IBM BladeCenter PS700 Express server delivers great value with POWER7 on an entry blade server

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At a glance

The IBM® BladeCenter® PS700 Express® server:

- Allows you to consolidate workload on IBM BladeCenter Power Blades and virtualize applications to better utilize resources and amplify the already-significant advantages of BladeCenter efficiencies
- Simplifies your deployment with flexible configurations that make it easy to implement the right system and the ability to run AIX®, IBM i, and Linux® operating systems simultaneously
- Offers elegantly simple scalability, allows easy expansion, and enables pay-as-you-grow flexibility for the utmost in investment protection, performance growth, and time to value
- Provides a highly secure, resilient infrastructure solution that can help drive cost down, reduces risk, improves energy efficiency, and enhances flexibility

Overview

Built on the proven foundation of the IBM BladeCenter family of products -- easy-to-use, integrated platforms with a high degree of deployment flexibility, energy efficiency, scalability, and manageability -- the BladeCenter PS700 Express is the premier blade for 64-bit applications. Minimize complexity, improve efficiency, automate processes, reduce energy consumption, and scale easily: these are the benchmarks that matter on a smarter planet. The new POWER7™ processor-based PS blade automatically optimizes performance and capacity at either a system or virtual machine level and benefits from the new POWER7 processor, which contains innovative technologies that help maximize performance and optimize energy efficiency. It represents one of the most flexible and cost-efficient solutions for UNIX®, IBM i, and Linux deployments available in the market. Further enhanced by its ability to be installed in the same chassis with other IBM BladeCenter blade servers, the PS700 blade can deliver the rapid return on investment that clients and businesses demand.

Delivering on the promise for a highly dynamic infrastructure, the BladeCenter PS blade helps in delivering superior business and IT services with agility and speed, all in a simple-to-manage, highly efficient way. The PS700 Express blade has been preconfigured and tested by IBM and is based on proven technology. Utilizing a 3.0 GHz 64-bit POWER7 processor and available in a four-core configuration, it is optimized to achieve maximum performance for both the system and its virtual machines. Couple that performance with PowerVM™, which can be purchased for an extra charge, and you are now enabled for massive workload consolidation to drive maximum system utilization, predictable performance, and cost efficiency.

- Effortless balancing of workload performance

  POWER7 Intelligent Threads technology enables workload optimization by selecting the most suitable threading mode: Single Thread (per core) or Simultaneous Multi Thread-2 or -4 modes. Consequently, Intelligent Threads technology can provide improved application performance. In addition, POWER7 processors can maximize cache access to cores, improving performance, using Intelligent Cache technology.

- Dynamic energy optimization

  EnergyScale™ Technology offers Intelligent Energy management features, which can dramatically and dynamically conserve power and further improve energy efficiency. These Intelligent Energy features enable the POWER7 processor to operate at a higher frequency if environmental conditions permit, for increased performance per watt; or alternatively operate at a reduced frequency if user settings permit, for significant energy savings.

- Smart BladeCenter Solutions with Power Blades

  If you are looking for the perfect alternative to replacing traditional rack servers, then look no further. With a range of available PS blade choices and BladeCenter chassis supported you have the performance and scalability you need for demanding workloads of any sort. When combined with the BladeCenter S Chassis, the PS blade becomes an ideal solution for deploying blades in an office or distributed enterprise environment. Unlike a stand-alone server that needs multiple power supplies and fans, individual systems management, numerous cables, and a lot of space, IBM BladeCenter is compact and easy to use. By integrating servers, storage, networking, and management, BladeCenter is helping companies in every industry sweep complexity aside. The blade contains all the necessities to run application processors, memory, I/O, and storage. The chassis contains shared redundant power, shared hot-swap cooling, a media tray, integrated Ethernet, storage, switching, and consolidated powerful management.

Simplify. Cut costs. Boost productivity. They are all priorities for IT, and they are all driving organizations to rethink their server strategies and become more receptive to new ways to use IT. Blades are the next-generation solution, promising improvements across the board. So toss your cables and take the leap. Migrate to the blade solution that uses less energy and gives more choices and control. You have nothing to lose but complexity. IBM BladeCenter is the right choice. Open. Easy.

Key prerequisites

- A BladeCenter chassis
- A rack (7014-B42 recommended)
- An operating system (IBM AIX, IBM i operating system, Red Hat Linux, or Novell SUSE Linux)

Planned availability date

June 4, 2010

Description

IBM BladeCenter PS700 Express

The IBM BladeCenter PS700 Express is the latest high-density blade server with POWER7 and EnergyScale technology.

The IBM BladeCenter PS700 Express is a single-wide blade with a 4-core 64-bit 3.0 GHz processor, and eight DIMM slots which can contain up to a maximum of 64

GB of memory. Two optional SAS Small Form Factor (SFF) 2.5-inch drives can be installed in the PS700.

Integrated features on the PS700 include:

- Dual Gigabit Ethernet
- SAS Controller
- Service Processor
- Two USB ports and one Serial over LAN (SOL)
- One PCI-e CIOv expansion card slot and one PCI-e CFFh high-speed expansion card slot

As a heterogeneous infrastructure consolidation platform, the BladeCenter H, HT, E, and S Chassis also support running the PS700 alongside your x86-based blades in the same chassis with independent monitoring, security, power, and systems management. With several Gigabit Ethernet, Fibre Channel, iSCSI, and 4x high-performance expansion cards using InfiniBand technology to choose from, the PS700 can be tailored to the demands of your data center network and application workloads.

The BladeCenter S Chassis supports a maximum of six PS700 blades, or a mix of PS700 blades and other blades. For the BladeCenter H Chassis, the maximum number of PS700 blades is 14; for the BladeCenter HT Chassis, the maximum number of PS700 blades is 12; for the BladeCenter E Chassis, the maximum number of PS700 blades is 14.

IBM i supports the BladeCenter S Chassis and BladeCenter H Chassis only. IBM i does not support the BladeCenter HT Chassis, or BladeCenter E Chassis.

The PS700 has autonomic power and thermal controls designed to maintain operation in out-of-specification situations. If thermal or power conditions become unacceptable, it may reduce the processor or memory performance capability to maintain acceptable conditions. When the conditions are restored to an acceptable value, the blade will again automatically resume normal operation. Some applications may be sensitive to these capability changes. Contact your application vendors to determine any possible impacts.

Full keyboard, video, and mouse support can be used at installation instead of Serial over LAN (SOL), which requires a network switch module in the chassis. Multiple console connections are also supported by simultaneously using the BladeCenter keyboard, video, and mouse, and a SOL connection. The Advanced Management Module (AMM) on the chassis controls the routing of keyboard inputs to one of up to 14 blade servers. An embedded video controller is used to support 2D graphics on an SVGA video display. The PS700 has two USB ports.

As a robust blade solution for 64-bit UNIX applications, the PS700 also delivers leadership single-instruction, multiple-data (SMID) capabilities with the Linux operating system for scientific research and HPC.

PS700 features and benefits:

- Highly efficient and flexible design of the IBM blade
  - Densely pack more servers into a smaller space.
  - Tailor the system to meet varied business requirements with a choice of BladeCenter chassis.
  - Integrate networking switch infrastructure for improved cabling and data center maintenance.
  - Deploy in virtually any office environment for quieter, highly secure, and contaminant-protected operation.
- Pioneering IBM EnergyScale technology and Systems Director Active Energy Manager software
  - Generate less heat by managing application utilization and server energy consumption.

- Use less energy to cool the system.
- Industry-leading PowerVM virtualization technology
  - Reduce infrastructure costs by doing more with fewer servers.
  - Simplify IT operations to leverage storage, network, and computing resources to control costs and be more responsive.
- Innovative reliability features and systems management
  - Help to expedite hardware repairs and reduce service time.
  - Enable scheduled maintenance with proactive monitoring of critical system components to help reduce unplanned failures.
- Choice of IBM AIX, IBM i, or Linux operating environment
  - Standardize on a single platform that runs the large and varied portfolio of applications that support your business

PowerVM Editions (Advanced POWER Virtualization) (optional)

The PS700 supports PowerVM technology. The PS700 is designed to make it more affordable to consolidate multiple independent applications on a single blade using the same proven virtualization technologies offered on IBM Power servers.

The PS700 supports three leading-edge virtualization technologies:
PowerVM Express Edition (#5225), PowerVM Standard Edition (#5227), and PowerVM Enterprise Edition (#5228).

- PowerVM Express Edition supports up to three partitions per system (VIOS, AIX, Linux, and/or IBM i) which share processors and I/O. No hardware management console (HMC) is required or supported. It allows users to try out the Integrated Virtualization Manager (IVM) and the Virtual I/O Server (VIOS), which they would not get with an HMC.
- PowerVM Standard Edition makes the PS700 an ideal platform for consolidation of AIX, Linux, and IBM i operating system applications, helping clients reduce infrastructure complexity and cost. Offering an intuitive, Web-based interface for managing virtualization within a single blade, the IVM component of VIOS allows the small business IT manager to quickly and easily set up and manage logical partitions (LPARs). It also enables Virtual I/O and Virtual Ethernet so that storage and communications adapters can be shared among all the LPARs running on the PS700. Ultimately, IBM Micro-Partitioning™ technology allows each processor core to be subdivided into as many as 10 virtual servers. And since the PS700 is built with POWER7 technology, other advanced virtualization functions such as Shared Dedicated Capacity may be exploited.
- PowerVM Enterprise Edition includes all the features of PowerVM Standard Edition plus a new capability called Live Partition Mobility. Live Partition Mobility allows for the movement of a running AIX or Linux partition from one POWER7 processor-based server to another with no application downtime, resulting in better system utilization, improved application availability, and potential energy savings. With Live Partition Mobility, planned application downtime due to regular server maintenance can be a thing of the past. Software Maintenance for Virtual I/O Server (577x-PVE) must be purchased with VIOS (5765-PVE). PowerVM Enterprise Edition must be purchased separately.

Note: PowerVM Express Edition, PowerVM Standard Edition, and PowerVM Enterprise Edition are optional when running AIX or Linux. PowerVM Express Edition, PowerVM Standard Edition, or PowerVM Enterprise Edition is required when running the IBM i operating system on the PS700.

Capacity Backup (CBU) support for IBM i on BladeCenter PS700

The 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 entitlements and IBM i user entitlements purchased for a primary machine to a secondary CBU system. Temporarily transferring these resources, instead of purchasing them for a secondary system, may result in significant savings.

The CBU specify feature #4898 for the BladeCenter PS700 (8406-70Y) is available as part of a new blade purchase. This CBU feature can not be added to an existing blade server.

Certain system prerequisites must be met and system registration and approval is 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 entitlements or IBM i user entitlements to be transferred permanently or temporarily. These entitlements remain with the machine they were ordered for. When you register the association between a 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 entitlement and user entitlements from the primary system to the CBU system for any purpose provided the corresponding primary system processors are not being used concurrently for production purposes. The CBU system can therefore better support failover and role swapping for a full range of test, disaster recovery, and high availability scenarios. Temporary entitlement transfer means that the entitlement is a property transferred from the primary system to the CBU system and may remain in use on the CBU as long as the registered primary and CBU systems are in deployment for the high availability or disaster recovery operation.

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Primary System          Capacity Backup System
(Processor Group)       (Processor Group)

JS23/JS43 (P10)         JS23/JS43 (P10)  PS701/PS702 (P10), PS700 (P05)
JS23/JS43 (P10)         JS22 (P10) PS701/PS702 (P10), PS700 (P05)
JS22 (P10)              JS23/JS43 (P10) PS701/PS702 (P10), PS700 (P05)
JS23/JS43 (P10)         JS12 (P05) PS700 (P05),
PS701/PS702 (P10)       PS701/PS702 (P10), PS700 (P05)
PS701/PS702 (P10)       JS23/JS43 (P10), PS700 (P05)
PS701/PS702 (P10)       JS12 (P05), PS700 (P05)
PS700 (P05)             PS700 (P05)
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These systems have IBM i software licenses with an IBM i P05 or P10 processor group. The primary machine must be in the same enterprise and country as the CBU system.

Before you can temporarily transfer IBM i processor entitlements from the registered primary system, you must have more than one IBM i processor entitlement on the primary machine and at least one IBM i processor entitlement on the CBU server. You can then transfer any IBM i processor entitlements above the minimum one, assuming the total IBM i workload on the primary system does not require the IBM i entitlement that you want 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 entitlements are not updated, and you may see IBM i license noncompliance warning messages from the CBU system. These warning messages in this situation do not mean you are not in compliance.

The PS700 high availability options include PowerHA™ with Geographic Mirroring, iCluster®, and iClusterSMB. You may also use Metro Mirror or Global Mirror replication solutions provided by the storage subsystem as well as other third-party software replication packages.

Before you can temporarily transfer IBM i user entitlements you must have more than five IBM i user entitlements on the PS700 primary server and at least five IBM i user entitlements on the CBU server. You can transfer optional entitlements (any IBM i user entitlements above the minimum five) from the primary to the CBU. The user entitlements transferred to the CBU may not be used concurrently on the primary server from which they were transferred. If the primary server is of a P10 processor group then the primary server must have a minimum of 10 user entitlements and the optional user entitlements (those over the 10 required) may be transferred temporarily the CBU. As a general principle of the CBU on i offering, temporary entitlement transfer can not originate on the CBU.

For example, if you have a PS700 as your primary system with two IBM i processor entitlements (one above the minimum) and 50 IBM i user entitlements (40 above the minimum), you can temporarily transfer up to one IBM i processor entitlement and up to 40 user entitlements. During this temporary transfer, the CBU system's internal records of its total number of IBM i processor and user entitlements are 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 details, visit

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

N_Port ID Virtualization - NPIV

NPIV provides direct access to Fibre Channel adapters from multiple client partitions, simplifying the management of Fibre Channel SAN environments. NPIV support is included with PowerVM Express, Standard, and Enterprise Editions and supports AIX V5.3, AIX V6.1, IBM i 6.1.1, IBM i 7.1 hosted by VIOS 2.1.3.0, and SUSE Linux Enterprise Server 10 partitions on PS POWER® blades with an 8Gb Fibre Channel Host Bus Adapter (HBA). Supported 8Gb Fibre Channel HBAs are feature #8240, #8242, and #8271.

The following levels of AIX and VIOS are required for NPIV on blades:

- AIX V5.3 with the 5300-12 Technology Level, or later
- AIX V5.3 with the 6100-05 Technology Level, or later
- VIOS 2.1.3.0, or later

See table for interoperability.

NPIV Compatibility Matrix	AIX Client			
	QLogic 8Gb CIOv Feature #8242 See note 1	QLogic 8Gb CFFh Feature #8271 See note 1	Emulex 8Gb CIOv Feature #8240	QLogic 10GbE FCoE CFFh Feature #8275
QLogic 4 Gb Switch Modules Feature #3243, #3244 See note 2	Yes	Yes	No	NA
QLogic 8 Gb Switch Modules Feature #3284 See note 3	Yes	Yes	No	NA
Brocade 4 Gb Switch Modules Feature #3206, #3207	No	No	No	NA
Brocade 8 Gb Switch Modules Feature	Yes	Yes	Yes	NA

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|#5045,#5869   |          |          |          |          |
|---------------------------------------------------------|
|10 Gb E       |    NA    |    NA    |    NA    |   Yes    |
|Passthru      |          |          |          |          |
|Module        |          |          |          |          |
|Feature #5412 |          |          |          |          |
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|-----------------------------------------------|
|NPIV          |           IBM i Client          |
|Compatibility |                                 |
|Matrix        |---------------------------------|
|              |QLogic    |QLogic    |Emulex     |
|              |8 Gb CIOv |8 Gb CFFh |8 Gb CIOv  |
|              |          |          |           |
|              |Feature   |Feature   |Feature    |
|              |#8242     |#8271     |#8240      |
|              |See note 1|See note 1|           |
|----------------------------------------------|
|QLogic 4 Gb   | Yes,     | Yes,     |    No     |
|Switch        | Virtual  | Virtual  |           |
|Modules       | Tape only| Tape only|           |
|Feature       |          |          |           |
|#3243, #3244  |          |          |           |
|See note 2    |          |          |           |
|----------------------------------------------|
|QLogic 8 Gb   | Yes,     | Yes,     |    No     |
|Switch        | Virtual  | Virtual  |           |
|Modules       | Tape only| Tape only|           |
|Feature #3284 |          |          |           |
|See note 3    |          |          |           |
|----------------------------------------------|
|Brocade 4 Gb  |    No    |    No    |    No     |
|Switch        |          |          |           |
|Modules       |          |          |           |
|Feature       |          |          |           |
|#3206,#3207   |          |          |           |
|---------------------------------|-----------|
|Brocade 8 Gb  | Yes,     | Yes,     | Yes,      |
|Switch        | Virtual  | Virtual  | Virtual   |
|Modules       | Tape only| Tape only|Tape only  |
|Feature       |          |          |           |
|#5045,#5869   |          |          |           |
|----------------------------------------------|
|10 GbE        |    NA    |    NA    |    NA     |
|Passthru      |          |          |           |
|Module        |          |          |           |
|Feature #5412 |          |          |           |
|----------------------------------------------|
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|-----------------------------------------------------------|
|NPIV          |              Linux Client                  |
|Compatibility |                                            |
|Matrix        |--------------------------------------------|
|              |QLogic 8Gb|QLogic 8Gb|Emulex 8Gb|QLogic     |
|              |CIOv      |CFFh      |CIOv      |10GbE      |
|              |          |          |          |FCoE CFFh  |
|              |Feature   |Feature   |Feature   |Feature    |
|              |#8242     |#8271     |#8240     |#8275      |
|              |See note 1|See note 1|          |           |
|----------------------------------------------|-----------|
|QLogic 4 Gb   |   Yes    |   Yes    |    No    |    NA     |
|Switch        |          |          |          |           |
|Modules       |          |          |          |           |
|Features      |          |          |          |           |
|#3243,#3244   |          |          |          |           |
|See note 2    |          |          |          |           |
|----------------------------------------------|-----------|
|QLogic 8 Gb   |   Yes    |   Yes    |    No    |    NA     |
|Switch        |          |          |          |           |
|Modules       |          |          |          |           |
|Feature #3284 |          |          |          |           |
|See note 3    |          |          |          |           |
|----------------------------------------------|-----------|
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Brocade 4 Gb Switch Modules Feature #3206,#3207	No	No	No	NA
Brocade 8 Gb Switch Modules Feature #5045,#5869	Yes	Yes	Yes	NA
10 GbE Passthru Module Feature #5412	NA	NA	NA	Yes

Note 1: Requires firmware version level 5.02.01 or later.

Note 2: Requires firmware version level 6.5.0.22.00 or later.

Note 3: Requires firmware version level 7.10.1.04 or later.

Systems management and administrative tools

Integrated diagnostic and administrative tools like IBM Predictive Failure Analysis® and light path diagnostics are designed to simplify administration to help lower costs and improve control of the IT environment. Remote management capabilities allow automating IT networking tasks.

Proven technology like VIOS allows the sharing of disk drives, communications, and Fibre Channel adapters.

Systems management tools for the PS700:

- AIX 5.3 or AIX 6.1: IBM Director V6.2, Cluster Systems Management (CSM) for AIX, V1.7, and Extreme Cloud Administrative Toolkit (xCAT) V2
- SUSE Linux Enterprise Server 10 Service Pack 3 for POWER, with current maintenance updates available from Novell to enable all planned functionality: IBM Director V6.2
- Red Hat Enterprise Linux 5.5, for POWER, or later: IBM Director V6.2 xCAT V2
- IBM i 6.1 with i 6.1.1 machine code or IBM i 7.1, or later: IBM Director V6.2

  IBM Director V6.2 must be downloaded from

  http://www.ibm.com/systems/management/director/downloads.html
- xCAT is an open source scalable distributed computing management and provisioning tool that provides a unified interface for hardware control, discovery, and OS diskful/diskfree deployment. Highlights include:
  - Client/server architecture
  - Role-based administration
  - Stateless and iSCSI support
  - Scalability
  - Automatic discovery
  - Plug-in architecture
  - Notification
  - SNMP monitoring
  - Centralized console and system logs
  - Documentation

  xCAT V2 can be downloaded from

  http://sourceforge.net/apps/mediawiki/xcat/index.php?title=Main_Page

CSM for AIX, V1.7 (5765-F67) provides a full suite of systems management software for the PS700, including:

- Hardware control
- Installation and updating of software on nodes
- Distributed command execution
- File synchronization across a cluster
- Monitoring and automated response
- Automatic security configuration
- Management of node groups (static and dynamic)
- Diagnostics tools

More information on CSM and xCAT can be found at

http://www.ibm.com/systems/clusters/software/

xCAT/IBM Director positioning

xCAT is recommended for HPC computing customers for managing Linux clusters and has been enhanced to support the unique HPC requirements needed to integrate with other open source system management tools.

For general computing customers who operate non-HPC clustering infrastructures, IBM Systems Director and its family of products are IBM's strategic cross-platform system management solution.

IBM BladeCenter PS700 Express system at a glance

- Form factor

  The PS700 is a single-wide blade server for BladeCenter S, BladeCenter H, BladeCenter E, or BladeCenter HT Chassis.

- Processor cores

  The PS700 contains one 4-core 64-bit 3.0 GHz POWER7 processor. Processors are not features. Processors contain AltiVec SIMD and Hardware Decimal Floating-Point acceleration.

- Level 2 (L2) cache

  256 KB per processor core.

- Level 3 (L3) cache.

  4 MB per processor core.

- Memory (standard and maximum)

  Base offering: 8 GB (2 x 4 GB). Up to 64 GB maximum in 8 DIMM slots. ECC and Chipkill™ DDR3 SDRAM memory running at 1066 MHz (4 GB DIMMs) or 800 MHz (8 GB DIMMs).

- Internal drive storage maximums (optional)

  – Two 300 GB or 600 2.5-inch Serial Attached SCSI (SAS) 10,000 RPM non-hot-swappable hard disk drives.
  – Integrated RAID-0 or RAID-1 standard on blade server with support for disk mirroring.

- Networking

  Two 1-Gigabit Ethernet ports and support for optional Dual Gigabit Ethernet daughter card.

- I/O upgrade

  One PCI-e CIOv expansion card slot and one PCI-e CFFh high-speed expansion card slot.

- Optional connectivity

  1 and 10 Gbps Ethernet, 4 and 8 Gbps Fibre Channel.

- PowerVM Express Edition

  Support for up to three partitions per system which share processors and I/O.

- PowerVM Standard Edition

  Virtual LAN, POWER Hypervisor™, Micro-partitioning, Virtual I/O Server with Integrated Virtualization Manager, Shared Dedicated Capacity, PowerVM Lx86.

- PowerVM Enterprise Edition

  All the features of PowerVM Standard Edition plus Live Partition Mobility and Active Memory™ Sharing.

- Systems management

  Integrated systems management processor, IBM Systems Director Active Energy Manager™, light path diagnostics, Predictive Failure Analysis, Cluster Systems Management for AIX (CSM), Extreme Cloud Administrative Toolkit (xCAT), Serial Over LAN, IPMI-compliant.

- RAS features
  - IBM Chipkill ECC and cache Processor Instruction Retry
  - Service processor with fault monitoring
  - Hot-swappable disk bays (in BladeCenter S Chassis)
  - Hot-plug power supplies and cooling fans (on chassis)
  - Dynamic processor deallocation
  - Dynamic deallocation of logical partitions and PCI bus slots
  - Extended error handling on PCI-e slots
  - Redundant power supplies and cooling fans (on chassis)

- Operating environments
  - AIX V5.3 with the 5300-12 Technology Level, or later
  - AIX V6.1 with the 6100-05 Technology Level, or later
  - IBM i 6.1 with i 6.1.1 machine code, or later
  - IBM i 7.1, or later
  - Novell SUSE Linux Enterprise Server 10 Service Pack 3 for POWER, with current maintenance updates available from Novell to enable all planned functionality
  - Red Hat Enterprise Linux 5.5, for POWER, or later

  Note: Users should also update their systems with the latest Linux for Power service and productivity tools from IBM's Web site

    http://www14.software.ibm.com/webapp/set2/sas/f/lopdiags/home.html

  Note: For detailed installation instructions and I/O support information for IBM i refer to the "Read Me First" and "Supported Environments" at

    http://www.ibm.com/systems/power/hardware/blades/ibmi.html

- High availability

  IBM PowerHA family.

Enhancements for IBM i 6.1 and IBM i 7.1

Enhanced support for BladeCenter

Support for BladeCenter PS700 blade

IBM i 6.1 and IBM i 7.1 support the BladeCenter PS700 blade. For IBM i, the BladeCenter PS700 blade is supported in the BladeCenter S and BladeCenter H Chassis. The blade also supports AIX and Linux operating systems.

IBM i uses the PowerVM VIOS partition for access to BladeCenter resources and storage devices. The VIOS partition owns adapters on the blade and virtualizes the resources to the IBM i partition.

IBM i supports the following I/O adapters and storage options on the BladeCenter PS700:

- QLogic 8 Gb Fibre Channel Expansion Card (CIOv) for IBM BladeCenter (#8242)
- Emulex 8 Gb Fibre Channel Expansion Card (CIOv) for IBM BladeCenter (#8240)
- QLogic 4 Gb Fibre Channel Expansion Card (CIOv) for IBM BladeCenter (#8241)
- 3 Gb SAS Passthrough Expansion Card (CIOv) for IBM BladeCenter (#8246)
- QLogic Ethernet and 4 Gb Fibre Channel Expansion Card (CFFh) (#8252)
- 4X InfiniBand DDR Expansion Card (CFFh) (#8258)
- QLogic 8 Gb Fibre Channel Expansion Card (CFFh) (#8271)
- IBM 300 GB SAS 10K SFF HDD (#8274)
- IBM 600 GB SAS 10K SFF HDD (#8276)

For use with IBM i, the blade can be deployed with one VIOS partition and one IBM i partition, with one VIOS partition and multiple IBM i partitions, or with one VIOS partition and a combination of IBM i, AIX, and Linux partitions. Integrated Virtualization Manager (IVM), a function of VIOS, is used to set up and manage the partitions.

IBM i 6.1 (5761-SS1) and IBM i 7.1 (5770-SS1) include per processor core and per user entitlements for blade servers. When you select IBM i on a BladeCenter PS700 blade, you must purchase at least one processor core entitlement and at least five user entitlements. You may purchase additional IBM i processor core entitlements up to a maximum of four on the PS700. Additional IBM i user entitlements can also be purchased in blocks of five users. You may also purchase unlimited user, external user, and unlimited collaboration user options.

Support for virtual tape

IBM i 6.1 and IBM i 7.1 partitions on BladeCenter JS12, JS22, JS23, JS43, and PS700 blades support virtual tape, which simplifies backup and restore processing. IBM i can use native save/restore commands and BRMS to directly back up to a PowerVM VIOS attached LTO-4 tape drive, saving hardware costs and management time. This virtual tape support provides an effective backup solution for BladeCenter S configurations. It can also be used with BladeCenter H implementations. The virtual tape function supports the IBM Systems Storage SAS LTO-4 drive, specifically the TS2240.

Tape backup with IBM i 6.1.1, or IBM i 7.1 or later partitions on BladeCenter JS12, JS22, JS23, JS43, PS700, PS701, and PS702 blades may also be done using N_Port ID Virtualization (NPIV) with Fibre Channel attached tape libraries. NPIV support is available for the following tape libraries: 3584 (TS3500), 3573 (TS3100 and TS3200), 3576 (TS3310), and 3577 (TS3400). NPIV is provided via 8 Gb Fibre Channel Adapters:

- QLogic 8 Gb Fibre Channel Expansion Card (CFFh) (#8271)
- QLogic 8 Gb Fibre Channel Expansion Card (CIOv) for IBM BladeCenter (#8242)
- Emulex 8 Gb Fibre Channel Expansion Card (CIOv) for IBM BladeCenter (#8240)

Support for BladeCenter S SAS RAID Controller Module

The BladeCenter S SAS RAID Controller Module is supported with POWER7 processor-based blades in addition to x86 processor-based blades with the BladeCenter S Chassis. This controller module provides additional protection options for BladeCenter S storage, providing:

- Support for RAID-0, -1, -10, and -5

- Support for two disk storage modules with up to 12 SAS drives
- Support for an external SAS tape drive
- Support for 3 Gb SAS Passthrough Expansion Card (CIOv) for IBM BladeCenter (#8246) for PS700 blade
- 1 GB of battery-backed write cache between the two modules

Two SAS RAID Controller Modules are required with the BladeCenter S. For environments with high performance demands, separate RAID sets are recommended for each IBM i partition and for x86 blades. The controller is supported with BladeCenter JS12, JS22, JS23, JS43, and PS700 blades running AIX, Linux, and VIOS partitions, including a VIOS partition that virtualizes I/O resources for IBM i 6.1 partitions.

Statement of general direction

In addition to supporting RHEL5, with update 5.5, Red Hat plans to support POWER7 in Red Hat's upcoming version, Red Hat Enterprise Linux 6, with the Power 750, 755, 770, and 780 models and the IBM BladeCenter PS700, the IBM BladeCenter PS701, and IBM BladeCenter PS702. For additional questions or to be part of the Red Hat Enterprise Linux 6 beta program, contact Red Hat.

Novell currently supports IBM BladeCenter PS700, IBM BladeCenter PS701, and IBM BladeCenter PS702 with SUSE Linux Enterprise Server 10 Service Pack 3. In addition, Novell plans to support the IBM BladeCenter PS700, the IBM BladeCenter PS701, and IBM BladeCenter PS702 with an upcoming SUSE Linux Enterprise Server 11 Service Pack targeted for availability during the second quarter of 2010. For additional questions about the availability of this release, contact Novell.

IBM plans to enable support for Active Memory Expansion capability on POWER7 based blade servers with the IBM AIX operating system.

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

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

Product number

The following are newly announced features on the specific models of the IBM Power Systems™ 8406 machine type:

```
Description                                      MT    Model Feature

IBM BladeCenter PS700                            8406  70Y

EMEA Bulk MES Indicator                          8406  70Y   0004

AIX Partition Specify                            8406  70Y   0265
Linux Partition Specify                          8406  70Y   0266
IBM i Operating System Partition Specify         8406  70Y   0267
CSC Specify                                      8406  70Y   0275
IBM i 6.1 with 6.1.1 Machine Code Specify Code   8406  70Y   0566
IBM i 7.1 Specify Code                           8406  70Y   0567
US TAA Compliance Indicator                      8406  70Y   0983
```

```
Primary OS - IBM i                                      8406   70Y    2145
Primary OS - AIX                                        8406   70Y    2146
Primary OS - Linux                                      8406   70Y    2147
Integrate Blade Server in Chassis (BP)                  8406   70Y    4645
Integrate Blade Server in Chassis                       8406   70Y    4646
Rack Indicator- Not Factory Integrated                  8406   70Y    4650
Rack Indicator, Rack #1                                 8406   70Y    4651
Rack Indicator, Rack #2                                 8406   70Y    4652
Rack Indicator, Rack #3                                 8406   70Y    4653
Rack Indicator, Rack #4                                 8406   70Y    4654
Rack Indicator, Rack #5                                 8406   70Y    4655
Rack Indicator, Rack #6                                 8406   70Y    4656
Rack Indicator, Rack #7                                 8406   70Y    4657
Rack Indicator, Rack #8                                 8406   70Y    4658
Rack Indicator, Rack #9                                 8406   70Y    4659
Rack Indicator, Rack #10                                8406   70Y    4660
Rack Indicator, Rack #11                                8406   70Y    4661
Rack Indicator, Rack #12                                8406   70Y    4662
Rack Indicator, Rack #13                                8406   70Y    4663
Rack Indicator, Rack #14                                8406   70Y    4664
Rack Indicator, Rack #15                                8406   70Y    4665
Rack Indicator, Rack #16                                8406   70Y    4666
Chassis indicator-Not Factory Integrated                8406   70Y    4680
BladeCenter chassis specify, Chassis #1                 8406   70Y    4681
BladeCenter chassis specify, Chassis #2                 8406   70Y    4682
BladeCenter chassis specify, Chassis #3                 8406   70Y    4683
BladeCenter chassis specify, Chassis #4                 8406   70Y    4684
BladeCenter chassis specify, Chassis #5                 8406   70Y    4685
BladeCenter chassis specify, Chassis #6                 8406   70Y    4686
BladeCenter chassis specify, Chassis #7                 8406   70Y    4687
BladeCenter chassis specify, Chassis #8                 8406   70Y    4688
BladeCenter chassis specify, Chassis #9                 8406   70Y    4689
IBM i CBU Specify Code                                  8406   70Y    4898
Software Pre-Install                                    8406   70Y    5005

PowerVM Express Edition                                 8406   70Y    5225
PowerVM Standard Edition                                8406   70Y    5227
PowerVM Enterprise Edition                              8406   70Y    5228
RFID tags for servers, blades, BladeCenters,
racks, and HMCs                                         8406   70Y    5524

IBM i Software Pre-Install                              8406   70Y    8141
Linux Software Pre-Install                              8406   70Y    8143
Linux Software Pre-Install (Business Partners)          8406   70Y    8144
AIX/VIOS Software Pre-Install                           8406   70Y    8146
8GB (2x4GB DIMMs) DDR3 1066 MHz System Memory           8406   70Y    8208
16GB (2 x 8GB DIMMs) DDR3 800 MHz System Memory         8406   70Y    8209
Emulex 8Gb Fibre Channel Expansion Card (CIOv)
for IBM BladeCenter                                     8406   70Y    8240
QLogic 4 Gb Fibre Channel Expansion Card (CIOv)
for IBM BladeCenter                                     8406   70Y    8241
QLogic 8Gb Fibre Channel Expansion Card (CIOv)
for IBM BladeCenter                                     8406   70Y    8242
3 Gb SAS Passthrough Expansion Card (CIOv) for
IBM BladeCenter                                         8406   70Y    8246
QLogic Ethernet and 4 Gb Fibre Channel Expansion
Card (CFFh)                                             8406   70Y    8252
4x DDR Expansion Card (CFFh) for IBM BladeCenter        8406   70Y    8258
QLogic 8 Gb Fibre Channel Expansion Card (CFFh)         8406   70Y    8271
IBM 300GB SAS 10K RPM SFF HDD                           8406   70Y    8274
QLogic 2-port 10Gb Converged Network Adapter
(CFFh)                                                  8406   70Y    8275
IBM 600GB SAS 10K RPM SFF HDD                           8406   70Y    8276
Voltaire 4x DDR Expansion Card (CFFh) for IBM
BladeCenter                                             8406   70Y    8298
One Processor Entitlement for the IBM
BladeCenter 70Y                                         8406   70Y    8405
Zero-priced Processor Entitlement for IBM
BladeCenter PS700                                       8406   70Y    8406
IBM BladeCenter PS700/PS701/PS702 Installation/
Users Guide (Brazilian Portuguese)                      8406   70Y    8900
IBM BladeCenter PS700/PS701/PS702 Installation/
Users Guide (English)                                   8406   70Y    8901
IBM BladeCenter PS700/PS701/PS702 Installation/
```

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Users Guide (French)                            8406  70Y    8902
IBM BladeCenter PS700/PS701/PS702 Installation/
Users Guide (German)                            8406  70Y    8903
IBM BladeCenter PS700/PS701/PS702 Installation/
Users Guide (Italian)                           8406  70Y    8904
IBM BladeCenter PS700/PS701/PS702 Installation/
Users Guide (Japanese English)                  8406  70Y    8905
IBM BladeCenter PS700/PS701/PS702 Installation/
Users Guide (Japanese)                          8406  70Y    8906
IBM BladeCenter PS700/PS701/PS702 Installation/
Users Guide (Korean)                            8406  70Y    8907
IBM BladeCenter PS700/PS701/PS702 Installation/
Users Guide (Chinese English)                   8406  70Y    8908
IBM BladeCenter PS700/PS701/PS702 Installation/
Users Guide (Spanish)                           8406  70Y    8909
IBM BladeCenter PS700/PS701/PS702 Installation/
Users Guide (Chinese - Taiwan )                 8406  70Y    8910
IBM BladeCenter PS700/PS701/PS702 Installation/
Users Guide (UK English)                        8406  70Y    8911
IBM BladeCenter PS700/PS701/PS702 Service/
Warranty CDs (Multi-language)                   8406  70Y    8912
IBM BladeCenter PS700/PS701/PS702 Installation/
Users Guide (Korean English)                    8406  70Y    8913
IBM BladeCenter PS700/PS701/PS702 Installation/
Users Guide (Chinese - Hong Kong)               8406  70Y    8914
Order Routing Indicator- System Plant           8406  70Y    9169
New AIX License Core Counter                    8406  70Y    9440
New IBM i License Core Counter                  8406  70Y    9441
New Red Hat License Core Counter                8406  70Y    9442
New SUSE License Core Counter                   8406  70Y    9443
Other AIX License Core Counter                  8406  70Y    9444
Other Linux License Core Counter                8406  70Y    9445
3rd Party Linux License Core Counter            8406  70Y    9446
VIOS Core Counter                               8406  70Y    9447
Month Indicator                                 8406  70Y    9461
Day Indicator                                   8406  70Y    9462
Hour Indicator                                  8406  70Y    9463
Minute Indicator                                8406  70Y    9464
Qty Indicator                                   8406  70Y    9465
Countable Member Indicator                      8406  70Y    9466
```

The following are newly announced features on the specific models of the IBM Power Systems 7779 and 7989 machine types:

```
Description                                 MT   Model Feature

BladeCenter Chassis content specify - 8406-70Y/
71Y                                         7779  BCS    0311
                                            7989  BCH
BladeCenter Chassis content specify - 8406-71Y
with Feature #8358                          7779  BCS    0314
                                            7989  BCH
```

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 8406-70Y virtualization engine features

```
                                            Return
From feature:          To feature:          parts

5225 - PowerVM Express  5227 - PowerVM Standard   No
Edition                 Edition
```

5225 – PowerVM Express Edition	5228 – PowerVM Enterprise Edition	No
5227 – PowerVM Standard Edition	5228 – PowerVM Enterprise Edition	No

Publications

No publications are shipped with the announced product.

With the IBM Systems Information Center, users can use a single information center to access product documentation for IBM Systems hardware, operating systems, and server software. Through a consistent framework, users can efficiently find information and personalize their access to that information. The IBM Systems Information Center is at

http://publib14.boulder.ibm.com/infocenter/systems

Services

Global Technology Services

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

These services help you learn about, plan, install, manage, or optimize your IT infrastructure to be an On Demand Business. They can help you integrate your high-speed networks, storage systems, application servers, wireless protocols, and an array of platforms, middleware, and communications software for IBM and many non-IBM offerings. IBM is your one-stop shop for IT support needs.

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

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

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

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

For details on education offerings related to specific products, visit

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

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

Technical information

Specified operating environment

Physical specifications

- PS700
  - Height: 9.65 in (245 mm)
  - Width: 1.14 in (29 mm)
  - Depth: 17.55 in (445 mm)
  - Weight: 9.6 lb (4.35 kg)
- BladeCenter H Chassis
  - Height: 15.75 in (400 mm)
  - Width: 17.5 in (444 mm)
  - Depth: 28.0 in (711 mm)

- Weight: 350 lb (159 kg)
- BladeCenter S Chassis
  - Height: 12.0 in (306 mm)
  - Width: 17.5 in (444 mm)
  - Depth: 28.3 in (733 mm)
  - Weight: 240 lb (108.9 kg)

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

Operating environment

- Temperature:
  - 10 to 35 degrees C (50 to 95 degrees F) at 0 to 914 m (0 to 3,000 ft)
  - 10 to 32 degrees C (50 to 90 degrees F) at 914 to 2,133 m (3,000 to 7,000 ft)

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

    http://www-912.ibm.com/see/EnergyEstimator
- Relative humidity: 8% to 80%
- Maximum altitude: 2,133 m (7,000 ft)
- Power consumption (@ +12 V supplied by BladeCenter chassis): 350 watts maximum

EMC conformance

- U.S.: FCC - Verified to comply with Part 15 of the FCC Rules Class A
- Canada: ICES-004, issue 3 Class A
- EMEA: EN55022: 2006 Class A
- Australia and New Zealand: CISPR 22, Class A

Safety certifications

- U.S.: (UL Mark) UL 60950-1 1st Edition
- CAN: (cUL Mark) CAN/CSA22.2 No.60950-1 1st Edition
- Europe: (CE Mark) EN60950-1, 1st Edition
- CB: IEC60950-1, 1st Edition
- Russia: (GOST Mark) IEC60950-1

Hardware requirements
Standard PS700 blade configuration

```
                      L3
  8406-70Y  Processor cache  Memory   Ethernet  Local storage

  PS700     4-core    4 MB/  8 GB-    Dual 1    Two optional
            3.0 GHz   core   64 GB    Gigabit   2.5" drives
            POWER7
```

Serial over LAN (SOL) function routes the console data stream over the standard two, 1 Gb Ethernet ports to the chassis AMM.

Minimum system configuration

Each 8406-70Y configuration must contain a minimum of:

- One - Memory DIMMs (at least one of these):
  – 8 GB (2 x 4 GB DIMMs) DDR3 1066 MHz (#8208)
  – 16 GB (2 x 8 GB DIMMs) DDR3 800 MHz (#8209)
- Four Processor Entitlements (one of these)
  – 8 x #8405, or 4 x #8405 and 4 x #8406

    Note: Feature #8406 is part of Express Product Offerings.

    Note: PowerVM Express Edition (4 x #5225) will be included in the base configuration. Either PowerVM Standard Edition (4 x #5227) or PowerVM Enterprise Edition (4 x #5228) may be substituted for PowerVM Express Edition. PowerVM is not required and may be removed from the order. If the IBM i operating system is installed on the PS700, a PowerVM edition is required.

Note: A minimum of one copy of the *IBM BladeCenter PS700 Service/Warranty CDs (Multi-language)* (#8912) and one copy of the *PS700 Installation and User's Guide* (#8700-8911, 8913-8914) is required at each customer installation.

Express Product Offerings

If you order a PS700 server Express Product Offering, as defined here, you may qualify for a processor entitlement at no additional charge. A minimum of 16 GB of memory and one SAS 10 K SFF disk drive is required to determine if you are entitled to a processor entitlement at no additional charge.

You can make changes to the standard features as needed and still qualify for processor entitlements at no additional charge. However, selection of total memory smaller than the totals defined as the minimums disqualifies the order as an Express Product Offering.

BladeCenter PS700 Express

- Minimum 16 GB memory -- one of these:
  – Two - 8 GB (2 x 4 GB DIMMs) DDR3 1066 MHz (#8208)
  – One - 16 GB (2 x 8 GB DIMMs) DDR3 800 MHz (#8209)
    Note: Additional memory DIMMs of any size may be added.
- One of these:
  – One - 300 GB SAS 10K SFF HDD (#8274)
  – One - 600 GB SAS 10K SSF HDD (#8276)
- Two - Processor Entitlements (#8405)
- Two - Zero-priced Processor Entitlements (#8406); receive two processor entitlements (#8406) at no additional charge. Four cores are entitled.

Note: A minimum of one copy of *IBM BladeCenter PS700 Service/Warranty CDs (Multi-language)* (#8912) and one copy of the *PS700 Installation and User's Guide* (#8900-8911, 8913-8914) is required at each customer installation.

Optional and additional features

- Up to 64 GB of system memory
  – The PS700 system board contains eight RDIMM memory connections.
  – Memory DIMMs must be installed in matched pairs (same size and speed) with a minimum of 8 GB and maximum of 64 GB.
  – Memory sizes can be mixed.
  – PS700 supports Memory Scrubbing, ECC, and Chipkill.
  – 8 GB (2 x 4 GB DIMMs) memory feature operates at 1066 MHz while the 16 GB (2 x 8 GB DIMMs) memory feature operates at 800 MHz.

- Storage devices
  - The PS700 does not support removable media within the blade.
  - PS700 has two locations for installation of a 2.5-inch SAS SFF drive.
  - Drives may be selected in any combination. However, if RAID-1 is to be implemented, the drives must be of the same size.

Expansion cards

The PS700 has one PCI-e CIOv expansion card slot and one PCI-e CFFh High Speed expansion card slot.

CFFh expansion cards include:

- QLogic Ethernet and 4 GB Fibre Channel Expansion Card (CFFh) (#8252)

Note: Not supported in the BladeCenter S Chassis (7779-BCS):
- 4X DDR Expansion Card (CFFh) for IBM BladeCenter (#8258)
- QLogic Ethernet and 8 Gb Fibre Channel Expansion Card (CFFh) (#8271)
- QLogic 2-port 10Gb Converged Network Adapter (CFFh) (#8275)

CIOv expansion cards include:

- Emulex 8 Gb Fibre Channel Expansion Card (CIOv) (#8240)
- QLogic 4 Gb Fibre Channel Expansion Card (CIOv) for IBM BladeCenter (#8241)
- QLogic 8 Gb Fibre Channel Expansion Card (CIOv) (#8242)
- 3 Gb SAS Passthrough Expansion Card (CIOv) for IBM BladeCenter (#8246)

Note: IBM i does not support Fibre Channel adapters (feature numbers 8252, 8240, 8241, 8242) when used in the BladeCenter S Chassis.

Software requirements

The PS700 server supports the AIX, Linux, and IBM i operating systems, providing the flexibility of using applications written for any one of the three. IBM has qualified two popular Linux distributions for use with the PS700 server:

- Red Hat Enterprise Linux for POWER
- Novell SUSE Linux Enterprise Server for POWER Systems

One or more of the following operating systems is required for an operational PS700:

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

- AIX V5.3 with the 5300-12 Technology Level, or later
- AIX V6.1 with the 6100-05 Technology Level, or later

If installing the IBM i operating system:

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

Note: VIOS is required with the IBM i operating system.

If installing VIOS:

- VIOS 2.1.3.0, or later

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

- SUSE Linux Enterprise Server 10 Service Pack 3 for POWER Systems, with current maintenance updates available from Novell to enable all planned functionality
- Red Hat Enterprise Linux 5.5 for POWER, or later

Users should also update their systems with the latest Linux for Power service and productivity tools from IBM's Web site

http://www14.software.ibm.com/webapp/set2/sas/f/lopdiags/home.html

Note: For systems ordered with the Linux operating system, IBM ships the most current versions available from the distributor. If your hardware requires a different version of a Linux OS than that shipped by IBM, you must obtain it via download from the Linux distributor's Web site. Information concerning access to a distributor's Web site is located on the product registration card delivered to you as part of your Linux OS order.

Processor is the unit of measure by which this program is licensed. A processor (commonly called a processor core or CPU) is a functional unit within a computing device that interprets and executes instructions. A processor consists of at least an instruction control unit and one or more arithmetic or logic units. With multi-core technology, each core is considered a processor. For programs eligible for sub-capacity licensing, a Proof of Entitlement (PoE) must be acquired for all activated processors available for use in each partition (utilizing eligible partitioning technologies) where the program runs. A PoE must be acquired for all activated processor cores available for use on the server.

Disclaimer: Some information in this announcement addresses anticipated future capabilities and may be subject to change.

Planning information

Cable orders

No cables are required.

Security, auditability, and control

Security and auditability features include:

- A power-on password function provides control of who has access to the data and server setup program on the server.
- A selectable boot sequence can be used to prevent unauthorized installation of software or removal of data from the diskette drive.

Limitations: The BladeCenter and PS700 blade have no security-intrusion detection.

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

Global Technology Services

Contact your IBM representative for the list of selected services available in your country, either as standard or customized offerings, for the efficient installation, implementation, and/or integration of this product.

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.

Warranty period

Three years

Warranty service

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

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

CRU Service

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

Tier 1 CRU

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

Tier 2 CRU

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

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

The following parts have been designated as Tier 1 CRUs:

- Hard disk drive
- Daughter cards
- Battery
- Bezel
- Memory DIMMs
- Top cover

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 service level is:

- IBM On-site Repair Limited, 9 hours per day, Monday through Friday, excluding public or national holidays, next-business-day response, Latest Call Registration 15:00

Additional reference for Europe

For additional info, refer to the European HW Operations Guide and Service Level Description Table available at

http://www-5.ibm.com/services/europe/maintenance/

Machine Exchange Service

IBM will initiate shipment of a replacement machine to your location. You are responsible for its installation and verification of operation. You must pack the failed machine into the shipping container that contained the replacement machine and return the failed machine to IBM. Transportation charges, both ways, are paid by IBM. You may be charged for the replacement machine if IBM does not receive the failed machine within 15 days of your receipt of the replacement.

Non-IBM parts service

Warranty service

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

International Warranty Service

International Warranty Service (IWS) is available in selected countries or regions.

The warranty service type and the service level provided in the servicing country may be different from that provided in the country in which the machine was purchased. Under IWS, warranty service will be provided with the prevailing warranty service type and service level available for the IWS-eligible machine type

in the servicing country and the warranty period observed will be that of the country in which the machine was purchased.

To determine the eligibility of your machine and to view a list of countries where service is available, visit

http://www-304.ibm.com/jct01004c/systems/support/supportsite.wss/ warrantyform?brandind=5000008

For more information on IWS, refer to Services Announcement ZS01-0168, dated September 25, 2001.

Warranty service upgrades and maintenance service options

Warranty service upgrades

During the warranty period, a warranty service upgrade provides an enhanced level of On-site Service for an additional charge. A warranty service upgrade must be purchased during the warranty period and is for a fixed term (duration). It is not refundable or transferable and may not be prorated. If required, IBM will provide the warranty service upgrade enhanced level of On-site Service acquired by the customer. Service levels are response-time objectives and are not guaranteed. See the Warranty service section for additional details.

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

CRUs will be provided as part of the machine's standard warranty CRU Service except that you may install a Tier 1 CRU yourself or request IBM installation, at no additional charge, under one of the On-site Service levels specified below.

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.

- IBM On-site Repair, Same Business Day On-site Response Time, Latest Call Registration 12:00, 9 hours per day, Monday through Friday, excluding public or national holidays
- IBM On-site Repair, Same Business Day 6 hours average On-site Response Time, 24 hours per day, Monday through Sunday, 365 days a year

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

Maintenance services

If required, IBM provides repair or exchange service depending on the types of maintenance service specified for the machine. IBM will attempt to resolve your problem over the telephone or electronically, via an IBM Web site. You must follow the problem determination and resolution procedures that IBM specifies. Scheduling of service will depend upon the time of your call and is subject to parts availability. Service levels are response-time objectives and are not guaranteed.

CRU Service

If your problem can be resolved with a CRU (for example, memory or hard disk drive), IBM will ship the CRU to you for you to install. CRU information and

replacement instructions are shipped with your machine and are available from IBM at any time on your request.

IBM specifies in the materials shipped with a replacement CRU whether a defective CRU must be returned to IBM. When return is required, return instructions and a container are shipped with the replacement CRU, and you may be charged for the replacement CRU if IBM does not receive the defective CRU within 15 days of your receipt of the replacement.

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.

- IBM On-site Repair Limited, Next Business Day On-site Response Time, Latest Call Registration 15:00, 9 hours per day, Monday through Friday, excluding public or national holidays
- IBM On-site Repair, Next Business Day On-site Response Time, 9 hours per day, Latest Call Registration 15:00, Monday through Friday, excluding public or national holidays
- IBM On-site Repair, Same Business Day On-site Response Time, Latest Call Registration 12:00, 9 hours per day, Monday through Friday, excluding public or national holidays
- IBM On-site Repair, Same Business Day 6 hours average On-site Response Time, 24 hours per day, Monday through Sunday, 365 days a year

Maintenance service (ICA)

Maintenance services are available for ICA legacy contracts.

Alternative service (warranty service upgrades)

During the warranty period, a warranty service upgrade provides an enhanced level of On-site Service for an additional charge. A warranty service upgrade must be purchased during the warranty period and is for a fixed term (duration). It is not refundable or transferable and may not be prorated. If required, IBM will provide the warranty service upgrade enhanced level of On-site Service acquired by the customer. Service levels are response-time objectives and are not guaranteed.

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

A CRU will be provided as part of the machine's standard warranty CRU Service except that you may install a Tier 1 CRU yourself or request IBM to install it, at no additional charge, under the type of warranty service specified below, 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.

See the Pricing section for specific offerings.

Maintenance service

If required, IBM provides repair or exchange service depending on the type of maintenance service specified below for the machine. IBM will attempt to resolve your problem over the telephone or electronically by access to 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. Service levels are response-time objectives and are not guaranteed.

Customer Replaceable Unit (CRU) Service

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

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

See the Pricing section for specific offerings.

Non-IBM parts support

Warranty service

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

Warranty service upgrades and maintenance services

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 (for example, adapter cards, PCMCIA cards, disk drives, or memory) installed within IBM machines 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.

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

No

Machine installation

Customer setup. Customers are responsible for installation according to the instructions IBM provides with the machine.

Graduated program license charges apply

Yes

The applicable processor tier is small.

Licensed Machine Code

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

http://www-1.ibm.com/servers/support/machine_warranties/ machine_code.html

Machine using LMC: Type-model 8406-70Y

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

http://www-304.ibm.com/jct01004c/systems/support/ supportsite.wss/ docdisplay?lndocid=MIGR- 5069766&brandind=5000020

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.

Europe Business Partner terms and conditions

For more information, Business Partners should refer to the relevant product exhibits on

https://www.ibm.com/partnerworld/mem/bpal/emea/exhibit/index.jsp

Pricing

For all local charges, contact your IBM representative.

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Corrections

(Corrected on April 29, 2010)
Information on International Warranty Service was added.