IBM Power Systems expands I/O features

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At a glance

New I/O enhancements are available for Power® Systems. These include:

- Three additional Small Form Factor (SFF) SAS disk drive capacities
- An additional 12X DDR 19-inch I/O drawer with PCIe slots and no disk bays
- Support by IBM® i 6.1 for dual feature 5903 PCIe SAS 380 MB Cache Adapters
- Dual adapter support for the feature 5904, 5906, and 5908 PCI-X DDR 1.5 GB Cache SAS RAID Adapter
- Additional solid state drive configuration flexibility
- New Fibre Channel over Ethernet (FCoE) capability
- USB Removable Disk Drive
- A new RFID tag convenience option labeling selected Power Systems and components
- Deployment-Ready Services
  http://www.ibm.com/systems/power/support/drs/index.html
- Customer-Specified Placement

Overview

Innovative enhancements expand the I/O options for Power Systems:

- Three SFF SAS disk drives in 139, 146, and 300 GB capacities boost the SFF server storage capacity on IBM Power 520, 550, 560, 570, 575, and 595 servers. The 139 GB (#1888) is a 15,000 rpm drive supported by IBM i. The 146 GB (#1886) is a 15,000 rpm drive and the 300 GB drive (#1885) is a 10,000 rpm drive supported by AIX® and Linux®. The new hot-swappable SAS drives are available on the IBM POWER6™ processor-based family of servers in the SFF drive bays.
- A diskless 19-inch PCIe 12X I/O drawer (#5877) joins the already announced feature 5802 I/O drawer on the Power 520, 550, 560, and 570. The feature 5877 has 10 PCIe slots but has zero disk bays, offering a lower purchase price and lower maintenance price compared to the feature 5802 drawer with its 18 disk bays. Configuration rules and minimum operating system support rules are identical between the feature 5802 and feature 5877. This fulfills the statement of direction, announced in ZG09-0331, dated April 28, 2009.
- IBM i 6.1 with 6.1.1 machine code, or later, supports the PCIe 380 MB Cache Dual-x4 3Gb SAS RAID Adapter (#5903), fulfilling another statement of direction, announced in ZG09-0331, dated April 28, 2009. IBM i support of the feature 5903 allows IBM i clients to take advantage of the SFF disk bays in the feature 5802
and feature 5803 PCIe 12X I/O drawers, announced earlier using a SAS controller with write cache. A pair of feature 5903 adapters are always configured together to provide redundancy of both controllers and write cache (dual adapter support). This feature is supported on POWER6 processor-based servers.

- AIX, IBM i 6.1 with 6.1.1 machine code, or later, and Linux support redundant paired PCI-X DDR 1.5 GB Cache SAS RAID Adapters (#5904, #5906, and #5908) with the use of either 3 meter or 6 meter SAS adapter-to-adapter (AA) cables along with one or more X cables for device enclosure attachment. The operating system and cable allow pairing of controllers for redundantly accessing a set of drives running RAID protection. Paired controllers may reside in different I/O drawers for increased availability. For IBM i, the paired adapters must be used in a single-system configuration and the nonpaired indicator is not used. For AIX and Linux, the paired adapters may be used in either a single-system or two-system configuration. A nonpaired indicator (#5921) is used for AIX or Linux when the second adapter of a pair is on a different system.

- 12X PCIe I/O drawers (#5802 and #5803) support SFF Solid State Drive (SSD) (#1909) for expanded configuration flexibility. Select the PCIe 380 MB Cache Dual x4 3Gb SAS RAID Adapter (#5903) when configuring the 12X PCIe I/O drawers to control SSD drives. The 12X PCIe I/O drawer (#5802) is available on IBM Power 520, Power 550, Power 560, and Power 570. The 12X PCIe I/O drawer (#5803) is available on IBM Power 575 and Power 595.

- A new 10 Gb FCoE (Fibre Channel over Ethernet) PCIe Dual Port Adapter card (#5708) can provide not only 10 Gb Ethernet capability but can allow Fibre Channel protocols to run over the same network. This merger of adapter, cabling, and switches can reduce the complexity of installing or managing two different sets of medium and their switches. It can also reduce the number of PCI adapters required.

- Available on the Power 520 and Power 550 is an internal USB docking station (#1103) and external USB docking station (#1104). Available on the Power 560 and Power 570 is an external USB docking station (#1104). The docking stations support rugged removable disk cartridges in 160 GB capacity (#1106) and 500 GB capacity (#1107). The docking stations and a supply of rugged disk cartridges provide AIX clients a cost-effective alternative to using 8 mm VXA or DAT tape drives. USB Removable Disk Cartridges secure the business' valuable assets. The rugged removable disk cartridges and docking stations provide backup and restore, including boot support similar to tape drive.

- A new USB mouse feature (#8845) replaces the previous USB mouse feature (#8841).

- To assist clients employing RFID (Radio Frequency Identification Device) technology to track their equipment in their data centers, IBM can now optionally place RFID tags on selected Power Systems servers and racks, HMCs, and IBM BladeCenter® servers. For additional details, refer to the RFID technology available to help track equipment section regarding feature 5524. The tag is designed to meet the performance and numbering specification as outlined by the radio frequency identification (FSTC) specifications.


Deployment-Ready Services

IBM Power Systems now offers comprehensive integration, configuration, and customization services for IBM POWER® technology-based servers, including:

- Component integration
- Rack integration
- Operating system preinstallation
- Asset tagging
- Third-party hardware/software installation
- Box consolidation
- Remote access to your servers in the factory
- Partitioning
- Customized operating system /firmware
• Unit personalization
• Customized testing

These services can significantly accelerate solution deployment time and allow clients to focus on their core business. They are offered at attractive prices by leveraging IBM’s economy of scale and expertise in product assembly, test, and integration.

**Key prerequisites**

Refer to the Technical information section.

**Planned availability date**

October 30, 2009

**Description**

**Fibre Channel over Ethernet**

Fibre Channel over Ethernet (FCoE) is an emerging standard in the computer industry that is gaining a lot of momentum. FCoE also called FCoEE (EE = Enhanced Ethernet) or FCoCEE (CEE = Converged Enhanced Ethernet). ECoE offers several important potential benefits:

• It can save PCI slots by allowing one PCI adapter to replace two adapters (one Ethernet + one Fibre Channel adapter). The FCoE adapter is therefore also called a Converged Network Adapter (CNA). If enough PCI adapter slots are saved, I/O drawers may be saved too.
• It can save rack space by using just one FCoE switch instead of separate switches from both Ethernet and Fibre Channel. In addition, if an I/O drawer is avoided, that can save additional rack space.
• It can simplify wiring by using Ethernet cabling instead of Ethernet plus Fibre Channel.
• It can offer additional flexibility over time by being able to more easily adjust its usage with the same hardware to changing client requirements.
• Given a converged wiring and switching structure, it can offer operational savings because fewer unique networks have to be managed.

The feature 5708 10 Gb FCoE PCIe Dual Port Adapter is announced for POWER6 520, 550, 560, 570, 575, and 595. The NIC (Network Interface Card) traffic functionality is supported by AIX, IBM i, Linux, and VIOS. The Fibre Channel (FC) capability is supported by AIX, Linux, and VIOS. NPIV functionality for the FC interface is not announced. See the feature 5708 statement of direction for more information on planned functional enhancements. See the 5708 feature description for additional operating system requirements.

Feature 5708 has two 10 Gb ports. A port can run just NIC traffic, just FC traffic, or a mixture of NIC and FC traffic.

From a NIC traffic perspective, the total available bandwidth of the PCIe slot will not support 20 Gb (10 Gb+10 Gb) but will probably be around a 15 Gb maximum. Though most environments do not run at maximum throughput all the time and thus the limitation may not be a significant consideration for many, the limitation should be considered for high-volume connections. See the feature description for additional performance and configuration considerations with Ethernet.

From a FC traffic perspective, a dual port feature 5708 can provide up to 5% to 45% additional performance throughput compared to the feature 5735 8 Gb PCIe Dual
Port FC Adapter, depending on the scenario and measurement. Note both the feature 5708 and feature 5735 can be limited by the total bandwidth of the PCIe slot.

FCoE can be implemented along with existing FC and Ethernet infrastructures, allowing a controlled, smooth transition. The cabling from a FCoE adapter in the server typically attaches to a FCoE switch and then a connection is made to a device or another switch (FCoE, Ethernet, or FC). The FCoE adapter in the server can attach directly to an Ethernet switch instead of an FCoE switch, but in this case FC usage is not supported. Note that most of today's FC-attached tape drives/libraries or FC-attached disk storage systems do not also have an FCoE interface. Until the storage device offers an FCoE interface, the cabling will be Ethernet from the FCoE adapter in the server to an FCoE switch and then will be FC from the FCoE switch to either the device or to existing FC switches (8 Gb, 4 Gb, 2 Gb, or 1 Gb).

The 10 Gb feature 5708 requires an Ethernet switch to attach to Ethernet devices using 1 Gb speed.

IBM announced two FCoE switches in July 2009, the IBM Converged Switch B32 (5758-B32) and the Cisco Nexus 5000 for IBM System Storage™ (3722-S51).

**SSD configuration rules for using 19-inch and 24-inch 12X I/O Drawer PCIe,**

**SFF disk drawer**

- A pair of feature 5903 PCIe SAS adapters is the only supported SSD attachment option for the feature 5802 or 5803 12X I/O Drawer.
- The pair of feature 5903 adapters must be located in the same feature 5802 or 5803 as the SAS drives they control.
- There is a maximum of nine SSDs per pair of feature 5903 adapters (versus a maximum of eight SSDs if located in the feature 5886 Disk Drawer).
- SSDs and HDDs cannot be mixed on the same pair of feature 5903 adapters. However, using mode switch setting 2, half of the feature 5802 or 5803 12X drawer can use HDDs and the other half can use SSDs but must be attached to separate pairs of feature 5903 adapters.
- The SAS ports on the pair of feature 5903 adapters are connected to one set of SSD drives. The second ports on the feature 5903 pairs are not used for any other purpose when the other pair of ports is controlling SSD.
- Up to 18 SSDs can be configured in one feature 5802 or 5803 12X I/O drawer, but they must be driven by two pairs of feature 5903 controllers and the feature 5802 or 5803 12X Drawer's mode switch must be in position 2. If the mode switch is in position 1 (AIX/Linux not IBM i), the maximum is nine SSDs and no HDD. A mode switch setting of 4 is not supported due to the cabling requirement of a pair of feature 5903 controllers.
- The feature 5802 or 5803 drawer uses the SFF SSD feature 1890 or 1909.

**RFID technology available to help track equipment**

IBM can now optionally place RFID (Radio Frequency Identification Device) tags on selected Power Systems servers and I/O.

To assist clients employing RFID technology to track their equipment in their data centers, IBM can now optionally place an RFID tag on selected Power Systems servers, racks, HMC, and BladeCenter (#5524) systems. For specifications, visit [http://www.fstc.org/projects/index.php?id=29](http://www.fstc.org/projects/index.php?id=29)

**RFID feature 5524**

- For machine type/model (MTM) 8203-E4A, 8204-E8A, 8234-EMA, 9117-MMA, or 9119-FHA. This specify feature causes IBM to attach and ship one RFID tag for the specific CEC that is included in one order. One tag is attached and shipped with a 8203-E4A, 8204-E8A, 8234-EMA, 9117-MMA, or 9119-FHA CEC or with an upgrade from a POWER5™ server into one of these POWER6 servers. Ordering this feature will not result in the tagging of individual I/O drawers or subcomponents.
such as disks. This specify feature should not be ordered separately, but with a 
CEC. If ordered separately, this specify feature will not ship any tags.

• For POWER6 processor-based BladeCenter offerings MTM 7778-23X, 7779-BCS, 
or 7989-BCH, or for IBM BladeCenter Express MTM 7998-60X (JS12 Express) 
or 7998-61X (JS22 Express). This specify feature causes IBM to attach and 
ship one RFID tag for a JS23/JS43 Power blade (7778-23X), for JS12/JS22 
Express (7998-60X,61X) or one tag for a BladeCenter enclosure (7779-BCS and 
7989-BCH). Use one RFID Tag Specify feature for each blade or each enclosure 
for which a tag is desired. Do not use this feature when changing a JS23 to a 
JS43 by MES ordering feature 8446. Ordering this feature will not result in the 
tagging of individual subcomponents such as disks. Do not order the specify 
feature separately and instead order with a Power blade or enclosure. If ordered 
separately, this specify feature will not ship any tags.

• For MTM racks 7014-T00, 7014-T42, 7014-B42, and 7014-S25. This specify 
feature causes IBM to attach and ship one RFID tag to the rack. Use one RFID 
Tag Specify feature for each 19-inch rack. Ordering this feature will not result 
in the tagging of individual drawers, PDUs, and so on. Do not order the feature 
separately, but with a rack. It should not be ordered as an MES because if ordered 
separately, this specify feature will not ship any tags.

• For MTM HMCs 7042-C07 and 7042-CR5. This specify feature causes IBM to 
attach and ship one RFID tag to the HMC system unit. Use one RFID Tag Specify 
feature for each HMC. Ordering this feature will not result in the tagging of the 
monitor, keyboard, or mouse. This specify feature should not be ordered as an 
MES, because if ordered separately, this specify feature will not ship any tags.

Ordering feature 5524 will not result in the tagging of the monitor, keyboard, or 
mouse. This specify feature should not be ordered as an MES, because if ordered 
separately, this specify feature will not ship any tags.

Removable Disk/Drive Cartridge
Features 1106 and 1107 disk/cartridge have a separate one-year limited warranty 
and limitation of remedies. IBM warrants that these IBM features are free from 
defects in material and manufacture at the time of purchase. If any defect in 
material or manufacture appears during the one-year limited warranty, IBM's entire 
liability, and your exclusive remedy is, at IBM's option, either (a) repair, or (b) 
replacement of the product.

These warranties are made in lieu of all other rights, conditions, and warranties, 
expressed or implied, including but not limited to the implied warranties of 
merchantability and fitness for a particular purpose.

IBM and seller shall not be liable under any legal theory (including tort or contract) 
for any direct, indirect, incidental, special or consequential damage (including 
without limitation damages for lost profits, lost savings or lost data) in any way 
related to the product. This limitation does not apply to claims for personal injury.

This warranty does not apply to failure of the IBM product resulting from misuse, 
abuse, accident, neglect or mishandling, improperly adjusted or maintained drives, 
incorrect environments, or wear from ordinary use.

Feature 1106 and 1107 are not entitled under the IBM Maintenance Agreement, if 
one is purchased.

Deployment-Ready Services
For more information on Deployment-Ready Services, refer to

http://www.ibm.com/systems/power/support/drs/index.html

Integration Services:
Refer to the Customer Specified Placement (CSP) Web site for all offerings in this 
section
Component integration: Integration and testing of additional features. IBM can also support customer-specified placement of features within a system.

Rack integration: Integrate blade or server into a rack and support for customer-specified placement of systems in a rack.

Operating system preinstallation: Load AIX, IBM i, or Linux onto the system prior to shipment.

Customized Services:

All offerings in this section are provided by IBM's Customer Solution Center. Contact Deployment-Ready Services@us.ibm.com to receive a quote on behalf of the customer and determine what customer information is required.

Unit personalization: Customize settings to each individual system. This is a custom offering that is provided by the IBM Customer Solution Center. At the customer's request, IBM will load customer-specified settings, such as IP address, onto the machine prior to shipping the system to the customer.

Third-party hardware/software integration: Install supported third-party hardware or load supported third-party applications per customer instructions. This is a custom offering that is provided by the IBM Customer Solution Center. At the customer's request, IBM will load any software or application the customer requires. The software or applications can be IBM, third-party, or unique to the specific customer.

Asset tagging:

All offerings in this section are provided by IBM's Customer Solution Center.

Contact Deployment-Ready Services@us.ibm.com to receive a quote on behalf of the customer and determine what customer information is required.

To assist clients employing RFID technology to track their equipment in their data centers, IBM can now optionally place RFID tags on selected Power Systems servers and racks, HMCs, and BladeCenter servers. For additional details, refer to the RFID technology available to help track equipment section regarding feature 5524. The tag is designed to meet the performance and numbering specification as outlined by the radio frequency identification (FSTC) specifications. This service does not require a quote from the Customer Solution Center.

Standard physical asset tagging and labeling: Create a standard physical asset tag or label, affix it to a system, and provide reporting upon request. This is a custom offering that is provided by the IBM Customer Solution Center. At the customer's request, IBM will place a physical asset tag (label) on the machine. This service is a call for quote service because IBM requires specific information from the customer to provide the service.

Customer-defined physical asset tagging and labeling: Create a custom physical asset tag or label, affix it to system, and provide reporting upon request. This is a custom offering that is provided by the IBM Customer Solution Center. At the customer's request, IBM will place a physical asset tag (label) with customer-defined, customer-specified information on it. This service is a call for quote service because IBM requires specific information from the customer to provide the service.

Special packaging

All offerings in this section are provided by IBM's Customer Solution Center.

Contact Deployment-Ready Services@us.ibm.com to receive a quote on behalf of the customer and determine what customer information is required.

Box consolidation:

This is a custom offering that is provided by the IBM Customer Solution Center. At the customer's request, IBM will consolidate all orders into a single shipment to the customer. IBM will also consolidate individual frames into a single box to
the extent that is possible without impacting the integrity of the shipment. This service is a call for quote service because IBM requires specific information from the customer to provide the service.

**System customization**

All offerings in this section are provided by IBM's Customer Solution Center.

Contact Deployment-Ready Services@us.ibm.com to receive a quote on behalf of the customer and determine what customer information is required.

- Remote access: Access systems prior to shipment through a secure network while the systems are still located in the IBM factory. This is a custom offering that is provided by the IBM Customer Solution Center. At the customer's request, IBM will keep the machine in a test cell and allow the customer to access the machine prior to shipping it. The customer can customize settings and software through this remote access. They can also do testing, if required. This service is a call-for-quote service because IBM requires specific information from the customer to provide the service.

- Partitioning: IBM will configure partitions per customer-specified instructions. This is a custom offering that is provided by the IBM Customer Solution Center. At the customer's request, IBM will set up and configure logic partitions for the customer prior to shipment. This service is a call-for-quote service because IBM requires specific information from the customer to provide the service.

- Customized OS/firmware: IBM will load operating system/firmware combination per customer instructions. This is a custom offering that is provided by the IBM Customer Solution Center. At the customer's request, IBM will load custom operating system or firmware. The operating system or firmware must be something that is supported and has been tested by the IBM development lab. This service is a call-for-quote service because IBM requires specific information from the customer to provide the service.

**IBM System Storage**

IBM i 6.1.1 expands support for IBM System Storage DS5100 and DS5300 via native Fibre attachment (#5749, #5774, and #5735) from the IBM i 6.1.1 environment to IBM POWER6 processor-based servers.

IBM i support for IBM System Storage DS5100 and DS5300: December 4, 2009

For more information, visit


For compatibility information, consult the System Storage Interoperation Center

http://www.ibm.com/systems/support/storage/config/ssic/displayesssearchwithoutj_s.wss?start_over=yes

**Product positioning**

The feature 5877 PCIe 12X I/O drawer is identical to the feature 5802 PCIe 12X I/O drawer except that feature 5877 does not have disk bays. Use feature 5877 when you do not need the disk bays and save on the price of the I/O drawer in addition to ongoing maintenance after warranty. Note that conversions between a diskless feature 5877 and a feature 5802 with disk bays are not available.

Dual adapter support is new for IBM i clients. In general, for customers using internal disk drives, the existing approach using mirrored adapters and disk drives remains the preferred approach for the highest levels of availability and performance compared to dual controllers with one set of drives protected by RAID 5 or RAID 6. However, where the highest levels are not required, the new option may allow a smaller number of drives to be used.
FCoE technology provides a way to simplify the data center environment. Instead of having separate wiring and separate switches for Ethernet and Fibre Channel, Ethernet cabling and a FCoE switch can be used. Existing data centers can add FCoE to their existing Fibre Channel and Ethernet infrastructure, focusing new growth on the FCoE infrastructure and working in parallel. This "add-to" approach can ease financial and implementation considerations. The FCoE adapter can attach to an existing Ethernet switch, but is then limited to just the Ethernet functionality.

USB Removable Disk drives can be a great alternative to DAT, 8mm, DLT, or VXA tape drives. These rugged drives are sealed, and in dirty office environments will probably experience fewer problems than tape drives. The removable disk drives allow a much larger number of usages per drive compared to a tape cartridge and saving media costs over time. USB disk drives provide most of the capabilities of a tape drive. With random retrieval (for AIX mksysb backups), backup and restore of data should be faster than the DAT, VXA, and 8mm tape drives. The docking station (#1103 and #1104) accommodates only one cartridge at a time in either 160 GB (#1106) or 500 GB (#1107) capacity.

**Statement of general direction**

IBM plans to enhance its support of 10 Gb FCoE PCIe Dual Port Adapter (#5708) on the Linux and IBM AIX operating systems in first half 2010 by adding N_Port ID Virtualization (NPIV) capability through VIOS. IBM plans to enhance its support of 10 Gb FCoE PCIe Dual Port Adapter (#5708) on the IBM i operating system in second half 2010 by adding Fibre Channel and N_Port ID Virtualization (NPIV) capability through VIOS.

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

**Product number**

The following are newly announced features on the specific models of the IBM Power Systems 7014, 7028, 7037, 7038, 7039, 7040, 7042, 7047, 7310, 7311, 7314, 7315, 7778, 7779, 7986, 7989, 7998, 8203, 8204, 8234, 9110, 9111, 9113, 9115, 9116, 9117, 9118, 9119, 9123, 9124, 9125, 9131, 9133, 9405, 9406, 9407, 9408, and 9409 machine type:

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USB Internal Docking Station for Removable Disk Drive
USB External Docking Station for Removable Disk Drive
USB 160 GB Removable Disk Drive
USB 500 GB Removable Disk Drive
10 Meter 12X to 4X Enhanced Channel Conversion Cable
300GB 10K RPM SFF SAS Disk Drive
146GB 15K RPM SFF SAS Disk Drive
139GB 15K RPM SFF SAS Disk Drive
69GB SFF SAS Solid State Drive
SAS SFF Cable
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No publications are shipped with these features.

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Yes

Warranty period
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