk D					
	MHD	1884	Support	Yes	No
300GB 10K RPM SFF SAS Disk D					
	MHD	1885	Both	Yes	No
146GB 15K RPM SFF SAS Disk D					
	MHD	1886	Both	Yes	No
Quantity 150 of #1793					
	MHD	1887	Both	Yes	No
139GB 15K RPM SFF SAS Disk D					
	MHD	1888	Both	Yes	No
QUANTITY 150 OF 1883					
	MHD	1891	Support	Yes	No
QUANTITY 150 OF 1882					
	MHD	1899	Support	Yes	No
283GB 10K RPM SFF SAS Disk Dri					
	MHD	1911	Both	Yes	No
PCI X DDR Dual Channel Ultra32					
	MHD	1912	Support	Yes	No
GX++ 2-port PCIe2 x8 Adapter					
	MHD	1914	Both	Yes	No
571GB 10k RPM SAS SFF Disk					
	MHD	1916	Both	Yes	No
146GB 15k RPM SAS SFF-2 Disk					
	MHD	1917	Both	Yes	No
300GB 10k RPM SAS SFF-2 Disk					
	MHD	1925	Both	Yes	No
Quantity 150 of #1879					
	MHD	1926	Both	Yes	No
Quantity 150 of #1948					
	MHD	1927	Both	Yes	No
Quantity 150 of #1880					
	MHD	1928	Both	Yes	No
Quantity 150 of #1953					
	MHD	1929	Both	Yes	No
139GB 15k RPM SAS SFF-2 Disk					
	MHD	1947	Both	Yes	No
283GB 15k RPM SAS SFF-2 Disk					
	MHD	1948	Both	Yes	No
300GB 15k RPM SAS SFF-2 Disk					
	MHD	1953	Both	Yes	No
283GB 10k RPM SAS SFF-2 Disk					
	MHD	1956	Both	Yes	No
Quantity 150 of #1794					
	MHD	1958	Both	Yes	No
571GB 10k RPM SAS SFF-2 Disk					
	MHD	1962	Both	Yes	No
600GB 10k RPM SAS SFF-2 Disk					
	MHD	1964	Both	Yes	No
177GB SSD Module with eMLC (AI					
	MHD	1995	Both	No	No
1 Gigabit iSCSI TOE PCI X on C					
	MHD	1996	Both	No	No
PCIe RAID SSD SAS Adapter 3Gb					
	MHD	2055	Both	Yes	No
Converter Cable, VHDCI to P, M					
	MHD	2118	Support	Yes	No
Primary OS - IBM i					
	MHD	2145	Both	Yes	No
Primary OS AIX					
	MHD	2146	Both	Yes	No
Primary OS Linux					
	MHD	2147	Both	Yes	No
LC-SC 50 Micron Fiber Conv Cab					
	MHD	2456	Both	Yes	No
LC-SC 62.5 Mic.Fib.Conv.Cable					

4 port USB PCIe Adapter	MHD	2459	Both	Yes	No
2 Port USB PCI Adapter	MHD	2728	Both	Yes	No
POWER GXT135P Graphics Acceler	MHD	2738	Support	Yes	No
ARTIC960Hx 4 Port EIA 232 Cabl	MHD	2849	Support	Yes	No
ARTIC960Hx 4 Port X 21 Cable	MHD	2861	Support	Yes	No
ARTIC960Hx 4-Port V.35(DTE)Cab	MHD	2863	Support	Yes	No
PCIe 2 Line WAN w/Modem	MHD	2864	Support	Yes	No
	MHD	2893	Both	Yes	No
Asynch.Termin/Print.Cbl EIA232	MHD	2934	Both	Yes	No
Asynchronous Cable EIA 232/V	MHD	2936	Both	Yes	No
8P Async Adp. EIA232/RS-422	MHD	2943	Support	Yes	No
ARTIC960Hx 4Port Mult.PCI Adp	MHD	2947	Support	Yes	No
Cable, v.24 / EIA-232	MHD	2951	Support	Yes	No
Cable, v.35	MHD	2952	Support	Yes	No
Cable, v.36 / EIA 499	MHD	2953	Support	Yes	No
Cable, X.21	MHD	2954	Support	Yes	No
2-Port Multip. PCI Adapter	MHD	2962	Support	Yes	No
Ser to Ser Port Cab Draw/Draw	MHD	3124	Both	Yes	No
Serial to Se.Port Cbl Rack 8M	MHD	3125	Both	Yes	No
1m, QDR IB Copper Cable	MHD	3287	Both	Yes	No
3m, QDR IB Copper Cable	MHD	3288	Both	Yes	No
5m QDR IB/E'Net Copper Cable	MHD	3289	Both	Yes	No
10m QDR IB Optic Cable	MHD	3290	Both	Yes	No
30m QDR IB Optic Cable	MHD	3293	Both	Yes	No
SAS YO Cable 1.5m - HD 6Gb Ada	MHD	3450	Both	Yes	No
SAS YO Cable 3m - HD 6Gb Adapt	MHD	3451	Both	Yes	No
SAS YO Cable 6m - HD 6Gb Adapt	MHD	3452	Both	Yes	No
SAS YO Cable 10m - HD 6Gb Adap	MHD	3453	Both	Yes	No
SAS X Cable 3m - HD 6Gb 2-Adap	MHD	3454	Both	Yes	No
SAS X Cable 6m - HD 6Gb 2-Adap	MHD	3455	Both	Yes	No
SAS X Cable 10m - HD 6Gb 2-Ada	MHD	3456	Both	Yes	No
SAS YO Cable 15m - HD 3Gb Adap	MHD	3457	Both	Yes	No
SAS X Cable 15m - HD 3Gb 2-Ada	MHD	3458	Both	Yes	No
69GB 3.5 SAS Solid State Driv	MHD	3586	Support	Yes	No
69GB 3.5 SAS Solid State Driv	MHD	3587	Support	Yes	No

NOTE: The monitor or display features are subject to a \$8 Electronic Waste Recycling Fee (15-inch to 34-inch video device.)

Widescreen LCD Monitor

T210 Flat Panel Monitor	MHD	3632	Both	Yes	No
T541H/L150p 15inchTFT Col.M	MHD	3635	Support	Yes	No
ThinkVision L170p Flat Pan.M	MHD	3637	Support	Yes	No
ThinkVision L171p Flat Panel M	MHD	3639	Support	Yes	No
IBM T115 Flat Panel Monitor	MHD	3640	Support	Yes	No
ThinkVision L191p Flat Panel M	MHD	3641	Support	Yes	No
IBM T120 Flat Panel Monitor	MHD	3642	Support	Yes	No
19in. Flat Panel Monitor	MHD	3643	Support	Yes	No
17in. Flat Panel Monitor	MHD	3644	Support	Yes	No
73GB 15K RPM SAS Disk Drive	MHD	3645	Support	Yes	No
146GB 15K RPM SAS Disk Drive	MHD	3646	Support	Yes	No
300GB 15K RPM SAS Disk Drive	MHD	3647	Support	Yes	No
450GB 15K RPM SAS Disk Drive	MHD	3648	Support	Yes	No
SAS Cable (EE) Drawer to Dr 1M	MHD	3649	Support	Yes	No
SAS Cable (EE) Drawer to Dr 3M	MHD	3652	Both	Yes	No
SAS Cable (EE) Drawer to Dr 6M	MHD	3653	Both	Yes	No
428GB 15K RPM SAS Disk Drive	MHD	3654	Both	Yes	No
SAS Cable (X) Adapter to SAS E	MHD	3658	MES	Yes	No
SAS Cbl X Adp SAS Enclosure 6M	MHD	3661	Both	Yes	No
SAS Cbl X Adp SAS Encl 15M	MHD	3662	Both	Yes	No
Serv Interface Cable 2 3 and 4	MHD	3663	Both	Yes	No
Serv Interface Cable 3 and 4 E	MHD	3671	Both	Yes	No
Serv Interface Cable 4 Encl	MHD	3672	Both	Yes	No
SAS EX cable 3M - Drw to Drw	MHD	3673	Both	Yes	No
69.7GB 15k rpm SAS Disk Drv	MHD	3675	Both	Yes	No
139.5GB 15k rpm SAS Disk Drive	MHD	3676	Support	Yes	No
283.7GB 15k rpm SAS Disk Drive	MHD	3677	MES	Yes	No
SAS Cab (AI) Adapter to Int 1M	MHD	3678	MES	Yes	No
SAS EX Cable 6m - Drw to Drw	MHD	3679	Both	Yes	No
3M SAS CABLE, ADPTR TO ADPTR (MHD	3680	Both	Yes	No
6M SAS CABLE, ADPTR TO ADPTR (MHD	3681	Both	Yes	No
SAS Cab (AE) Adapter to En 3M	MHD	3682	Support	Yes	No
SAS Cable(AE) Adapter to En 6M	MHD	3684	Both	Yes	No
SAS Ca(YI) System to SAS 1.5M	MHD	3685	Both	Yes	No
SAS Ca(YI) System to SAS 3M	MHD	3686	Support	Yes	No
SAS Cable (AT) 0.6 Meter	MHD	3687	Both	Yes	No
SAS AT Cable 0.6m - HD 6Gb Ada	MHD	3688	Both	Yes	No

	MHD	3689	Both	Yes	No
SAS Cab(YO) Adapter to SAS1.5M	MHD	3691	Both	Yes	No
SAS Cab(YO) Adapter to SAS 3M	MHD	3692	Both	Yes	No
SAS Cab(YO) Adapter to SAS 6M	MHD	3693	Both	Yes	No
SAS Cab(YO) Adapter to SAS 15M	MHD	3694	Both	Yes	No
Process Cbl TwoThree Drawer	MHD	3715	Both	Yes	Yes
Process Cbl TwoThreeFour Drwr	MHD	3716	Both	Yes	Yes
Process Cbl ThreeFour Drawer	MHD	3717	Both	Yes	Yes
Process Cbl Four Drawer	MHD	3718	Both	Yes	Yes
0.3M Serial Prt Converter Cbl	MHD	3925	Both	Yes	No
Asynch Printer/Term.Cab,4M	MHD	3926	Support	Yes	No
Serial Port Null Mod Cab 3.7M	MHD	3927	Both	Yes	No
Ser.Port Null Modem Cable,10M	MHD	3928	Both	Yes	No
System Serial Port Converter C	MHD	3930	Both	Yes	No
6Foot Extend.Cbl for Displays	MHD	4242	Both	Yes	No
Extender Cable USB Keybo 1.8M	MHD	4256	Both	Yes	No
VGA to DVI Connection Converte	MHD	4276	Both	Yes	No
Package 5X 2055 20X 1995	MHD	4367	Both	Yes	No
Package 5X 2055 20X 1995	MHD	4377	Both	Yes	No
One and only one rack indicator feature is required on all orders (#4650 to #4666). No Factory Integration Ind.					
Rack Indicator, Rack 1	MHD	4650	Initial	N/A	No
Rack Indicator, Rack 2	MHD	4651	Initial	N/A	No
Rack Indicator, Rack 3	MHD	4652	Initial	N/A	No
Rack Indicator, Rack 4	MHD	4653	Initial	N/A	No
Rack Indicator, Rack 5	MHD	4654	Initial	N/A	No
Rack Indicator, Rack 6	MHD	4655	Initial	N/A	No
Rack Indicator, Rack 7	MHD	4656	Initial	N/A	No
Rack Indicator, Rack 8	MHD	4657	Initial	N/A	No
Rack Indicator, Rack 9	MHD	4658	Initial	N/A	No
Rack Indicator, Rack 10	MHD	4659	Initial	N/A	No
Rack Indicator, Rack 11	MHD	4660	Initial	N/A	No
Rack Indicator, Rack 12	MHD	4661	Initial	N/A	No
Rack Indicator, Rack 13	MHD	4662	Initial	N/A	No
Rack Indicator, Rack 14	MHD	4663	Initial	N/A	No
Rack Indicator, Rack 15	MHD	4664	Initial	N/A	No
Rack Indicator, Rack 16	MHD	4665	Initial	N/A	No
On/Off, 999 GB-Days Billing	MHD	4666	Initial	N/A	No

PCI-X Crypt.Coproc.(FIPS 4)	MHD	4710	MES	Yes	No
Active Memory Exp Enablement	MHD	4764	Support	Yes	No
PCIe Crypto Coprocessor Gen3	MHD	4791	Both	Yes	No
PCIe Crypto Coprocessor Gen4	MHD	4808	Both	Yes	No
CBU SPECIFY	MHD	4809	Both	Yes	No
Single 5250 Enter. Enabl.	MHD	4891	Initial	N/A	
Full 5250 Enter. Enable.	MHD	4992	Both	Yes	No
Software Preload Required	MHD	4997	Both	Yes	No
Power Dist Unit 1 Phase NEMA	MHD	5000	Initial	N/A	No
Power Dist Unit 1 Phase IEC	MHD	5160	Support	Yes	No
Power Dist Unit 2 of 3 Phase	MHD	5161	Support	Yes	No
Power Dist Unit - 3 Phase	MHD	5162	Support	Yes	No
PCIe 2-Port 4X IB QDR Adapt	MHD	5163	Support	Yes	No
PCIe2 2-port 10GbE SR Adapter	MHD	5285	Both	Yes	No
PCIe2 2-port 10GbE SFP+ Adaptr	MHD	5287	Both	Yes	No
2 Port Async EIA 232 PCIe Adap	MHD	5288	Both	Yes	No
System Pwr Sup -1925W	MHD	5289	Both	Yes	No
Sys Console On HMC	MHD	5532	Both	Yes	No
Sys Console Ethernet No IOP	MHD	5550	Both	Yes	No
0/256GB DDR3 1066MHZ 4 DIMMS	MHD	5553	Both	Yes	No
0/32GB DDR3 1066MHZ 4 DIMMS	MHD	5564	MES	No	No
0/64GB DDR3 1066MHZ 4 DIMMS	MHD	5600	MES	No	Yes
0/128GB DDR3 1066MHZ 4 DIMMS	MHD	5601	MES	No	Yes
Blind Swap Type III Cas PCIe	MHD	5602	MES	No	Yes
Blind Swap Type III Cas PCI X	MHD	5646	MES	Yes	No
Disk/Media Backplane	MHD	5647	MES	Yes	No
175MB Cache RAID Dual IOA	MHD	5652	Both	No	No
FSP/Clock Pass Through Card	MHD	5662	Both	Yes	No
IBM Gigab.Eth-SX PCI-X Adapter	MHD	5665	Both	Yes	No
10/100/1000 BaseTX Eth.PCI-X	MHD	5700	Support	Yes	No
2-Port BaseTX Etht.PCI-X Adp	MHD	5701	Support	Yes	No
10Gb FCoE PCIe Dual Port Adapt	MHD	5706	Both	Yes	No
1Gb iSCSI TOE PCI-X-Copp.Adpt	MHD	5708	Both	Yes	No
1Gb iSCSI TOE PCI-X-Opt.Adpt	MHD	5713	Both	Yes	No
2 Gigab.Fibre Chann.PCI-X Adp	MHD	5714	Support	Yes	No
4 Port 10/100/1000 Base TX PCI	MHD	5716	Support	Yes	No
10Gb Etht-SR PCI-X 2.0 DDR Adp	MHD	5717	Both	Yes	No

	MHD	5721	Support	Yes	No
10Gb Etht-LR PCI-X 2.0 DDR Adp	MHD	5722	Support	Yes	No
2 Port Asyn.EIA-232 PCI Adpt	MHD	5723	Support	Yes	No
PCIe2 8Gb 4-port Fibre Channel	MHD	5729	Both	Yes	No
10 Gigabit Ethernet CX4 PCI Ex	MHD	5732	Both	Yes	No
8 Gigabit PCI Express Dual Por	MHD	5735	Both	Yes	No
PCI X DDR Dual Channel Ultra32	MHD	5736	Both	Yes	No
4-Port 10/100/1000 BaseTX Adpt	MHD	5740	Support	Yes	No
PCIe2 4-Port 10GbE&1GbE SR&RJ4	MHD	5744	Both	Yes	No
PCIe2 4-Port 10GbE&GbE SFP+Cop	MHD	5745	Both	Yes	No
POWER GXT145 PCI Express Graph	MHD	5748	Both	Yes	No
4Gbps Fibre Channel (2 Port)	MHD	5749	Both	Yes	No
4 GB Single-Port Fibre Channel	MHD	5758	Support	Yes	No
4 Gb Dual Port Fibre Channel	MHD	5759	Both	Yes	No
SATA Slimline DVD RAM Drive	MHD	5762	Both	Yes	No
2 Port 10/100/1000 Base TX Eth	MHD	5767	Both	Yes	No
2 Port Gigabit Ethernet SX PCI	MHD	5768	Both	Yes	No
10 Gb Eth SR PCI Express Adp	MHD	5769	Both	Yes	No
SATA Slimline DVD-RAM Drive	MHD	5771	Both	Yes	No
10 Gigabit Ethernet LR PCI	MHD	5772	Both	Yes	No
4GigabitPCI-E Single Port Fibr	MHD	5773	Support	Yes	No
4 Gigabit PCI Express Dual Por	MHD	5774	Both	Yes	No
4 Port Async EIA 232 PCIe Adap	MHD	5785	Both	Yes	No
PCI DDR 12X Expansion Drawer	MHD	5796	Support	Yes	No
12X I/O Drawer PCIe, SFF disk	MHD	5802	Both	Yes	No
PCIe 380MB Cache Dual x4 3Gb S	MHD	5805	Both	Yes	No
12X I/O Drawer PCIe, No Disk	MHD	5877	Both	Yes	No
EXP 12S Expansion Drawer	MHD	5886	Support	Yes	No
EXP24S SFF Gen2-bay Drawer	MHD	5887	Both	Yes	No
PCIe2 4-port 1GbE Adapter	MHD	5899	Both	Yes	No
PCI-X SAS Adaper	MHD	5900	Support	Yes	No
PCIe Dual x4 SAS Adapter	MHD	5901	Both	Yes	No
PCI X DDR Dual x4 3Gb SAS RAID	MHD	5902	Support	Yes	No
PCIe 380MB Cache Dual x4 3Gb	MHD	5903	Support	Yes	No
PCI X DDR 1.5GB Cache SAS RAID	MHD	5908	Both	Yes	No
PCI X DDR Dual x4 SAS Adapter	MHD	5912	Both	Yes	No
PCIe2 1.8GB Cache RAID SAS Ada	MHD	5913	Both	Yes	No
SAS AA Cable 3m - HD 6Gb Adapt					

SAS AA Cable 6m - HD 6Gb Adapt	MHD	5915	Both	Yes	No
SAS AA Cable 1.5m - HD 6Gb Ada	MHD	5916	Both	Yes	No
SAS AA Cbl 0.6m - HD 6Gb Adapt	MHD	5917	Both	Yes	No
Non paired SAS RAID indicator	MHD	5918	Both	Yes	No
Non paired PCIe SAS RAID Ind	MHD	5922	Support	Yes	No
Non-paired Indicator 5913 PCIe	MHD	5923	Both	Yes	No
Shared EXP30 Indicator	MHD	5924	Both	Yes	No
SAS EX Cable 1.5m - Drw to Drw	MHD	5925	Both	Yes	No
Remote EXP30 Indicator	MHD	5926	Both	Yes	No
Full width Key USB, US English	MHD	5927	Both	Yes	No
Full width Key USB, French	MHD	5951	Support	Yes	No
Full width Key USB, Italian	MHD	5952	Support	Yes	No
Full width Key USB, German/Aus	MHD	5953	Support	Yes	No
Full width Key USB, UK English	MHD	5954	Support	Yes	No
Full width Key USB, Spanish	MHD	5955	Support	Yes	No
Full width Key USB, Japanese	MHD	5956	Support	Yes	No
Full width Key USB, BrazilianP	MHD	5957	Support	Yes	No
Full width Key USB, Hungarian	MHD	5958	Support	Yes	No
Full width Key USB, Korean	MHD	5959	Support	Yes	No
Full width Key USB, Chinese	MHD	5960	Support	Yes	No
Full width Key USB, French Can	MHD	5961	Support	Yes	No
Full width Keyb-USB, Canad Fr	MHD	5962	Support	Yes	No
Full width Key USB, Belgian/UK	MHD	5963	Support	Yes	No
Full width Key USB, Swedish/Fi	MHD	5964	Support	Yes	No
Full width Key USB, Danish	MHD	5965	Support	Yes	No
Full width Key USB, Bulgarian	MHD	5966	Support	Yes	No
Full width Key USB, Swiss/Fr/G	MHD	5967	Support	Yes	No
Full width Key USB, Norwegian	MHD	5968	Support	Yes	No
Full width Key USB, Dutch	MHD	5969	Support	Yes	No
Full width Key USB, Portuguese	MHD	5970	Support	Yes	No
Full width Key USB, Greek	MHD	5971	Support	Yes	No
Full width Key USB, Hebrew	MHD	5972	Support	Yes	No
Full width Key USB, Polish	MHD	5973	Support	Yes	No
Full width Key USB, Slovakian	MHD	5974	Support	Yes	No
Full width Key USB, Czech	MHD	5975	Support	Yes	No
Full width Key USB, Turkish	MHD	5976	Support	Yes	No
Full width Key USB, LA Spanish	MHD	5977	Support	Yes	No

Full width Key USB, Arabic	MHD	5978	Support	Yes	No
Full width Key USB, Thai	MHD	5979	Support	Yes	No
Full width Key USB, Russian	MHD	5980	Support	Yes	No
Full width Key USB, Slovenian	MHD	5981	Support	Yes	No
Full width Key USB, US English	MHD	5982	Support	Yes	No
Power Control Cable(SPCN)-2m	MHD	5983	Support	Yes	No
Power Control Cbl (SPCN) 3 m	MHD	6001	Support	Yes	No
Power Control Cbl (SPCN) 15 m	MHD	6006	Both	Yes	No
Power Control Cable(SPCN)-6m	MHD	6007	Both	Yes	No
Power Control Cable(SPCN)-30m	MHD	6008	Support	Yes	No
Opt Front Door for 1.8m Rack	MHD	6029	Support	Yes	No
Opt Front Door for 2.0m Rack	MHD	6068	MES	Yes	No
High-end Side Covers	MHD	6069	MES	Yes	No
1.8m Rack Trim Kit	MHD	6238	MES	Yes	No
2.0m Rack Trim Kit	MHD	6246	Support	Yes	No
1.8m Rack Acoustic Doors	MHD	6247	Support	Yes	No
2.0m Rack Acoustic Doors	MHD	6248	MES	Yes	No
High-end Front Door	MHD	6249	MES	Yes	No
1.8m Rack Trim Kit	MHD	6250	MES	Yes	No
2.0m Rack Trim Kit	MHD	6263	MES	Yes	No
Dual prt 12X Chan Attach Short	MHD	6272	MES	Yes	No
4.3m 250V/10A Power Cord	MHD	6446	Support	Yes	No
Dual port 12X Chan Attach Long	MHD	6455	Support	Yes	No
Pwr Crd 4.3m 14ft wall IBM PDU	MHD	6457	Support	Yes	No
3.7m 250V/10A RA Pwr Cd	MHD	6458	Both	Yes	No
Pwr Crd (14FT), Drwr - OEM PDU	MHD	6459	Support	Yes	No
4.3m 250V/10A Power Cord	MHD	6460	Both	Yes	No
4.3m 250V/10A Power Cord	MHD	6461	Support	Yes	No
4.3m 250V/10A Power Cord	MHD	6462	Support	Yes	No
4.3m 250V/10A Power Cord	MHD	6463	Support	Yes	No
4.3m 250V/10A Power Cord	MHD	6464	Support	Yes	No
4.3m 250V/10A Power Cord	MHD	6465	Support	Yes	No
4.3m 250V/10A Power Cord	MHD	6466	Support	Yes	No
4.3m 250V/10A Power Cord	MHD	6467	Support	Yes	No
Pwr Crd 4.3m 14ft wall OEM PDU	MHD	6469	Both	Yes	No
Pwr Crd 1.8m 6ft wall 125V/15A	MHD	6470	Support	Yes	No
Pwr Crd 2.7m 9ft wall OEM PDU	MHD	6471	Both	Yes	No

Pwr Crd 2.7m 9ft wall OEM PDU	MHD	6472	Both	Yes	No
Pwr Crd 2.7m 9ft wall OEM PDU	MHD	6473	Both	Yes	No
Pwr Crd 2.7m 9ft wall OEM PDU	MHD	6474	Both	Yes	No
Pwr Crd 2.7m 9ft wall OEM PDU	MHD	6475	Both	Yes	No
Pwr Crd 2.7m 9ft wall OEM PDU	MHD	6476	Both	Yes	No
Pwr Crd 2.7m 9ft wall OEM PDU	MHD	6477	Both	Yes	No
Pwr Crd 2.7m 9ft wall OEM PDU	MHD	6478	Both	Yes	No
PWR Cord(9foot), (250V,10A)	MHD	6479	Support	Yes	No
Pwr Crd 1.8m 6ft wall 250V,15A	MHD	6487	Support	Yes	No
Pwr Crd 2.7m 9ft wall OEM PDU	MHD	6488	Both	Yes	No
4.3m (14 Ft) 3PH/24A Power Cor	MHD	6489	MES	Yes	No
4.3m (14 Ft) 1PH/48A Pwr Cord	MHD	6491	MES	Yes	No
4.3m (14 Ft) 1PH/48 60A Pwr Co	MHD	6492	MES	Yes	No
Pwr Crd 2.7m 9ft wall OEM PDU	MHD	6493	Both	Yes	No
Pwr Crd 2.7m 9ft wall OEM PDU	MHD	6494	Both	Yes	No
To wall/OEM PDU, (250V, 10A)	MHD	6495	Support	Yes	No
Pwr Crd 2.7m 9ft wall 250V,10A	MHD	6496	Both	Yes	No
PWR Cord(6ft),To wall/OEM PDU	MHD	6497	Both	Yes	No
Power Cord 6ftTo wall OEM PDU	MHD	6498	Support	Yes	No
Power Cable Drawer to IBM PD	MHD	6577	Both	Yes	No
Optional Rack Security Kit	MHD	6580	MES	Yes	No
Modem Tray for 19-Inch Rack	MHD	6586	MES	Yes	No
Pwr Crd 2.7m 9ft wall 125V,15A	MHD	6651	Both	Yes	No
4.3m 1PH/24-30A Pwr Cord	MHD	6654	MES	Yes	No
4.3m 14Ft 1PH/24 30A WR Pwr	MHD	6655	MES	Yes	No
4.3m 14Ft 1PH/24A Power Cord	MHD	6656	MES	Yes	No
Pwr.Cord(9ft),To wall/OEM PDU	MHD	6659	Both	Yes	No
Pwr Crd 14ft 4.3m wallOEM PDU	MHD	6660	MES	Yes	No
2.1m 200V PDU Power Cable	MHD	6664	Support	Yes	No
Pwr Crd 2.8m 9.2ft wall PDU	MHD	6665	Both	Yes	No
Pwr Crd 4.3M, Drwr - OEM PDU	MHD	6669	Both	Yes	No
Pwr Crd 6-FT, (125V,15A)PT#59	MHD	6670	Support	Yes	No
Pwr Crd 2.7M, Drwr - IBM PDU	MHD	6671	Both	Yes	No
Pwr Crd 1.5M, Drwr - IBM PDU	MHD	6672	Both	Yes	No
Pwr Crd 2.7m 9ft wall OEM PDU	MHD	6680	Both	Yes	No
Power Cord (6ft),To wall	MHD	6687	Support	Yes	No
PCI 2-Line WAN IOA No IOP	MHD	6805	Support	Yes	No

PCI 4-Modem WAN IOA No IOP	MHD	6808	Support	Yes	No
PCI 2-Line WAN w/Modem NoIOP	MHD	6833	Support	Yes	No
IIIntelligent PDU+ 1 EIA Unit	MHD	7109	MES	Yes	No
Environmental Monitoring Probe	MHD	7118	Both	Yes	No
Power Distribution Unit	MHD	7188	MES	Yes	No
AAP Software Pre-Inst.Indic.	MHD	7305	Initial	N/A	No
I/O Drawer Mounting Enclosure	MHD	7314	Support	Yes	No
On/Off, 1GB-1Day Billing	MHD	7377	MES	Yes	No
Quantity 150 of #3676	MHD	7517	Support	Yes	No
Quantity 150 of #3677	MHD	7518	Support	Yes	No
Quantity 150 of #3678	MHD	7519	Support	Yes	No
Quantity 150 of 3586	MHD	7535	Support	Yes	No
Quantity 150 of 3587	MHD	7536	Support	Yes	No
Quantity 150 of 3658	MHD	7538	Support	Yes	No
Quantity 150 of #1884	MHD	7543	Support	Yes	No
Quantity 150 of #1888	MHD	7544	Both	Yes	No
Quantity 150 of #1885	MHD	7547	Both	Yes	No
Quantity 150 of #1886	MHD	7548	Both	Yes	No
Quantity 150 of 3647	MHD	7549	Support	Yes	No
Quantity 150 of #1790	MHD	7550	Both	Yes	No
PCIe RAID SSD SAS Adapter 3Gb	MHD	7557	Both	Yes	No
Quantity 150 of 3648	MHD	7564	Support	Yes	No
Quantity 150 of 3649	MHD	7565	Support	Yes	No
Quantity 150 of #1916	MHD	7566	Both	Yes	No
QTY 150 177GB SFF-1 SSD 1775	MHD	7578	Both	Yes	No
QTY 150 177GB SFF-1 SSD IBM i	MHD	7582	Both	Yes	No
2.0m Rack Side Attach Kit	MHD	7780	Support	Yes	No
Eth Cbl 6M HW Management	MHD	7801	Support	Yes	No
Eth Cbl 15M HW Management	MHD	7802	Both	Yes	No
Side-by-Side for 1.8m Racks	MHD	7840	Support	Yes	No
Ruggedize Rack Kit	MHD	7841	Support	Yes	No
PCI Blind Swap Cassette Kit	MHD	7862	Support	Yes	No
PCI Blind Swap Cassette Kit	MHD	7863	MES	Yes	No
PowerVM Standard Edition	MHD	7942	Both	Yes	No
PowerVM Enterprise Edition	MHD	7995	Both	Yes	No
570toMMA Adv POWER Virt COI	MHD	8018	MES	Yes	No
Advanced POWER Virtualization					

	MHD	8030	MES	Yes	No
RJ-45 to DB-25 Converter Cable	MHD	8133	Support	Yes	No
Linux Software Preinstall	MHD	8143	Initial	N/A	No
Linux Software Preinstall BP	MHD	8144	Initial	N/A	No
One Processor Activation for P	MHD	8430	Support	Yes	No
PWR Cord Carry Over Ind,#9802	MHD	8431	Support	Yes	No
PWR Cord Carry Over Ind,#9820	MHD	8432	Support	Yes	No
PWR Cord Carry Over Ind,#9821	MHD	8433	Support	Yes	No
PWR Cord Carry Over Ind,#9825	MHD	8434	Support	Yes	No
PWR Cord Carry Over Ind,#9827	MHD	8435	Support	Yes	No
PWR Cord Carry Over Ind,#9828	MHD	8436	Support	Yes	No
PWR Cord Carry Over Ind,#9829	MHD	8437	Support	Yes	No
PWR Cord Carry Over Ind,#9830	MHD	8438	Support	Yes	No
PWR Cord Carry Over Ind,#9831	MHD	8439	Support	Yes	No
PWR Cord Carry Over Ind,#9833	MHD	8440	Support	Yes	No
PWR Cord Carry Over Ind,#9834	MHD	8441	Support	Yes	No
Base Customer Spec Plcmnt	MHD	8453	Initial	N/A	No
Carry-over Indicator for 5665	MHD	8525	MES	No	No
Carry-over Indicator for 5652	MHD	8526	MES	No	No
Carry-over Indicator for 5662	MHD	8529	MES	No	No
Carry-over Indicator for 1853	MHD	8532	MES	No	No
Mouse-USB,Black KBD Att C	MHD	8841	Support	Yes	No
USB Mouse	MHD	8845	Both	Yes	No
Order Routing Indicator System	MHD	9169	Initial	N/A	No
Language Group Spcf-US Eng	MHD	9300	Initial	N/A	No
specify mode-1 & (1)5901/5278	MHD	9359	Both	Yes	No
Specify mode-1 & (2)5901/5278	MHD	9360	Both	Yes	No
Specify mode-2 & (2)5901/5278	MHD	9361	Both	Yes	No
Specify mode-4 & (4)5901/5278	MHD	9365	Both	Yes	No
Specify mode-2 & (4)5901/5278	MHD	9366	Both	Yes	No
Specify mode-1 & (2)5903/5805	MHD	9367	Both	Yes	No
Specify mode-2 & (4)5903/5805	MHD	9368	Both	Yes	No
Specify mode-1 & (1)5904/6/8	MHD	9382	MES	Yes	No
Specify mode-1 & (2) 5904/6/8	MHD	9383	MES	Yes	No
Specify mode-1 & CEC SAS port	MHD	9384	Both	Yes	No
Specify mode-1 & (2) 5913 EXP	MHD	9385	Both	Yes	No
Specify mode-2 & (4) 5913 EXP	MHD	9386	Both	Yes	No
Mode-1 & EXP30 for 1 EXP24S #5					

	MHD	9388	Both	Yes	No
New AIX License Core Counter	MHD	9440	Initial	N/A	No
New IBM i Lic Core Counter	MHD	9441	Initial	N/A	No
New Red Hat Lic Core Counter	MHD	9442	Initial	N/A	No
New SUSE Lic Core Counter	MHD	9443	Initial	N/A	No
Other AIX Lic Core Counter	MHD	9444	Initial	N/A	No
Other Linux Lic Core Counter	MHD	9445	Initial	N/A	No
3rd Party Linux Lic Core Cnt	MHD	9446	Initial	N/A	No
VIOS Core Counter	MHD	9447	Initial	N/A	No
Month Indicator	MHD	9461	Initial	N/A	No
Day Indicator	MHD	9462	Initial	N/A	No
Hour Indicator	MHD	9463	Initial	N/A	No
Minute Indicator	MHD	9464	Initial	N/A	No
Qty Indicator	MHD	9465	Initial	N/A	No
Countable Member Indicator	MHD	9466	Initial	N/A	No
Reserved Rack Space Indicator	MHD	9570	Initial	N/A	No
Language Group Spcf-Dutch	MHD	9700	Initial	N/A	No
Language Group Spcf-French	MHD	9703	Initial	N/A	No
Language Group Spcf-German	MHD	9704	Initial	N/A	No
Language Group Spcf-Polish	MHD	9705	Initial	N/A	No
Lang Group Specify - Norwegian	MHD	9706	Initial	N/A	No
Lang.Group Spcf-Portuguese	MHD	9707	Initial	N/A	No
Language Group Spcf-Spanish	MHD	9708	Initial	N/A	No
Language Group Spcf-Italian	MHD	9711	Initial	N/A	No
Langua Gr Speci Canadian Frenc	MHD	9712	Initial	N/A	No
Language Group Spcf-Japanese	MHD	9714	Initial	N/A	No
Language Group Specify Tr Chin	MHD	9715	Initial	N/A	No
Language Group Spcf-Korean	MHD	9716	Initial	N/A	No
Language Group Spcf-Turkish	MHD	9718	Initial	N/A	No
Language Group Spcf-Hungarian	MHD	9719	Initial	N/A	No
Language Group Spcf-Slovakian	MHD	9720	Initial	N/A	No
Language Group Spcf-Russian	MHD	9721	Initial	N/A	No
Lang Group Spcf Simpl Chinese	MHD	9722	Initial	N/A	No
Language Group Spcf-Czech	MHD	9724	Initial	N/A	No
Language Group Spcf-Romanian	MHD	9725	Initial	N/A	No
Lang Group Specify - Croatian	MHD	9726	Initial	N/A	No
Language Group Spcf-Slovenian	MHD	9727	Initial	N/A	No
Lang Group Specify - Braz Port					

	MHD	9728	Initial	N/A	No
Lang Group Specify - Thai	MHD	9729	Initial	N/A	No
Dynamic Platform Optimizer					
	MHD	EB33	Both	Yes	No
Chasis & IBM Bezel for	MHD	EB95	Both	No	Yes
Chasis & OEM Bezel for	MHD	EB96	Both	No	Yes
PCIe2 2-Port 10GbE RoCE SFP+ A	MHD	EC28	Both	Yes	No
PCIe2 2-Port 10GbE RoCE SR Ada	MHD	EC30	Both	Yes	No
Operator Panel					
	MHD	EC53	Both	Yes	Yes
0.6m Blue CAT5 Ethernet Cable	MHD	ECB0	Both	Yes	No
1.5m Blue CAT5 Ethernet Cable	MHD	ECB2	Both	Yes	No
EXP30 Ultra SSD I/O Drawer					
	MHD	EDR1	Both	Yes	No
Carry-over Indicator for 4992	MHD	EH01	MES	Yes	No
Carry-over Inicator for 4997	MHD	EH02	MES	Yes	No
Carry-over for AME #4791	MHD	EH03	MES	Yes	No
Carry-over for DDR3 #5600	MHD	EH04	MES	No	No
Carry-over for DDR3 #5601	MHD	EH05	MES	No	No
Carry-over for DDR3 #5602	MHD	EH06	MES	No	No
Carry-over for DDR3 #5564	MHD	EH07	MES	No	No
Carry-over Inicator for 3715	MHD	EH08	MES	No	No
Carry-over Inicator for 3716	MHD	EH09	MES	No	No
Carry-over Inicator for 3717	MHD	EH0A	MES	No	No
Carry-over Inicator for 3718	MHD	EH0B	MES	No	No
Mode-1 & (1)ESA1/ESA2 for 5887	MHD	EJP1	Both	Yes	No
Mode-1 & (2)ESA1/ESA2 for 5887	MHD	EJP2	Both	Yes	No
Mode-2 & (2)ESA1/ESA2 for 5887	MHD	EJP3	Both	Yes	No
Mode-2 & (4)ESA1/ESA2 for 5887	MHD	EJP4	Both	Yes	No
Mode-4 & (4)ESA1/ESA2 for 5887	MHD	EJP5	Both	Yes	No
Mode-2 & (1)ESA1/ESA2 for 5887	MHD	EJP6	Both	Yes	No
Specify Mode-2(2)ESA1/ESA2	MHD	EJP7	Both	Yes	No
Specify mode-2(1) ESA1/ESA2	MHD	EJPA	Both	Yes	No
Specify mode-2 (2) ESA1/ESA2	MHD	EJPB	Both	Yes	No
Specify mode-4 (1)ESA1/ESA2	MHD	EJPC	Both	Yes	No
Specify mode-4(2)ESA1/ESA2	MHD	EJPD	Both	Yes	No
Specify mode-4 (3)ESA1/ESA2	MHD	EJPE	Both	Yes	No
Specify mode-2 (1)5901/5278	MHD	EJPJ	Both	Yes	No
Specify mode-2(2)5901/5278	MHD	EJPK	Both	Yes	No
Specify mode-4 (1)5901/5278	MHD	EJPL	Both	Yes	No

Specify mode-4 (2) 5901/5278	MHD	EJPM	Both	Yes	No
Specify mode-4 (3) 5901/5278	MHD	EJPN	Both	Yes	No
Specify mode-2 (2) 5903/5805	MHD	EJPR	Both	Yes	No
Specify mode-2 (2) 5913	MHD	EJPT	Both	Yes	No
Specify Left Half 12X I/O Draw	MHD	EJPY	Both	Yes	No
Specify Right Half 12X I/O Dra	MHD	EJPZ	Both	Yes	No
Full width Key USB, US English	MHD	EK51	Both	Yes	No
Full width Key USB, French	MHD	EK52	Both	Yes	No
Full width Key USB, Italian	MHD	EK53	Both	Yes	No
Full width Key USB, German/Aus	MHD	EK54	Both	Yes	
Full width Key USB, UK English	MHD	EK55	Both	Yes	No
Full width Key USB, Spanish	MHD	EK56	Both	Yes	
Full width Key USB, Japanese	MHD	EK57	Both	Yes	No
Full width Key USB, BrazilianP	MHD	EK58	Both	Yes	No
Full width Key USB, Hungarian	MHD	EK59	Both	Yes	No
Full width Key USB, Korean	MHD	EK60	Both	Yes	No
Full width Key USB, Chinese	MHD	EK61	Both	Yes	No
Full width Key USB, French Can	MHD	EK62	Both	Yes	No
Full width Key USB, Belgian/UK	MHD	EK64	Both	Yes	No
Full width Key USB, Swedish/Fi	MHD	EK65	Both	Yes	No
Full width Key USB, Danish	MHD	EK66	Both	Yes	No
Full width Key USB, Bulgarian	MHD	EK67	Both	Yes	No
Full width Key USB, Swiss/Fr/G	MHD	EK68	Both	Yes	No
Full width Key USB, Norwegian	MHD	EK69	Both	Yes	No
Full width Key USB, Dutch	MHD	EK70	Both	Yes	No
Full width Key USB, Portuguese	MHD	EK71	Both	Yes	No
Full width Key USB, Greek	MHD	EK72	Both	Yes	No
Full width Key USB, Hebrew	MHD	EK73	Both	Yes	No
Full width Key USB, Polish	MHD	EK74	Both	Yes	No
Full width Key USB, Slovakian	MHD	EK75	Both	Yes	No
Full width Key USB, Czech	MHD	EK76	Both	Yes	No
Full width Key USB, Turkish	MHD	EK77	Both	Yes	No
Full width Key USB, LA Spanish	MHD	EK78	Both	Yes	No
Full width Key USB, Arabic	MHD	EK79	Both	Yes	No
Full width Key USB, Thai	MHD	EK80	Both	Yes	No
Full width Key USB, Russian	MHD	EK81	Both	Yes	No
Full width Key USB, Slovenian	MHD	EK82	Both	Yes	No

Full width Key USB, US English	MHD	EK83	Both	Yes	No
Trial Live Partition Mobility	MHD	ELPM	Both	Yes	No
0/32GB DDR3 1066MHZ 4 DIMMs	MHD	EM40	Both	No	Yes
0/64GB DDR3 1066MHZ 4 DIMMs	MHD	EM41	Both	No	Yes
0/128GB DDR3 1066MHZ 4 DIMMs	MHD	EM42	Both	No	Yes
0/256GB DDR3 1066MHZ 4 DIMMs	MHD	EM44	Both	No	Yes
90 Days On/Off CoD Mem Enable	MHD	EM9T	MES	Yes	No
Activation of 1 GB DDR3 P7+	MHD	EMA2	Both	Yes	No
QTY 100 OF FC EMA2, 1GB Act	MHD	EMA3	Both	Yes	No
\$0 768 GB-Days On/Off CoD Mem	MHD	EMJ0	Both	Yes	No
\$0 384 GB- Days On/Off CoD Mem	MHD	EMJ2	Both	Yes	No
1m 10GbE Cable SFP+ Act Twinax	MHD	EN01	Both	Yes	No
3m 10GbE Cable SFP+ Act Twinax	MHD	EN02	Both	Yes	No
5m 10GbE Cable SFP+ Act Twinax	MHD	EN03	Both	Yes	No
PCIe x8 Cable 1.5m	MHD	EN05	Both	Yes	No
PCIe x8 Cable 3m	MHD	EN07	Both	Yes	No
PCIe x8 Cable 8m	MHD	EN08	Both	Yes	No
90 Days On/Off CoDProc Enable	MHD	EP9T	MES	Yes	No
4.42 GHz Proc, 0/16 core P7+	MHD	EPH0	Both	No	Yes
3.72 GHz Proc, 0/32 core P7+	MHD	EPH2	Both	No	Yes
1-Core Activation for EPH0	MHD	EPHA	Both	Yes	No
1-Core Activation for EPH2	MHD	EPHC	Both	Yes	No
1 On/Off Proc-day #EPH0, AIXL	MHD	EPHE	MES	Yes	No
1 On/Off Proc-day #EPH0, IBM i	MHD	EPHF	MES	Yes	No
1 On/Off Proc-day #EPH2, AIXL	MHD	EPHJ	MES	Yes	No
1 On/Off Proc-day #EPH2, IBM i	MHD	EPHK	MES	Yes	No
100 On/Off Prc-Days #EPH0 AIXL	MHD	EPHN	MES	Yes	No
100 On/Off Prc-Days #EPH0 IBMi	MHD	EPHP	MES	Yes	No
100 On/Off Prc-Days #EPH2 AIXL	MHD	EPHS	MES	Yes	No
100 On/Off Prc-Days #EPH2 IBMi	MHD	EPHT	MES	Yes	No
100 CoD Ut1 mins, #EPH0, AIXL	MHD	EPHU	MES	Yes	No
100 CoD Ut1 mins, #EPH0, IBMi	MHD	EPHV	MES	Yes	No
100 CoD Ut1 mins, #EPH2, AIXL	MHD	EPHY	MES	Yes	No
100 CoD Ut1 mins, #EPH2, IBMi	MHD	EPHZ	MES	Yes	No
\$0 48 Proc-Day On/Off CoD	MHD	EPJ0	Both	Yes	No
\$0 24 Proc-Days On/Off CoD	MHD	EPJ2	Both	Yes	No
Quantity 150 of #3452 SAS Cabl	MHD	EQ02	Both	Yes	No

Quantity 150 of #3453 SAS YO	MHD	EQ03	Both	Yes	No
Quantity 150 of #ES0A	MHD	EQ0A	Both	Yes	No
Quantity of 150 #ES0B	MHD	EQ0B	Both	Yes	No
Quantity of 150 #ES0C	MHD	EQ0C	Both	Yes	No
Quantity of 150 #ES0D	MHD	EQ0D	Both	Yes	No
Quantity 150 of #1737	MHD	EQ37	Both	Yes	No
Quantity 150 of #1738	MHD	EQ38	Both	Yes	No
Quantity 150 of #1751	MHD	EQ51	Both	Yes	No
Quantity 150 of #1752	MHD	EQ52	Both	Yes	No
Power Cable Drawer to IBM PD	MHD	EQ77	Both	Yes	No
RFID Tags for Compute Nodes	MHD	ERF1	Initial	N/A	No
Front Door for P770/780 2MRack	MHD	ERG7	MES	Yes	No
387GB 1.8" SAS SSD (AIX/Linux)	MHD	ES02	Both	Yes	No
387GB SFF-1 SSD for AIX/Linux	MHD	ES0A	Both	Yes	No
387GB SFF-1 SSD for IBMi	MHD	ES0B	Both	Yes	No
387GB SFF-2 SSD for AIX/Linux	MHD	ES0C	Both	Yes	No
387GB SFF-2 SSD for IBM i	MHD	ES0D	Both	Yes	No
PCIe2 RAID SAS Adapter 6Gb	MHD	ESA1	Both	Yes	No
S&H - No Charge	MHD	ESC0	Initial	N/A	No
S&H	MHD	ESC8	Initial	N/A	No
1TB Removable Disk Cartridge	MHD	EU01	Both	Yes	No
RDX USB External Docking	MHD	EU04	Both	Yes	No
RDX 320 GB Removable Disk Driv	MHD	EU08	Both	Yes	No
Service Processor-3	MHD	EU09	Both	No	No
10G Base T Wrap	MHD	EU20	Both	Yes	No
12X Cable Performance Specify	MHD	EUC5	Initial	N/A	No

Type/model conversions

From Type	Model	To Type	Model	Parts Returned
9117	MMA	9179	MHD	Yes
9179	MHB	9179	MHD	Yes
9179	MHC	9179	MHD	Yes

The following are newly announced features on the specific models of the IBM Power Systems 1455, 1457, 1611, 7014, 7863, 7893, 7895, 7953, 7955, 9119 machine type:

Description Machine Type	Model Number	Feature Numbers	Initial/ MES/ Both/ Support		RP CSU MES
1455					

Power Cable Drawer to IBM PD					
	24E	6577	Both	Yes	No
	48E		Both	Yes	No
	64C		Both	Yes	No
				Initial/	
				MES/	
Description	Model	Feature	Both/		RP
Machine Type	1457	Number	Numbers	Support	CSU MES

				Initial/	
				MES/	
Description	Model	Feature	Both/		RP
Machine Type	1611	Number	Numbers	Support	CSU MES

Power Cable Drawer to IBM PD					
	16E	6577	Both	Yes	
				Initial/	
				MES/	
Description	Model	Feature	Both/		RP
Machine Type	7014	Number	Numbers	Support	CSU MES

Analytics Data Node Add-on					
	T42	EDAN	Both	Yes	No
Advanced Rack Integration					
	B42	ER00	Initial	N/A	No
	S25		Initial	N/A	No
	T00		Initial	N/A	No
	T42		Initial	N/A	No
Rack Content Specify: 2076-224					
	T42	ER03	Initial	N/A	No
Rack Content Specify: 2076-124					
	T42	ER04	Initial	N/A	No
Rack Content Specify: 1611-16E					
	B42	ER07	Initial	N/A	No
	S25		Initial	N/A	No
	T00		Initial	N/A	No
	T42		Initial	N/A	No
Rack Content Specify: 1455-24E					
	B42	ER08	Initial	N/A	No
	S25		Initial	N/A	No
	T00		Initial	N/A	No
	T42		Initial	N/A	No
Rack Content Specify: 1455-48E					
	B42	ER09	Initial	N/A	No
	S25		Initial	N/A	No
	T00		Initial	N/A	No
	T42		Initial	N/A	No
Rack Content Specify: 1455-64C					
	B42	ER0A	Initial	N/A	No
	S25		Initial	N/A	No
	T00		Initial	N/A	No
	T42		Initial	N/A	No
Front Door for P770/780 2MRack					
	T42	ERG7	Both	Yes	No

The following are features already announced for the IBM Power Systems 7014, machine type:

				Initial/	
				MES/	
Description	Model	Feature	Both/		RP
Machine Type	7014	Number	Numbers	Support	CSU MES

Customer-Specified Rack Plac.					
	B42	0469	Initial	N/A	No

Feature conversions

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

From FC:	To FC:	Parts Returned
-		
5684 - Activation of 100 GB DDR2 Memory	8213 - Activation of 100 GB DDR3 POWER7 Memory	No

Feature conversions for 9117-MMA to 9179-MHD adapters features:

From FC:	To FC:	Parts Returned
4808 - PCIe Crypto Coprocessor Gen3 BSC 4765-001	4809 - PCIe Crypto Coprocessor Gen4 BSC 4765-001	No
5904 - PCI-X DDR 1.5GB Cache SAS RAID Adapter	5908 - PCI-X DDR 1.5GB Cache SAS RAID Adapter (BSC)	No
5648 - Service Interface Card	EU09 - Service Processor-3	Yes

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

From FC:	To FC:	Parts Returned
4495 - 4/8GB (4X2GB) DIMMS, 276 PIN 533 MHZ, DDR2 SDRAM	EM40 - 0/32GB DDR3 Memory (4X8GB) DIMMS - 1066 MHZ - POWER7+ CoD Memory	Yes
4496 - 8/16GB (4X4GB) DIMMS, 276 PIN, 533 MHZ DDR2 SDRAM	EM40 - 0/32GB DDR3 Memory (4X8GB) DIMMS - 1066 MHZ - POWER7+ CoD Memory	Yes
4497 - 16GB (4X4GB) DIMMS, 276 PIN, 533 MHZ, DDR2 SDRAM	EM40 - 0/32GB DDR3 Memory (4X8GB) DIMMS - 1066 MHZ - POWER7+ CoD Memory	Yes
4499 - 16GB (4X4GB) DIMMS, 276 pin, 400MHZ DDR2 SDRAM	EM40 - 0/32GB DDR3 Memory (4X8GB) DIMMS - 1066 MHZ - POWER7+ CoD Memory	Yes
5693 - 0/4GB DDR2 Memory (4X1GB) DIMMS- 667 MHZ- POWER6 CoD Memory	EM40 - 0/32GB DDR3 Memory (4X8GB) DIMMS - 1066 MHZ - POWER7+ CoD Memory	Yes
5694 - 0/8GB DDR2 Memory (4X2GB) DIMMS- 667 MHZ- POWER6 CoD Memory	EM40 - 0/32GB DDR3 Memory (4X8GB) DIMMS - 1066 MHZ - POWER7+ CoD Memory	Yes
5695 - 0/16GB DDR2 Memory (4X4GB) DIMMS- 533 MHZ- POWER6 CoD Memory	EM40 - 0/32GB DDR3 Memory (4X8GB) DIMMS - 1066 MHZ - POWER7+ CoD Memory	Yes
7892 - 2GB (4x512MB) DIMMS, 276-pin, 533MHZ DDR2 SDRAM	EM40 - 0/32GB DDR3 Memory (4X8GB) DIMMS - 1066 MHZ - POWER7+ CoD Memory	Yes
7893 - 4GB (4x1GB) DIMMS, 276-pin, 533MHZ DDR2 SDRAM	EM40 - 0/32GB DDR3 Memory (4X8GB) DIMMS - 1066 MHZ - POWER7+ CoD Memory	Yes
7894 - 8GB (4x2GB) DIMMS, 276-pin, 533 MHZ DDR2 SDRAM	EM40 - 0/32GB DDR3 Memory (4X8GB) DIMMS - 1066 MHZ - POWER7+ CoD Memory	Yes
4495 - 4/8GB (4X2GB) DIMMS, 276 PIN 533 MHZ,	EM41 - 0/64GB DDR3 Memory (4X8GB) DIMMS -	Yes

DDR2 SDRAM	1066 MHz - POWER7+ CoD Memory	
4496 - 8/16GB (4X4GB) DIMMs, 276 PIN, 533 MHZ DDR2 SDRAM	EM41 - 0/64GB DDR3 Memory (4X8GB) DIMMS - 1066 MHz - POWER7+ CoD Memory	Yes
4497 - 16GB (4X4GB) DIMMs, 276 PIN, 533 MHZ, DDR2 SDRAM	EM41 - 0/64GB DDR3 Memory (4X8GB) DIMMS - 1066 MHz - POWER7+ CoD Memory	Yes
4498 - 32GB (4X8GB) DIMMs, 276 pin, 400MHZ DDR2 SDRAM	EM41 - 0/64GB DDR3 Memory (4X8GB) DIMMS - 1066 MHz - POWER7+ CoD Memory	Yes
4499 - 16GB (4X4GB) DIMMs, 276 pin, 400MHZ DDR2 SDRAM	EM41 - 0/64GB DDR3 Memory (4X8GB) DIMMS - 1066 MHz - POWER7+ CoD Memory	Yes
5690 - 0/32GB DDR2 Memory (4X8GB) DIMMS- 400 MHZ- POWER6 CoD Memory	EM41 - 0/64GB DDR3 Memory (4X8GB) DIMMS - 1066 MHz - POWER7+ CoD Memory	Yes
5693 - 0/4GB DDR2 Memory (4X1GB) DIMMS- 667 MHZ- POWER6 CoD Memory	EM41 - 0/64GB DDR3 Memory (4X8GB) DIMMS - 1066 MHz - POWER7+ CoD Memory	Yes
5694 - 0/8GB DDR2 Memory (4X2GB) DIMMS- 667 MHZ- POWER6 CoD Memory	EM41 - 0/64GB DDR3 Memory (4X8GB) DIMMS - 1066 MHz - POWER7+ CoD Memory	Yes
5695 - 0/16GB DDR2 Memory (4X4GB) DIMMS- 533 MHZ- POWER6 CoD Memory	EM41 - 0/64GB DDR3 Memory (4X8GB) DIMMS - 1066 MHz - POWER7+ CoD Memory	Yes
5696 - 0/32GB DDR2 Memory (4X8GB) DIMMS- 400 MHZ- POWER6 CoD Memory	EM41 - 0/64GB DDR3 Memory (4X8GB) DIMMS - 1066 MHz - POWER7+ CoD Memory	Yes
7892 - 2GB (4x512MB) DIMMs, 276-pin, 533MHZ DDR2 SDRAM	EM41 - 0/64GB DDR3 Memory (4X8GB) DIMMS - 1066 MHz - POWER7+ CoD Memory	Yes
7893 - 4GB (4x1GB) DIMMs, 276-pin, 533MHZ DDR2 SDRAM	EM41 - 0/64GB DDR3 Memory (4X8GB) DIMMS - 1066 MHz - POWER7+ CoD Memory	Yes
7894 - 8GB (4x2GB) DIMMs, 276-pin, 533 MHZ DDR2 SDRAM	EM41 - 0/64GB DDR3 Memory (4X8GB) DIMMS - 1066 MHz - POWER7+ CoD Memory	Yes
4496 - 8/16GB (4X4GB) DIMMs, 276 PIN, 533 MHZ DDR2 SDRAM	EM42 - 0/128GB DDR3 Memory (4X8GB) DIMMS - 1066 MHz - POWER7+ CoD Memory	Yes
4497 - 16GB (4X4GB) DIMMs, 276 PIN, 533 MHZ, DDR2 SDRAM	EM42 - 0/128GB DDR3 Memory (4X8GB) DIMMS - 1066 MHz - POWER7+ CoD Memory	Yes
4498 - 32GB (4X8GB) DIMMs, 276 pin, 400MHZ DDR2 SDRAM	EM42 - 0/128GB DDR3 Memory (4X8GB) DIMMS - 1066 MHz - POWER7+ CoD Memory	Yes
4499 - 16GB (4X4GB) DIMMs, 276 pin, 400MHZ DDR2 SDRAM	EM42 - 0/128GB DDR3 Memory (4X8GB) DIMMS - 1066 MHz - POWER7+ CoD Memory	Yes
5690 - 0/32GB DDR2 Memory (4X8GB) DIMMS- 400 MHZ- POWER6 CoD Memory	EM42 - 0/128GB DDR3 Memory (4X8GB) DIMMS - 1066 MHz - POWER7+ CoD Memory	Yes
5695 - 0/16GB DDR2 Memory (4X4GB) DIMMS- 533 MHZ- POWER6 CoD Memory	EM42 - 0/128GB DDR3 Memory (4X8GB) DIMMS - 1066 MHz - POWER7+ CoD Memory	Yes

5696 - 0/32GB DDR2 Memory (4X8GB) DIMMS-400 MHz- POWER6 CoD Memory	EM42 - 0/128GB DDR3 Memory (4X8GB) DIMMS - 1066 MHz - POWER7+ CoD Memory	Yes
5680 - Activation of 1GB DDR2 POWER6 Memory	EMA2 - Activation of 1 GB DDR3 POWER7+ Memory	No
7272 - 2GB CUoD Memory Activation	EMA2 - Activation of 1 GB DDR3 POWER7+ Memory	No
7273 - 4GB CUoD Memory Activation	EMA2 - Activation of 1 GB DDR3 POWER7+ Memory	No
7274 - 8GB CUoD Memory Activation	EMA2 - Activation of 1 GB DDR3 POWER7+ Memory	No
7275 - 16GB CUoD Memory Activation	EMA2 - Activation of 1 GB DDR3 POWER7+ Memory	No
7276 - 32GB CUoD Memory Activation	EMA2 - Activation of 1 GB DDR3 POWER7+ Memory	No
7663 - 1GB DDR2 Memory Activation	EMA2 - Activation of 1 GB DDR3 POWER7+ Memory	No
5681 - Activation of 256 GB DDR2 POWER6 Memory	EMA3 - Activation of 100 GB DDR3 POWER7+ Memory	No
5684 - Activation of 100 GB DDR2 Memory	EMA3 - Activation of 100 GB DDR3 POWER7+ Memory	No

Feature conversions for 9117-MMA to 9179-MHD miscellaneous

features:

From FC:	To FC:	Parts Returned
1845 - Operator Panel	EC53 - Operator Panel	Yes

Feature conversions for 9117-MMA to 9179-MHD processor features

From FC:	To FC:	Parts Returned
4990 - Single 5250 Enterprise Enablement	4992 - Single 5250 Enterprise Enablement	No
4991 - Full 5250 Enterprise Enablement	4997 - Full 5250 Enterprise Enablement	No
5620 - 3.5 GHz Proc Card, 0/2 Core POWER6, 12 DDR2 Memory Slots	EPH0 - 4.42 GHz 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	EPH0 - 4.42 GHz 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	EPH0 - 4.42 GHz 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	EPH0 - 4.42 GHz Proc Card, 0/16 Core POWER7+, 16 DDR3 Memory Slots	Yes
7387 - 4.4GHz Proc Card, 0/2 Core POWER6, 12 DDR2 Memory Slots.	EPH0 - 4.42 GHz 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	EPH0 - 4.42 GHz 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	EPH0 - 4.42 GHz Proc Card, 0/16 Core POWER7+, 16 DDR3 Memory Slots	Yes
5620 - 3.5 GHz Proc Card, 0/2 Core POWER6, 12 DDR2 Memory Slots	EPH2 - 3.72 GHz Proc Card, 0/32 Core POWER7+, 16 DDR3 Memory Slots	Yes
5621 - 4.2 GHz Proc Card, 0/2 Core POWER6, 8 DDR2 Memory Slots	EPH2 - 3.72 GHz Proc Card, 0/32 Core POWER7+, 16 DDR3 Memory Slots	Yes
5622 - 4.2 GHz Proc Card, 0/2 Core POWER6, 12 DDR2 Memory Slots	EPH2 - 3.72 GHz Proc Card, 0/32 Core POWER7+, 16 DDR3 Memory Slots	Yes
7380 - 4.7 GHz Proc	EPH2 - 3.72 GHz Proc	Yes

Feature conversions for 9179-MHB to 9179-MHD adapter features

From FC:	To FC:	Parts Returned
4808 - PCIe Crypto Coprocessor Gen3 BSC 4765-001	4809 - PCIe Crypto Coprocessor Gen4 BSC 4765-001	No
5904 - PCI-X DDR 1.5GB Cache SAS RAID Adapter	5908 - PCI-X DDR 1.5GB Cache SAS RAID Adapter (BSC)	No
5664 - Service Processor	EU09 - Service Processor-3	Yes

Feature conversions for 9179-MHB to 9179-MHD cable features

From FC:	To FC:	Parts Returned
3711 - Processor Cable, Two-Drawer System	3715 - Processor Cable, Two,Three-Drawer System, 4 socket	Yes
3712 - Processor Cable, Two, Three or Four Drawer System	3716 - Processor Cable, Two,Three,Four-Drawer System, 4 socket	Yes
3713 - Processor Cables, Three or Four Drawer System	3717 - Processor Cable, Three,Four-Drawer System, 4 socket	Yes
3714 - Processor Cables, Four-Drawer System	3718 - Processor Cable, Four-Drawer System, 4 socket	Yes

Feature conversions for 9179-MHB to 9179-MHD memory features

From FC:	To FC:	Parts Returned
8212 - Activation of 1 GB DDR3 POWER7 Memory	EMA2 - Activation of 1 GB DDR3 POWER7+ Memory	No
8213 - Activation of 100 GB DDR3 POWER7 Memory	EMA3 - Activation of 100 GB DDR3 POWER7+ Memory	No

Feature conversions for 9179-MHB to 9179-MHD processor features

From FC:	To FC:	Parts Returned
4982 - 3.86 GHZ / 4.14 GHZ TurboCore Proc Card, 0/16 Core POWER7, 16 DDR3 Memory Slots	EPH0 - 4.42 GHZ Proc Card, 0/16 Core POWER7+, 16 DDR3 Memory Slots	Yes
4982 - 3.86 GHZ / 4.14 GHZ TurboCore Proc Card, 0/16 Core POWER7, 16 DDR3 Memory Slots	EPH2 - 3.72 GHZ Proc Card, 0/32 Core POWER7+, 16 DDR3 Memory Slots	Yes
5469 - One Processor Activation for Processor Feature #4982	EPHA - 1-Core Activation for Processor Feature EPH0	No
5469 - One Processor Activation for Processor Feature #4982	EPHC - 1-Core Activation for Processor Feature EPH2	No

Feature conversions for 9179-MHB to 9179-MHD 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 to 9179-MHD system unit base features

From FC:	To FC:	Parts Returned
5597 - System CEC Enclosure with IBM BEZEL, I/O Backplane, and System Midplane	EB95 - System CEC Enclosure with IBM BEZEL, I/O Backplane, and System Midplane	Yes
5598 - System CEC Enclosure with OEM BEZEL, I/O Backplane, and System Midplane	EB96 - System CEC Enclosure with OEM BEZEL, I/O Backplane, and System Midplane	Yes

Feature conversions for 9179-MHC to 9179-MHD adapter features

From FC:	To FC:	Parts Returned
4808 - PCIe Crypto Coprocessor Gen3 BSC 4765-001	4809 - PCIe Crypto Coprocessor Gen4 BSC 4765-001	No
5904 - PCI-X DDR 1.5GB Cache SAS RAID Adapter	5908 - PCI-X DDR 1.5GB Cache SAS RAID Adapter (BSC)	No
EU05 - Service Processor-2	EU09 - Service Processor-3	Yes

Feature conversions for 9179-MHC to 9179-MHD cable features

From FC:	To FC:	Parts Returned
3711 - Processor Cable, Two-Drawer System	3715 - Processor Cable, Two,Three-Drawer System, 4 socket	Yes
3712 - Processor Cable, Two, Three or Four Drawer System	3716 - Processor Cable, Two,Three,Four-Drawer System, 4 socket	Yes
3713 - Processor Cables, Three or Four Drawer System	3717 - Processor Cable, Three,Four-Drawer System, 4 socket	Yes
3714 - Processor Cables, Four-Drawer System	3718 - Processor Cable, Four-Drawer System, 4 socket	Yes

Feature conversions for 9179-MHC to 9179-MHD memory features

From FC:	To FC:	Parts Returned
8212 - Activation of 1 GB DDR3 POWER7 Memory	EMA2 - Activation of 1 GB DDR3 POWER7+ Memory	No
8213 - Activation of 100 GB DDR3 POWER7 Memory	EMA3 - Activation of 100 GB DDR3 POWER7+ Memory	No

Feature conversions for 9179-MHC to 9179-MHD processor features

From FC:	To FC:	Parts Returned
5003 - 3.92 GHz / 4.14 GHz TurboCore Proc Card, 0/16 Core POWER7, 16 DDR3 Memory Slots	EPH0 - 4.42 GHz Proc Card, 0/16 Core POWER7+, 16 DDR3 Memory Slots	Yes
EP24 - 3.44 GHz Proc Card, 0/24 Core POWER7, 16 DDR3 Memory Slots	EPH0 - 4.42 GHz Proc Card, 0/16 Core POWER7+, 16 DDR3 Memory Slots	Yes
5003 - 3.92 GHz / 4.14 GHz TurboCore Proc Card, 0/16 Core POWER7, 16 DDR3 Memory Slots	EPH2 - 3.72 GHz Proc Card, 0/32 Core POWER7+, 16 DDR3 Memory Slots	Yes

EP24 - 3.44 GHz Proc Card, 0/24 Core POWER7, 16 DDR3 Memory Slots	EPH2 - 3.72 GHz Proc Card, 0/32 Core POWER7+, 16 DDR3 Memory Slots	Yes
5339 - 1-Core Activation for Processor Feature #5003	EPHA - 1-Core Activation for Processor Feature EPH0	No
EP25 - 1-Core Activation for Processor Feature #EP24	EPHA - 1-Core Activation for Processor Feature EPH0	No
5339 - 1-Core Activation for Processor Feature #5003	EPHC - 1-Core Activation for Processor Feature EPH2	No
EP25 - 1-Core Activation for Processor Feature #EP24	EPHC - 1-Core Activation for Processor Feature EPH2	No

Feature conversions for 9179-MHC to 9179-MHD system unit base features

From FC:	To FC:	Parts Returned
5595 - System CEC Enclosure with IBM BEZEL, I/O Backplane, and System Midplane	EB95 - System CEC Enclosure with IBM BEZEL, I/O Backplane, and System Midplane	Yes
5596 - System CEC Enclosure with OEM BEZEL, I/O Backplane, and System Midplane	EB96 - System CEC Enclosure with OEM BEZEL, I/O Backplane, and System Midplane	Yes

Feature conversions for 9179-MHD virtualization engine features

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

Alternative and maintenance service

Pricing terms

Prices in the following PDF prices link are suggested list prices on day of announcement for the U.S. only. They are provided for your information only. Dealer prices may vary, and prices may also vary by country. IBM list price does not include tax or shipping and is subject to change without notice.

[ENUS-112-186-LIST_PRICES_2012_10_03.PDF](#)

ServicePac prices

For ServiceElect (ESA) maintenance service charges, contact IBM Global Services at 888-IBM-4343 (426-4343).

Model conversion

Model From	To
9117-MMA	9179-MHD
9179-MHB	9179-MHD
9179-MHC	9179-MHD

* Parts removed or replaced become the property of IBM and must be returned.

IBM Global Financing

IBM Global Financing offers competitive financing to credit-qualified customers to assist them in acquiring IT solutions. Offerings include financing for IT acquisition, including hardware, software, and services, from both IBM and other manufacturers or vendors. Offerings (for all customer segments: small, medium, and large enterprise), rates, terms, and availability can vary by country. Contact your local IBM Global Financing organization or visit

<http://www.ibm.com/financing>

IBM Global Financing offerings are provided through IBM Credit LLC in the United States, and other IBM subsidiaries and divisions worldwide to qualified commercial and government customers. Rates are based on a customer's credit rating, financing terms, offering type, equipment type, and options, and may vary by country. Other restrictions may apply. Rates and offerings are subject to change, extension, or withdrawal without notice.

IBM Global Financing offers competitive financing of hardware, software, and services, from both IBM and other manufacturers or vendors.

Financing Power Systems solutions from IBM Global Financing can help you acquire more from existing budgets while helping you conserve cash, and provide a comprehensive end-to-end multivendor IT financing solution. This end-to-end approach helps form the foundation of a cohesive technology management strategy that can be superior to ownership. IBM can help reduce costs compared to purchase, increase ROI, lower total cost of ownership, minimize risk, improve accountability, and enable you to focus on your core business strategies while giving you the ability to make flexible equipment decisions throughout the entire technology life cycle.

Through the IBM Project Financing™ program, credit-qualified customers can obtain funding to design and build your entire IT infrastructure, aligning up-front costs to expected project benefits. This could include financing for select facility design and construction, building and structural upgrades, infrastructure equipment, IT hardware, software, services, and consulting. Through our Global Asset Recovery Services' buyback program you can obtain cash for marketable IT assets and dispose of nonmarketable assets in a way that complies with environmental laws and regulations.

In addition for certain mid-range and high-end systems, customers leasing their Power Systems can upgrade to new technology at mid-lease for little or no change in their existing monthly payment. IBM offers options for clients to perform either in-place upgrades or side-by-side, nondisruptive migrations (IBM Power Exchange) to the latest POWER technology.

IBM Global Financing offerings are provided through IBM Credit LLC in the United States, and other IBM subsidiaries and divisions worldwide to qualified commercial and government customers. For all customer segment offerings, rates, financing terms, offering type, equipment type, and options may vary by country. Other restrictions may apply. Rates and offerings are subject to change, extension, or withdrawal without notice.

For more information contact your local IBM Global Financing organization or visit

<http://www.ibm.com/financing>

Order now

To order, contact the Americas Call Centers or your local IBM representative, or your IBM Business Partner.

To identify your local IBM representative or IBM Business Partner, call 800-IBM-4YOU (426-4968).

Phone: 800-IBM-CALL (426-2255)
Fax: 800-2IBM-FAX (242-6329)
Internet: callserv@ca.ibm.com
Mail: IBM Teleweb Customer Support
ibm.com® Sales Execution Center, Americas North
3500 Steeles Ave. East, Tower 3/4
Markham, Ontario
Canada
L3R 2Z1

Reference: YE001

The Americas Call Centers, our national direct marketing organization, can add your name to the mailing list for catalogs of IBM products.

Note: Shipments will begin after the planned availability date.

Trademarks

Active Memory, Power Systems, IBM Systems Director Active Energy Manager, Electronic Service Agent and IBM Project Financing are trademarks of IBM Corporation in the United States, other countries, or both.

Power, IBM, POWER7, AIX, PowerVM, Micro-Partitioning, PowerHA, POWER6, POWER, xSeries, Express, System x and ibm.com are registered trademarks of IBM Corporation in the United States, other countries, or both.

Linux is a registered trademark of Linus Torvalds in the United States, other countries, or both.

Other company, product, and service names may be trademarks or service marks of others.

Terms of use

IBM products and services which are announced and available in your country can be ordered under the applicable standard agreements, terms, conditions, and prices in effect at the time. IBM reserves the right to modify or withdraw this announcement at any time without notice. This announcement is provided for your information only. Additional terms of use are located at:

<http://www.ibm.com/legal/us/en/>

For the most current information regarding IBM products, consult your IBM representative or reseller, or visit the IBM worldwide contacts page

<http://www.ibm.com/planetwide/us/>

Corrections

(Corrected on November 14, 2012)

Changed the availability date for feature 5564 from October 19 to November 16.
Changed the availability date for features 5899, EC28, EMJ0, EMJ1, EPJ0, and EPJ1 from November 16 to October 19.

(Corrected on December 24, 2012)

In Prices section changed order status for features 9382 and 9383 from BOTH to MES.