



IBM Power 770 delivers unprecedented performance, scalability, reliability, and manageability for demanding commercial workloads

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At a glance

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

- Up to 64 IBM® POWER7+™ cores with four processor drawers per server
- One POWER7+ processor card per processor drawer: 16-core at 3.80 GHz or 12-core at 4.22 GHz
- Up to 4.0 TB of DDR3 memory with frequencies up to 1066 MHz, augmented with standard Active Memory™ Mirroring and optional Active Memory Expansion
- Enhanced I/O performance with two integrated POWER7+ I/O controllers per processor drawer
- Dynamic Platform Optimizer, a new option for managing memory and processor resources
- Active Memory Expansion optimized onto the processor chip
- 90 Days On/Off CoD Temporary Memory Enablement
- Logical partitions, up to 1000 per system
- Core Use HW Feature (EUC6) for 9117-MMD and Core Use HW Feature 10X (EUC7) for 9117-MMC & -MMD
- EXP30 Ultra SSD I/O Drawer with integrated, high-performance SAS controllers

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

Overview

The new IBM Power 770 server (9117-MMD) uses the latest POWER7+ processor and the next-generation I/O technology designed to deliver unprecedented performance, scalability, reliability, and manageability for demanding commercial workloads.

The innovative Power 770 model MMD 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 that was introduced with the model MMC.

The new POWER7+ processors are designed as single chip modules (SCMs), each with 64-bit architecture. L3 cache on POWER7+ 770 processor chips has been increased 2.5X compared to previous POWER7+ processor chips. Each POWER7+ SCM enables either three or four active processor cores with 10 MB per core of L3 cache and 256 KB per core of L2 cache. Power 770 systems are available at frequencies of 3.8 GHz with 64 cores, or 4.2 GHz with 48 cores. This new system is available with as few as four active cores and incrementing one core at a time through built-in Capacity on Demand (CoD) to the full capacity of the system.

POWER7+ 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 provides 25% higher levels of memory expansion than available with POWER7® 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.

The EXP30 Ultra SSD I/O Drawer (#EDR1) provides the Power 770+ and Power 780+ up to 30 SSDs in just 1U of rack space without any PCIe slots. The drawer provides up to 480,000 IOPS and up to 12.6.2 TB of capacity for AIX or Linux™ clients. Up to 48 additional HDD 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 x 8 Adapter (#1914).

Also being announced for the Power 770 model MMD are new high-density memory DIMMs using 4Gb technology. This includes new memory DIMMs for 32, 64 GB, 128 GB, and 256 GB DDR3 memory feature codes. Existing memory features are supported for model upgrades.

IBM continues to expand the availability of orderable features supporting the MSP Utility Pricing Offer. This program leverages channel-led discounting for Managed Service Providers (MSPs) who purchase a Cloud Hosting Infrastructure built with IBM hardware and software. The discounts, which lower the up-front purchase price, are made available only when the MSPs sign an attachment to their current IBM Customer Agreement (ICA), requiring the MSP to pay for use of their cloud infrastructure.

IBM has previously announced the Core Use HW Feature (EUC6) for the following Power Systems (8202-E4C, 8205-E6C, 9117-MMC) and BladeCenters (7891-73X). Newly available are the Core Use HW Feature (EUC6) for 9117-MMD and the Ten Core Use HW Feature (EUC7) for the following Power Systems (8202-E4C, 8205-E6C, 9117-MMC and 9117-MMD).

Also available is the MSP Order Recognition RPQ (8A2060) for Power Systems models 8202-E4C, 8205-E6C, 9117-MMC, and 9117-MMD, BladeCenter® model 7891-73X, and Flex System Compute Node models 7895-22X, 7895-42X, and 7863-10x. A quantity of one 8A2060 is required to be ordered at initial purchase or MES purchase for each machine type model included in the MSP's cloud infrastructure, when contracting for the MSP Utility Pricing Offer.

Also new is the MSP Core Use Payment PRPQ (P91287). MSPs can order a quantity of Core Use Features (combination of MSP per Processor Core and MSP per 10 Processor Cores) each quarter to make their use payment if the cloud infrastructure includes Flex System Compute Nodes. The quantity of features to be ordered is

determined by the MSP's actual use of the cloud infrastructure (average cores assigned to active client virtual servers).

Key prerequisites

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

Planned availability date

- October 19, 2012, for model 9117-MMD
- The following 9117-MMD features are not being announced in China
 - #EPM1 - 3.80 GHz Proc Card, 0/16 Core POWER7+ , 16 DDR3 Memory Slots
 - #EPMB - 1-Core Activation for Processor Feature EPM1
 - #EPMG - 1 Proc-Day On/Off Billing for #EPM1, AIX/Linux
 - #EPMH - 1 Proc-Day On/Off Billing for #EPM1, IBM i
 - #EPMQ - 100 On/Off Proc-Days of CoD Billing for Processor #EPM1
 - #EPMR - 100 On/Off Proc-Days of CoD Billing for Processor #EPM1. IBM i
 - #EPMY - Proc CoD Utility Billing, 100 Proc-mins. for #EPM1, AIX/Linux
 - #EPMZ - Proc CoD Utility Billing, 100 Proc-mins. for #EPM1, IBM i
- November 6, 2012, for:
 - Core Use HW Feature EUC6
 - Core Use HW Feature 10X EUC7
- November 16, 2012 for model upgrade to 9117-MMD
- February 14, 2013, for 9117-MMD, CEC hot 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 or supported on the Power 770 server:

- 4U 19-inch rack-mount system drawer
- One to four system drawers: 16U maximum system size
- One processor card feature per enclosure (includes the voltage regulator):
 - 0/12 core, 4.22 GHz processor card (#EPM0)
 - 0/16 core, 3.80 GHz processor card (#EPM1)
- POWER7 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)
 - Only ordered with model upgrade from MMB
 - Carries forward with model upgrades from MMB/MMC
- Dynamic Platform Optimizer, new option for managing memory and processor resources (EB33)
- Active Memory Expansion optimized onto the processor chip (4791)
- 90 Day On/Off CoD Temporary Memory Enablement (#EM9T)
- 90 Days On/Off CoD Temporary Memory Enablement (#EP9T)
- Six hot-swappable, 2.5-inch, small form-factor SAS disk, or solid-state disk (SSD) bays per enclosure
- One hot-plug, slim-line, SATA media bay per enclosure (optional #5652)
- Redundant hot-swap ac power supplies in each enclosure
- Choice of integrated multifunction card options (maximum of 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 LPAR support, processor and memory CUoD
- PowerVM® (optional):
 - Micro-Partitioning®
 - Virtual I/O server (VIOS)
 - Automated CPU and memory reconfiguration
 - Support for dedicated and shared processor logical partition (LPAR) groups
 - Support for manual provisioning of resources partition migration (PowerVM - Enterprise Edition)
- Optional PowerHA® for AIX , IBM i, and Linux
- 12X I/O drawer with PCI slots
 - Up to 16 PCIe I/O drawers (#5802 or #5877)
 - Up to 32 PCI-X DDR I/O drawers (7314-G30 or #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)
 - One EXP30 Ultra SSD I/O Drawer with integrated, high-performance, SAS controllers (#EDR1)
- IBM Systems Director Active Energy Manager™

Processors

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

MMB/MMC
SMP cables

MMD
SMP cables

MMB/MMC/MMD
FSP cables

Two-drawer	3711, 3712	3715, 3716	3671
Three-drawer	3712, 3713	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 (four DIMMs per memory feature number).
- All processor cards in the system must have the same feature number.
- Each system must have a minimum of four active processors.
- Processor Capacity on Demand activations will activate processor hardware only in the system serial number they are purchased for. If you move processor hardware to another system, the processor may not be functional in that system until you make arrangements to move the processor activations or purchase additional processor activations.
- The minimum activations ordered with MES orders of memory features EM40, EM41, EM42, and EM44 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 capacity. 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 (8 DIMMs per card) installed. This includes inactive processor card features present in the system.
- Memory features include a total of four DIMMs. There is a required plug location for every memory feature attached to a processor.
- 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 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).
- Each system must contain a minimum of 32 GB of active system memory.
- Memory feature numbers EM40, EM41, EM42, EM44, 5600, 5601, 5602, and 5564 can be mixed on the same POWER7+ processor card.
- Memory Capacity on Demand activations will activate memory hardware only in the system serial number they are purchased for. If you move memory hardware to another system, the memory may not be functional in that system until you 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 770 using any operating systems.

- It is recommended that any attached remote I/O drawers be located in the same rack as the Power 770 server for ease of service, but they can be installed in separate racks if the application or other rack content requires it.
- The following list shows the I/O drawers that are supported or available on the model 770, with the correct interface to use for each of the drawers and the maximum number of attached I/O drawers:

Feature	Order description	Status	Interface	Maximum number
5796	PCI-X DDR 12X I/O Drawer	Supported	12X	32
5802	PCIe 12X I/O w/Disks Drawer (disk bays)	Available	12X	16
5877	PCIe 12X I/O No Disk Drawer (no disk bays)	Available	12X	16
5886	Exp 12S SAS Disk Drawer	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 feature-numbered I/O drawers are available for order on the Power 770 server:

- 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 (#5802 and #5877) is a 19-inch I/O and storage drawer. Feature 5802 provides a 4 EIA unit tall drawer containing 10 PCI-E-based I/O adapter slots and 18 SAS hot-swap small form-factor disk bays, which can be used for either disk drives or SSD, organized into two groups of nine. Each group of disk slots is controlled by one or two PCIe SAS storage adapters located in a PCIe slot in the same feature 5802 as the SAS drives. A maximum of two feature 5802 drawers can be placed on the same 12X loop. Mixing 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 ac power cables, and two SPCN cables is required to ensure proper redundancy. The drawer attaches to the host CEC enclosure with a 12X adapter in a GX slot via 12X DDR cables available in different cable lengths: 0.6 (#1861), 1.5 (#1862), 3.0 (#1865), or 8 meters (#1864). The 12X SDR cables are not supported.
- 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 511.05 mm (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 being used, the operating system being used, and the protection that you need.

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

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

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. Ultrahigh levels of performance are provided without using any PCIe slots on the POWER7 server in an ultradense packaging design. The two high-performance, integrated SAS controllers each physically provide 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 reestablished. Each controller is connected to a GX++ PCIe adapter 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 controllers provide RAID 0, RAID 5, RAID 6 and RAID 10 for AIX and Linux and VIOS. AIX/Linux/VIOS also provide OS mirroring (LVM). The adapters' CCIN is 57C3. eMLC SSDs designed to fit in the Ultra drawer bays such as the 387GB #ES02 SSD are used. 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 controllers "owns" one of the logical sets. With proper software if one of the controllers 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 (HDD). 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, the EXP24S can be ordered 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, the EXP24S can be ordered 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 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-DDR 12X cable choices: Each feature 5796 drawer requires one Dual-Port PCI-DDR 12X Channel Adapter, either Short Run (#6446) or Long Run (#6457). The following table identifies the supported cable lengths for each 12X channel adapter. I/O drawers containing the short range adapter can be mixed in a single loop with I/O drawers containing the long range adapter. In this table a "Yes" indicates that the 12X cable identified in that column can be used to connect the drawer configuration identified to the left. A "No" means it cannot be used.

PCI-DDR 12X Cable options

	0.6 M (#1861)(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 w/12X Short Run adapter (#6446) in both drawers	Yes	Yes	No	No
5796 w/12X Short Run adapter (#6446) to 5796 w/12X Long Run adapter (#6457)	Yes	Yes	Yes	No
5796 to 5796 w/12X Long Run adapter (#6457) in both drawers	Yes	Yes	Yes	Yes
5796 w/12X Short Run adapter (#6446) to system unit	No	Yes	Yes	No
5796 w/12X Long Run adapter (#6457) to system unit	No	Yes	Yes	Yes

Note: (1) The PCI-DDR 12X Cable (#1829, #1861 or #1862) is limited to connecting the CEC 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 between two modules located one beneath the other in a 19-inch rack.

Note: (2) The PCI-DDR 12X Cable (#1840 or #1865) is limited to connecting the CEC to the drawer if in the same rack and further than 20 EIA. It is possible in some limited configurations to use the 3.0 M, 12X cable (#1840 or #1865) to locate 5796 modules in adjacent racks. The cable length requires careful management of each drawer location within the rack. The best choice for connecting a feature 5796 or G30 I/O drawer in an adjacent rack is the 8.0 M, 12X cable (#1834 or #1864).

Note: (3) The PCI-DDR 12X Cable (#1834 or #1864) is limited to connecting the CEC to the drawer if in different racks. It is intended for use when connecting between two modules that are located in adjacent racks. This cable may not be connected to the 12X Short Run adapter (#6446).

19-inch racks

The 9117-MMD 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 9117 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 9117-MMD 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 770 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 770 configurations with two, three, or four drawers, all drawers must be installed together in the same rack, in a contiguous space of 8U, 12U, or 16U within the rack. The uppermost enclosure in the system is the base enclosure. This enclosure will contain the active service processor and the operator panel, if an operator panel is present in the system. If a second CEC enclosure is part of the system, the backup service processor is contained in the second CEC enclosure. The service processor is a component of the Service Interface Card in these enclosures.
- When a Power 770 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 770 is optimized for use in an IBM 7014-T00, or 7014-T42 rack. Both the front cover and the external processor fabric cables occupy space on the front left and right side of an IBM 7014 rack that may not be available in non-IBM racks. If loading two or more CEC enclosures in a 7014-T42 or 7014-B42 rack, the CEC enclosures need to be loaded 36U or below to allow space for the flex cables.
- Acoustic door features are available with the 7014-T00 (feature 0551), 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), 7014-T42 (feature 0553) racks or for the 7014-T00 (feature 0551), 7014-T42 (feature 0553) racks that you already own.
- A Power 780 door (#6250 or #ERG7) is available on the 7014-T42 rack.

1.3 Meter Rack (#0555)

This 25 EIA unit rack delivered as feature 0555 is the same rack delivered when you order the 7014-S25 rack; the included features may be different. Only feature 0555 is supported.

1.8 Meter Rack (#0551)

This 36 EIA unit rack 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 Manufacturing.

2.0 Meter Rack (#0553)

This 42 EIA unit rack delivered as feature 0553 is the same rack delivered when you order the 7014-T42 or 7014-B42 rack; the included features may be different. Some features that are delivered as part of the 7014-T42 or 7014-B42 must be ordered separately with feature 0553. Order feature 0553 only when required to support rack integration of MES orders prior to shipment from IBM Manufacturing.

Integrated I/O

- Each CEC enclosure must contain one Integrated Multifunction Card (#1768 or #1769).
- The 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 i console.
- The first CEC enclosure must contain one Integrated Multifunction Card (#1768 or #1769). The Integrated Multifunction Card is optional for the second, third and fourth CEC enclosure.
- Each card has four Ethernet ports, two USB ports, and one serial port. Usage of the serial port by AIX or 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 770 model MMB. Unlike the model MMB, using 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, or located in an 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 or Linux and two for IBM i, or if using a Fibre Channel attached SAN (indicated by feature number 0837), a disk drive is not required. Attachment of the SAN using a Fibre Channel over Ethernet connection is also supported.
- Each CEC enclosure can support one media device when the Disk/Media Enclosure and Backplane feature (#5652) is ordered. Any supported DVD-RAM drive can be installed. Each system can support up to four media devices in the CEC enclosure -- a maximum of one in each enclosure.
- The model MMD supports both 2.5-inch and 3.5-inch SAS SFF DASD hard disks. The 3.5-inch DASD hard disks can be attached to the model MMD 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 system. Feature 1815 and feature 5662 cannot be installed in the same drawer. Feature 1819 must not be installed in a drawer unless feature 5662 is also installed.

I/O slots and adapters

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

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

- The Power 770 I/O slot population rules are complex. Extensive configuration rules and checking procedures are incorporated into the marketing configurator ECFGPWR to help ensure a valid system configuration. Configurations generated without using the ECFGPWR configurator may create orders that cannot be built, resulting in possible order rejection or delayed delivery.
- 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 770 system with two or more CEC enclosures must have one Power Control Cable (#6006 or similar) to connect the Service Interface Card in the first enclosure to the Service Interface Card in the second enclosure.
- Two ac power supplies are required for each CEC enclosure; the second power supply provides redundant power for enhanced system availability. A CEC enclosure will continue to function with one working power supply. A failed power supply can be hot swapped but must remain in the system until the replacement power supply is available for exchange.

Power distribution units

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

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

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

Hot-plug options

- The following options are hot-plug capable:
 - GX++ adapters.

- System ac power supplies: one functional power supply must remain installed at all times while the system is operating.
- Disk drives.
- Most PCIe adapters.
- Media devices.
- Hot-plug procedures are contained in the Customer Information Center on <http://www.ibm.com>
- If the system boot device or system console is attached using an I/O adapter feature, that adapter may not be hot-plugged.

Logical partitioning

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

Available backplane configurations

The 770 CEC drawer has an extremely flexible and powerful backplane for supporting disk or 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 provided for redundancy or for additional flexibility. The optional 175 MB Cache RAID - Dual IOA Enablement Card feature (#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 or 3/3 configurations are always the two pairs of embedded controllers. 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, providing additional performance capability as well as redundancy. If configured as a pair, the pair controls all six SFF bays and all six drives. The 3/3 or 2/2/2 configurations are not used with the paired controllers. RAID 0 and RAID 10 are supported, and you can also mirror two sets of controller/drives using the operating system.

Adding the optional 175 MB Cache RAID - Dual IOA Enablement Card (#5662) causes the pair of embedded controllers in that processor enclosure to be configured

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

Another expansion option available using the paired embedded controller configuration with the 175 MB Cache RAID - Dual IOA Enablement Card feature is a SAS expansion port. The SAS expansion port can add more SAS bays to the six bays in the system unit. A feature 5886 SAS disk drawer is attached using a 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 are now running 18 SAS bays (six SFF bays in the system unit and twelve 3.5-inch bays in the drawer). The disk drawer is attached to the SAS port with a SAS YI cable and the embedded controllers connected to the port using a 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 processor enclosure. AIX and Linux support configurations using two sets of three bays (3/3) or three sets of two bays (2/2/2) without feature 5662 and supports dual controllers running one set of six bays with feature 5662.

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 allows 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 and memory are optionally available on the Power 770 server to help meet changing resource requirements in an on demand environment by using resources installed on the system but not activated.

Capacity Upgrade On Demand

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

On/Off Capacity on Demand

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

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

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

AIX/Linux IBM i

Model	Processor feature	On/off CoD processor enablement feature	On/off CoD processor billing feature	On/off CoD processor billing feature
MMD	EPM0	EP9T	EPME	EPMF : 1 Proc-Day
MMD	EPM1	EP9T	EPMG	EPMH : 1 Proc-Day
MMD	EPM0	EP9T	EPMN	EPMP : 100 Proc-Days
MMD	EPM1	EP9T	EPMQ	EPMR : 100 Proc-Days

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

The On/Off CoD process consists of three steps: enablement, activation, and billing.

On/Off CoD enablement: Description

Before requesting temporary capacity on a server, you must "enable" it for On/Off CoD. To do this, order 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 1800 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 9000 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 and/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: Sales channel (IBM Business Partner) must sign one of the following contracts, if applicable:

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

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

<http://www.ibm.com/servers/eserver/iserries/ondemand/cod>

- Step 1: You initiate request for On/Off CoD use by requesting Sales channel to enable the machine for temporary capacity.
- Step 2: You 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 to tcod@us.ibm.com

- Required: IBM Customer Agreement, Attachment for On/Off Capacity On Demand; IBM Supplement for On/Off Capacity On Demand
- Optional: IBM Addendum for On/Off Capacity On Demand Alternative Reporting
- Step 3: Sales channel places an order for processor or memory enablement features.
- Step 4: Sales channel updates the website registration data (refer to prerequisite 2) with information about the customer machine being enabled for step is completed.
Note: The order for an enablement feature will not be fulfilled until this step is completed.
- Step 5: IBM generates an enablement code and mails and posts it.
- Step 6: You retrieve the enablement code and apply it to the server.

On/Off activation requests: Description

When On/Off CoD temporary capacity is needed, simply use the HMC menu for On/Off CoD and specify how many of the inactive processors or 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).

On/Off CoD activation requests: Step-by-step

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

On/Off CoD billing: Description

The contract, which you sign 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 customer requests for temporary capacity. As a result, the sales channel must order a quantity of billing features (one feature for each billable processor and memory day reported).

On/Off CoD billing: Step-by-step

You must report billing data (requested and unreturned processor and memory days) at a minimum of once per month either electronically or via fax (stated requirement in the signed contract). At the end of each billing period (calendar quarter), IBM will process the accumulated data reported and notify the sales channel for proper billing. The sales channel places an order for the appropriate quantity of billing features (one processor billing feature ordered for each processor day used, or one memory day for each memory day utilized). IBM will ship a billing notice (notifies customer of billing actions) to the ship-to address on the order as part of the fulfillment process. You pay the sales channel and the sales channel pays IBM for the fulfillment of the billing features.

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

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

Utility CoD

Utility CoD autonomically provides additional processor performance on a temporary basis within the shared processor pool. Utility CoD enables you to place a quantity of inactive processors into the server's shared processor pool, which then becomes available to the pool's resource manager. When the server recognizes that the combined processor utilization within the shared pool exceeds 100% of the level of base (purchased/active) processors assigned across uncapped partitions, then a Utility CoD processor minute is charged and this level of performance is available for the next minute of use. If additional workload requires a higher level of performance, the system automatically allows the additional Utility CoD processors to be used. The system automatically and continuously monitors and charges for the performance needed above the base (permanent) level. Registration and usage reporting for Utility CoD is made using a public 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 9117-MMC.

If a Power 770 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 Utility CoD processor use so that the correct feature can be used for billing.

Model	Utility billing processor feature	Utility CoD feature description
MMD	EPMW	100 Processor minutes for #4983
MMD	EPMX	100 Processor minutes for #4983, IBM i
MMD	EPMY	100 Processor minutes for #4984
MMD	EPMZ	100 Processor minutes for #4983, 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)

To request either a Standard or an Exception Trial, visit

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

Software licensing

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

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

Services

The IBM Server Product Services offers implementation and migration services to help you put your 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. IBM's goal is to continually enhance these offers to provide you with a comprehensive selection of services. To see what IBM can do for you, visit

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

IBM 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 customer solution deployment and reduce related resources and cost. Offerings include:

- Integration:
 - Component integration
 - Rack integration
 - Operating system preinstallation
 - Unit personalization
 - Third-party hardware/software installation
 - Customer-specified placement
- Asset tagging: Standard tagging radio frequency item device (RFID)
- Special packaging: Box consolidation
- System customization: Remote access partitioning customized operating system/firmware

For more information on Deployment-Ready Services, refer to

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

Model upgrades

You can upgrade the 9117-MMA, 9117-MMB, or 9117-MMC with 9117-MMD processors. For upgrades from 9117-MMA, 9117-MMB, or 9117-MMC systems, IBM will install new CEC enclosures to replace your currently CEC enclosure. The current CEC enclosures will be returned to IBM in exchange for the financial consideration identified under the applicable feature conversions for each upgrade.

Clients taking advantage of the model upgrade offer from a 9117-MMA or 9117-MMB/MMC 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, 9117-MMB, or 9117-MMC processors to 9117-MMD processors with activations
- DDR2 memory DIMMs to DDR3 memory DIMMs
- New trim kits upgrading from 9117-MMA or 9117-MMB to 9117-MMD (existing trim kits are only functional for one drawer configurations or for racks holding only I/O and no 770 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, and #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, #6858)
- SATA DVD-RAM (#5762)

The Power 770 can support the following 12X drawers and disk-only 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 9117-MMD system that have 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 770 system to keep the On/Off CoD function active. The On/Off enablement features should be removed from the configuration file before the MES order is started to initiate the model upgrade. Any temporary use of processors or memory owed to IBM on the existing system must be paid before installing the new Power 770 model MMD.

Features 8018 and 8030 are available to support migration of the PowerVM features 7942 or 7995 during the initial order and build of the MMC upgrade MES order. You can add feature 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. 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.

PowerVM

PowerVM is available on the 9117-MMD:

- PowerVM Editions are available as a hardware feature (#7942 for Standard Edition, #7995 for Enterprise Edition). You 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.
- VIOS 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.
- Virtual networking: A shared Ethernet adapter enables connectivity between internal and external virtual LANs (VLANs); virtual Ethernet enables 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 780 systems are enabled to migrate to another Power 770/780 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
 - Active Memory Sharing allows memory to be dynamically moved between running partitions for optimal resource usage.

Capacity Backup offering (applies to IBM i only)

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

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

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

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

The primary system for a Power 770 server can be:

- 9119-FHA
- 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 P30 software tier, or higher. The primary machine must be in the same enterprise as the CBU system.

Before you can temporarily transfer IBM i processor license entitlements from the registered primary system, you must have more than one IBM i processor license on the primary machine and at least one IBM i processor license on the CBU server. An activated processor must be available on the CBU server to use the transferred entitlement. You may then transfer any IBM i processor entitlements above the minimum one, assuming the total IBM i workload on the primary system does not require the IBM i entitlement you would like to transfer during the time of the transfer. During this temporary transfer, the CBU system's internal records of its total number of IBM i processor license entitlements are not updated, and you may see IBM i license noncompliance warning messages from the CBU system. Such messages that arise in this situation do not mean you are not in compliance.

Before you can temporarily transfer 5250 entitlements, you must have more than one 5250 Enterprise Enablement entitlement on the primary server and at least one 5250 Enterprise Enablement entitlement on the CBU system. You may then transfer the entitlements that are not required on the primary server during the time of transfer and that are above the minimum of one entitlement.

For example, if you have an 8-core Power 770 as your primary system with four IBM i processor license entitlements (three above the minimum) and two 5250 Enterprise Enablement entitlements (one above the minimum), you can temporarily transfer up to three IBM i entitlements and one 5250 Enterprise Enablement entitlement. During the temporary transfer, the CBU system's internal records of its total number of IBM i processor entitlements is not updated, and you may see IBM i license noncompliance warning messages from the CBU system.

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

For CBU registration and further information, visit

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

Active Memory Expansion

Active Memory Expansion is an innovative POWER7+ technology 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 with Technology Level 4 and Service Pack 2, or later.

Active Memory Expansion uses CPU resource to compress/decompress the memory contents. The trade-off of memory capacity for processor cycles can be an excellent choice, but the degree of expansion varies on how compressible the memory

content is. 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. Once turned on, monitoring capabilities are available in standard AIX performance tools such as lparstat, vmstat, topas, and svmon.

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

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

Active Memory Expansion is enabled by 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 9117-MMC 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 4984, the QPRCFEAT value for the system would be 4984.

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

Reliability, availability, and serviceability (RAS)

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

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

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

Memory error-correction extensions

POWER7+ memory has error detection and correction code circuitry designed to detect and correct faults that extend across multiple memory modules (DRAMs). This includes tolerating a complete DRAM chip failure (Chipkill recovery). POWER7+ memory used in the Power 770 system also contains a spare memory (DRAM) per rank of memory, which can be substituted for a failed DRAM module (DRAM sparing). The spares can be used when a DRAM fault is detected and offers additional protection beyond that provided by the error detection and correction circuitry. In addition, the POWER7+ memory subsystem scrubs 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, if a data bit goes bad, the memory bus has the spare capacity to substitute a new data bit-line.

Fault monitoring functions

On POWER7+ processor-based servers, hardware failures and software-detected hardware failures are recorded in the system log. An error log analysis (ELA) routine analyzes the error, forwards the event to the Service Focal Point (SFP) application running on the HMC, and notifies the system administrator that it has isolated a likely cause of the system problem. The service processor event log also records unrecoverable check stop conditions and forwards them to the SFP application and notifies the system administrator.

After the information is logged, if the system is properly configured, a call home service request is initiated, and the pertinent failure data with service parts information and part locations is sent to an IBM Service organization. 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 customer operation.

Mutual surveillance

The service processor monitors the operation of firmware during the boot process and also monitors the hypervisor for termination. The hypervisor monitors the service processor and performs 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 temperature remains above the warning level for too long, the system shuts 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 can 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, after which the failing core is dynamically reconfigured and called out for replacement. The entire process is transparent to the partition owning the failing instruction. These systems are designed to avoid a full system outage.

POWER7+ single processor check stopping

As in POWER6 , POWER7+ includes single processor check stopping 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 detection code (ECC). In addition, the caches maintain a cache line delete capability. A threshold of correctable errors detected on a cache line can result in the data in the cache line being purged and the cache line removed from further operation without requiring a reboot. An ECC uncorrectable error detected in the cache can also trigger a purge and delete of the cache line. This results in no loss of operation 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 a featured option (#4797) on MMC. This option mirrors the main memory used by the hypervisor firmware. With this option, an uncorrectable error in one copy of the mirrored memory will be corrected by use of the mirrored pair. This option efficiently guards against system-wide outages due to any such error associated with the mirrored hypervisor firmware memory. With this option, uncorrectable errors in data owned by a partition or application will continue to be handled by the existing special uncorrectable error (SUE) handling methods in the hardware, firmware and operating system.

SUE handling

SUE handling prevents an uncorrectable error in memory or cache from immediately causing the system to terminate. Rather, the system tags the data and determines whether it will ever be used again. If the error is irrelevant, it will not force a check

stop. If the data is used, termination may be limited to the program/kernel or hypervisor owning the data; or the I/O adapters controlled by an I/O hub controller would freeze if data were 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 770 is designed with both IBM and customer serviceability in mind. Advancements such as Guiding Light LED architecture are used to control a system of integrated LEDs that lead the individual servicing the machine to the correct part as quickly as possible. With the Power 770, you can replace service parts (customer replaceable unit). To do this, the Power 770 uses Guiding Light LEDs to indicate the parts that need to be replaced.

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

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

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

Note: Because the 9117-MMD 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 are documented and available for display on any web browser-enabled system as well as on the HMC. These procedures are available through the InfoCenter application.

Service environments

The HMC is a dedicated server that provides functions for configuring and managing servers for either partitioned or full-system partition using a GUI or command-line interface (CLI). An HMC attached to the system allows support personnel (with client authorization) to remotely log in to review error logs and perform remote maintenance if required.

Service Interface

The Service Interface allows support personnel to communicate with the service support applications in a server using a console, interface, or terminal. Delivering a clear, concise view of available service applications, the Service Interface 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 is illuminated on the operator panel. The Guiding Light system pinpoints the exact part by blinking the amber field-replaceable unit (FRU) identify LED associated with the part to be replaced when selected by the servicer as part of the repair procedure. This action will roll up to the enclosure locate and blue system locate LED on the operator panel to provide a path from the system level to the enclosure and down to the individual component to be serviced.

The enclosure and system identify LEDs will turn on solid and can be used to follow the path from the system to the enclosure and down to the specific FRU.

First-failure data capture and error data analysis

First-failure data capture (FFDC) is a technique that helps ensure that when a fault is detected in a system, the root cause of the fault will be captured without the need to re-create the problem or run any sort of extended tracing or diagnostics program. For the vast majority of faults, a good FFDC design means that the root cause can also be detected automatically without servicer intervention. FFDC information, error data analysis, and fault isolation are necessary to implement the advanced serviceability techniques that enable efficient service of the systems and to help determine the failing items.

Error handling and reporting

In the unlikely event of system hardware or environmentally induced failure, the system runtime error capture capability systematically analyzes the hardware error signature to determine the cause of failure. The analysis result is stored in system NVRAM. When the system can be successfully restarted either manually or automatically, the error is 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 also turns on the amber System Fault LED located on the system unit to alert the user of an internal hardware problem. The indicator may

also be set to blink by the operator as a tool to allow system identification. For identification, the blue locate LED on the enclosure and at the system level will turn on solid. The amber system fault LED will be on solid when an error condition occurs.

On POWER7+ processor-based servers, hardware and software failures are recorded in the system log. When an HMC is attached, an ELA routine analyzes the error, forwards the event to the Service Focal Point (SFP) application running on the HMC, and notifies the system administrator that it has isolated a likely cause of the system problem. The service processor event log also records unrecoverable checkstop conditions, forwards them to the SFP application, and notifies the system administrator. Once the information is logged in the SFP application, if the system is properly configured, a call home service request 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 can diagnose, check the status of, and sense the operational conditions of a system. It runs on its own power boundary and does not require resources from a system processor to be operational to perform its tasks.

The service processor supports surveillance of the connection to the HMC and to the system firmware (hypervisor). It also provides several remote power control options, environmental monitoring, reset, restart, remote maintenance, and diagnostic functions, including console mirroring. The service processor menus (ASMI) can be accessed concurrently with system operation, allowing nondisruptive abilities to change system default parameters.

Concurrent maintenance

The Power 770 continues to support concurrent add or repair of power, cooling, PCI adapters, media devices, I/O drawers, 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 (IO hub) and repair

With the proper configuration and required protective measures, the Power 770 server is designed for node add, memory upgrade, GX adapter add and repair, or node repair without powering down the system. Power 770 servers support the adding of an additional CEC enclosure (node) to a system (hot-node add) or adding additional memory (memory upgrade) to an existing node or adding additional GX adapter to an existing node. The additional Power 770 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 OS partitions or new partitions as required. Hot-node add, GX adapter add, and memory upgrade makes 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). A GX adapter can be repaired by freeing up its attached IO 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, the system should have sufficient inactive or spare processor 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+ partition system to another POWER6 , POWER7 , or POWER7+ system without disrupting services. Also, IBM i and Linux partitions in Power 770 and 780 systems are enabled to migrate to another Power 770/780 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 770 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 U.S. Section 508 Voluntary Product Accessibility Template (VPAT) can be requested via the IBM website

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

Statement of general direction

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

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 [112-186](#), dated October 03, 2012

Product number

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

Description	MT	Model	Feature
IBM Power 770	9117	MMD	
Specify EXP30 Load Source placement	9117	MMD	0729
#1737 Load Source Specify (856GB SFF-1 disk)	9117	MMD	0879
#1738 Load Source Specify (856GB SFF-2 disk)	9117	MMD	0880
856GB 10k RPM SAS SFF Disk Drive (IBM i)	9117	MMD	1737
856GB 10k RPM SAS SFF-2 Disk Drive (IBM i)	9117	MMD	1738
900GB 10K RPM SAS SFF Disk Drive (AIX/Linux)	9117	MMD	1751
900GB 10k RPM SAS SFF-2 Disk Drive (AIX/Linux)	9117	MMD	1752
GX++ 2-port PCIe2 x8 Adapter	9117	MMD	1914
SAS EX Cable 3m - Drawer to Drawer	9117	MMD	3675
SAS EX Cable 6m - Drawer to Drawer	9117	MMD	3680
Processor Cable, Two,Three-Drawer System, 4 socket	9117	MMD	3715
Processor Cable, Two,Three,Four-Drawer System, 4 socket	9117	MMD	3716
Processor Cable, Three,Four-Drawer System, 4 socket	9117	MMD	3717
Processor Cable, Four-Drawer System, 4 socket	9117	MMD	3718
SATA Slimline DVD-RAM Drive	9117	MMD	5771
Shared EXP30 Indicator	9117	MMD	5925
SAS EX Cable 1.5m - Drawer to Drawer	9117	MMD	5926
Remote EXP30 Indicator	9117	MMD	5927
Specify Mode-1 & EXP30 for 1 EXP24S #5887	9117	MMD	9388
Dynamic Platform Optimizer	9117	MMD	EB33
System CEC Enclosure with IBM BEZEL, I/O Backplane, and System Midplane	9117	MMD	EB85
System CEC Enclosure with OEM BEZEL, I/O Backplane, and System Midplane	9117	MMD	EB86
PCIe2 2-Port 10GbE RoCE SR Adapter	9117	MMD	EC30
Operator Panel	9117	MMD	EC53
EXP30 Ultra SSD I/O Drawer	9117	MMD	EDR1
Carry-over Indicator for 0/32 GB DDR3 #5600 (MDL Upgrade Only)	9117	MMD	EH04
Carry-over Indicator for 0/64 GB DDR3 #5601 (MDL Upgrade Only)	9117	MMD	EH05
Carry-over Indicator for 0/128 GB DDR3 #5602 (MDL Upgrade Only)	9117	MMD	EH06
Carry-over Indicator for 0/256 GB DDR3 #5564 (MDL Upgrade Only)	9117	MMD	EH07
0/32GB DDR3 Memory (4X8GB) DIMMS - 1066 MHZ - POWER7+ CoD Memory	9117	MMD	EM40
0/64GB DDR3 Memory (4X8GB) DIMMS - 1066 MHZ - POWER7+ CoD Memory	9117	MMD	EM41
0/128GB DDR3 Memory (4X8GB) DIMMS - 1066 MHZ - POWER7+ CoD Memory	9117	MMD	EM42
0/256GB DDR3 Memory (4X64GB) DIMMS - 1066 MHZ - POWER7+ CoD Memory	9117	MMD	EM44
90 Days On/Off CoD Temporary Memory Enablement	9117	MMD	EM9T
Activation of 1 GB DDR3 POWER7+ Memory	9117	MMD	EMA2
Activation of 100 GB DDR3 POWER7+ Memory	9117	MMD	EMA3
PCIe x8 Cable 1.5m	9117	MMD	EN05
PCIe x8 Cable 3m	9117	MMD	EN07
PCIe x8 Cable 8m	9117	MMD	EN08
90 Days On/Off CoD Temporary Processor Core Enablement	9117	MMD	EP9T
4.22 GHz Proc Card, 0/12 Core POWER7+, 16 DDR3			

Memory Slots	9117	MMD	EPM0
3.80 GHz Proc Card, 0/16 Core POWER7+, 16 DDR3 Memory Slots	9117	MMD	EPM1
1-Core Activation for Processor Feature EPM0	9117	MMD	EPMA
1-Core Activation for Processor Feature EPM1	9117	MMD	EPMB
1 Proc-Day On/Off Billing for #EPM0, AIX/Linux	9117	MMD	EPME
1 Proc-Day On/Off Billing for #EPM0, IBM i	9117	MMD	EPMF
1 Proc-Day On/Off Billing for #EPM1, AIX/Linux	9117	MMD	EPMG
1 Proc-Day On/Off Billing for #EPM1, IBM i	9117	MMD	EPMH
100 On/Off Proc-Days of CoD Billing for Processor #EPM0. AIX/Linux	9117	MMD	EPMN
100 On/Off Proc-Days of CoD Billing for Processor #EPM0. IBM i	9117	MMD	EPMP
100 On/Off Proc-Days of CoD Billing for Processor #EPM1. AIX/Linux	9117	MMD	EPMQ
100 On/Off Proc-Days of CoD Billing for Processor #EPM1. IBM i	9117	MMD	EPMR
Proc CoD Utility Billing, 100 Proc-mins. for #EPM0, AIX/Linux	9117	MMD	EPMW
Proc CoD Utility Billing, 100 Proc-mins. for #EPM0, IBM i	9117	MMD	EPMX
Proc CoD Utility Billing, 100 Proc-mins. for #EPM1, AIX/Linux	9117	MMD	EPMY
Proc CoD Utility Billing, 100 Proc-mins. for #EPM1, IBM i	9117	MMD	EPMZ
Quantity 150 of #1737 (856GB SFF-1 disk)	9117	MMD	EQ37
Quantity 150 of #1738 (856GB SFF-2 disk)	9117	MMD	EQ38
Quantity 150 of #1751 (900GB SFF-1 disk)	9117	MMD	EQ51
Quantity 150 of #1752 (900GB SFF-2 disk)	9117	MMD	EQ52
Optional Front Door for Power 770 & 780 2.0m Rack	9117	MMD	ERG7
387GB 1.8" SAS SSD for AIX/Linux with eMLC	9117	MMD	ES02
RDX USB External Docking Station for Removable Disk Cartridge	9117	MMD	EU04
Service Processor-3	9117	MMD	EU09
10G Base T Wrap	9117	MMD	EU20
Core Use HW Feature 10X	9117	MMD	EUC7

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

Description	MT	Model	Feature
One CSC Billing Unit	9117	MMD	0010
Ten CSC Billing Units	9117	MMD	0011
Specify Code for External High Speed Modem	9117	MMD	0032
Mirrored System Disk Level, Specify Code	9117	MMD	0040
Device Parity Protection-All, Specify Code	9117	MMD	0041
Mirrored System IOP Level Specify Code	9117	MMD	0042
Mirrored System Bus Level, Specify Code	9117	MMD	0043
Device Parity RAID-6 All, Specify Code	9117	MMD	0047
RISC-to-RISC Data Migration	9117	MMD	0205
1Gbps Ethernet Specify	9117	MMD	0226
AIX Partition Specify	9117	MMD	0265
Linux Partition Specify	9117	MMD	0266
IBM i Operating System Partition Specify	9117	MMD	0267
CSC Specify	9117	MMD	0275
Ext Tape Attached via #5736	9117	MMD	0290
Specify Custom Data Protection	9117	MMD	0296
Specify EXP24 Attach via Existing Controller	9117	MMD	0302
Mirrored Level System Specify Code	9117	MMD	0308
IPCS Extension Cables for NT	9117	MMD	0325
RAID Hot Spare Specify	9117	MMD	0347
V.24/EIA232 6.1m (20-Ft) PCI Cable	9117	MMD	0348
V.24/EIA232 15.2m (50-Ft) PCI Cable	9117	MMD	0349
V.35 6.1m (20-Ft) PCI Cable	9117	MMD	0353
V.35 15.2m (50-Ft) PCI Cable	9117	MMD	0354
V.36 6.1m (20-Ft) PCI Cable	9117	MMD	0356
X.21 6.1m (20-Ft) PCI Cable	9117	MMD	0359

X.21 15.2m (50-Ft) PCI Cable	9117	MMD	0360
V.24/EIA232 (80-Ft) PCI Cable	9117	MMD	0365
V.24/EIA232 6.1M (20-Ft) PCI cable	9117	MMD	0367
UPS Factory Integration Specify	9117	MMD	0373
HMC Factory Integration Specify	9117	MMD	0374
Display Factory Integration Specify	9117	MMD	0375
Reserve Rack Space for UPS	9117	MMD	0376
Reserve Rack Space for HMC	9117	MMD	0377
Reserve Rack Space for Display	9117	MMD	0378
MTM Upgrade Indicator	9117	MMD	0395
MMA/MMB/MHB upgrade indicator	9117	MMD	0397
512MB DDR Server Memory	9117	MMD	0446
1GB DDR Server Memory	9117	MMD	0447
Customer Specified Placement	9117	MMD	0453
SSD Placement Indicator - CEC	9117	MMD	0462
SSD Placement Indicator (5802/5803)	9117	MMD	0463
SSD Placement Indicator - 5886	9117	MMD	0464
SSD Placement Indicator - 5887	9117	MMD	0465
IBM i 5.4 w/ V5R4M5 Specify Code	9117	MMD	0533
IBM i 6.1 Specify Code	9117	MMD	0534
19 inch, 1.8 meter high rack	9117	MMD	0551
19 inch, 2.0 meter high rack	9117	MMD	0553
19 inch, 1.3 meter high rack	9117	MMD	0555
IBM i 6.1 with 6.1.1 Machine Code Specify Code	9117	MMD	0566
IBM i 7.1 Specify Code	9117	MMD	0567
PCI-X Expansion Unit in Rack	9117	MMD	0588
PCI/SCSI Disk Expansion Drawer	9117	MMD	0595
Rack Filler Panel Kit	9117	MMD	0599
#5094 Equivalent	9117	MMD	0694
#5096 Equivalent	9117	MMD	0696
Balanced Warehouse Solution Indicator	9117	MMD	0710
Manufacturing Routing Code for CSC	9117	MMD	0712
Load Source Not in CEC	9117	MMD	0719
Load Source in #0595	9117	MMD	0720
Load Source in #5094/5294	9117	MMD	0721
#1787 Load Source Specify	9117	MMD	0722
#1996 Load Source Specify	9117	MMD	0724
Specify Load Source in #5786	9117	MMD	0725
Specify Load Source in #5802/#5803/#5877	9117	MMD	0726
Specify #5886 Load Source placement	9117	MMD	0727
Specify #5887 Load Source placement	9117	MMD	0728
#4319 Load Source Specify	9117	MMD	0830
#4326 Load Source Specify	9117	MMD	0834
#4327 Load Source Specify	9117	MMD	0835
#4328 Load Source Specify	9117	MMD	0836
SAN Load Source Specify	9117	MMD	0837
#3676 Load Source Specify	9117	MMD	0838
#3677 Load Source Specify	9117	MMD	0839
#3678 Load Source Specify	9117	MMD	0840
#4329 Load Source Specify	9117	MMD	0841
#3658 Load Source Specify	9117	MMD	0844
#1884 Load Source Specify	9117	MMD	0851
#1888 Load Source Specify	9117	MMD	0853
#1909 Load Source Specify	9117	MMD	0854
#3587 Load Source Specify	9117	MMD	0855
#1911 Load Source Specify	9117	MMD	0856
#1916 Load Source Specify	9117	MMD	0857
#1879 Load Source Specify	9117	MMD	0870
#1947 Load Source Specify	9117	MMD	0871
#1948 Load Source Specify	9117	MMD	0872
#1956 Load Source Specify	9117	MMD	0874
#1962 Load Source Specify	9117	MMD	0875
#1794 Load Source Specify	9117	MMD	0876
#ES0B Load Source Specify	9117	MMD	0893
#ES0D Load Source Specify	9117	MMD	0894
US TAA Compliance Indicator	9117	MMD	0983
Modem Cable - US/Canada and General Use	9117	MMD	1025
USB External Docking Station for Removable Disk			

Drive	9117	MMD	1104
USB 160 GB Removable Disk Drive	9117	MMD	1106
USB 500 GB Removable Disk Drive	9117	MMD	1107
3m, Blue Cat5e Cable	9117	MMD	1111
10m, Blue Cat5e Cable	9117	MMD	1112
25m, Blue Cat5e Cable	9117	MMD	1113
3m, Yellow Cat5e Cable	9117	MMD	1118
Decline Electronic Service Agent™ Install Indicator	9117	MMD	1120
CAT5E Ethernet Cable, 25M YELLOW	9117	MMD	1121
Custom Service Specify, Rochester Minn, USA	9117	MMD	1140
System Unique Identifier	9117	MMD	1311
200V 16A 4.3m (14-Ft) TL Line Cord	9117	MMD	1406
4.3m 200V/16A Pwr Cd Italy	9117	MMD	1408
125V 4.3m (14-Ft) Line Cord	9117	MMD	1413
200V 1.8m (6-Ft) Locking Line Cord	9117	MMD	1414
200V 1.8m (6-Ft) Watertight Line Cord	9117	MMD	1415
200V 4.3m (14-Ft) Locking Line Cord	9117	MMD	1416
200V 4.3m (14-Ft) Watertight Line Cord	9117	MMD	1417
4.3m 200V/16A Power Cord EU/Asia	9117	MMD	1420
4.3m 200V/16A Power Cord CH/DK	9117	MMD	1421
200V 1.8m (6-Ft) Locking Line Cord	9117	MMD	1424
200V 1.8m (6-Ft) Watertight Line Cord	9117	MMD	1425
200V 4.3m (14-Ft) Locking Line Cord	9117	MMD	1426
200V 4.3m (14-Ft) Watertight Line Cord	9117	MMD	1427
4.3m 200V/10A Power Cord EU/Asia	9117	MMD	1439
4.3m 200V/10A Power Cord Denmark	9117	MMD	1440
4.3m 200V/10A Power Cord S. Africa	9117	MMD	1441
4.3m 200V/10A Power Cord Swiss	9117	MMD	1442
4.3m 200V/10A Power Cord UK	9117	MMD	1443
4.3m 200V/10A Power Cord Israel	9117	MMD	1445
4.3m 200V/32A Power Cord EU 1-PH	9117	MMD	1449
4.3m 200V/16A Power Cord EU 2-PH	9117	MMD	1450
200V (6-Ft) 1.8m Line Cord	9117	MMD	1451
Power Cord (4.3 M), To Wall (250V/15A)	9117	MMD	1452
200V (6-Ft) 1.8m Locking Line Cord	9117	MMD	1453
200V 12A (14-Ft) 4.3m TL Line Cord	9117	MMD	1454
200V (6-Ft) 1.8m Watertight Line Cord	9117	MMD	1455
200V (14-Ft) 4.3m Watertight Line Cord	9117	MMD	1456
200V (6-Ft) 1.8m Upper Line Cord	9117	MMD	1457
200V (6-Ft) 1.8m Upper Locking Cord	9117	MMD	1458
200V (6-Ft) 1.8m Upper watertight Cord	9117	MMD	1459
3m Copper RIO Cable	9117	MMD	1460
6m Copper RIO Cable	9117	MMD	1461
15m RIO Cable	9117	MMD	1462
30m SPCN Cable	9117	MMD	1466
6m RIO to RIO-2 Cable	9117	MMD	1474
10m RIO to RIO-2 Cable	9117	MMD	1475
4.3m 200V/16A Pwr Cd	9117	MMD	1477

Remote I/O Cable, 15M	9117	MMD	1485
3m RIO to RIO-2 Cable	9117	MMD	1487
IPCS Keyboard/Mouse for NT	9117	MMD	1700
Integrated Multifunction card with Copper SFP+	9117	MMD	1768
Integrated Multifunction card with SR Optical	9117	MMD	1769
177GB SFF-1 SSD w/ eMLC (AIX/Linux)	9117	MMD	1775
177GB SFF-1 SSD w/ eMLC (IBM i)	9117	MMD	1787
600GB 10K RPM SAS SFF Disk Drive (AIX/Linux)	9117	MMD	1790
177GB SFF-2 SSD w/ eMLC (AIX/Linux)	9117	MMD	1793
177GB SFF-2 SSD w/ eMLC (IBM i)	9117	MMD	1794
GX Dual Port- RIO-2 Attach	9117	MMD	1800
GX Dual Port- 12X Channel Attach	9117	MMD	1802
Integrated, 4 Port- 1Gb Virtual Ethernet, I/O ports	9117	MMD	1803
Integrated, 4 Port (2x1Gb and 2x10Gb SFP+ Optical-SR ports)	9117	MMD	1804
GX++ 12X DDR Adapter, Dual-port	9117	MMD	1808
Integrated, 4 Port (2x1Gb and 2x10Gb SFP+ Copper twinax ports)	9117	MMD	1813
SAS Cable for triple split DASD backplane	9117	MMD	1815
Quantity 150 of #1962	9117	MMD	1817
Quantity 150 of #1964	9117	MMD	1818
SAS Cable Assembly for SAS Port	9117	MMD	1819
System port/UPS Conversion Cable	9117	MMD	1827
1.5 Meter 12X to 4X Channel Conversion Cable	9117	MMD	1828
0.6 Meter 12X Cable	9117	MMD	1829
1.5 Meter 12X cable	9117	MMD	1830
8.0 Meter 12X Cable	9117	MMD	1834
3.0 Meter 12X Cable	9117	MMD	1840
3 Meter 12X to 4X Channel Conversion Cable	9117	MMD	1841
10 Meter 12X to 4X Channel Conversion Cable	9117	MMD	1842
Quantity 150 of #1956	9117	MMD	1844
Operator Panel	9117	MMD	1845
Operator Panel	9117	MMD	1846
Operator Panel	9117	MMD	1853
10 Meter 12X to 4X Enhanced Channel Conversion Cable	9117	MMD	1854
0.6 Meter 12X DDR Cable	9117	MMD	1861
1.5 Meter 12X DDR Cable	9117	MMD	1862
8.0 Meter 12X DDR Cable	9117	MMD	1864
3.0 Meter 12X DDR Cable	9117	MMD	1865
Quantity 150 of #1917	9117	MMD	1866
Quantity 150 of #1947	9117	MMD	1868
Quantity 150 of #1925	9117	MMD	1869
283GB 15K RPM SAS SFF Disk Drive (IBM i)	9117	MMD	1879
300GB 15K RPM SAS SFF Disk Drive (AIX/Linux)	9117	MMD	1880
146.8GB 10K RPM SAS SFF Disk Drive	9117	MMD	1882
73.4 GB 15K RPM SAS SFF Disk Drive	9117	MMD	1883
69.7 GB 15K RPM SAS SFF Disk Drive	9117	MMD	1884
300GB 10K RPM SFF SAS Disk Drive	9117	MMD	1885
146GB 15K RPM SFF SAS Disk Drive (AIX/Linux)	9117	MMD	1886
Quantity 150 of #1793	9117	MMD	1887
139GB 15K RPM SFF SAS Disk Drive (IBM i)	9117	MMD	1888
69GB SFF SAS Solid State Drive	9117	MMD	1890
Quantity 150 of #1883	9117	MMD	1891
Quantity 150 of #1882	9117	MMD	1899
69GB SFF SAS Solid State Drive	9117	MMD	1909
283GB 10K RPM SFF SAS Disk Drive (IBM i)	9117	MMD	1911
PCI-X DDR Dual Channel Ultra320 SCSI Adapter	9117	MMD	1912
571GB 10k RPM SAS SFF Disk Drive (IBM i)	9117	MMD	1916
146GB 15k RPM SAS SFF-2 Disk Drive (AIX/Linux)	9117	MMD	1917
300GB 10k RPM SAS SFF-2 Disk Drive (AIX/Linux)	9117	MMD	1925
Quantity 150 of #1879	9117	MMD	1926
Quantity 150 of #1948	9117	MMD	1927
Quantity 150 of #1880	9117	MMD	1928
Quantity 150 of #1953	9117	MMD	1929
139GB 15k RPM SAS SFF-2 Disk Drive (IBM i)	9117	MMD	1947
283GB 15k RPM SAS SFF-2 Disk Drive (IBM i)	9117	MMD	1948
300GB 15k RPM SAS SFF-2 Disk Drive (AIX/Linux)	9117	MMD	1953
283GB 10k RPM SAS SFF-2 Disk Drive (IBM i)	9117	MMD	1956
Quantity 150 of #1794	9117	MMD	1958
571GB 10k RPM SAS SFF-2 Disk Drive (IBM i)	9117	MMD	1962
600GB 10k RPM SAS SFF-2 Disk Drive (AIX/Linux)	9117	MMD	1964
177GB SSD Module with eMLC (AIX/Linux)	9117	MMD	1995

177GB SSD Module with eMLC (IBM i)	9117	MMD	1996
PCIe RAID & SSD SAS Adapter 3Gb w/ Blind Swap Cassette	9117	MMD	2055
PCI SCSI Adapter 16-Bit Differential External Y Cable	9117	MMD	2114
Converter Cable, VHDCI to P, Mini-68 pin to 68 pin, 0.3M	9117	MMD	2118
Ultra 320 SCSI Cable 1 Meter	9117	MMD	2124
Ultra 320 SCSI Cable 3 Meter	9117	MMD	2125
Ultra 320 SCSI Cable 5 Meter	9117	MMD	2126
Ultra 320 SCSI Cable 10 Meter	9117	MMD	2127
Ultra 320 SCSI Cable 20 Meter	9117	MMD	2128
0.55 Meter Ultra 320 SCSI Cable	9117	MMD	2138
Primary OS - IBM i	9117	MMD	2145
Primary OS - AIX	9117	MMD	2146
Primary OS - Linux	9117	MMD	2147
0.6M 16-bit SCSI-2 System-to-System Cable	9117	MMD	2424
2.5M 16-bit SCSI-2 System-to-System Cable	9117	MMD	2425
2M LC-SC 50 Micron Fiber Converter Cable	9117	MMD	2456
2M LC-SC 62.5 Micron Fiber Converter Cable	9117	MMD	2459
External USB 1.44 MB Diskette Drive	9117	MMD	2591
4 port USB PCIe Adapter	9117	MMD	2728
2-Port USB PCI Adapter	9117	MMD	2738
PCI Ultra Mag Media Controller	9117	MMD	2749
PCI-X Ultra RAID Disk Controller	9117	MMD	2757
PCI-X Ultra4 RAID Disk Controller	9117	MMD	2780
PCI-X Fibre Chan Disk Controller	9117	MMD	2787
PCI IOP	9117	MMD	2844
PCI IOP for SAN Load Source	9117	MMD	2847
POWER GXT135P Graphics Accelerator with Digital Support	9117	MMD	2849
ARTIC960Hx 4-Port EIA-232 Cable	9117	MMD	2861
ARTIC960Hx 4-Port X.21 Cable	9117	MMD	2863
ARTIC960Hx 4-Port V.35 (DTE) Cable	9117	MMD	2864
PCIe 2-Line WAN w/Modem	9117	MMD	2893
Asynchronous Terminal/Printer Cable EIA-232	9117	MMD	2934
Asynchronous Cable EIA-232/V.24 3M	9117	MMD	2936
8-Port Asynchronous Adapter EIA-232/RS-422, PCI bus	9117	MMD	2943
IBM ARTIC960Hx 4-Port Multiprotocol PCI Adapter Cable, V.24 / EIA-232	9117	MMD	2947
Cable, V.35	9117	MMD	2951
Cable, V.36 / EIA-499	9117	MMD	2952
Cable, X.21	9117	MMD	2953
2-Port Multiprotocol PCI Adapter	9117	MMD	2954
Serial-to-Serial Port Cable for Drawer/Drawer-3.7M	9117	MMD	2962
Serial-to-Serial Port Cable for Rack/Rack- 8M	9117	MMD	3124
RIO-2(Remote I/O-2)Cbl, 1.2M	9117	MMD	3125
RIO-2(Remote I/O-2)Cbl, 3.5M	9117	MMD	3146
RIO-2 (Remote I/O-2) Cable, 10M	9117	MMD	3147
RIO-2 (Remote I/O-2) Cable, 1.75M	9117	MMD	3148
RIO-2 (Remote I/O-2) Cbl, 2.5M	9117	MMD	3156
36.4 GB 10,000 RPM Ultra320 SCSI Disk Drive Assembly	9117	MMD	3168
73.4 GB 10,000 RPM Ultra320 SCSI Disk Drive Assembly	9117	MMD	3273
146.8 GB 10,000 RPM Ultra320 SCSI Disk Drive Assembly	9117	MMD	3274
36.4 GB 15,000 RPM Ultra320 SCSI Disk Drive Assembly	9117	MMD	3275
73.4 GB 15,000 RPM Ultra320 SCSI Disk Drive Assembly	9117	MMD	3277
146.8 GB 15,000 RPM Ultra320 SCSI Disk Drive Assembly	9117	MMD	3278
1m, (3.3-ft) IB 40G Copper Cable QSFP/QSFP	9117	MMD	3279
3m, (9.8-ft.) IB 40G Copper Cable QSFP/QSFP	9117	MMD	3287
5m QDR IB/E'Net Copper Cable QSFP/QSFP	9117	MMD	3288
10 meter Quad Data Rate InfiniBand Optical Cable, QSFP/QSFP	9117	MMD	3289
30 meter Quad Data Rate InfiniBand Optical Cable, QSFP/QSFP	9117	MMD	3290
SAS YO Cable 1.5m - HD 6Gb Adapter to Enclosure	9117	MMD	3293
	9117	MMD	3450

SAS YO Cable 3m - HD 6Gb Adapter to Enclosure	9117	MMD	3451
SAS YO Cable 6m - HD 6Gb Adapter to Enclosure	9117	MMD	3452
SAS YO Cable 10m - HD 6Gb Adapter to Enclosure	9117	MMD	3453
SAS X Cable 3m - HD 6Gb 2-Adapter to Enclosure	9117	MMD	3454
SAS X Cable 6m - HD 6Gb 2-Adapter to Enclosure	9117	MMD	3455
SAS X Cable 10m - HD 6Gb 2-Adapter to Enclosure	9117	MMD	3456
SAS YO Cable 15m - HD 3Gb Adapter to Enclosure	9117	MMD	3457
SAS X Cable 15m - HD 3Gb 2-Adapter to Enclosure	9117	MMD	3458
300 GB 10,000 RPM Ultra320 SCSI Disk Drive Assembly	9117	MMD	3578
300 GB 15K RPM SCSI Disk Drive (AIX/Linux)	9117	MMD	3585
69GB 3.5" SAS Solid State Drive	9117	MMD	3586
69GB 3.5" SAS Solid State Drive	9117	MMD	3587
Widescreen LCD Monitor	9117	MMD	3632
T210 Flat-Panel Monitor	9117	MMD	3635
L200P Flat Panel Monitor	9117	MMD	3636
IBM T541H /L150p 15" TFT Color Monitor	9117	MMD	3637
IBM Thinkvision L170p Flat Panel Monitor	9117	MMD	3639
ThinkVision L171p Flat Panel Monitor	9117	MMD	3640
IBM T115 Flat Panel Monitor	9117	MMD	3641
ThinkVision L191p Flat Panel Monitor	9117	MMD	3642
IBM T120 Flat Panel Monitor	9117	MMD	3643
IBM T119 Flat Panel Monitor	9117	MMD	3644
IBM T117 Flat Panel Monitor	9117	MMD	3645
73GB 15K RPM SAS Disk Drive	9117	MMD	3646
146GB 15K RPM SAS Disk Drive (AIX/Linux)	9117	MMD	3647
300GB 15K RPM SAS Disk Drive (AIX/Linux)	9117	MMD	3648
450GB 15K RPM SAS Disk Drive (AIX/Linux)	9117	MMD	3649
External connection for 3 of 6 internal SAS Disk Slots	9117	MMD	3650
External connection for the 6 internal SAS Disk slots.	9117	MMD	3651
SAS Cable (EE) Drawer to Drawer 1M	9117	MMD	3652
SAS Cable (EE) Drawer to Drawer 3M	9117	MMD	3653
SAS Cable (EE) Drawer to Drawer 6M	9117	MMD	3654
428GB 15K RPM SAS Disk Drive (IBM i)	9117	MMD	3658
Processor Fabric Cable, 2 enclosure	9117	MMD	3660
SAS Cable (X) Adapter to SAS Enclosure, Dual Controller/Dual Path 3M:	9117	MMD	3661
SAS Cable (X) Adapter to SAS Enclosure, Dual Controller/Dual Path 6M:	9117	MMD	3662
SAS Cable (X) Adapter to SAS Enclosure, Dual Controller/Dual Path 15M:	9117	MMD	3663
Processor Fabric Cable, 3 enclosure	9117	MMD	3664
Processor Fabric Cable, 4 enclosure	9117	MMD	3665
SAS Cable (YR) -1M	9117	MMD	3667
Serv Interface Cable- 2, 3, and 4 Enclosure	9117	MMD	3671
Serv Interface Cable- 3 and 4 Enclosure	9117	MMD	3672
Serv Interface Cable- 4 Enclosure	9117	MMD	3673
69.7GB 15k rpm SAS Disk Drive	9117	MMD	3676
139.5GB 15k rpm SAS Disk Drive (IBM i)	9117	MMD	3677
283.7GB 15k rpm SAS Disk Drive (IBM i)	9117	MMD	3678
SAS Cable (AI)- Adapter to Internal drive 1M	9117	MMD	3679
3M SAS CABLE, ADPTR TO ADPTR (AA)	9117	MMD	3681
6M SAS CABLE, ADPTR TO ADPTR (AA)	9117	MMD	3682
SAS Cable (AE) Adapter to Enclosure, single controller/single path 3M	9117	MMD	3684
SAS Cable (AE) Adapter to Enclosure, single controller/single path 6M	9117	MMD	3685
SAS Cable (YI) System to SAS Enclosure, Single Controller/Dual Path 1.5M	9117	MMD	3686
SAS Cable (YI) System to SAS Enclosure, Single Controller/Dual Path 3M	9117	MMD	3687
SAS Cable (AT) 0.6 Meter	9117	MMD	3688
SAS AT Cable 0.6m - HD 6Gb Adapter to 12X Enclosure (AT)	9117	MMD	3689
SAS Cable (YO) Adapter to SAS Enclosure, Single Controller/Dual Path 1.5 M	9117	MMD	3691
SAS Cable (YO) Adapter to SAS Enclosure, Single Controller/Dual Path 3 M	9117	MMD	3692
SAS Cable (YO) Adapter to SAS Enclosure, Single Controller/Dual Path 6 M	9117	MMD	3693
SAS Cable (YO) Adapter to SAS Enclosure, Single Controller/Dual Path 15 M	9117	MMD	3694

External xSeries® Attach	9117	MMD	3704
PCI IOP	9117	MMD	3705
DVD-ROM	9117	MMD	3706
30GB 1/4-Inch Cartridge Tape	9117	MMD	3707
50GB 1/4-Inch Cartridge Tape	9117	MMD	3708
PCI 100/10Mbps Ethernet IOA	9117	MMD	3709
Processor Cable, Two-Drawer System	9117	MMD	3711
Processor Cable, Two, Three or Four Drawer System	9117	MMD	3712
Processor Cables, Three or Four Drawer System	9117	MMD	3713
Processor Cables, Four-Drawer System	9117	MMD	3714
0.3M Serial Port Converter Cable, 9-Pin to 25-Pin	9117	MMD	3925
Asynch Printer/Terminal Cable, 9-pin to 25-pin, 4M	9117	MMD	3926
Serial Port Null Modem Cable, 9-pin to 9-pin, 3.7M	9117	MMD	3927
Serial Port Null Modem Cable, 9-pin to 9-pin, 10M	9117	MMD	3928
System Serial Port Converter Cable	9117	MMD	3930
1.8 M (6-ft) Extender Cable for Displays (15-pin D-shell to 15-pin D-shell)	9117	MMD	4242
Extender Cable - USB Keyboards, 1.8M	9117	MMD	4256
VGA to DVI Connection Converter	9117	MMD	4276
35.16GB 10k rpm Disk Unit	9117	MMD	4319
35.16GB 15k rpm Disk Unit	9117	MMD	4326
70.56GB 15k rpm Disk Unit	9117	MMD	4327
141.12GB 15k rpm Disk Unit	9117	MMD	4328
282.25GB 15k rpm Disk Unit	9117	MMD	4329
Package 5X #2055 & 20X #1995 (AIX/Linux)	9117	MMD	4367
Package 5X #2055 & 20X #1996 (IBM i)	9117	MMD	4377
DVD-RAM	9117	MMD	4430
50GB 1/4-Inch Cartridge Tape	9117	MMD	4487
4/8GB (4X2GB) DIMMS, 276 PIN 533 MHZ, DDR2 SDRAM	9117	MMD	4495
8/16GB (4X4GB) DIMMS, 276 PIN, 533 MHZ DDR2 SDRAM	9117	MMD	4496
16GB (4X4GB) DIMMS, 276 PIN, 533 MHZ, DDR2 SDRAM	9117	MMD	4497
16GB (4X4GB) DIMMS, 276 pin, 400MHZ DDR2 SDRAM	9117	MMD	4499
DVD-RAM	9117	MMD	4630
DVD-RAM	9117	MMD	4633
One and only one rack indicator feature is required on all orders (#4650 to #4666).			
Rack Indicator- Not Factory Integrated	9117	MMD	4650
Rack Indicator, Rack #1	9117	MMD	4651
Rack Indicator, Rack #2	9117	MMD	4652
Rack Indicator, Rack #3	9117	MMD	4653
Rack Indicator, Rack #4	9117	MMD	4654
Rack Indicator, Rack #5	9117	MMD	4655
Rack Indicator, Rack #6	9117	MMD	4656
Rack Indicator, Rack #7	9117	MMD	4657
Rack Indicator, Rack #8	9117	MMD	4658
Rack Indicator, Rack #9	9117	MMD	4659
Rack Indicator, Rack #10	9117	MMD	4660
Rack Indicator, Rack #11	9117	MMD	4661
Rack Indicator, Rack #12	9117	MMD	4662
Rack Indicator, Rack #13	9117	MMD	4663
Rack Indicator, Rack #14	9117	MMD	4664
Rack Indicator, Rack #15	9117	MMD	4665
Rack Indicator, Rack #16	9117	MMD	4666
On/Off 999 GB-Days, Memory Billing POWER7	9117	MMD	4710
PCI Twinaxial workstn IOA	9117	MMD	4746
PCI-X Cryptographic Coprocessor (FIPS 4)	9117	MMD	4764
ACTIVE MEMORY EXPANSION ENABLEMENT	9117	MMD	4791
Active Memory Mirroring	9117	MMD	4797
PCI Crypto Coprocessor	9117	MMD	4801
PCI Crypto Accelerator	9117	MMD	4805
PCIe Crypto Coprocessor Gen3 BSC 4765-001	9117	MMD	4808
PCIe Crypto Coprocessor Gen4 BSC 4765-001	9117	MMD	4809
PCI Integ xSeries Server	9117	MMD	4812
PCI Integ xSeries Server	9117	MMD	4813
CBU SPECIFY	9117	MMD	4891
3.5 GHZ Proc Card, 0/12 Core POWER7, 16 DDR3 Memory Slots	9117	MMD	4980
3.1 GHZ Proc Card, 0/16 Core POWER7, 16 DDR3 Memory Slots	9117	MMD	4981
3.72 GHZ Proc Card, 0/12 Core POWER7, 16 DDR3 Memory Slots	9117	MMD	4983
3.30 GHZ Proc Card, 0/16 Core POWER7, 16 DDR3			

Memory Slots	9117	MMD	4984
Single 5250 Enterprise Enablement	9117	MMD	4990
Full 5250 Enterprise Enablement	9117	MMD	4991
Single 5250 Enterprise Enablement	9117	MMD	4992
Full 5250 Enterprise Enablement	9117	MMD	4997
Software Preload Required	9117	MMD	5000
Custom Service Specify, Off-Site	9117	MMD	5001
Customer Solution Center - Rochester Mfg	9117	MMD	5002
Software Preinstall	9117	MMD	5005
PCI-X Expansion Unit	9117	MMD	5088
PCI-X Expansion Tower	9117	MMD	5094
PCI-X Exp Tower (no disk)	9117	MMD	5096
30-Disk Expansion Feature	9117	MMD	5108
Dual Line Cords - Tower	9117	MMD	5115
Dual Line Cords - 5294 Tower	9117	MMD	5116
Redundant Power and Cooling	9117	MMD	5138
Power Dist Unit 1 Phase NEMA	9117	MMD	5160
Power Dist Unit 1 Phase IEC	9117	MMD	5161
Power Dist Unit 2 of 3 Phase	9117	MMD	5162
Power Dist Unit - 3 Phase	9117	MMD	5163
PCIe2 2-Port 4X IB QDR Adapter 40Gb	9117	MMD	5285
PCIe2 2-port 10GbE SR Adapter	9117	MMD	5287
PCIe2 2-Port 10GbE SFP+Copper Adapter	9117	MMD	5288
2 Port Async EIA-232 PCIe Adapter	9117	MMD	5289
1.8m I/O Tower	9117	MMD	5294
1.8m I/O Tower (no disk)	9117	MMD	5296
1-Core Activation for Processor Feature #4983	9117	MMD	5329
Proc CoD Utility Billing, 100 Proc-mins. for #4983, AIX/Linux	9117	MMD	5330
Proc CoD Utility Billing, 100 Proc-mins. for #4983, IBM i	9117	MMD	5331
1 Proc-Day On/Off Billing for #4983, AIX/Linux	9117	MMD	5332
1 Proc-Day On/Off Billing for #4983, IBM i	9117	MMD	5333
1-Core Activation for Processor Feature #4984	9117	MMD	5334
Proc CoD Utility Billing, 100 Proc-mins. for #4984, AIX/Linux	9117	MMD	5335
Proc CoD Utility Billing, 100 Proc-mins. for #4984, IBM i	9117	MMD	5336
1 Proc-Day On/Off Billing for #4984, AIX/Linux	9117	MMD	5337
1 Proc-Day On/Off Billing for #4984, IBM i	9117	MMD	5338
One Processor Activation for Processor Feature #7380	9117	MMD	5403
Utility Billing for FC# 7380- 100 processor minutes	9117	MMD	5404
One Processor Activation for Processor Feature #4980	9117	MMD	5459
One Processor Activation for Processor Feature #4981	9117	MMD	5468
Utility Billing for FC# 7380 with IBM i - 100 processor minutes	9117	MMD	5480
Utility Billing for FC# 5620 with IBM i - 100 processor minutes	9117	MMD	5481
Utility Billing for FC# 5621 or #5622 with IBM i - 100 processor minutes	9117	MMD	5482
On/Off Processor Billing for FC#5620 with IBM i - 1 processor day	9117	MMD	5483
On/Off Processor Billing for Feature #5621 or #5622 with IBM i - 1 processor day	9117	MMD	5484
On/Off Processor Billing for FC#7380 with IBM i - 1 processor day	9117	MMD	5485
RFID Tags for Servers, Blades, BladeCenters, Racks, and HMCs	9117	MMD	5524
System AC Power Supply, 1925 w	9117	MMD	5532
Sys Console on OP Console	9117	MMD	5544
Sys Console 100Mbps Ethernet	9117	MMD	5548
Sys Console On HMC	9117	MMD	5550
Sys Console-Ethernet No IOP	9117	MMD	5553
Mirror 35GB Disk/Controller Pkg	9117	MMD	5554
Mirror 70GB Disk/Controller Pkg	9117	MMD	5555
Mirror 141GB Disk/Controller Pkg	9117	MMD	5556
Mirror 35GB Drawer Package	9117	MMD	5560
Mirror 70GB Drawer Package	9117	MMD	5561

0/256GB DDR3 Memory (4X64GB) DIMMS - 1066 MHZ - POWER7 CoD Memory	9117	MMD	5564
2780 Controller w/Aux Write Cache	9117	MMD	5580
2757 Controller w/Aux Write Cache	9117	MMD	5581
5777 Controller w/Aux Write Cache	9117	MMD	5583
System CEC Enclosure with IBM BEZEL, I/O Backplane, and System Midplane	9117	MMD	5585
System CEC Enclosure with OEM BEZEL, I/O Backplane, and System Midplane	9117	MMD	5586
2780 Controller w/Aux Write Cache	9117	MMD	5590
2757 Controller w/Aux Write Cache	9117	MMD	5591
0/32GB DDR3 Memory (4X8GB) DIMMS - 1066 MHZ - POWER7 CoD Memory	9117	MMD	5600
0/64GB DDR3 Memory (4X16GB) DIMMS - 1066 MHZ - POWER7 CoD Memory	9117	MMD	5601
0/128GB DDR3 Memory (4X32GB) DIMMS - 1066 MHZ - POWER7 CoD Memory	9117	MMD	5602
Processor Power Regulator	9117	MMD	5617
3.5 GHz Proc Card, 0/2 Core POWER6, 12 DDR2 Memory Slots	9117	MMD	5620
4.2 GHz Proc Card, 0/2 Core POWER6, 8 DDR2 Memory Slots	9117	MMD	5621
4.2 GHz Proc Card, 0/2 Core POWER6, 12 DDR2 Memory Slots	9117	MMD	5622
Proc Power Regulator	9117	MMD	5625
System CEC Enclosure with IBM Bezel	9117	MMD	5626
Sys AC Power Supply, 1600 w	9117	MMD	5628
Media Enclosure and Backplane	9117	MMD	5629
Integrated, 2 Port- 1Gb Virtual Ethernet, I/O ports	9117	MMD	5636
Integrated, 2 Port- 10Gb (SR) Virtual Ethernet, I/O ports	9117	MMD	5637
Integrated, 4 Port- 1Gb Virtual Ethernet, I/O ports	9117	MMD	5639
Utility Billing for FC# 5620- 100 processor minutes	9117	MMD	5640
Utility Billing for FC# 5621 or #5622 - 100 processor minutes	9117	MMD	5641
Blind Swap Type III Cassette- PCIe, Short Slot	9117	MMD	5646
Blind Swap Type III Cassette- PCI-X or PCIe, Standard Slot	9117	MMD	5647
Service Interface Card	9117	MMD	5648
On/Off Processor Day Billing for Feature #5620	9117	MMD	5650
Disk/Media Backplane	9117	MMD	5652
On/Off Processor Billing for Feature #5621 or #5622 - 1 processor day	9117	MMD	5653
On/Off Processor Day Billing for Feature #7380	9117	MMD	5656
Serv Interface Cable- 2 Enclosure	9117	MMD	5657
Serv Interface Cable- 3 Enclosure	9117	MMD	5658
System CEC Enclosure with IBM BEZEL, I/O Backplane, and System Midplane	9117	MMD	5659
Serv Interface Cable- 4 Enclosure	9117	MMD	5660
175MB Cache RAID - Dual IOA Enablement Card	9117	MMD	5662
Proc Enclosure and Backplane	9117	MMD	5663
Service Processor	9117	MMD	5664
FSP/Clock Pass Through Card	9117	MMD	5665
I/O Backplane	9117	MMD	5666
System Midplane	9117	MMD	5667
SAS Disk Backplane -6 slot	9117	MMD	5668
System CEC Enclosure with OEM BEZEL, I/O Backplane, and System Midplane	9117	MMD	5669
One Processor Activation for Processor Feature #5620	9117	MMD	5670
One Processor Activation for Processor Feature #5621	9117	MMD	5671
One Processor Activation for Processor Feature #5622	9117	MMD	5672
SATA Media Enclosure and Backplane	9117	MMD	5674
0/4 Core Processor Enclosure and Backplane	9117	MMD	5675
Activation of 1GB DDR2 POWER6 Memory	9117	MMD	5680
Activation of 256 GB DDR2 POWER6 Memory	9117	MMD	5681
Power 570 System Bezel	9117	MMD	5682
System Chassis - 4 EIA	9117	MMD	5683
Activation of 100 GB DDR2 Memory	9117	MMD	5684

Virtual Processor Power Regulator	9117	MMD	5686
0/32GB DDR2 Memory (4X8GB) DIMMS- 400 MHZ- POWER6 CoD Memory	9117	MMD	5690
On/Off, 1GB-1Day, Memory Billing POWER6 Memory	9117	MMD	5691
0/2GB DDR2 Memory (4X0.5GB) DIMMS- 667 MHZ- POWER6 Memory	9117	MMD	5692
0/4GB DDR2 Memory (4X1GB) DIMMS- 667 MHZ- POWER6 CoD Memory	9117	MMD	5693
0/8GB DDR2 Memory (4X2GB) DIMMS- 667 MHZ- POWER6 CoD Memory	9117	MMD	5694
0/16GB DDR2 Memory (4X4GB) DIMMS- 533 MHZ- POWER6 CoD Memory	9117	MMD	5695
0/32GB DDR2 Memory (4X8GB) DIMMS- 400 MHZ- POWER6 CoD Memory	9117	MMD	5696
System Ship Group	9117	MMD	5699
IBM Gigabit Ethernet-SX PCI-X Adapter	9117	MMD	5700
IBM 10/100/1000 Base-TX Ethernet PCI-X Adapter	9117	MMD	5701
PCI-X Ultra Tape Controller	9117	MMD	5702
PCI-X Fibre Channel Tape Controller	9117	MMD	5704
IBM 2-Port 10/100/1000 Base-TX Ethernet PCI-X Adapter	9117	MMD	5706
IBM 2-Port Gigabit Ethernet-SX PCI-X Adapter	9117	MMD	5707
10Gb FCoE PCIe Dual Port Adapter	9117	MMD	5708
PCI-X Dual Channel Ultra320 SCSI Adapter	9117	MMD	5712
1 Gigabit iSCSI TOE PCI-X on Copper Media Adapter	9117	MMD	5713
1 Gigabit iSCSI TOE PCI-X on Optical Media Adapter	9117	MMD	5714
2 Gigabit Fibre Channel PCI-X Adapter	9117	MMD	5716
4-Port 10/100/1000 Base-TX PCI Express® Adapter	9117	MMD	5717
10 Gigabit Ethernet -SR PCI-X Adapter	9117	MMD	5718
IBM 10 Gigabit Ethernet-LR PCI-X Adapter	9117	MMD	5719
10 Gb Ethernet-SR PCI-X 2.0 DDR Adapter	9117	MMD	5721
10 Gb Ethernet-LR PCI-X 2.0 DDR Adapter	9117	MMD	5722
2-Port Asynchronous EIA-232 PCI Adapter	9117	MMD	5723
PCIe2 8Gb 4-port Fibre Channel Adapter	9117	MMD	5729
10 Gigabit Ethernet-CX4 PCI Express Adapter	9117	MMD	5732
8 Gigabit PCI Express Dual Port Fibre Channel Adapter	9117	MMD	5735
PCI-X DDR Dual Channel Ultra320 SCSI Adapter	9117	MMD	5736
4-Port 10/100/1000 Base-TX PCI-X Adapter	9117	MMD	5740
IBM Single Bus Ultra 320 SCSI Repeater Card	9117	MMD	5741
IBM Dual Bus Ultra 320 SCSI Repeater Card	9117	MMD	5742
SATA Slimline DVD-ROM Drive	9117	MMD	5743
PCIe2 4-Port 10GbE&1GbE SR&RJ45 Adapter	9117	MMD	5744
PCIe2 4-Port 10GbE&1GbE SFP+Copper&RJ45 Adapter	9117	MMD	5745
POWER GXT145 PCI Express Graphics Accelerator	9117	MMD	5748
4Gbps Fibre Channel (2-Port)	9117	MMD	5749
IDE Slimline DVD-ROM Drive	9117	MMD	5756
IBM 4.7 GB IDE Slimline DVD-RAM Drive	9117	MMD	5757
4 GB Single-Port Fibre Channel PCI-X 2.0 DDR Adapter	9117	MMD	5758
4 Gb Dual-Port Fibre Channel PCI-X 2.0 DDR Adapter	9117	MMD	5759
PCI-X Fibre Chan Disk Controller	9117	MMD	5760
PCI-X Fibre Chan Tape Controller	9117	MMD	5761
SATA Slimline DVD-RAM Drive	9117	MMD	5762
2-Port 10/100/1000 Base-TX Ethernet PCI Express Adapter	9117	MMD	5767
2-Port Gigabit Ethernet-SX PCI Express Adapter	9117	MMD	5768
10 Gigabit Ethernet-SR PCI Express Adapter	9117	MMD	5769
10 Gigabit Ethernet-LR PCI Express Adapter	9117	MMD	5772
4 Gigabit PCI Express Single Port Fibre Channel Adapter	9117	MMD	5773
4 Gigabit PCI Express Dual Port Fibre Channel Adapter	9117	MMD	5774
PCI-X Disk Controller-90MB No IOP	9117	MMD	5776
PCI-X Disk Controller-1.5GB No IOP	9117	MMD	5777
PCI-X EXP24 Ctl-1.5GB No IOP	9117	MMD	5778
PCI-X EXP24 Ctl-1.5GB No IOP	9117	MMD	5782
4 Port Async EIA-232 PCIe Adapter	9117	MMD	5785
TotalStorage EXP24 Disk Dwr	9117	MMD	5786
PCI Expansion Drawer	9117	MMD	5790
PCI-DDR 12X Expansion Drawer	9117	MMD	5796
12X I/O Drawer PCIe, SFF disk	9117	MMD	5802

PCIe 380MB Cache Dual - x4 3Gb SAS RAID Adapter	9117	MMD	5805
PCI-X DDR Dual Channel Ultra320 SCSI Adapter	9117	MMD	5806
12X I/O Drawer PCIe, No Disk	9117	MMD	5877
SAS Disk Backplane -6 slot	9117	MMD	5878
EXP 12S Expansion Drawer	9117	MMD	5886
EXP24S SFF Gen2-bay Drawer	9117	MMD	5887
PCIe2 4-port 1GbE Adapter	9117	MMD	5899
PCI-X DDR Dual -x4 SAS Adapter	9117	MMD	5900
PCIe Dual-x4 SAS Adapter	9117	MMD	5901
PCI-X DDR Dual - x4 3Gb SAS RAID Adapter	9117	MMD	5902
PCIe 380MB Cache Dual - x4 3Gb SAS RAID Adapter	9117	MMD	5903
PCI-X DDR 1.5GB Cache SAS RAID Adapter	9117	MMD	5904
PCI-X DDR 1.5GB Cache SAS RAID Adapter (BSC)	9117	MMD	5908
Alternate SAS controller for 3 of 6 internal SAS Disk Slots	9117	MMD	5909
SAS adapter for internal split DASD option	9117	MMD	5911
PCI-X DDR Dual - x4 SAS Adapter	9117	MMD	5912
PCIe2 1.8GB Cache RAID SAS Adapter Tri-port 6Gb	9117	MMD	5913
SAS AA Cable 3m - HD 6Gb Adapter to Adapter	9117	MMD	5915
SAS AA Cable 6m - HD 6Gb Adapter to Adapter	9117	MMD	5916
SAS AA Cable 1.5m - HD 6Gb Adapter to Adapter	9117	MMD	5917
SAS AA Cable 0.6m - HD 6Gb Adapter to Adapter	9117	MMD	5918
Non-paired PCIx SAS RAID Indicator	9117	MMD	5921
Non-paired SAS RAID indicator	9117	MMD	5922
Non-paired PCIe SAS RAID Indicator	9117	MMD	5923
Non-paired Indicator 5913 PCIe SAS RAID Adapter	9117	MMD	5924
Full width Keyboard -- USB, US English, #103P	9117	MMD	5951
Full width Keyboard -- USB, French, #189	9117	MMD	5952
Full width Keyboard -- USB, Italian, #142	9117	MMD	5953
Full width Keyboard -- USB, German/Austrian, #129	9117	MMD	5954
Full width Keyboard -- USB, UK English, #166P	9117	MMD	5955
Full width Keyboard -- USB, Spanish, #172	9117	MMD	5956
Full width Keyboard -- USB, Japanese, #194	9117	MMD	5957
Full width Keyboard -- USB, Brazilian Portuguese, #275	9117	MMD	5958
Full width Keyboard -- USB, Hungarian, #208	9117	MMD	5959
Full width Keyboard -- USB, Korean, #413	9117	MMD	5960
Full width Keyboard -- USB, Chinese, #467	9117	MMD	5961
Full width Keyboard -- USB, French Canadian, #445	9117	MMD	5962
Full width Keyboard -- USB, Canadian French, #058	9117	MMD	5963
Full width Keyboard -- USB, Belgian/UK, #120	9117	MMD	5964
Full width Keyboard -- USB, Swedish/Finnish, #153	9117	MMD	5965
Full width Keyboard -- USB, Danish, #159	9117	MMD	5966
Full width Keyboard -- USB, Bulgarian, #442	9117	MMD	5967
Full width Keyboard -- USB, Swiss/French/German, #150	9117	MMD	5968
Full width Keyboard -- USB, Norwegian, #155	9117	MMD	5969
Full width Keyboard -- USB, Dutch, #143	9117	MMD	5970
Full width Keyboard -- USB, Portuguese, #163	9117	MMD	5971
Full width Keyboard -- USB, Greek, #319	9117	MMD	5972
Full width Keyboard -- USB, Hebrew, #212	9117	MMD	5973
Full width Keyboard -- USB, Polish, #214	9117	MMD	5974
Full width Keyboard -- USB, Slovakian, #245	9117	MMD	5975
Full width Keyboard -- USB, Czech, #243	9117	MMD	5976
Full width Keyboard -- USB, Turkish, #179	9117	MMD	5977
Full width Keyboard -- USB, LA Spanish, #171	9117	MMD	5978
Full width Keyboard -- USB, Arabic, #253	9117	MMD	5979
Full width Keyboard -- USB, Thai, #191	9117	MMD	5980
Full width Keyboard -- USB, Russian, #443	9117	MMD	5981
Full width Keyboard -- USB, Slovenian, #234	9117	MMD	5982
Full width Keyboard -- USB, US English Euro, #103P	9117	MMD	5983
Power Control Cable (SPCN) - 2 meter	9117	MMD	6001
Power Control Cable (SPCN) - 3 meter	9117	MMD	6006
Power Control Cable (SPCN) - 15 meter	9117	MMD	6007
Power Control Cable (SPCN) - 6 meter	9117	MMD	6008
Power Control Cable (SPCN) - 30 meter	9117	MMD	6029
Opt Front Door for 1.8m Rack	9117	MMD	6068
Opt Front Door for 2.0m Rack	9117	MMD	6069
1.8m Rack Trim Kit	9117	MMD	6246
2.0m Rack Trim Kit	9117	MMD	6247
1.8m Rack Acoustic Doors	9117	MMD	6248
2.0m Rack Acoustic Doors	9117	MMD	6249
1.8m Rack Trim Kit	9117	MMD	6263

2.0m Rack Trim Kit	9117	MMD	6272
RIO-2 Bus Adapter	9117	MMD	6417
RIO-2 Remote I/O Loop Adapter for #5790	9117	MMD	6438
Dual-port 12X Channel Interface Attach - Short Run	9117	MMD	6446
4.3m (14-Ft) 250V/10A Power Cord	9117	MMD	6455
Dual-port 12X Channel Interface Attach- Long Run Power Cord 4.3m (14-ft), Drawer to wall/IBM PDU (250V/10A)	9117	MMD	6457
3.7m (12-Ft) 250V/10A RA Pwr Cd	9117	MMD	6458
Power Cord 4.3m (14-ft), Drawer To OEM PDU (125V, 15A)	9117	MMD	6459
4.3m (14-Ft) 250V/10A Power Cord	9117	MMD	6460
4.3m (14-Ft) 250V/10A Power Cord	9117	MMD	6461
4.3m (14-Ft) 250V/10A Power Cord	9117	MMD	6462
4.3m (14-Ft) 250V/10A Power Cord	9117	MMD	6463
4.3m (14-Ft) 250V/10A Power Cord	9117	MMD	6464
4.3m (14-Ft) 250V/10A Power Cord	9117	MMD	6465
4.3m (14-Ft) 250V/10A Power Cord	9117	MMD	6466
4.3m (14-Ft) 250V/10A Power Cord	9117	MMD	6466
Power Cord 4.3m (14-ft), Drawer to wall/OEM PDU (250V/15A) U. S.	9117	MMD	6467
Power Cord 1.8m (6-ft), Drawer to wall (125V/15A)	9117	MMD	6469
Power Cord 2.7m (9-ft), Drawer to wall/OEM PDU (125V/15A)	9117	MMD	6470
Power Cord 2.7m (9-ft), Drawer to wall/OEM PDU (250V/16A)	9117	MMD	6471
Power Cord 2.7m (9-ft), Drawer to wall/OEM PDU (250V/10A)	9117	MMD	6472
Power Cord 2.7m (9-ft), Drawer to wall/OEM PDU, (250V/13A)	9117	MMD	6473
Power Cord 2.7m (9-ft), Drawer to wall/OEM PDU, (250V/16A)	9117	MMD	6474
Power Cord 2.7m (9-ft), Drawer to wall/OEM PDU, (250V/10A)	9117	MMD	6475
Power Cord 2.7m (9-ft), Drawer to wall/OEM PDU, (250V/16A)	9117	MMD	6476
Power Cord 2.7m (9-ft), Drawer to wall/OEM PDU, (250V/10A)	9117	MMD	6477
Power Cord 2.7m (9-foot), To wall/OEM PDU, (250V, 16A)	9117	MMD	6478
Power Cord (9-foot) , To wall/OEM PDU, (250V, 10A)	9117	MMD	6479
Power Cord 1.8M (6-foot),To wall, (250V, 15A), United States	9117	MMD	6487
Power Cord 2.7m (9-ft), Drawer to wall/OEM PDU, (125V/15A or 250V/10A)	9117	MMD	6488
4.3m (14-Ft) 3PH/24A 380-415V Power Cord	9117	MMD	6489
4.3m (14-Ft) 1PH/48A 200-240V Power Cord	9117	MMD	6491
4.3m (14-Ft) 1PH/48-60A 200-240V Power Cord	9117	MMD	6492
Power Cord 2.7m (9-ft), Drawer to wall/OEM PDU, (250V/10A)	9117	MMD	6493
Power Cord 2.7m (9-ft), Drawer to wall/OEM PDU, (250V/10A)	9117	MMD	6494
Power Cord (9-foot), To wall/OEM PDU, (250V, 10A)	9117	MMD	6495
Power Cord 2.7M (9-foot), To wall/OEM PDU, (250V, 10A)	9117	MMD	6496
Power Cord (6-foot), To wall/OEM PDU, (250V, 10A)	9117	MMD	6497
Power Cord (6-foot), To wall/OEM PDU, (250V, 15A)	9117	MMD	6498
Power Cable - Drawer to IBM PDU, 200-240V/10A	9117	MMD	6577
Optional Rack Security Kit	9117	MMD	6580
Modem Tray for 19-Inch Rack	9117	MMD	6586
Power Cord 2.7M (9-foot), To wall/OEM PDU, (125V, 15A)	9117	MMD	6651
4.3m (14-Ft) 1PH/24-30A Pwr Cord	9117	MMD	6654
4.3m (14-Ft) 1PH/24-30A WR Pwr Cord	9117	MMD	6655
4.3m (14-Ft)1PH/24A Power Cord	9117	MMD	6656

Power Cord 2.7M (9-foot), To wall/OEM PDU,

(250V, 15A)	9117	MMD	6659
Power Cord 4.3m (14-ft), Drawer to wall/OEM PDU (125V/15A)	9117	MMD	6660
2.1m (7-Ft) 200V PDU Power Cable	9117	MMD	6664
Power Cord 2.8m (9.2-ft), Drawer to wall/IBM PDU, (250V/10A)	9117	MMD	6665
Power Cord 4.3M (14-foot), Drawer to OEM PDU, (250V, 15A)	9117	MMD	6669
Power Cord (6-foot), To Wall (125V, 15A), PT #59	9117	MMD	6670
Power Cord 2.7M (9-foot), Drawer to IBM PDU, 250V/10A	9117	MMD	6671
Power Cord 1.5M (5-foot), Drawer to IBM PDU, 250V/10A	9117	MMD	6672
Power Cord 2.7m (9-ft), Drawer to wall/OEM PDU, (250V/10A)	9117	MMD	6680
Power Cord (6-foot), To Wall, (250V, 15A)	9117	MMD	6687
RIIO-2 Bus Adapter	9117	MMD	6699
PCI 2-Line WAN IOA No IOP	9117	MMD	6805
PCI 4-Modem WAN IOA No IOP	9117	MMD	6808
PCI 2-Line WAN w/Modem NoIOP	9117	MMD	6833
Cable Restraint Hardware- excess Service Interface Cable	9117	MMD	7099
Intelligent PDU+, 1 EIA Unit, Universal UTG0247 Connector	9117	MMD	7109
Environmental Monitoring Probe	9117	MMD	7118
IBM/OEM Rack-mount Drawer Rail Kit- Adjustable Depth	9117	MMD	7164
OEM Rack-mount Drawer Rail Kit	9117	MMD	7165
Power Distribution Unit	9117	MMD	7188
Quantity 150 of #2124	9117	MMD	7204
Quantity 150 of #2125	9117	MMD	7205
Quantity 150 of #2126	9117	MMD	7206
Quantity 150 of #2127	9117	MMD	7207
Quantity 150 of #2128	9117	MMD	7208
Quantity 150 of #2138	9117	MMD	7213
2GB CUoD Memory Activation	9117	MMD	7272
4GB CUoD Memory Activation	9117	MMD	7273
8GB CUoD Memory Activation	9117	MMD	7274
16GB CUoD Memory Activation	9117	MMD	7275
32GB CUoD Memory Activation	9117	MMD	7276
SDI Software Pre-Install Indicator	9117	MMD	7305
One Processor Activation for Processor Feature #7388	9117	MMD	7306
Dual I/O Unit Enclosure	9117	MMD	7307
Dual I/O Unit Enclosure	9117	MMD	7311
I/O Drawer Mounting Enclosure	9117	MMD	7314
Utility Billing for Processor #7388- 100 processor minutes	9117	MMD	7332
On/Off Processor Day Billing for Processor #7388	9117	MMD	7333
Utility Billing for Processor #7388 with IBM i - 100 processor minutes	9117	MMD	7334
On/Off Processor Billing for Processor #7388 with IBM i - 1 processor day	9117	MMD	7346
On/Off, 1GB-1Day, Memory Billing POWER7	9117	MMD	7377
4.7 GHz Proc Card, 0/2 Core POWER6, 12 DDR2 Memory Slots	9117	MMD	7380
4.4GHz Proc Card, 0/2 Core POWER6, 12 DDR2 Memory Slots.	9117	MMD	7387
5.0 GHz Proc Card, 0/2 Core POWER6, 12 DDR2 Memory Slots	9117	MMD	7388
Quantity 150 of #4319	9117	MMD	7504
Quantity 150 of #4326	9117	MMD	7508
Quantity 150 of #4327	9117	MMD	7509
Quantity 150 of #4328	9117	MMD	7510
Quantity 150 of #4329	9117	MMD	7511
Quantity 150 of #5741	9117	MMD	7514

Quantity 150 of #3676	9117	MMD	7517
Quantity 150 of #3677	9117	MMD	7518
Quantity 150 of #3678	9117	MMD	7519
Quantity 150 of #3586	9117	MMD	7535
Quantity 150 of #3587	9117	MMD	7536
Quantity 150 of #3658	9117	MMD	7538
4.2 GHZ Proc Card, 0/4 Core POWER6, 12 DDR2 Memory Slots	9117	MMD	7540
Quantity 150 of #1884	9117	MMD	7543
Quantity 150 of #1888	9117	MMD	7544
Quantity 150 of #1890	9117	MMD	7545
Quantity 150 of #1909	9117	MMD	7546
Quantity 150 of #1885	9117	MMD	7547
Quantity 150 of #1886	9117	MMD	7548
Quantity 150 of #3647	9117	MMD	7549
Quantity 150 of #1790	9117	MMD	7550
Quantity 150 of #1911	9117	MMD	7557
Quantity 150 of #3648	9117	MMD	7564
Quantity 150 of #3649	9117	MMD	7565
Quantity 150 of #1916	9117	MMD	7566
QTY 150, 177GB SFF-1 SSD w/ eMLC (AIX/Linux)	9117	MMD	7578
QTY 150, 177GB SFF-1 SSD w/ eMLC (IBM i)	9117	MMD	7582
PROC COD UTILITY BILLING FOR FC 4980, 100 PROC-MINS	9117	MMD	7642
PROC COD UTILITY BILLING FOR FC 4980. 100 PROC-MINS, FOR IBM i	9117	MMD	7643
1 PROC-DAY ON/OFF BILLING FOR FC 4980	9117	MMD	7644
1 PROC-DAY ON/OFF BILLING FOR FC 4980, FOR IBM i	9117	MMD	7645
PROC COD UTILITY BILLING FOR FC 4981, 100 PROC-MINS	9117	MMD	7646
PROC COD UTILITY BILLING FOR FC 4981, 100 PROC-MINS, FOR IBM i	9117	MMD	7647
1 PROC-DAY ON/OFF BILLING FOR FC 4981	9117	MMD	7648
1 PROC-DAY ON/OFF BILLING FOR FC 4981, FOR IBM i	9117	MMD	7649
1GB DDR2 Memory Activation One Processor Activation for Processor Feature #7540	9117	MMD	7700
Utility Billing for Processor #7540- 100 processor minutes	9117	MMD	7701
On/Off Processor Day Billing for Processor #7540	9117	MMD	7702
Utility Billing for Processor #7540 with IBM i - 100 processor minutes	9117	MMD	7706
On/Off Processor Billing for Processor #7540 with IBM i - 1 processor day	9117	MMD	7709
One Processor Activation for Processor Feature #7387	9117	MMD	7719
Utility Billing for Processor #7387 - 100 processor minutes	9117	MMD	7726
Utility Billing for Processor #7387 with IBM i - 100 processor minutes	9117	MMD	7743
On/Off Processor Billing for Processor #7387 with IBM i - 1 processor day	9117	MMD	7744
On/Off Processor Day Billing for Processor #7387	9117	MMD	7745
2.0m Rack Side Attach Kit	9117	MMD	7780
Ethernet Cable, 6M, Hardware Management Console to System Unit	9117	MMD	7801
Ethernet Cable, 15m, Hardware Management Console to System Unit	9117	MMD	7802
Side-by-Side for 1.8m Racks	9117	MMD	7840
Ruggedize Rack Kit	9117	MMD	7841
PCI Blind Swap Cassette Kit, Single Wide Adapters, Type II	9117	MMD	7862
PCI Blind Swap Cassette Kit, Double Wide Adapters, Type III	9117	MMD	7863
Power Distribution Backplane	9117	MMD	7870
AC Power Supply, 1400 W	9117	MMD	7888
2GB (4x512MB) DIMMs, 276-pin, 533MHz DDR2 SDRAM	9117	MMD	7892
4GB (4x1GB) DIMMs, 276-pin, 533MHz DDR2 SDRAM	9117	MMD	7893
8GB (4x2GB) DIMMs, 276-pin, 533 MHz DDR2 SDRAM	9117	MMD	7894
PowerVM -Standard Edition	9117	MMD	7942
On/Off Processor Enablement	9117	MMD	7951
On/Off Memory Enablement	9117	MMD	7954
PowerVM - Enterprise Edition	9117	MMD	7995

570 to MMA CoD Memory Activation Carry Over Indicator	9117	MMD	8017
Advanced POWER Virtualization Carry Over Indicator	9117	MMD	8018
Advanced POWER Virtualization Carry Over Indicator	9117	MMD	8030
0/256GB DDR2 Memory (32X8GB) DIMMS- 400 MHZ- POWER6 Memory	9117	MMD	8129
RJ-45 to DB-25 Converter Cable	9117	MMD	8133
Linux Software Preinstall	9117	MMD	8143
Linux Software Preinstall (Business Partners)	9117	MMD	8144
Activation of 1 GB DDR3 POWER7 Memory	9117	MMD	8212
Activation of 100 GB DDR3 POWER7 Memory	9117	MMD	8213
Power Cord Carry Over Indicator, #9800, Model Conversion Only	9117	MMD	8430
Power Cord Carry Over Indicator, #9802, Model Conversion Only	9117	MMD	8431
Power Cord Carry Over Indicator, #9820, Model Conversion Only	9117	MMD	8432
Power Cord Carry Over Indicator, #9821, Model Conversion Only	9117	MMD	8433
Power Cord Carry Over Indicator, #9825, Model Conversion Only	9117	MMD	8434
Power Cord Carry Over Indicator, #9827, Model Conversion Only	9117	MMD	8435
Power Cord Carry Over Indicator, #9828, Model Conversion Only	9117	MMD	8436
Power Cord Carry Over Indicator, #9829, Model Conversion Only	9117	MMD	8437
Power Cord Carry Over Indicator, #9830, Model Conversion Only	9117	MMD	8438
Power Cord Carry Over Indicator, #9831, Model Conversion Only	9117	MMD	8439
Power Cord Carry Over Indicator, #9833, Model Conversion Only	9117	MMD	8440
Power Cord Carry Over Indicator, #9834, Model Conversion Only	9117	MMD	8441
Base Customer Spec Plcmnt	9117	MMD	8453
MMB/MHB to MMC/MHC #5665 Carry Over Indicator	9117	MMD	8525
MMB/MHB to MMC/MHC #5652 Carry Over Indicator	9117	MMD	8526
MMB/MHB to MMC/MHC CoD Memory Activation Carry Over Indicator	9117	MMD	8527
MMB/MHB to MMC/MHC CoD Memory Activation Carry Over Indicator	9117	MMD	8528
MMB/MHB to MMC/MHC #5662 Carry Over Indicator	9117	MMD	8529
MMB/MHB to MMC/MHC #1853 Carry Over Indicator	9117	MMD	8532
Keyboard - USB, US English, #103P	9117	MMD	8800
Keyboard - USB, French, #189	9117	MMD	8801
Keyboard - USB, Italian, #142	9117	MMD	8802
Keyboard - USB, German/Austrian, #129	9117	MMD	8803
Keyboard - USB, UK English, #166	9117	MMD	8804
Keyboard - USB, Spanish, #172	9117	MMD	8805
Keyboard - USB, Japanese, #194	9117	MMD	8806
Keyboard - USB, Brazilian/Portuguese, #275	9117	MMD	8807
Keyboard - USB, Canadian French, #058	9117	MMD	8808
Keyboard - USB, Belgium/UK, #120	9117	MMD	8810
Keyboard - USB, Swedish/Finnish, #153	9117	MMD	8811
Keyboard - USB, Danish, #159	9117	MMD	8812
Keyboard - USB, Bulgarian, #442	9117	MMD	8813
Keyboard - USB, Swiss/French/German, #150F/G	9117	MMD	8814
Keyboard - USB, Norwegian, #155	9117	MMD	8816
Keyboard - USB, Dutch, #143	9117	MMD	8817
Keyboard - USB, Portuguese, #163	9117	MMD	8818
Keyboard - USB, Greek, #319	9117	MMD	8819
Keyboard - USB, Hebrew, #212	9117	MMD	8820
Keyboard - USB, Hungarian, #208	9117	MMD	8821
Keyboard - USB, Polish, #214	9117	MMD	8823
Keyboard - USB, Slovakian, #245	9117	MMD	8825
Keyboard - USB, Czech, #243	9117	MMD	8826
Keyboard - USB, Turkish, #179	9117	MMD	8827
Keyboard - USB, LA Spanish, #171	9117	MMD	8829
Keyboard - USB, Arabic, #253	9117	MMD	8830
Keyboard - USB, Korean, #413	9117	MMD	8833
Keyboard - USB, Chinese/US, #467	9117	MMD	8834

Keyboard - USB, French Canadian, #445	9117	MMD	8835
Keyboard - USB, Thai, #191	9117	MMD	8836
Keyboard - USB, Russian, #443	9117	MMD	8838
Keyboard - USB, Yugoslavian/Latin, #105	9117	MMD	8839
Keyboard - USB, US English (EMEA), #103P	9117	MMD	8840
Mouse - USB, with Keyboard Attachment Cable	9117	MMD	8841
USB Mouse	9117	MMD	8845
Order Routing Indicator- System Plant	9117	MMD	9169
Language Group Specify - US English	9117	MMD	9300
Specify mode-1 & (1)5901/5278 for EXP24S #5887	9117	MMD	9359
Specify mode-1 & (2)5901/5278 for EXP24S #5887	9117	MMD	9360
Specify mode-2 & (2)5901/5278 for EXP24S #5887	9117	MMD	9361
Specify mode-4 & (4)5901/5278 for EXP24S #5887	9117	MMD	9365
Specify mode-2 & (4)5901/5278 for EXP24S #5887	9117	MMD	9366
Specify mode-1 & (2)5903/5805 for EXP24S #5887	9117	MMD	9367
Specify mode-2 & (4)5903/5805 for EXP24S #5887	9117	MMD	9368
Specify mode-1 & (1)5904/6/8 for EXP24S #5887	9117	MMD	9382
Specify mode-1 & (2) 5904/6/8 for EXP24S #5887	9117	MMD	9383
Specify mode-1 & CEC SAS port for EXP24 #5887	9117	MMD	9384
Specify mode-1 & (2) 5913 for EXP24S #5887	9117	MMD	9385
Specify mode-2 & (4) 5913 for EXP24S #5887	9117	MMD	9386
New AIX License Core Counter	9117	MMD	9440
New IBM i License Core Counter	9117	MMD	9441
New Red Hat License Core Counter	9117	MMD	9442
New SUSE License Core Counter	9117	MMD	9443
Other AIX License Core Counter	9117	MMD	9444
Other Linux License Core Counter	9117	MMD	9445
3rd Party Linux License Core Counter	9117	MMD	9446
VIOS Core Counter	9117	MMD	9447
Month Indicator	9117	MMD	9461
Day Indicator	9117	MMD	9462
Hour Indicator	9117	MMD	9463
Minute Indicator	9117	MMD	9464
Qty Indicator	9117	MMD	9465
Countable Member Indicator	9117	MMD	9466
Reserved Rack Space Indicator - 4U	9117	MMD	9570
Language Group Specify - Dutch	9117	MMD	9700
Language Group Specify - French	9117	MMD	9703
Language Group Specify - German	9117	MMD	9704
Language Group Specify - Polish	9117	MMD	9705
Language Group Specify - Norwegian	9117	MMD	9706
Language Group Specify - Portuguese	9117	MMD	9707
Language Group Specify - Spanish	9117	MMD	9708
Language Group Specify - Italian	9117	MMD	9711
Language Group Specify - Canadian French	9117	MMD	9712
Language Group Specify - Japanese	9117	MMD	9714
Language Group Specify - Traditional Chinese (Taiwan)	9117	MMD	9715
Language Group Specify - Korean	9117	MMD	9716
Language Group Specify - Turkish	9117	MMD	9718
Language Group Specify - Hungarian	9117	MMD	9719
Language Group Specify - Slovakian	9117	MMD	9720
Language Group Specify - Russian	9117	MMD	9721
Language Group Specify - Simplified Chinese (PRC)	9117	MMD	9722
Language Group Specify - Czech	9117	MMD	9724
Language Group Specify -- Romanian	9117	MMD	9725
Language Group Specify - Croatian	9117	MMD	9726
Language Group Specify -- Slovenian	9117	MMD	9727
Language Group Specify - Brazilian Portuguese	9117	MMD	9728
Language Group Specify - Thai	9117	MMD	9729
PCIe2 2-Port 10GbE RoCE SFP+ Adapter	9117	MMD	EC28
0.6m (2.0-ft), Blue CAT5 Ethernet Cable	9117	MMD	ECB0
1.5m (4.9-ft), Blue CAT5 Ethernet Cable	9117	MMD	ECB2
Carry-over Indicator for Single 5250 Enablement #4992 (MDL Upgrade Only)	9117	MMD	EH01
Carry-over Indicator for Full 5250 Enablement #4997 (MDL Upgrade Only)	9117	MMD	EH02
Carry-over Indicator AME #4791 (MDL Upgrade Only)	9117	MMD	EH03
Specify Mode-1 & (1)ESA1/ESA2 for EXP24S #5887	9117	MMD	EJP1
Specify Mode-1 & (2)ESA1/ESA2 for EXP24S #5887	9117	MMD	EJP2
Specify Mode-2 & (2)ESA1/ESA2 for EXP24S #5887	9117	MMD	EJP3
Specify Mode-2 & (4)ESA1/ESA2 for EXP24S #5887	9117	MMD	EJP4
Specify Mode-4 & (4)ESA1/ESA2 for EXP24S #5887	9117	MMD	EJP5

Specify Mode-2 & (1)ESA1/ESA2 for EXP24S #5887	9117	MMD	EJP6
Specify Mode-2 (2)ESA1/ESA2 for EXP24 #5887	9117	MMD	EJP7
Specify mode-2 (1) ESA1/ESA2 for EXP24 #5887	9117	MMD	EJPA
Specify mode-2 (2)ESA1/ESA2 for EXP24#5887	9117	MMD	EJPB
Specify mode-4 (1)ESA1/ESA2 for EXP24 #5887	9117	MMD	EJPC
Specify mode-4 (2)ESA1/ESA2 for EXP24 #5887	9117	MMD	EJPD
Specify mode-4 (3)ESA1/ESA2 for EXP24 #5887	9117	MMD	EJPE
Specify mode-2 (1)5901/5278 for EXP24 #5887	9117	MMD	EJPJ
Specify mode-2 (2)5901/5278 for EXP24 #5887	9117	MMD	EJPK
Specify mode-4 (1)5901/5278 for EXP24 #5887	9117	MMD	EJPL
Specify mode-4 (2)5901/5278 for EXP24 #5887	9117	MMD	EJPM
Specify mode-4 (3)5901/5278 for EXP24 #5887	9117	MMD	EJPN
Specify mode-2 (2)5903/5805 for EXP24 #5887	9117	MMD	EJPR
Specify mode-2 (2)5913 for EXP24 #5887	9117	MMD	EJPT
Specify Left Half 12X I/O Drawer to ESA1/ESA2	9117	MMD	EJPY
Specify Right Half 12X I/O Drawer to ESA1/ESA2	9117	MMD	EJPZ
Full width Keyboard -- USB, US English, #103P	9117	MMD	EK51
Full width keyboard -- USB, French, #189	9117	MMD	EK52
Full width Keyboard -- USB, Italian, #142	9117	MMD	EK53
Full width Keyboard -- USB, German/Austrian, #129	9117	MMD	EK54
Full width Keyboard -- USB, UK English, #166P	9117	MMD	EK55
Full width Keyboard -- USB, Spanish, #172	9117	MMD	EK56
Full width keyboard -- USB, Japanese, #194	9117	MMD	EK57
Full width Keyboard -- USB, Brazilian Portuguese, #275	9117	MMD	EK58
Full width keyboard -- USB, Hungarian, #208	9117	MMD	EK59
Full width Keyboard -- USB, Korean, #413	9117	MMD	EK60
Full width keyboard -- USB, Chinese, #467	9117	MMD	EK61
Full width keyboard -- USB, French Canadian, #445	9117	MMD	EK62
Full width Keyboard -- USB, Belgian/UK, #120	9117	MMD	EK64
Full width keyboard -- USB, Swedish/Finnish, #153	9117	MMD	EK65
Full width Keyboard -- USB, Danish, #159	9117	MMD	EK66
Full width keyboard -- USB, Bulgarian, #442	9117	MMD	EK67
Full width keyboard -- USB, Swiss/French/German, #150	9117	MMD	EK68
Full width keyboard -- USB, Norwegian,#155	9117	MMD	EK69
Full width keyboard -- USB, Dutch, #143	9117	MMD	EK70
Full width keyboard -- USB, Portuguese, #163	9117	MMD	EK71
Full width keyboard -- USB, Greek, #319	9117	MMD	EK72
Full width keyboard -- USB, Hebrew, #212	9117	MMD	EK73
Full width keyboard -- USB, Polish, #214	9117	MMD	EK74
Full width keyboard -- USB, Slovakian, #245	9117	MMD	EK75
Full width keyboard -- USB, Czech, #243	9117	MMD	EK76
Full width keyboard -- USB, Turkish, #179	9117	MMD	EK77
Full width keyboard -- USB, LA Spanish, #171	9117	MMD	EK78
Full width keyboard -- USB, Arabic, #253	9117	MMD	EK79
Full width keyboard -- USB, Thai, #191	9117	MMD	EK80
Full width keyboard -- USB, Russian, #443	9117	MMD	EK81
Full width keyboard -- USB, Slovenian, #234	9117	MMD	EK82
Full width Keyboard -- USB, US English Euro, #103P	9117	MMD	EK83
Trial PowerVM Live Partition Mobility	9117	MMD	ELPM
1m (3.3-ft), 10GbE'Net Cable SFP+ Act Twinax Copper	9117	MMD	EN01
3m (9.8-ft), 10Gb E'Net Cable SFP+ Act Twinax Copper	9117	MMD	EN02
5m (16.4-ft), 10Gb E'Net Cable SFP+ Act Twinax Copper	9117	MMD	EN03
100 On/Off Proc-Days of CoD Billing for Processor #4980. AIX/Linux	9117	MMD	EP2A
100 On/Off Proc-Days of CoD Billing for Processor #4980. IBM i	9117	MMD	EP2B
100 On/Off Proc-Days of CoD Billing for Processor #4981, AIX/Linux	9117	MMD	EP2C
100 On/Off Proc-Days of CoD Billing for Processor #4981, IBM i	9117	MMD	EP2D
100 On/Off Proc-Days of CoD Billing for Processor #4983. AIX/Linux	9117	MMD	EP2G
100 On/Off Proc-Days of CoD Billing for Processor #4983. IBM i	9117	MMD	EP2H
100 On/Off Proc-Days of CoD Billing for Processor #4984. AIX/Linux	9117	MMD	EP2J
100 On/Off Proc-Days of CoD Billing for Processor #4984. IBM i	9117	MMD	EP2K

Quantity 150 of #3452 SAS YO Cable 6m - HD 6Gb Adapter to Enclosure	9117	MMD	EQ02
Quantity 150 of #3453 SAS YO Cable 10m - HD 6Gb Adapter to Enclosure	9117	MMD	EQ03
Quantity 150 of #ES0A	9117	MMD	EQ0A
Quantity of 150 #ES0B	9117	MMD	EQ0B
Quantity of 150 #ES0C	9117	MMD	EQ0C
Quantity of 150 #ES0D	9117	MMD	EQ0D
Power Cable - Drawer to IBM PDU, 200-240v/10A	9117	MMD	EQ77
RFID Tags for Servers, Compute Nodes, Chassis, Racks, and HMCs	9117	MMD	ERF1
387GB SFF-1 SSD for AIX/Linux with eMLC	9117	MMD	ES0A
387GB SFF-1 SSD for IBM i with eMLC	9117	MMD	ES0B
387GB SFF-2 SSD for AIX/Linux with eMLC	9117	MMD	ES0C
387GB SFF-2 SSD for IBM i with eMLC	9117	MMD	ES0D
PCIe2 RAID SAS Adapter Dual-port 6Gb	9117	MMD	ESA1
S&H - No Charge	9117	MMD	ESC0
S&H	9117	MMD	ESC8
1TB Removable Disk Drive Cartridge	9117	MMD	EU01
Service Processor-2	9117	MMD	EU05
RDX 320 GB Removable Disk Drive	9117	MMD	EU08
12X Cable Performance Specify	9117	MMD	EUC5
Core Use HW Feature	9117	MMD	EUC6

Type/model conversions

From	To
Type Model	Type Model
9117 MMA	9117 MMD
9117 MMB	9117 MMD
9117 MMC	9117 MMD

Feature conversions

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

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

The following conversions are available to customers:

Feature conversions for 9117-MMA to 9117-MMC 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 9117-MMD 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 9117-MMD 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, 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 9117-MMD miscellaneous features

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

Feature conversions for 9117-MMA to 9117-MMD 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	EPM0 - 4.22 GHz Proc Card, 0/12 Core POWER7+, 16 DDR3 Memory Slots	Yes
5621 - 4.2 GHz Proc Card, 0/ 2 Core POWER6, 8 DDR2 Memory Slots	EPM0 - 4.22 GHz Proc Card, 0/12 Core POWER7+, 16 DDR3 Memory Slots	Yes
5622 - 4.2 GHz Proc Card, 0/ 2 Core POWER6, 12 DDR2 Memory Slots	EPM0 - 4.22 GHz Proc Card, 0/12 Core POWER7+, 16 DDR3 Memory Slots	Yes
7380 - 4.7 GHz Proc Card, 0/ 2 Core POWER6, 12 DDR2 Memory Slots	EPM0 - 4.22 GHz Proc Card, 0/12 Core POWER7+, 16 DDR3 Memory Slots	Yes

7387 - 4.4GHz Proc Card, 0/2 Core POWER6, 12 DDR2 Memory Slots.	EPM0 - 4.22 GHz Proc Card, 0/12 Core POWER7+, 16 DDR3 Memory Slots	Yes
7388 - 5.0 GHz Proc Card, 0/2 Core POWER6, 12 DDR2 Memory Slots	EPM0 - 4.22 GHz Proc Card, 0/12 Core POWER7+, 16 DDR3 Memory Slots	Yes
7540 - 4.2 GHz Proc Card, 0/4 Core POWER6, 12 DDR2 Memory Slots	EPM0 - 4.22 GHz Proc Card, 0/12 Core POWER7+, 16 DDR3 Memory Slots	Yes
5403 - One Processor Activation for Processor Feature #7380	EPMA - 1-Core Activation for Processor Feature EPM0	No
5670 - One Processor Activation for Processor Feature #5620	EPMA - 1-Core Activation for Processor Feature EPM0	No
5671 - One Processor Activation for Processor Feature #5621	EPMA - 1-Core Activation for Processor Feature EPM0	No
5672 - One Processor Activation for Processor Feature #5622	EPMA - 1-Core Activation for Processor Feature EPM0	No
7306 - One Processor Activation for Processor Feature #7388	EPMA - 1-Core Activation for Processor Feature EPM0	No
7700 - One Processor Activation for Processor Feature #7540	EPMA - 1-Core Activation for Processor Feature EPM0	No
7719 - One Processor Activation for Processor Feature #7387	EPMA - 1-Core Activation for Processor Feature EPM0	No

Feature conversions for 9117-MMA to 9117-MMD 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	EB85 - System CEC Enclosure with IBM BEZEL, I/O Backplane, and System Midplane	Yes
5683 - System Chassis - 4 EIA	EB85 - System CEC Enclosure with IBM BEZEL, I/O Backplane, and System Midplane	Yes
5627 - System CEC Enclosure with OEM Bezel + Labels	EB86 - System CEC Enclosure with OEM BEZEL, I/O Backplane, and System Midplane	Yes

Feature conversions for 9117-MMB to 9117-MMD 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 9117-MMB to 9117-MMD cable features

From FC:	To FC:	Return Parts
3711 - Processor Cable,	3715 - Processor Cable,	Yes

Two-Drawer System	Two,Three-Drawer System, 4 socket	
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 9117-MMB to 9117-MMD 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 9117-MMB to 9117-MMD processor features

From FC:	To FC:	Return Parts
4980 - 3.5 GHz Proc Card, 0/12 Core POWER7, 16 DDR3 Memory Slots	EPM0 - 4.22 GHz Proc Card, 0/12 Core POWER7+, 16 DDR3 Memory Slots	Yes
4981 - 3.1 GHz Proc Card, 0/16 Core POWER7, 16 DDR3 Memory Slots	EPM0 - 4.22 GHz Proc Card, 0/12 Core POWER7+, 16 DDR3 Memory Slots	Yes
4980 - 3.5 GHz Proc Card, 0/12 Core POWER7, 16 DDR3 Memory Slots	EPM1 - 3.80 GHz Proc Card, 0/16 Core POWER7+, 16 DDR3 Memory Slots	Yes
4981 - 3.1 GHz Proc Card, 0/16 Core POWER7, 16 DDR3 Memory Slots	EPM1 - 3.80 GHz Proc Card, 0/16 Core POWER7+, 16 DDR3 Memory Slots	Yes
5459 - One Processor Activation for Processor Feature #4980	EPMA - 1-Core Activation for Processor Feature EPM0	No
5468 - One Processor Activation for Processor Feature #4981	EPMA - 1-Core Activation for Processor Feature EPM0	No
5459 - One Processor Activation for Processor Feature #4980	EPMB - 1-Core Activation for Processor Feature EPM1	No
5468 - One Processor Activation for Processor Feature #4981	EPMB - 1-Core Activation for Processor Feature EPM1	No

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

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

Feature conversions for 9117-MMB to 9117-MMD system unit base features

From FC:	To FC:	Return Parts
5659 - System CEC Enclosure with IBM BEZEL, I/O Backplane, and System Midplane	EB85 - System CEC Enclosure with IBM BEZEL, I/O Backplane, and System Midplane	Yes

5669 - System CEC Enclosure with OEM BEZEL, I/O Backplane, and System Midplane	EB86 - System CEC Enclosure with OEM BEZEL, I/O Backplane, and System Midplane	Yes
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Feature conversions for 9117-MMC to 9117-MMD 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 9117-MMC to 9117-MMD 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 9117-MMC to 9117-MMD 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 9117-MMC to 9117-MMD processor features

From FC:	To FC:	Return Parts
4983 - 3.72 GHz Proc Card, 0/12 Core POWER7, 16 DDR3 Memory Slots	EPM0 - 4.22 GHz Proc Card, 0/12 Core POWER7+, 16 DDR3 Memory Slots	Yes
4984 - 3.30 GHz Proc Card, 0/16 Core POWER7, 16 DDR3 Memory Slots	EPM0 - 4.22 GHz Proc Card, 0/12 Core POWER7+, 16 DDR3 Memory Slots	Yes
4983 - 3.72 GHz Proc Card, 0/12 Core POWER7, 16 DDR3 Memory Slots	EPM1 - 3.80 GHz Proc Card, 0/16 Core POWER7+, 16 DDR3 Memory Slots	Yes
4984 - 3.30 GHz Proc Card, 0/16 Core POWER7, 16 DDR3 Memory Slots	EPM1 - 3.80 GHz Proc Card, 0/16 Core POWER7+, 16 DDR3 Memory Slots	Yes
5329 - 1-Core Activation for Processor Feature #4983	EPMA - 1-Core Activation for Processor Feature EPM0	No
5334 - 1-Core Activation for Processor Feature #4984	EPMA - 1-Core Activation for Processor Feature EPM0	No
5329 - 1-Core Activation for Processor Feature #4983	EPMB - 1-Core Activation for Processor Feature EPM1	No
5334 - 1-Core Activation	EPMB - 1-Core Activation	No

Feature conversions for 9117-MMC to 9117-MMD system unit base features

From FC:	To FC:	Return Parts
5585 - System CEC Enclosure with IBM BEZEL, I/O Backplane, and System Midplane	EB85 - System CEC Enclosure with IBM BEZEL, I/O Backplane, and System Midplane	Yes
5586 - System CEC Enclosure with OEM BEZEL, I/O Backplane, and System Midplane	EB86 - System CEC Enclosure with OEM BEZEL, I/O Backplane, and System Midplane	Yes

Feature conversions for 9117-MMD virtualization engine features

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

Business Partner information

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

<https://www.ibm.com/partnerworld/mem/sla.jsp?num=112-174>

Publications

IBM Power Systems hardware documentation provides you with the following topical information:

- System overview
- Planning for the system
- Installing and configuring the system
- Working with consoles, terminals, and interfaces
- Managing system resources
- Working with operating systems and software applications
- Troubleshooting, service, and support

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

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

Services

Global Technology Services

IBM services include business consulting, outsourcing, hosting services, applications, and other technology management.

These services help you learn about, plan, install, manage, or optimize your IT infrastructure to be an On Demand Business. They can help you integrate your high-speed networks, storage systems, application servers, wireless protocols, and an

array of platforms, middleware, and communications software for IBM and many non-IBM offerings. IBM is your one-stop shop for IT support needs.

For details on available services, contact your IBM representative or visit

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

For details on available IBM Business Continuity and Recovery Services, contact your IBM representative or visit

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

For details on education offerings related to specific products, visit

<http://www.ibm.com/services/learning/index.html>

Select your country, and then select the product as the category.

Technical information

Specified operating environment

Physical specifications

IBM Power 770 model MMD 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 MMD systems can have one to four CEC enclosures.

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

Operating environment

- Temperature:
 - 5 to 45 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: 1,600 watts maximum (per enclosure with 16 cores active)
- Power source loading: 1.649 kVA maximum (per enclosure with 16 cores active)
- Thermal output: 5,461 Btu/hr maximum (per enclosure with 16 cores active)
- Maximum altitude: 3,048 m (10,000 ft)
- Noise level
 - One enclosure with 16 active cores:

- 7.1 bels (operating/idle)
- 6.6 bels (operating/idle) with acoustic rack doors

Four enclosures with 64 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 9117-MMD can be installed in a 7014-T00, 7014-T42, 7014-B42, or 7014-S25 rack, which provides:

- Proper dimensions
- Mounting surfaces
- Power distribution

- Ventilation
- Stability
- Other functional requirements

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

Minimum system configuration:

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

- One CEC enclosure (4U) with the following:
 - 1X System Enclosure with IBM Bezel (#EB85) or OEM Bezel (#EB86)
 - Service Processor-2 (#EU09)
 - 1X DASD Backplane (#5652)
 - 2X Power Cords (two selected by customer)
 - 2X AC Power Supply (#5532)
 - 1X Operator Panel (#EC53)
 - 1X Integrated Multifunction Card (one of these):
 - Quad Ethernet 2 X 1 GB and 2 X 10 GB Optical (#1769)
 - Quad Ethernet 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):
 - 4.22 GHz, 12-Core POWER7+ Processor Card, 0-core active (#EPM0)
 - 3.80 GHz, 16-Core POWER7+ Processor Card, 0-core active (#EPM1)
- 4X processor activations (quantity of four for one of these):
 - One Processor Activation for Processor Feature EPM0 (#EPMA)
 - One Processor Activation for Processor Feature EPM1 (#EPMB)
- 2X DDR3 Memory DIMMs: 0/32 GB (4 x 8 GB), 1066 MHz, (#EPM0, or larger)
- 32X Activation of 1 GB DDR3 - POWER7+ Memory (#EMA2).
- For AIX or Linux 1X disk drive and for IBM i 2X disk drive: formatted to match the system primary O/S indicator selected, or if using a Fibre Channel attached SAN (indicated by #0837) a disk drive is not required.
- 1X language group (selected by customer).
- 1X Removable Media Device (#5762): optionally orderable, a stand-alone system (not network attached) would required this feature.
- 1X HMC is required for every 9117-MMD; however, a communal HMC is acceptable.

Notes :

- 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

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

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

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

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

When IBM Systems Director is used to manage an HMC or if the HMC manages more than 254 partitions, the HMC should have 3 GB of RAM minimum and be a rack-mount HMC model CR3, or later, or desktside HMC model C05, or later.

Software requirements

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

- AIX Version 7.1 with the 7100-02 Technology level
- AIX Version 7.1 with the 7100-00 Technology Level and Service Pack 8 (planned availability December 19, 2012)
- AIX Version 7.1 with the 7100-01 Technology Level and Service Pack 6 (planned availability December 19, 2012)
- AIX Version 6.1 with the 6100-08 Technology Level
- AIX Version 6.1 with the 6100-06 Technology Level and service Pack 10 (planned availability December 19, 2012)
- AIX Version 6.1 with the 6100-07 Technology Level and service Pack 6 (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
 - Cannot be ordered as the primary operating system

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

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 9117-MMD has the following limitations:

- LPAR/Memory
 - The first eight DIMM slots (two features) of every enclosure always have to be populated with equal memory DIMM sizes.
 - The last eight DIMM slots (two features) can be populated with different memory DIMM sizes from the first eight and from each other.
 - The first eight DIMM slots will determine the maximum LPAR size that is supported within the system based on the following table:

Memory feature number	Maximum LPAR size
#EM40 (8 GB DIMM)	512 GB
#EM41 (16 GB DIMM)	1 TB
#EM42 (32 GB DIMM)	2 TB
#EM44 (64 GB DIMM)	4 TB

- If the last eight DIMM slots are populated with identical DIMMS and 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 can not be used for an IBM i console. Separate Ethernet adapters which can be directly controlled by IBM i without VIOS should be used for IBM i LAN consoles, if desired. 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) is not hot-plug capable.
- The 3.5-inch DASD disk drives are not supported in the CEC enclosure.
- A number of older I/O devices, adapters, and memory that were supported on the Power 570 (9117-MMA) are not supported on the Power 770, and newer technology must be used to replace it.
- These include:
 - HSL-2/RIO-2 interface drawers and towers
 - 10,000 rpm SCSI disks
 - 15,000 rpm SCSI drives
 - IDE DVD drives in the CEC enclosure (DVD drives: features 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): feature 6312
- Twinax: feature 4746
- Cryptographic adapters: features 4801 and 5805
- Diskette drives: feature 2591
- Quarter-Inch Cartridge (QIC) tape drives (neither feature number or machine type/model)
- One-step model upgrades from POWER5 or POWER5+ are not supported. Only model upgrades from the 9117-MMA, 9117-MMB, or 9117-MMC 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 can 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 Mirroring is standard on 9179-MHD and optional on 9117-MMD
 - AIX 7.1 APAR
 - AIX Version 6.1 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, or later

Planning information

Cable orders

No additional cables are required.

Security, auditability, and control

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

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

IBM Electronic Services

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

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

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

To learn how Electronic Services can work for you, visit

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

Terms and conditions

Volume orders: Contact your IBM representative.

IBM Global Financing

Yes

Warranty period

One year

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. An IBM technician will attempt to resolve your problem over the telephone. You must follow IBM's problem determination and resolution procedures. Scheduling of service will depend upon the time of your call and is subject to parts availability. Service levels are response time objectives and are not guaranteed. The specified level of warranty service may not be available in all worldwide locations. Additional charges may apply outside IBM's normal service area. Contact your local IBM representative or your reseller for country- and location-specific information.

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

Customer replacement parts

Tier 1 CRUs are those parts which require minimal effort, skill, or experience in order to service. Tier 1 items are mandatory CRUs when base 9 x 5 next-business-day warranty or maintenance is specified in the terms and conditions contract and is in force. However, if the customer elects not to perform Tier 1 service, an IBM SSR may be contracted at an additional service charge to perform the service. If

the customer has 7x24 warranty or maintenance in force, then all parts, Tier 1 and Tier2, may be replaced or serviced by a SSR without an additional charge.

The following parts have been designated as Tier 1 CRUs:

- Keyboard
- Mouse
- Display
- Mounting hardware
- Fans
- Line power cord
- Operator panel
- Power supply
- DASD
- Ethernet adapters
- RAID battery card and battery
- Slim line DVD
- FSP Card and cable
- Internal to External SAS Cable
- PCI Adapter and Adapter Cassette
- DVD
- TOD Battery
- Clock Pass-thru card

Tier 2 CRUs require more effort than Tier 1 CRUs and also require a higher level of skill and/or experience when being serviced by the customer. As with Tier 1 parts, if the customer elects not to perform Tier 2 service, an IBM SSR may be contracted at an additional service charge to perform the service. If the customer has 7 x 24 warranty or maintenance in force, then all parts will be replaced or serviced by an SSR without an additional charge.

The following parts have been designated as Tier 2 CRUs:

- FSP Cable
- SAS DASD / Media Backplane
- SMP Cable
- IO Planar

On-site service

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

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

Non-IBM parts support

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

Warranty service upgrades

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

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

Maintenance services

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

Customer replaceable unit service and on-site service for other selected parts

Customer replacement parts

Tier 1 CRUs are those parts which require minimal effort, skill, or experience in order to service. Tier 1 items are mandatory CRUs when base 9 x 5 next-business-day warranty or maintenance is specified in the terms and conditions contract and is in force. However, if the customer elects not to perform Tier 1 service, an IBM SSR may be contracted at an additional service charge to perform the service. If the customer has 7x24 warranty or maintenance in force, then all parts, Tier 1 and Tier2, may be replaced or serviced by a SSR without an additional charge.

The following parts have been designated as Tier 1 CRUs:

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

- FSP Card and cable
- Internal to External SAS Cable
- PCI Adapter and Adapter Cassette
- DVD
- TOD Battery
- Clock Pass-thru card

Tier 2 CRUs require more effort than Tier 1 CRUs and also require a higher level of skill and/or experience when being serviced by the customer. As with Tier 1 parts, if the customer elects not to perform Tier 2 service, an IBM SSR may be contracted at an additional service charge to perform the service. If the customer has 7 x 24 warranty or maintenance in force, then all parts will be replaced or serviced by an SSR without an additional charge.

The following parts have been designated as Tier 2 CRUs:

- FSP Cable
- SAS DASD / Media Backplane
- SMP Cable
- IO Planar

On-site service

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

- 9 hours per day, Monday through Friday, excluding holidays, next-business-day response
- 9 hours per day, Monday through Friday, excluding holidays, 4-hour average, same-business-day response
- 24 hours per day, 7 days a week, 4-hour average response
- 24 hours per day, 7 days a week, 2-hour average response

Non-IBM parts support

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

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

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

Warranty service upgrades

Usage plan machine

No

IBM hourly service rate classification

Two

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

Field-installable features

Yes

Model conversions

Yes

Machine installation

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

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

Graduated program license charges apply

Yes

The applicable processor tier is medium.

Licensed machine code

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

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

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 9117 machine type:

Description	Model Number	Feature Numbers	Initial/MES/Both/Support	CSU	RP MES
IBM Power 770					
CSC Billing Unit	MMD				No
Ten CSC Billing Units	MMD	0010	Both		Yes No
Mirrored System Disk Level, Sp	MMD	0011	Both		Yes No
Device Parity Protection All	MMD	0040	Both		Yes No
Mirrored System Bus Level	MMD	0041	Both		Yes No
Device Parity RAID 6 All	MMD	0043	Both		Yes No
RISC to RISC Data Migration	MMD	0047	Both		Yes No
AIX Partition Specify	MMD	0205	Initial		Yes No
Linux Partition Specify	MMD	0265	Both		Yes No
IBM i Partition Specify	MMD	0266	Both		Yes No
Ext Tape Attached via #5736	MMD	0267	Both		Yes No
Specify Custom Data Protection	MMD	0290	Support		Yes No
Spcf EXP24 Attach via Existing	MMD	0296	Both		Yes No
Mirrored Level System Specify	MMD	0302	Support		Yes No
RAID Hot Spare Specify	MMD	0308	Both		Yes No
V.24/EIA232 6.1m (20 Ft) PCI C	MMD	0347	Both		Yes No
V.24/EIA232 15.2m (50 Ft) PCI	MMD	0348	Both		Yes No
V.35 6.1m (20 Ft) PCI Cable	MMD	0349	Support		Yes No
V.35 15.2m (50 Ft) PCI Cable	MMD	0353	Both		Yes No
V.36 6.1m (20 Ft) PCI Cable	MMD	0354	Support		Yes No
X.21 6.1m (20 Ft) PCI Cable	MMD	0356	Support		Yes No
X.21 15.2m (50 Ft) PCI Cable	MMD	0359	Both		Yes No
V.24/EIA232 (80 Ft) PCI Cable	MMD	0360	Support		Yes No
UPS Factory Integration Spcfy	MMD	0365	Support		Yes No
HMC Factory Integration Spcfy	MMD	0373	MES		Yes No
Display Factory Int. Specify	MMD	0374	MES		Yes No
Rack Space for UPS	MMD	0375	MES		Yes No
Reserve Rack for HMC	MMD	0376	MES		Yes No
	MMD	0377	MES		Yes No

Reserve Rack Space for Display	MMD	0378	MES	Yes	No
MMA/MMB/MHB upgrade indicator	MMD	0397	MES	Yes	No
SSD Placement Indicator CEC	MMD	0462	Both	Yes	No
SSD Placement Indicator 5802/3	MMD	0463	Initial	N/A	No
SSD Placement Indicator 5886	MMD	0464	Initial	N/A	No
SSD Placement Indicator 5887	MMD	0465	Initial	N/A	No
19 inch, 1.8 meter high rack	MMD	0551	MES	Yes	No
19 inch, 2.0 meter high rack	MMD	0553	MES	Yes	No
19 inch, 1.3 meter high rack	MMD	0555	Support	Yes	No
IBM i 6.1 w/6.1.1 Machine Code	MMD	0566	Both	Yes	No
IBM i 7.1 Specify Code	MMD	0567	Both	Yes	No
Rack Filler Panel Kit	MMD	0599	Both	Yes	No
CSC Routing Indicator	MMD	0712	Initial	N/A	No
Load Source Not in CEC	MMD	0719	Both	Yes	No
#1787 Load Source Specify	MMD	0722	Both	Yes	No
#1996 Load Source Specify	MMD	0724	Initial	N/A	No
Specify Load Source 5802/3/77	MMD	0726	Both	Yes	No
Specify 5886 Load Source plac	MMD	0727	Both	Yes	No
#5887 Load Source Specify	MMD	0728	Both	Yes	No
EXP30 Load Source Specify	MMD	0729	Both	Yes	No
SAN Load Source Specify	MMD	0837	Both	Yes	No
3676 Load Source Specify	MMD	0838	Support	Yes	No
3677 Load Source Specify	MMD	0839	Support	Yes	No
3678 Load Source Specify	MMD	0840	Support	Yes	No
3658 Load Source Specify	MMD	0844	Support	Yes	No
1884 Load Source Specify	MMD	0851	Support	Yes	No
1888 Load Source Specify	MMD	0853	Both	Yes	No
1909 Load Source Specify	MMD	0854	Support	Yes	No
3587 Load Source Specify	MMD	0855	Support	Yes	No
1911 Load Source Specify	MMD	0856	Both	Yes	No
#1916 Load Source Specify	MMD	0857	Both	Yes	No
#1879 Load Source Specify	MMD	0870	Both	Yes	No
#1947 Load Source Specify	MMD	0871	Both	Yes	No
#1948 Load Source Specify	MMD	0872	Both	Yes	No
#1956 Load Source Specify	MMD	0874	Both	Yes	No
#1962 Load Source Specify	MMD	0875	Both	Yes	No
#1794 Load Source Specify	MMD	0876	Both	Yes	No

#1737 Load Source Specify(856G	MMD	0879	Both	Yes	No
#1738 Load Source Specify SFF2	MMD	0880	Both	Yes	No
#ES0B Load Source Specify	MMD	0893	Both	Yes	No
#ES0D Load Source Specify	MMD	0894	Both	Yes	No
US TAA Compliance Indicator	MMD	0983	Both	N/A	No
Modem Cable US/Canada and GU	MMD	1025	Both	Yes	No
USB External Docking Station R	MMD	1104	Both	Yes	No
USB 160 GB Removable Disk Dr	MMD	1106	Support	Yes	No
USB 500 GB Removable Disk Dr	MMD	1107	Both	Yes	No
3m, Blue Cat5e Cable	MMD	1111	Both	Yes	No
10m, Blue Cat5e Cable	MMD	1112	Both	Yes	No
25m, Blue Cat5e Cable	MMD	1113	Both	Yes	No
CAT5E Ethernet Cable 3M YELLOW	MMD	1118	Both	Yes	No
Decline ESA Indicator	MMD	1120	Initial	N/A	No
CAT5E Ethernet Cbl 25M YELLOW	MMD	1121	Both	Yes	No
Custom Serv. Specify, Roch	MMD	1140	Both	Yes	No
200V 16A 4.3m (14 Ft) TL Line	MMD	1406	Support	Yes	No
4.3m 200V/16A Pwr Cd Italy	MMD	1408	Support	Yes	No
125V 4.3m (14 Ft) Line Cord	MMD	1413	Support	Yes	No
200V 1.8m (6 Ft) Locking Line	MMD	1414	Support	Yes	No
200V 1.8m (6 Ft) Watertight LC	MMD	1415	Support	Yes	No
200V 4.3m (14 Ft) Locking Line	MMD	1416	Support	Yes	No
200V 4.3m (14 Ft) Watertight L	MMD	1417	Support	Yes	No
4.3m 200V/16A Power Cord EU/As	MMD	1420	Support	Yes	No
4.3m 200V/16A Power Cord CH/DK	MMD	1421	Support	Yes	No
200V 1.8m (6 Ft) Locking Line	MMD	1424	Support	Yes	No
200V 1.8m (6 Ft) Watertight Li	MMD	1425	Support	Yes	No
200V 4.3m (14 Ft) Locking Line	MMD	1426	Support	Yes	No
200V 4.3m (14 Ft) Watertight L	MMD	1427	Support	Yes	No
4.3m 200V/10A Power Cord EU/As	MMD	1439	Support	Yes	No
4.3m 200V/10A Power Cord Denma	MMD	1440	Support	Yes	No
4.3m 200V/10A Power Cord S. Af	MMD	1441	Support	Yes	No
4.3m 200V/10A Power Cord Swiss	MMD	1442	Support	Yes	No
4.3m 200V/10A Power Cord UK					

	MMD	1443	Support	Yes	No
4.3m 200V/10A Power Cord Israe	MMD	1445	Support	Yes	No
4.3m 200V/32A Power Cord EU 1	MMD	1449	Support	Yes	No
4.3m 200V/16A Power Cord EU 2	MMD	1450	Support	Yes	No
200V (6 Ft) 1.8m Line Cord	MMD	1451	Support	Yes	No
200V (14 Ft) 4.3m Line Cord	MMD	1452	Support	Yes	No
200V (6 Ft) 1.8m Locking Line	MMD	1453	Support	Yes	No
200V 12A (14 Ft) 4.3m TL Line	MMD	1454	Support	Yes	No
200V (6 Ft) 1.8m Watertight Li	MMD	1455	Support	Yes	No
200V (14 Ft) 4.3m Watertight L	MMD	1456	Support	Yes	No
200V (6 Ft) 1.8m Upper Line Co	MMD	1457	Support	Yes	No
200V (6 Ft) 1.8m Upper Locking	MMD	1458	Support	Yes	No
200V (6 Ft) 1.8m Locking	MMD	1459	Support	Yes	No
30m SPCN Cable	MMD	1466	Support	Yes	No
4.3m 200V/16A Pwr Cd	MMD	1477	Support	Yes	No
856GB 10k RPM SAS SFF Disk	MMD	1737	Both	Yes	No
856GB 10k RPM SAS SFF-2 Disk	MMD	1738	Both	Yes	No
900GB 10k RPM SAS SFF Disk	MMD	1751	Both	Yes	No
900GB 10k RPM SAS SFF-2 Disk	MMD	1752	Both	Yes	No
Quad ENET Card w Copper SFP+	MMD	1768	Both	Yes	No
Quad ENET Card w SR Optical	MMD	1769	Both	Yes	No
177GB SFF-1 SSD w/ eMLC AIX/Li	MMD	1775	Both	Yes	No
177GB SFF-1 SSD w/ eMLC IBM i	MMD	1787	Both	Yes	No
600GB 10k RPM SAS SFF Disk	MMD	1790	Both	Yes	No
177GB SFF-2 SSD w/ eMLC AIX/Li	MMD	1793	Both	Yes	No
177GB SFF-2 SSD w/ eMLC IBM i	MMD	1794	Both	Yes	No
GX 12X DDR Adapter Dual port	MMD	1808	Both	No	No
SAS Cable for triple split DAS	MMD	1815	Both	Yes	No
Quantity 150 of #1962	MMD	1817	Both	Yes	No
Quantity 150 of #1964	MMD	1818	Both	Yes	No
SAS Cbl Assembly for SAS Port	MMD	1819	Both	Yes	No
1.5 Meter 12X to 4X Channel CC	MMD	1828	Both	Yes	No
0.6 Meter 12X Cable	MMD	1829	Support	Yes	No
1.5 Meter 12X cable					

	MMD	1830	Support	Yes	No
8.0 Meter 12X Cable	MMD	1834	Support	Yes	No
3.0 Meter 12X Cable	MMD	1840	Support	Yes	No
3 Meter 12X to 4X Channel CC	MMD	1841	Both	Yes	No
12X to 4X Chan conv- 10M	MMD	1842	Support	Yes	No
Quantity 150 of #1956	MMD	1844	Both	Yes	No
Operator Panel	MMD	1853	Support	Yes	No
10 Meter 12X to 4X Enhance CCC	MMD	1854	Both	Yes	No
0.6 Meter 12X DDR Cable	MMD	1861	Both	Yes	No
1.5 Meter 12X DDR Cable	MMD	1862	Both	Yes	No
8 Meter 12X DDR Cable	MMD	1864	Both	Yes	No
3.0 Meter 12X DDR Cable	MMD	1865	Both	Yes	No
Quantity 150 of #1917	MMD	1866	Both	Yes	No
Quantity 150 of #1947	MMD	1868	Both	Yes	No
Quantity 150 of #1925	MMD	1869	Both	Yes	No
283GB 15K RPM SAS Disk	MMD	1879	Both	Yes	No
300GB 15K RPM SAS Disk	MMD	1880	Both	Yes	No
146.8GB 10K RPM SAS SFF Disk D	MMD	1882	Support	Yes	No
73.4 GB 15K RPM SAS SFF Disk D	MMD	1883	Support	Yes	No
69.7 GB 15K RPM SAS SFF Disk D	MMD	1884	Support	Yes	No
300GB 10K RPM SFF SAS Disk D	MMD	1885	Both	Yes	No
146GB 15K RPM SFF SAS Disk D	MMD	1886	Both	Yes	No
Quantity 150 of #1793	MMD	1887	Both	Yes	No
139GB 15K RPM SFF SAS Disk D	MMD	1888	Both	Yes	No
QUANTITY 150 OF 1883	MMD	1891	Support	Yes	No
QUANTITY 150 OF 1882	MMD	1899	Support	Yes	No
283GB 10K RPM SFF SAS Disk Dri	MMD	1911	Both	Yes	No
PCI X DDR Dual Channel Ultra32	MMD	1912	Support	Yes	No
GX++ 2-port PCIe2 x8 Adapter	MMD	1914	Both	Yes	No
571GB 10k RPM SAS SFF Disk	MMD	1916	Both	Yes	No
146GB 15k RPM SAS SFF-2 Disk	MMD	1917	Both	Yes	No
300GB 10k RPM SAS SFF-2 Disk	MMD	1925	Both	Yes	No
Quantity 150 of #1879	MMD	1926	Both	Yes	No
Quantity 150 of #1948	MMD	1927	Both	Yes	No
Quantity 150 of #1880	MMD	1928	Both	Yes	No
Quantity 150 of #1953	MMD	1929	Both	Yes	No
139GB 15k RPM SAS SFF-2 Disk	MMD	1947	Both	Yes	No
283GB 15k RPM SAS SFF-2 Disk					

	MMD	1948	Both	Yes	No
300GB 15k RPM SAS SFF-2 Disk	MMD	1953	Both	Yes	No
283GB 10k RPM SAS SFF-2 Disk	MMD	1956	Both	Yes	No
Quantity 150 of #1794					
	MMD	1958	Both	Yes	No
571GB 10k RPM SAS SFF-2 Disk	MMD	1962	Both	Yes	No
600GB 10k RPM SAS SFF-2 Disk	MMD	1964	Both	Yes	No
177GB SSD Module with eMLC (AI	MMD	1995	Both	No	No
1 Gigabit iSCSI TOE PCI X on C	MMD	1996	Both	No	No
PCIe RAID SSD SAS Adapter 3Gb	MMD	2055	Both	Yes	No
Converter Cable, VHDCI to P, M	MMD	2118	Support	Yes	No
Primary OS - IBM i	MMD	2145	Both	Yes	No
Primary OS AIX	MMD	2146	Both	Yes	No
Primary OS Linux	MMD	2147	Both	Yes	No
LC-SC 50 Micron Fiber Conv Cab	MMD	2456	Both	Yes	No
LC-SC 62.5 Mic.Fib.Conv.Cable	MMD	2459	Both	Yes	No
4 port USB PCIe Adapter	MMD	2728	Both	Yes	No
2 Port USB PCI Adapter	MMD	2738	Support	Yes	No
POWER GXT135P Graphics Acceler	MMD	2849	Support	Yes	No
ARTIC960Hx 4 Port EIA 232 Cabl	MMD	2861	Support	Yes	No
ARTIC960Hx 4 Port X 21 Cable	MMD	2863	Support	Yes	No
ARTIC960Hx 4-Port V.35(DTE)Cab	MMD	2864	Support	Yes	No
PCIe 2 Line WAN w/Modem	MMD	2893	Both	Yes	No
Asynch.Termin/Print.Cbl EIA232	MMD	2934	Both	Yes	No
Asynchronous Cable EIA 232/V	MMD	2936	Both	Yes	No
8P Async Adp. EIA232/RS-422	MMD	2943	Support	Yes	No
ARTIC960Hx 4Port Mult.PCI Adp	MMD	2947	Support	Yes	No
Cable, v.24 / EIA-232	MMD	2951	Support	Yes	No
Cable, v.35	MMD	2952	Support	Yes	No
Cable, v.36 / EIA 499	MMD	2953	Support	Yes	No
Cable, X.21	MMD	2954	Support	Yes	No
2-Port Multip. PCI Adapter	MMD	2962	Support	Yes	No
Ser to Ser Port Cab Draw/Draw	MMD	3124	Both	Yes	No
Serial to Se.Port Cbl Rack 8M	MMD	3125	Both	Yes	No
1m, QDR IB Copper Cable	MMD	3287	Both	Yes	No
3m, QDR IB Copper Cable	MMD	3288	Both	Yes	No
5m QDR IB/E'Net Copper Cable	MMD	3289	Both	Yes	No
10m QDR IB Optic Cable	MMD	3290	Both	Yes	No
30m QDR IB Optic Cable					

	MMD	3293	Both	Yes	No
SAS YO Cable 1.5m - HD 6Gb Ada	MMD	3450	Both	Yes	No
SAS YO Cable 3m - HD 6Gb Adapt	MMD	3451	Both	Yes	No
SAS YO Cable 6m - HD 6Gb Adapt	MMD	3452	Both	Yes	No
SAS YO Cable 10m - HD 6Gb Adap	MMD	3453	Both	Yes	No
SAS X Cable 3m - HD 6Gb 2-Adap	MMD	3454	Both	Yes	No
SAS X Cable 6m - HD 6Gb 2-Adap	MMD	3455	Both	Yes	No
SAS X Cable 10m - HD 6Gb 2-Ada	MMD	3456	Both	Yes	No
SAS YO Cable 15m - HD 3Gb Adap	MMD	3457	Both	Yes	No
SAS X Cable 15m - HD 3Gb 2-Ada	MMD	3458	Both	Yes	No
69GB 3.5 SAS Solid State Driv	MMD	3586	Support	Yes	No
69GB 3.5 SAS Solid State Driv	MMD	3587	Support	Yes	No
NOTE: The monitor or display features are subject to a \$8 Electronic Waste Recycling Fee (15- to 34-inch video device.)					
Widescreen LCD Monitor	MMD	3632	Both	Yes	No
T210 Flat Panel Monitor	MMD	3635	Support	Yes	No
T541H/L150p 15inchTFT Col.M	MMD	3637	Support	Yes	No
ThinkVision L170p Flat Pan.M	MMD	3639	Support	Yes	No
ThinkVision L171p Flat Panel M	MMD	3640	Support	Yes	No
IBM T115 Flat Panel Monitor	MMD	3641	Support	Yes	No
ThinkVision L191p Flat Panel M	MMD	3642	Support	Yes	No
IBM T120 Flat Panel Monitor	MMD	3643	Support	Yes	No
19in. Flat Panel Monitor	MMD	3644	Support	Yes	No
17in. Flat Panel Monitor	MMD	3645	Support	Yes	No
73GB 15K RPM SAS Disk Drive	MMD	3646	Support	Yes	No
146GB 15K RPM SAS Disk Drive	MMD	3647	Support	Yes	No
300GB 15K RPM SAS Disk Drive	MMD	3648	Support	Yes	No
450GB 15K RPM SAS Disk Drive	MMD	3649	Support	Yes	No
SAS Cable (EE) Drawer to Dr 1M	MMD	3652	Both	Yes	No
SAS Cable (EE) Drawer to Dr 3M	MMD	3653	Both	Yes	No
SAS Cable (EE) Drawer to Dr 6M	MMD	3654	Both	Yes	No
428GB 15K RPM SAS Disk Drive	MMD	3658	MES	Yes	No
SAS Cable (X) Adapter to SAS E	MMD	3661	Both	Yes	No
SAS Cbl X Adp SAS Enclosure 6M	MMD	3662	Both	Yes	No
SAS Cbl X Adp SAS Encl 15M	MMD	3663	Both	Yes	No
Serv Interface Cable 2 3 and 4	MMD	3671	Both	Yes	No
Serv Interface Cable 3 and 4 E	MMD	3672	Both	Yes	No
Serv Interface Cable 4 Encl	MMD	3673	Both	Yes	No
SAS EX cable 3M - Drw to Drw					

	MMD	3675	Both	Yes	No
69.7GB 15k rpm SAS Disk Drv	MMD	3676	Support	Yes	No
139.5GB 15k rpm SAS Disk Drive	MMD	3677	MES	Yes	No
283.7GB 15k rpm SAS Disk Drive	MMD	3678	MES	Yes	No
SAS Cab (AI) Adapter to Int 1M	MMD	3679	Both	Yes	No
SAS EX Cable 6m - Drw to Drw	MMD	3680	Both	Yes	No
3M SAS CABLE, ADPTR TO ADPTR (MMD	3681	Both	Yes	No
6M SAS CABLE, ADPTR TO ADPTR (MMD	3682	Support	Yes	No
SAS Cab (AE) Adapter to En 3M	MMD	3684	Both	Yes	No
SAS Cable(AE) Adapter to En 6M	MMD	3685	Both	Yes	No
SAS Ca(YI) System to SAS 1.5M	MMD	3686	Support	Yes	No
SAS Ca(YI) System to SAS 3M	MMD	3687	Both	Yes	No
SAS Cable (AT) 0.6 Meter	MMD	3688	Both	Yes	No
SAS AT Cable 0.6m - HD 6Gb Ada	MMD	3689	Both	Yes	No
SAS Cab(YO) Adapter to SAS1.5M	MMD	3691	Both	Yes	No
SAS Cab(YO) Adapter to SAS 3M	MMD	3692	Both	Yes	No
SAS Cab(YO) Adapter to SAS 6M	MMD	3693	Both	Yes	No
SAS Cab(YO) Adapter to SAS 15M	MMD	3694	Both	Yes	No
Process Cbl TwoThree Drawer	MMD	3715	Both	Yes	Yes
Process Cbl TwoThreeFour Drwr	MMD	3716	Both	Yes	Yes
Process Cbl ThreeFour Drawer	MMD	3717	Both	Yes	Yes
Process Cbl Four Drawer	MMD	3718	Both	Yes	Yes
0.3M Serial Prt Converter Cbl	MMD	3925	Both	Yes	No
Asynch Printer/Term.Cab,4M	MMD	3926	Support	Yes	No
Serial Port Null Mod Cab 3.7M	MMD	3927	Both	Yes	No
Ser.Port Null Modem Cable,10M	MMD	3928	Both	Yes	No
System Serial Port Converter C	MMD	3930	Both	Yes	No
6Foot Extend.Cbl for Displays	MMD	4242	Both	Yes	No
Extender Cable USB keybo 1.8M	MMD	4256	Both	Yes	No
VGA to DVI Connection Converte	MMD	4276	Both	Yes	No
Package 5X 2055 20X 1995	MMD	4367	Both	Yes	No
Package 5X 2055 20X 1995	MMD	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	MMD	4650	Initial	N/A	No
Rack Indicator, Rack 2	MMD	4651	Initial	N/A	No
Rack Indicator, Rack 3	MMD	4652	Initial	N/A	No
Rack Indicator, Rack 4	MMD	4653	Initial	N/A	No

Rack Indicator, Rack 5	MMD	4654	Initial	N/A	No
Rack Indicator, Rack 6	MMD	4655	Initial	N/A	No
Rack Indicator, Rack 7	MMD	4656	Initial	N/A	No
Rack Indicator, Rack 8	MMD	4657	Initial	N/A	No
Rack Indicator, Rack 9	MMD	4658	Initial	N/A	No
Rack Indicator, Rack 10	MMD	4659	Initial	N/A	No
Rack Indicator, Rack 11	MMD	4660	Initial	N/A	No
Rack Indicator, Rack 12	MMD	4661	Initial	N/A	No
Rack Indicator, Rack 13	MMD	4662	Initial	N/A	No
Rack Indicator, Rack 14	MMD	4663	Initial	N/A	No
Rack Indicator, Rack 15	MMD	4664	Initial	N/A	No
Rack Indicator, Rack 16	MMD	4665	Initial	N/A	No
On/Off, 999 GB-Days Billing	MMD	4666	Initial	N/A	No
PCI-X Crypt.Coproc.(FIPS 4)	MMD	4710	MES	Yes	No
Active Memory Exp Enablement	MMD	4764	Support	Yes	No
Active Memory Mirroring	MMD	4791	Both	Yes	No
PCIe Crypto Coprocessor Gen3	MMD	4797	Both	Yes	No
PCIe Crypto Coprocessor Gen4	MMD	4808	Both	Yes	No
CBU SPECIFY	MMD	4809	Both	Yes	No
Single 5250 Enter. Enabl.	MMD	4891	Initial	N/A	No
Full 5250 Enter. Enable.	MMD	4992	Both	Yes	No
Software Preload Required	MMD	4997	Both	Yes	No
Power Dist Unit 1 Phase NEMA	MMD	5000	Initial	N/A	No
Power Dist Unit 1 Phase IEC	MMD	5160	Support	Yes	No
Power Dist Unit 2 of 3 Phase	MMD	5161	Support	Yes	No
Power Dist Unit - 3 Phase	MMD	5162	Support	Yes	No
PCIe 2-Port 4X IB QDR Adapt	MMD	5163	Support	Yes	No
PCIe2 2-port 10GbE SR Adapter	MMD	5285	Both	Yes	No
PCIe2 2-port 10GbE SFP+ Adaptr	MMD	5287	Both	Yes	No
2 Port Async EIA 232 PCIe Adap	MMD	5288	Both	Yes	No
System Pwr Sup -1925W	MMD	5289	Both	Yes	No
Sys Console On HMC	MMD	5532	Both	Yes	No
Sys Console Ethernet No IOP	MMD	5550	Both	Yes	No
0/256GB DDR3 1066MHZ 4 DIMMs	MMD	5553	Both	Yes	No
Chasis & IBM Bezel for	MMD	5564	MES	No	No
Chasis & OEM Bezel for	MMD	5585	Both	No	Yes
0/32GB DDR3 1066MHZ 4 DIMMs	MMD	5586	Both	No	Yes

	MMD	5600	MES	No	Yes
0/64GB DDR3 1066MHZ 4 DIMMs	MMD	5601	MES	No	Yes
0/128GB DDR3 1066MHZ 4 DIMMs	MMD	5602	MES	No	Yes
Blind Swap Type III Cas PCIe	MMD	5646	MES	Yes	No
Blind Swap Type III Cas PCI X	MMD	5647	MES	Yes	No
Disk/Media Backplane	MMD	5652	Both	No	No
175MB Cache RAID Dual IOA	MMD	5662	Both	Yes	No
FSP/Clock Pass Through Card	MMD	5665	Both	Yes	No
IBM Gigab.Eth-SX PCI-X Adapter	MMD	5700	Support	Yes	No
10/100/1000 BaseTX Eth.PCI-X	MMD	5701	Support	Yes	No
2-Port BaseTX Etht.PCI-X Adp	MMD	5706	Both	Yes	No
10Gb FCoE PCIe Dual Port Adapt	MMD	5708	Both	Yes	No
1Gb iSCSI TOE PCI-X-Copp.Adpt	MMD	5713	Both	Yes	No
1Gb iSCSI TOE PCI-X-Opt.Adpt	MMD	5714	Support	Yes	No
2 Gigab.Fibre Chann.PCI-X Adp	MMD	5716	Support	Yes	No
4 Port 10/100/1000 Base TX PCI	MMD	5717	Both	Yes	No
10Gb Etht-SR PCI-X 2.0 DDR Adp	MMD	5721	Support	Yes	No
10Gb Etht-LR PCI-X 2.0 DDR Adp	MMD	5722	Support	Yes	No
2 Port Asyn.EIA-232 PCI Adpt	MMD	5723	Support	Yes	No
PCIe2 8Gb 4-port Fibre Channel	MMD	5729	Both	Yes	No
10 Gigabit Ethernet CX4 PCI Ex	MMD	5732	Both	Yes	No
8 Gigabit PCI Express Dual Por	MMD	5735	Both	Yes	No
PCI X DDR Dual Channel Ultra32	MMD	5736	Both	Yes	No
4-Port 10/100/1000 BaseTX Adpt	MMD	5740	Support	Yes	No
PCIe2 4-Port 10GbE&1GbE SR&RJ4	MMD	5744	Both	Yes	No
PCIe2 4-Port 10GbE&GbE SFP+Cop	MMD	5745	Both	Yes	No
POWER GXT145 PCI Express Graph	MMD	5748	Both	Yes	No
4Gbps Fibre Channel (2 Port)	MMD	5749	Both	Yes	No
4 GB Single-Port Fibre Channel	MMD	5758	Support	Yes	No
4 Gb Dual Port Fibre Channel	MMD	5759	Both	Yes	No
SATA Slimline DVD RAM Drive	MMD	5762	Both	Yes	No
2 Port 10/100/1000 Base TX Eth	MMD	5767	Both	Yes	No
2 Port Gigabit Ethernet SX PCI	MMD	5768	Both	Yes	No
10 Gb Eth SR PCI Express Adp	MMD	5769	Both	Yes	No
SATA Slimline DVD-RAM Drive	MMD	5771	Both	Yes	No
10 Gigabit Ethernet LR PCI	MMD	5772	Both	Yes	No
4GigabitPCI-E Single Port Fibr	MMD	5773	Support	Yes	No
4 Gigabit PCI Express Dual Por					

	MMD	5774	Both	Yes	No
4 Port Async EIA 232 PCIe Adap	MMD	5785	Both	Yes	No
PCI DDR 12X Expansion Drawer	MMD	5796	Support	Yes	No
12X I/O Drawer PCIe, SFF disk	MMD	5802	Both	Yes	No
PCIe 380MB Cache Dual x4 3Gb S	MMD	5805	Both	Yes	No
12X I/O Drawer PCIe, No Disk	MMD	5877	Both	Yes	No
EXP 12S Expansion Drawer	MMD	5886	Support	Yes	No
EXP24S SFF Gen2-bay Drawer	MMD	5887	Both	Yes	No
PCIe2 4-port 1GbE Adapter	MMD	5899	Both	Yes	No
PCI-X SAS Adapter	MMD	5900	Support	Yes	No
PCIe Dual x4 SAS Adapter	MMD	5901	Both	Yes	No
PCI X DDR Dual x4 3Gb SAS RAID	MMD	5902	Support	Yes	No
PCIe 380MB Cache Dual x4 3Gb	MMD	5903	Support	Yes	No
PCI X DDR 1.5GB Cache SAS RAID	MMD	5908	Both	Yes	No
PCI X DDR Dual x4 SAS Adapter	MMD	5912	Both	Yes	No
PCIe2 1.8GB Cache RAID SAS Ada	MMD	5913	Both	Yes	No
SAS AA Cable 3m - HD 6Gb Adapt	MMD	5915	Both	Yes	No
SAS AA Cable 6m - HD 6Gb Adapt	MMD	5916	Both	Yes	No
SAS AA Cable 1.5m - HD 6Gb Ada	MMD	5917	Both	Yes	No
SAS AA Cbl 0.6m - HD 6Gb Adapt	MMD	5918	Both	Yes	No
Non paired SAS RAID indicator	MMD	5922	Support	Yes	No
Non paired PCIe SAS RAID Ind	MMD	5923	Both	Yes	No
Non-paired Indicator 5913 PCIe	MMD	5924	Both	Yes	No
Shared EXP30 Indicator	MMD	5925	Both	Yes	No
SAS EX Cable 1.5m - Drw to Drw	MMD	5926	Both	Yes	No
Remote EXP30 Indicator	MMD	5927	Both	Yes	No
Full width Key USB, US English	MMD	5951	Support	Yes	No
Full width Key USB, French	MMD	5952	Support	Yes	No
Full width Key USB, Italian	MMD	5953	Support	Yes	No
Full width Key USB, German/Aus	MMD	5954	Support	Yes	No
Full width Key USB, UK English	MMD	5955	Support	Yes	No
Full width Key USB, Spanish	MMD	5956	Support	Yes	No
Full width Key USB, Japanese	MMD	5957	Support	Yes	No
Full width Key USB, BrazilianP	MMD	5958	Support	Yes	No
Full width Key USB, Hungarian	MMD	5959	Support	Yes	No
Full width Key USB, Korean	MMD	5960	Support	Yes	No
Full width Key USB, Chinese	MMD	5961	Support	Yes	No
Full width Key USB, French Can					

Full width Keyb-USB, Canad Fr	MMD	5962	Support	Yes	No
Full width Key USB, Belgian/UK	MMD	5963	Support	Yes	No
Full width Key USB, Swedish/Fi	MMD	5964	Support	Yes	No
Full width Key USB, Danish	MMD	5965	Support	Yes	No
Full width Key USB, Bulgarian	MMD	5966	Support	Yes	No
Full width Key USB, Swiss/Fr/G	MMD	5967	Support	Yes	No
Full width Key USB, Norwegian	MMD	5968	Support	Yes	No
Full width Key USB, Dutch	MMD	5969	Support	Yes	No
Full width Key USB, Portuguese	MMD	5970	Support	Yes	No
Full width Key USB, Greek	MMD	5971	Support	Yes	No
Full width Key USB, Hebrew	MMD	5972	Support	Yes	No
Full width Key USB, Polish	MMD	5973	Support	Yes	No
Full width Key USB, Slovakian	MMD	5974	Support	Yes	No
Full width Key USB, Czech	MMD	5975	Support	Yes	No
Full width Key USB, Turkish	MMD	5976	Support	Yes	No
Full width Key USB, LA Spanish	MMD	5977	Support	Yes	No
Full width Key USB, Arabic	MMD	5978	Support	Yes	No
Full width Key USB, Thai	MMD	5979	Support	Yes	No
Full width Key USB, Russian	MMD	5980	Support	Yes	No
Full width Key USB, Slovenian	MMD	5981	Support	Yes	No
Full width Key USB, US English	MMD	5982	Support	Yes	No
Power Control Cable (SPCN)-2m	MMD	5983	Support	Yes	No
Power Control Cbl (SPCN) 3 m	MMD	6001	Support	Yes	No
Power Control Cbl (SPCN) 15 m	MMD	6006	Both	Yes	No
Power Control Cable (SPCN)-6m	MMD	6007	Both	Yes	No
Power Control Cable (SPCN)-30m	MMD	6008	Support	Yes	No
Opt Front Door for 1.8m Rack	MMD	6029	Support	Yes	No
Opt Front Door for 2.0m Rack	MMD	6068	MES	Yes	No
1.8m Rack Trim Kit	MMD	6069	MES	Yes	No
2.0m Rack Trim Kit	MMD	6246	Support	Yes	No
1.8m Rack Acoustic Doors	MMD	6247	Support	Yes	No
2.0m Rack Acoustic Doors	MMD	6248	MES	Yes	No
1.8m Rack Trim Kit	MMD	6249	MES	Yes	No
2.0m Rack Trim Kit	MMD	6263	MES	Yes	No
Dual prt 12X Chan Attach Short	MMD	6272	MES	Yes	No
4.3m 250V/10A Power Cord	MMD	6446	Support	Yes	No
	MMD	6455	Support	Yes	No

Dual port 12X Chan Attach Long	MMD	6457	Support	Yes	No
Pwr Crd 4.3m 14ft wall IBM PDU	MMD	6458	Both	Yes	No
3.7m 250V/10A RA Pwr Cd	MMD	6459	Support	Yes	No
Pwr Crd (14FT), Drwr - OEM PDU	MMD	6460	Both	Yes	No
4.3m 250V/10A Power Cord	MMD	6461	Support	Yes	No
4.3m 250V/10A Power Cord	MMD	6462	Support	Yes	No
4.3m 250V/10A Power Cord	MMD	6463	Support	Yes	No
4.3m 250V/10A Power Cord	MMD	6464	Support	Yes	No
4.3m 250V/10A Power Cord	MMD	6465	Support	Yes	No
4.3m 250V/10A Power Cord	MMD	6466	Support	Yes	No
Pwr Crd 4.3m 14ft wall OEM PDU	MMD	6467	Support	Yes	No
Pwr Crd 1.8m 6ft wall 125V/15A	MMD	6469	Both	Yes	No
Pwr Crd 2.7m 9ft wall OEM PDU	MMD	6470	Support	Yes	No
Pwr Crd 2.7m 9ft wall OEM PDU	MMD	6471	Both	Yes	No
Pwr Crd 2.7m 9ft wall OEM PDU	MMD	6472	Both	Yes	No
Pwr Crd 2.7m 9ft wall OEM PDU	MMD	6473	Both	Yes	No
Pwr Crd 2.7m 9ft wall OEM PDU	MMD	6474	Both	Yes	No
Pwr Crd 2.7m 9ft wall OEM PDU	MMD	6475	Both	Yes	No
Pwr Crd 2.7m 9ft wall OEM PDU	MMD	6476	Both	Yes	No
Pwr Crd 2.7m 9ft wall OEM PDU	MMD	6477	Both	Yes	No
Pwr Crd 2.7m 9ft wall OEM PDU	MMD	6478	Both	Yes	No
PWR Cord(9foot), (250V,10A)	MMD	6479	Support	Yes	No
Pwr Crd 1.8m 6ft wall 250V,15A	MMD	6487	Support	Yes	No
Pwr Crd 2.7m 9ft wall OEM PDU	MMD	6488	Both	Yes	No
4.3m (14 Ft) 3PH/24A Power Cor	MMD	6489	MES	Yes	No
4.3m (14 Ft) 1PH/48A Pwr Cord	MMD	6491	MES	Yes	No
4.3m (14 Ft) 1PH/48 60A Pwr Co	MMD	6492	MES	Yes	No
Pwr Crd 2.7m 9ft wall OEM PDU	MMD	6493	Both	Yes	No
Pwr Crd 2.7m 9ft wall OEM PDU	MMD	6494	Both	Yes	No
To wall/OEM PDU, (250V, 10A)	MMD	6495	Support	Yes	No
Pwr Crd 2.7m 9ft wall 250V,10A	MMD	6496	Both	Yes	No
PWR Cord(6ft),To wall/OEM PDU	MMD	6497	Both	Yes	No
Power Cord 6ftTo wall OEM PDU	MMD	6498	Support	Yes	No
Power Cable Drawer to IBM PD	MMD	6577	Both	Yes	No
Optional Rack Security Kit	MMD	6580	MES	Yes	No
Modem Tray for 19-Inch Rack	MMD	6586	MES	Yes	No
Pwr Crd 2.7m 9ft wall 125V,15A	MMD	6651	Both	Yes	No

4.3m 1PH/24-30A Pwr Cord	MMD	6654	MES	Yes	No
4.3m 14Ft 1PH/24 30A WR Pwr	MMD	6655	MES	Yes	No
4.3m 14Ft 1PH/24A Power Cord	MMD	6656	MES	Yes	No
Pwr.Cord(9ft),To wall/OEM PDU	MMD	6659	Both	Yes	No
Pwr Crd 14ft 4.3m wallOEM PDU	MMD	6660	MES	Yes	No
2.1m 200V PDU Power Cable	MMD	6664	Support	Yes	No
Pwr Crd 2.8m 9.2ft wall PDU					
Pwr Crd 4.3M, Drwr - OEM PDU	MMD	6669	Both	Yes	No
Pwr Crd 6-FT, (125V,15A)PT#59	MMD	6670	Support	Yes	No
Pwr Crd 2.7M, Drwr - IBM PDU	MMD	6671	Both	Yes	No
Pwr Crd 1.5M, Drwr - IBM PDU	MMD	6672	Both	Yes	No
Pwr Crd 2.7m 9ft wall OEM PDU	MMD	6680	Both	Yes	No
Power Cord (6ft),To wall	MMD	6687	Support	Yes	No
PCI 2-Line WAN IOA No IOP	MMD	6805	Support	Yes	No
PCI 4-Modem WAN IOA No IOP	MMD	6808	Support	Yes	No
PCI 2-Line WAN w/Modem NoIOP	MMD	6833	Support	Yes	No
IIntelligent PDU+ 1 EIA Unit	MMD	7109	MES	Yes	No
Environmental Monitoring Probe	MMD	7118	Both	Yes	No
Power Distribution Unit	MMD	7188	MES	Yes	No
AAP Software Pre-Inst.Indic.	MMD	7305	Initial	N/A	No
I/O Drawer Mounting Enclosure	MMD	7314	Support	Yes	No
On/Off, 1GB-1Day Billing	MMD	7377	MES	Yes	No
Quantity 150 of #3676	MMD	7517	Support	Yes	No
Quantity 150 of #3677	MMD	7518	Support	Yes	No
Quantity 150 of #3678	MMD	7519	Support	Yes	No
Quantity 150 of 3586	MMD	7535	Support	Yes	No
Quantity 150 of 3587	MMD	7536	Support	Yes	No
Quantity 150 of 3658	MMD	7538	Support	Yes	No
Quantity 150 of #1884	MMD	7543	Support	Yes	No
Quantity 150 of #1888	MMD	7544	Both	Yes	No
Quantity 150 of #1885	MMD	7547	Both	Yes	No
Quantity 150 of #1886	MMD	7548	Both	Yes	No
Quantity 150 of 3647	MMD	7549	Support	Yes	No
Quantity 150 of #1790	MMD	7550	Both	Yes	No
PCIe RAID SSD SAS Adapter 3Gb	MMD	7557	Both	Yes	No
Quantity 150 of 3648	MMD	7564	Support	Yes	No
Quantity 150 of 3649	MMD	7565	Support	Yes	No

Quantity 150 of #1916					
	MMD	7566	Both	Yes	No
QTY 150 177GB SFF-1 SSD 1775					
	MMD	7578	Both	Yes	No
QTY 150 177GB SFF-1 SSD IBM i					
	MMD	7582	Both	Yes	No
2.0m Rack Side Attach Kit					
	MMD	7780	Support	Yes	No
Eth Cbl 6M HW Management					
	MMD	7801	Support	Yes	No
Eth Cbl 15M HW Management					
	MMD	7802	Both	Yes	No
Side-by-Side for 1.8m Racks					
	MMD	7840	Support	Yes	No
Ruggedize Rack Kit					
	MMD	7841	Support	Yes	No
PCI Blind Swap Cassette Kit					
	MMD	7862	Support	Yes	No
PCI Blind Swap Cassette Kit					
	MMD	7863	MES	Yes	No
PowerVM Standard Edition					
	MMD	7942	Both	Yes	No
PowerVM Enterprise Edition					
	MMD	7995	Both	Yes	No
570toMMA Adv POWER Virt COI					
	MMD	8018	MES	Yes	No
Advanced POWER Virtualization					
	MMD	8030	MES	Yes	No
RJ-45 to DB-25 Converter Cable					
	MMD	8133	Support	Yes	No
Linux Software Preinstall					
	MMD	8143	Initial	N/A	No
Linux Software Preinstall BP					
	MMD	8144	Initial	N/A	No
One Processor Activation for P					
	MMD	8430	Support	Yes	No
PWR Cord Carry Over Ind,#9802					
	MMD	8431	Support	Yes	No
PWR Cord Carry Over Ind,#9820					
	MMD	8432	Support	Yes	No
PWR Cord Carry Over Ind,#9821					
	MMD	8433	Support	Yes	No
PWR Cord Carry Over Ind,#9825					
	MMD	8434	Support	Yes	No
PWR Cord Carry Over Ind,#9827					
	MMD	8435	Support	Yes	No
PWR Cord Carry Over Ind,#9828					
	MMD	8436	Support	Yes	No
PWR Cord Carry Over Ind,#9829					
	MMD	8437	Support	Yes	No
PWR Cord Carry Over Ind,#9830					
	MMD	8438	Support	Yes	No
PWR Cord Carry Over Ind,#9831					
	MMD	8439	Support	Yes	No
PWR Cord Carry Over Ind,#9833					
	MMD	8440	Support	Yes	No
PWR Cord Carry Over Ind,#9834					
	MMD	8441	Support	Yes	No
Base Customer Spec Plcmnt					
	MMD	8453	Initial	N/A	No
Carry-over Indicator for 5665					
	MMD	8525	MES	No	No
Carry-over Indicator for 5652					
	MMD	8526	MES	No	No
Carry-over Indicator for 5662					
	MMD	8529	MES	No	No
Carry-over Indicator for 1853					
	MMD	8532	MES	No	No
Mouse-USB,Black KBD Att C					
	MMD	8841	Support	Yes	No
USB Mouse					
	MMD	8845	Both	Yes	No
Order Routing Indicator Syste					
	MMD	9169	Initial	N/A	No

Language Group Spcf-US Eng	MMD	9300	Initial	N/A	No
Specify mode-1 & (1)5901/5278	MMD	9359	Both	Yes	No
Specify mode-1 & (2)5901/5278	MMD	9360	Both	Yes	No
Specify mode-2 & (2)5901/5278	MMD	9361	Both	Yes	No
Specify mode-4 & (4)5901/5278	MMD	9365	Both	Yes	No
Specify mode-2 & (4)5901/5278	MMD	9366	Both	Yes	No
Specify mode-1 & (2)5903/5805	MMD	9367	Both	Yes	No
Specify mode-2 & (4)5903/5805	MMD	9368	Both	Yes	No
Specify mode-1 & (1)5904/6/8	MMD	9382	MES	Yes	No
Specify mode-1 & (2) 5904/6/8	MMD	9383	MES	Yes	No
Specify mode-1 & CEC SAS port	MMD	9384	Both	Yes	No
Specify mode-1 & (2) 5913 EXP	MMD	9385	Both	Yes	No
Specify mode-2 & (4) 5913 EXP	MMD	9386	Both	Yes	No
Mode-1 & EXP30 for 1 EXP24S #5	MMD	9388	Both	Yes	No
New AIX License Core Counter	MMD	9440	Initial	N/A	No
New IBM i Lic Core Counter	MMD	9441	Initial	N/A	No
New Red Hat Lic Core Counter	MMD	9442	Initial	N/A	No
New SUSE Lic Core Counter	MMD	9443	Initial	N/A	No
Other AIX Lic Core Counter	MMD	9444	Initial	N/A	No
Other Linux Lic Core Counter	MMD	9445	Initial	N/A	No
3rd Party Linux Lic Core Cnt	MMD	9446	Initial	N/A	No
VIOS Core Counter	MMD	9447	Initial	N/A	No
Month Indicator	MMD	9461	Initial	N/A	No
Day Indicator	MMD	9462	Initial	N/A	No
Hour Indicator	MMD	9463	Initial	N/A	No
Minute Indicator	MMD	9464	Initial	N/A	No
Qty Indicator	MMD	9465	Initial	N/A	No
Countable Member Indicator	MMD	9466	Initial	N/A	No
Reserved Rack Space Indicator	MMD	9570	Initial	N/A	No
Language Group Spcf-Dutch	MMD	9700	Initial	N/A	No
Language Group Spcf-French	MMD	9703	Initial	N/A	No
Language Group Spcf-German	MMD	9704	Initial	N/A	No
Language Group Spcf-Polish	MMD	9705	Initial	N/A	No
Lang Group Specify - Norwegian	MMD	9706	Initial	N/A	No
Lang.Group Spcf-Portuguese	MMD	9707	Initial	N/A	No
Language Group Spcf-Spanish	MMD	9708	Initial	N/A	No
Language Group Spcf-Italian	MMD	9711	Initial	N/A	No

Langua Gr Speci Canadian Frenc	MMD	9712	Initial	N/A	No
Language Group Spcf-Japanese	MMD	9714	Initial	N/A	No
Language Group Specify Tr Chin	MMD	9715	Initial	N/A	No
Language Group Spcf-Korean	MMD	9716	Initial	N/A	No
Language Group Spcf-Turkish	MMD	9718	Initial	N/A	No
Language Group Spcf-Hungarian	MMD	9719	Initial	N/A	No
Language Group Spcf-Slovakian	MMD	9720	Initial	N/A	No
Language Group Spcf-Russian	MMD	9721	Initial	N/A	No
Lang Group Spcf Simpl Chinese	MMD	9722	Initial	N/A	No
Language Group Spcf-Czech	MMD	9724	Initial	N/A	No
Language Group Spcf-Romanian	MMD	9725	Initial	N/A	No
Lang Group Specify - Croatian	MMD	9726	Initial	N/A	No
Language Group Spcf-Slovenian	MMD	9727	Initial	N/A	No
Lang Group Specify - Braz Port	MMD	9728	Initial	N/A	No
Lang Group Specify - Thai	MMD	9729	Initial	N/A	No
Dynamic Platform Optimizer	MMD	EB33	Both	Yes	No
Chasis & IBM Bezel for	MMD	EB85	Both	No	Yes
Chasis & OEM Bezel for	MMD	EB86	Both	No	Yes
PCIe2 2-Port 10GbE RoCE SFP+ A	MMD	EC28	Both	Yes	No
PCIe2 2-Port 10GbE RoCE SR Ada	MMD	EC30	Both	Yes	No
Operator Panel	MMD	EC53	Both	Yes	Yes
0.6m Blue CAT5 Ethernet Cable	MMD	ECB0	Both	Yes	No
1.5m Blue CAT5 Ethernet Cable	MMD	ECB2	Both	Yes	No
EXP30 Ultra SSD I/O Drawer	MMD	EDR1	Both	Yes	No
Carry-over Indicator for 4992	MMD	EH01	MES	Yes	No
Carry-over Inicator for 4997	MMD	EH02	MES	Yes	No
Carry-over for AME #4791	MMD	EH03	MES	Yes	No
Carry-over for DDR3 #5600	MMD	EH04	MES	No	No
Carry-over for DDR3 #5601	MMD	EH05	MES	No	No
Carry-over for DDR3 #5602	MMD	EH06	MES	No	No
Carry-over for DDR3 #5564	MMD	EH07	MES	No	No
Mode-1 & (1)ESA1/ESA2 for 5887	MMD	EJP1	Both	Yes	No
Mode-1 & (2)ESA1/ESA2 for 5887	MMD	EJP2	Both	Yes	No
Mode-2 & (2)ESA1/ESA2 for 5887	MMD	EJP3	Both	Yes	No
Mode-2 & (4)ESA1/ESA2 for 5887	MMD	EJP4	Both	Yes	No
Mode-4 & (4)ESA1/ESA2 for 5887	MMD	EJP5	Both	Yes	No
Mode-2 & (1)ESA1/ESA2 for 5887	MMD	EJP6	Both	Yes	No

Specify Mode-2(2)ESA1/ESA2	MMD	EJP7 Both	Yes	No
Specify mode-2(1) ESA1/ESA2	MMD	EJPA Both	Yes	No
Specify mode-2 (2) ESA1/ESA2	MMD	EJPB Both	Yes	No
Specify mode-4 (1)ESA1/ESA2	MMD	EJPC Both	Yes	No
Specify mode-4(2)ESA1/ESA2	MMD	EJPD Both	Yes	No
Specify mode-4 (3)ESA1/ESA2	MMD	EJPE Both	Yes	No
Specify mode-2 (1)5901/5278	MMD	EJPJ Both	Yes	No
Specify mode-2(2)5901/5278	MMD	EJPK Both	Yes	No
Specify mode-4 (1)5901/5278	MMD	EJPL Both	Yes	No
Specify mode-4 (2) 5901/5278	MMD	EJPM Both	Yes	No
Specify mode-4 (3) 5901/5278	MMD	EJPN Both	Yes	No
Specify mode-2 (2)5903/5805	MMD	EJPR Both	Yes	No
Specify mode-2 (2) 5913	MMD	EJPT Both	Yes	No
Specify Left Half 12X I/O Draw	MMD	EJPY Both	Yes	No
Specify Right Half 12X I/O Dra	MMD	EJPZ Both	Yes	No
Full width Key USB, US English	MMD	EK51 Both	Yes	No
Full width Key USB, French	MMD	EK52 Both	Yes	No
Full widthKey USB,Italian	MMD	EK53 Both	Yes	No
Full width Key USB, German/Aus	MMD	EK54 Both	Yes	No
Full width Key USB, UK English	MMD	EK55 Both	Yes	No
Full width Key USB, Spanish	MMD	EK56 Both	Yes	No
Full width Key USB, Japanese	MMD	EK57 Both	Yes	No
Full width Key USB, BrazilianP	MMD	EK58 Both	Yes	No
Full width Key USB, Hungarian	MMD	EK59 Both	Yes	No
Full width Key USB, Korean	MMD	EK60 Both	Yes	No
Full width Key USB, Chinese	MMD	EK61 Both	Yes	No
Full width Key USB, French Can	MMD	EK62 Both	Yes	No
Full width Key USB, Belgian/UK	MMD	EK64 Both	Yes	No
Full width Key USB, Swedish/Fi	MMD	EK65 Both	Yes	No
Full width Key USB, Danish	MMD	EK66 Both	Yes	No
Full width Key USB, Bulgarian	MMD	EK67 Both	Yes	No
Full width Key USB, Swiss/Fr/G	MMD	EK68 Both	Yes	No
Full width Key USB, Norwegian	MMD	EK69 Both	Yes	No
Full width Key USB, Dutch	MMD	EK70 Both	Yes	No
Full width Key USB, Portuguese	MMD	EK71 Both	Yes	No
Full width Key USB, Greek	MMD	EK72 Both	Yes	No
Full width Key USB, Hebrew	MMD	EK73 Both	Yes	No

Full width Key USB, Polish	MMD	EK74 Both	Yes	No
Full width Key USB, Slovakian	MMD	EK75 Both	Yes	No
Full width Key USB, Czech	MMD	EK76 Both	Yes	No
Full width Key USB, Turkish	MMD	EK77 Both	Yes	No
Full width Key USB, LA Spanish	MMD	EK78 Both	Yes	No
Full width Key USB, Arabic	MMD	EK79 Both	Yes	No
Full width Key USB, Thai	MMD	EK80 Both	Yes	No
Full width Key USB, Russian	MMD	EK81 Both	Yes	No
Full width Key USB, Slovenian	MMD	EK82 Both	Yes	No
Full width Key USB, US English	MMD	EK83 Both	Yes	No
Trial Live Partition Mobility	MMD	ELPM Both	Yes	No
0/32GB DDR3 1066MHz 4 DIMMs	MMD	EM40 Both	No	Yes
0/64GB DDR3 1066MHz 4 DIMMs	MMD	EM41 Both	No	Yes
0/128GB DDR3 1066MHz 4 DIMMs	MMD	EM42 Both	No	Yes
0/256GB DDR3 1066MHz 4 DIMMs	MMD	EM44 Both	No	Yes
90 Days On/off CoD Mem Enable	MMD	EM9T MES	Yes	No
Activation of 1 GB DDR3 P7+	MMD	EMA2 Both	Yes	No
QTY 100 OF FC EMA2, 1GB Act	MMD	EMA3 Both	Yes	No
1m 10GbE Cable SFP+ Act Twinax	MMD	EN01 Both	Yes	No
3m 10GbE Cable SFP+ Act Twinax	MMD	EN02 Both	Yes	No
5m 10GbE Cable SFP+ Act Twinax	MMD	EN03 Both	Yes	No
PCIe x8 Cable 1.5m	MMD	EN05 Both	Yes	No
PCIe x8 Cable 3m	MMD	EN07 Both	Yes	No
PCIe x8 Cable 8m	MMD	EN08 Both	Yes	No
90 Days On/Off CoDProc Enable	MMD	EP9T MES	Yes	No
4.22 GHz Proc, 0/12 core P7+	MMD	EPM0 Both	No	Yes
3.80 GHz Proc, 0/16 core P7+	MMD	EPM1 Both	No	Yes
1-Core Activation for EPM0	MMD	EPMA Both	Yes	No
1-Core Activation for EPM1	MMD	EPMB Both	Yes	No
1 On/Off Proc-day #EPM0, AIXL	MMD	EPME MES	Yes	No
1 On/Off Proc-day #EPM0, IBM i	MMD	EPMF MES	Yes	No
1 On/Off Proc-day #EPM1, AIXL	MMD	EPMG MES	Yes	No
1 On/Off Proc-day #EPM1, IBM i	MMD	EPMH MES	Yes	No
100 On/Off Prc-Days #EPM0 AIXL	MMD	EPMN MES	Yes	No
100 On/Off Prc-Days #EPM0 IBMi	MMD	EPMP MES	Yes	No
100 On/Off Prc-Days #EPM1 AIXL	MMD	EPMQ MES	Yes	No
100 On/Off Prc-Days #EPM1 IBMi	MMD	EPMR MES	Yes	No

100 CoD Ut1 mins, #EPMO, AIXL	MMD	EPMW MES	Yes	No
100 CoD Ut1 mins, #EPMO, IBMi	MMD	EPMX MES	Yes	No
100 CoD Ut1 mins, #EPML, AIXL	MMD	EPMY MES	Yes	No
100 CoD Ut1 mins, #EPML, IBMi	MMD	EPMZ MES	Yes	No
Quantity 150 of #3452 SAS Cabl	MMD	EQ02 Both	Yes	No
Quantity 150 of #3453 SAS YO	MMD	EQ03 Both	Yes	No
Quantity 150 of #ES0A	MMD	EQ0A Both	Yes	No
Quantity of 150 #ES0B	MMD	EQ0B Both	Yes	No
Quantity of 150 #ES0C	MMD	EQ0C Both	Yes	No
Quantity of 150 #ES0D	MMD	EQ0D Both	Yes	No
Quantity 150 of #1737	MMD	EQ37 Both	Yes	No
Quantity 150 of #1738	MMD	EQ38 Both	Yes	No
Quantity 150 of #1751	MMD	EQ51 Both	Yes	No
Quantity 150 of #1752	MMD	EQ52 Both	Yes	No
Power Cable Drawer to IBM PD	MMD	EQ77 Both	Yes	No
RFID Tags for Compute Nodes	MMD	ERF1 Initial	N/A	No
Front Door for P770/780 2MRack	MMD	ERG7 MES	Yes	No
387GB 1.8" SAS SSD (AIX/Linux)	MMD	ES02 Both	Yes	No
387GB SFF-1 SSD for AIX/Linux	MMD	ES0A Both	Yes	No
387GB SFF-1 SSD for IBMi	MMD	ES0B Both	Yes	No
387GB SFF-2 SSD for AIX/Linux	MMD	ES0C Both	Yes	No
387GB SFF-2 SSD for IBM i	MMD	ES0D Both	Yes	No
PCIe2 RAID SAS Adapter 6Gb	MMD	ESA1 Both	Yes	No
S&H - No Charge	MMD	ESC0 Initial	N/A	No
S&H	MMD	ESC8 Initial	N/A	No
1TB Removable Disk Cartridge	MMD	EU01 Both	Yes	No
RDX USB External Docking	MMD	EU04 Both	Yes	No
RDX 320 GB Removable Disk Driv	MMD	EU08 Both	Yes	No
Service Processor-3	MMD	EU09 Both	No	No
10G Base T Wrap	MMD	EU20 Both	Yes	No
12X Cable Performance Specify	MMD	EUC5 Initial	N/A	No
Core Use HW Feature	MMD	EUC6 MES	Yes	No
Core Use HW Feature 10	MMD	EUC7 MES	Yes	No

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9117	MMC	9117	MMD	Yes

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Corrections

(Corrected on December 24, 2012)

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