



PCIe SSD can reduce I/O-bound batch times and improve interactive or query response time

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At a glance

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 - Improves footprint density
- PCIe cryptographic adapter that adds IBM® i support
- 283 GB SFF 10k rpm disk drive for IBM i
- FCoE adapter that adds NPIV support
- ProtecTIER® and LTO-5 configuration enhancements for IBM i

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Overview

PCIe-based SSD offering

A new Solid® State Drive (SSD) option for the selected POWER7™ servers offers a significant price/performance improvement for many client SSD configurations. SSD or flash technology can provide 33X to 125X more I/O Operations Per Second (IOPS) compared to spinning disk drives (HDD) and can therefore slash I/O-bound batch window times, improve interactive or query response time, and even make previously performance-impractical applications work well.

Additionally, a small set of SSD can offer energy, cooling and footprint savings by replacing a much larger set of HDD. By combining SSD and HDD in the same partition or application, you can leverage the awesome performance capability of SSD on the hot data/files and leverage the HDD lower cost/GB on the cold data/files. This hot SSD plus cold HDD usage can often provide the best overall system price performance.

The new SSD option is packaged quite differently from the currently available Power Systems™ SSD. A new SAS PCIe adapter has up to four 177 GB SSD modules plugged directly onto the adapter saving the need for the SAS bays and cabling associated with the current SSD offering. Depending on the configurations being compared to the current 69GB SAS-bay-based SSD offering, the new PCIe-based SSD offering can save up to 70% of the list price assuming equivalent GB and up to 65% smaller footprint assuming equivalent GB.

The new PCIe adapters and their associated SSD modules are supported on the Power® 710, 720, 730, 740, 750, 770 and 780. AIX® 5.3 or later, IBM i 7.1, RHEL 5.5 or later, or SLES 10 or later is supported.

The new PCIe RAID & SSD SAS Adapter requires two adjacent PCIe slots. Though it is physically the same adapter, three feature codes (#2053, #2054 and #2055) are used to describe slightly different usages.

The 177GB SSD Module with eMLC uses a new enterprise-class MLC flash technology, which provides enhanced durability, capacity and performance. One, two, or four modules can be plugged onto a PCIe RAID & SSD SAS adapter providing up to 708 GB of SSD capacity on one PCIe adapter. Though it is physically the same module, two feature codes (#1995 or #1996) are used to describe usage in different OS environment for IBM configuration tools.

Two additional feature codes (#4367 or #4377) are used to order a block of five PCIe adapters and twenty SSD modules providing a lower price than if 2055 and 199x features were used.

The use of two SSD modules in a new Power 710, 720, 730, 740, or 750 Express® server is integrated into the server's Express packages. Two SSD modules fulfill the minimum I/O requirement required get up to 50% of the processor core activations at no charge.

PCIe Cryptographic for IBM i

IBM i 7.1 supports the previously announced PCIe cryptographic adapters (#4807, #4808, and #4809). PCIe Crypto cards can provide higher performance and more function than the currently available PCI-X Crypto cards. They can be installed in newer technology PCIe slots in Power Systems and I/O drawers.

283 GB 10k RPM SFF Disk for IBM i

POWER7 servers running IBM i can now leverage the price-performance of a large capacity, 10k rpm SAS SFF drive (#1911). The Power 710, 720, 730, 740, 750 770, 780 and 795 servers running IBM i 6.1 with machine code 6.1.1 or later, support the use of this RAID formatted, 528-byte block drive.

FCoE statement of direction fulfilled

IBM i 6.1 with machine code 6.1.1 or later support Fibre Channel connectivity and NPIV for the #5708 FCoE Adapter through VIOS. This joins the NPIV support for AIX and Linux® through VIOS which was made available 1H 2010. This fulfills the statement of direction provided in October 2009.

ProtectTIER and LTO-5 Enhancements for IBM i

The IBM System Storage® TS7650 ProtectTIER Deduplication Appliance configuration support was recently enhanced. IBM i 6.1 with 6.1.1 machine code or later now support attachment via IOP-less Fibre Channel adapters. The IOP-less configuration is more desirable than the previously available IOP-based support as it takes fewer PCI slots, can use newer technology I/O drawers and can run under IBM i on POWER7 servers

LTO-5 bridge box (TS2250 and TS2350) support on POWER6™ and POWER7 servers by IBM i 6.1.1 and later is now available. This joins existing AIX and Linux support of these tape drives.

Key prerequisites

For details, refer to the [Technical information](#) section.

Planned availability date

- September 17, 2010
- August 27, 2010: the 7014-B42 rack content specify features 0384, 0385, 0386, and 0387

Description

PCIe-based SSD offering

The new PCIe-based SSD offering consists of a new SAS PCIe adapter and a new SSD module. The RAID & SSD SAS Adapter is a double-wide, short PCIe 8x adapter, which requires two adjacent PCIe slots. One, two or four eMLC SSD modules are plugged directly onto the adapter avoiding using any SFF or 3.5-inch SAS bays or any cabling to the SAS bays.

eMLC technology stands for "Enterprise Multi-Level Cell" Flash memory technology. IBM is the first server vendor to provide this new SSD technology option which blends enterprise class performance and reliability characteristics with the more cost effective characteristics of MLC Flash storage. Using advances in both the SSD device controller Flash memory management plus advances in MLC technology itself, IBM can now provide much better cost on a per GB basis, much more dense physical packaging and about 50% less energy consumption and heat per drive. More impressively, eMLC does this while continuing to provide great sustained performance levels and extended endurance/reliability. For example, the new IBM eMLC SSD modules were designed to provide 24x7x365 usage even running write-intensive levels for at least five years. Typical client usage is expected to be much lower, especially regarding the average percentage of writes, and thus drive lifespan can be much longer.

Though it is physically the same PCIe, from an electronics perspective, adapter, three feature codes are used to describe slightly different usages for IBM configurator:

- PCIe LP RAID & SSD SAS Adapter 3Gb (#2053) designates a low profile PCIe adapter to be used in the Power 710, 720, 730 and 740 low-profile slots.
- PCIe RAID & SSD SAS Adapter 3Gb (#2054) designates a PCIe adapter with a tail stock adapter for full height slots to be used in the Power 720, 740 and 750.
- PCIe RAID & SSD SAS Adapter 3Gb w/ Blind Swap Cassette (#2055) designates the PCIe adapter with full height tail stock in a double-wide blind swap cassette for use in a 12X-attached #5802/5877 PCIe I/O drawer.

The new PCIe adapters and their associated eMLC SSD modules are supported in the Power 710, 720, 730, 740, and 750 system units or in the #5802/5877 12X PCIe I/O drawers when attached to the Power 720, 740, 750, 770 and 780. The adapter is not supported in the Power 770 or Power 780 system units. It is not supported in the 12X-attached #5803/5873 PCIe I/O drawer. It is not supported on POWER6 servers. AIX 5.3 or later, IBM i 7.1, RHEL 5.5 or later, or SLES 10 or later.

Each RAID formatted (528-byte blocks) SSD module provides up to 177 GB of capacity in an AIX/IBM i/Linux environment. Modules can also be JBOD formatted (512-byte blocks) and provide up to 200 GB of capacity in an AIX/Linux environment. Formatting for RAID provides additional data integrity and the option to use RAID-0, RAID-5 or RAID-6.

Though it is physically the same module, two feature codes are used to describe the different OS environment to allow IBM configurator tools to track the different SSD protection rules associated with AIX/Linux and IBM i:

- 177GB SSD MODULE WITH eMLC (AIX/Linux) (#1995)
- 177GB SSD MODULE WITH eMLC (IBM I) (#1996)

In addition to the individual PCIe adapter and SSD module features, feature code #4367 orders a quantity of 5 PCIe adapters plus 20 SSD modules used with AIX/Linux. Similarly, feature code #4377 orders a quantity of 5 PCIe adapters plus 20 SSD modules used with IBM i. The five PCIe adapters are equivalent to the #2055 adapter and shipped with the blind swap cassette.

Both the purchase price and the maintenance price of the 20 SSD modules and 5 PCIe adapters in the #4367/4577 package feature are lower than the prices associated with an equivalent number of #199x and #2055 features. Though physically the adapters and SSD modules within a #4367 or #4377 can be used in different partitions including AIX, Linux and IBM i, IBM configurator tools will only understand a single OS usage with the package features.

There are multiple configuration options to select to provide SSD protection/redundancy. The PCIe RAID & SSD SAS Adapter does not have write cache and therefore it is not mandatory that the adapter be protected, however it is an excellent choice to do so. This is because in order to replace an SSD module on the PCIe adapter, you must first remove the PCIe adapter from the server's or I/O drawer's PCI slot. If you have mirrored SSD module(s) of one PCIe RAID & SSD SAS Adapter against the SSD module(s) of another PCIe RAID & SSD SAS Adapter, you have thus mirrored the PCIe adapters as well.

With this mirroring in effect, you can remove one of the adapters and add/replace SSD modules while the other PCIe adapter and its SSD modules enable the server to continue running. Mirroring thus avoids scheduled downtime for this type of activity. Even though this is unlikely to happen, it can be strong motivation for selecting this protection option. Note this is different from the existing SAS-bay-based 69 GB SSD configurations which can leverage the hot plug capability of the SAS bay which allows the removal and replacement of a single SSD module without removing the associated PCI SAS adapter.

AIX, IBM i or Linux provide operating system mirroring of the SSD modules. With AIX/Linux the SSD modules can be formatted to either JBOD (200 GB) or RAID-0 (177 GB) while using operating system mirroring. IBM i uses only the RAID format (177 GB).

If you choose not to mirror the SSD modules with the operating system and also protect the PCIe adapters, you can alternatively protect just the SSD modules by using its associated PCIe adapter's RAID-5 or RAID-6 capability. Each PCIe adapter can provide RAID-5 or RAID-6 protection for its own SSD modules, but a pair of PCIe adapters can not share a RAID-5 or RAID-6 array for the #1995/1996 SSD modules.

SSD protection is optional but recommended for JBOD formatted SSD modules in an AIX/Linux partition. SSD protection is not optional for RAID-0 formatted SSD modules in an AIX/Linux partition. SSD protection is not optional for IBM i partitions and if you do not use operating system mirroring for SSD modules, then the modules must be protected with either RAID-5 or RAID-6.

A minimum of 4 SSD modules is required for RAID-6 and a minimum of 3 SSD modules is required for RAID-5. Note that physically having exactly three SSD modules on a PCIe adapter is not a supported configuration.

The fourth required SSD module can either be made part of the RAID array or it can optionally be used as a hot spare within the RAID array that exists on that same PCIe adapter."

Though PCIe-based SSD and SAS-bay-based SSD and HDD can all be in the same partition, they must be within separate arrays. They can not be mixed in the same RAID-5 array for example. You can not mirror an SSD against an HDD, nor can you mirror a 177GB PCIe-based SSD against a 69GB SAS-bay-based SSD.

PCIe-based SSD may be used as boot drives or load source drives.

The PCIe RAID & SSD SAS Adapter has zero write cache. Compared to existing SAS adapters with write cache attached to the existing 69 GB SSD, I/O performance

may vary based on protection schemes used and the amount of write workload. For example, mirroring the SSD modules of one PCIe RAID & SAS SSD Adapter against SSD modules in another adapter instead of using two adapters each running RAID-5 can provide more than 50% more transactions per second. As always, the SSD workload providing the optimal performance benefit compared to HDD is "random reads".

The 177GB SSD Module with eMLC uses a new enterprise-class MLC flash technology which provides enhanced durability, capacity and performance.

The PCIe RAID & SSD SAS Adapter is customer set-up (CSU). You can add or remove the adapter yourself. The 177 GB SSD modules on the PCIe card are not CSU and an IBM Service Representative should add or remove or replace the SSD module.

PCIe Cryptographic Coprocessor 4765-001 (feature numbers 4807, 4808, and 4809)

The PCIe cryptographic coprocessor adapter announced in April 2010 originally just for AIX, is now supported for IBM i 7.1 or later.

The PCIe cryptographic coprocessor adapter provides both coprocessor and accelerator function in a single PCIe card. The coprocessor function allows you to isolate your encryption activity and cryptographic keys onto a separate processor built into the PCIe adapter for greater security. The accelerator function allows you to offload workload from valuable primary Power Systems processors and can speed up various cryptographic operations.

The PCIe cryptographic adapter is a state-of-the-art, tamper-sensing, and tamper-responding, programmable cryptographic feature. The cryptographic electronics and microprocessor provide a secure cryptographic environment. Cryptographic keys are stored in a tamper-resistant hardware security module on the IBM cryptographic adapters which is designed to meet FIPS 140-2 level 4 security requirements. FIPS 140-2 is a U.S. Government National Institute of Standards and Technology administered standard and certification program for cryptographic modules.

Key features

- Supports all cryptographic functions provided in the #4764 PCI-X Cryptographic adapter.
- Each adapter contains dual processors that operate in parallel to provide higher reliability.
- Support the IBM Common Cryptographic Architecture (CCA) for both AIX and IBM i and PKCS#11 standard for AIX.
- Dynamic power management is designed to maximize reliability, availability, and serviceability (RAS) performance while keeping within temperature limits of the tamper-responding package.
- Includes improved RAS features -- even better than the excellent RAS offered by the predecessor PCI-X #4764 Crypto Coprocessor adapter features.
- Includes secure code loading that enables the updating of functionality while installed in application systems.
- Includes lock-step checking of dual CPUs for enhanced error detection and fault isolation of cryptographic operations performed by a coprocessor.
- Supports smart card applications using Europay, MasterCard, and Visa.
- Allows Cryptographic key generation.
- Includes Pseudo Random Number Generation (PRNG).
- Includes Random Number Generation Long (RNGL) - 8 bytes to 8096 bytes.
- Allows personal identification number (PIN) processing -- PIN generation, verification, and translation functions.
- Supports digital signature generation and verification.
- Supports the use of RSA for distribution of symmetric keys.
- Supports RSA key lengths of 512 - 4096 bits.

When the adapter is configured as a coprocessor (AIX) or by requesting services through the CCA interface (AIX/IBM i), it can be used to:

- Encrypt and decrypt data by utilizing secret-key algorithms. Algorithms supported for data confidentiality include:
 - Single-length key DES (AIX/IBM i), double-length key Triple DES (AIX/IBM i) and triple-length key Triple DES (AIX PKCS#11)
 - AES algorithms that have 128-, 192-, and 256-bit data-encrypting keys
- Generate, install, and distribute cryptographic keys securely using both public and secret key cryptographic methods.
- Generate, verify, and translate PINs.
- Generate, verify, and translate 13-digit through 19-digit personal account numbers (PANs).
- Ensure the integrity of data by using message authentication codes (MACs), hashing algorithms, and Rivest-Shamir-Adelman (RSA) public key algorithm (PKA) digital signatures.
- Perform™ financial PIN processing and other specialized banking functions.
- Manage DES, TDES, AES, and RSA keys.
- Offer highly secure encryption processing, use of secure encrypted key values, and User Defined Extensions (UDX) to CCA (AIX has UDX toolkit).
- Provide secure remote key loading of encryption keys to ATMs, point of sale terminals (POS), and PIN entry devices.
- Exchange cryptographic keys between IBM CCA and non-CCA servers.
- Generate high-quality random numbers for keys and other cryptographic applications.

When the adapter is configured as an accelerator (AIX), it is configured so that it uses only a subset of the coprocessor functions and runs at a higher speed. The adapter can be used for:

- High-performance clear-key RSA functions
- Acceleration of modular arithmetic operations, the RSA cryptographic operations used with the SSL/TLS protocol
- Offloading of compute-intensive RSA public-key and private-key cryptographic operations employed in the SSL protocol

Similarly under IBM i, whenever the system detects that an adapter is activated, all clear key RSA processing is automatically moved to the adapter.

The PCIe and PCI-X Crypto Adapters can be used in the same IBM i partition concurrently providing you the option to add PCIe adapters to an existing PCI-X configuration.

Product positioning

The PCIe RAID & SSD SAS Adapter provides up to four SSD modules and 708 GB in one pair of PCIe slots. In general, this delivers much better pricing not only on a SSD-to-SSD basis, but especially if it avoids a separate #5886 EXP12S SAS disk drawer or the need for a more expensive #5802 PCI drawer and their SAS bays and their associated maintenance costs.

The new PCIe RAID & SSD SAS Adapter is not supported on as many servers and operating system levels as the existing 69GB SSD device. At this time, the new SSD option is not supported on POWER6 server, on the Power 795, and under IBM i 6.1.

Configuration savings options and performance considerations are varied and are heavily configuration and usage dependent:

- For example, assume you use one pair of #5903 PCIe SAS adapters in two PCIe slots to run eight #3586/3587 69GB SSD units located in a #5886 EXP12S Drawer

(total 552 GB). Compare this to one PCIe RAID & SSD SAS Adapter with four 177GB SSD Modules (total 708 GB). You save an I/O drawer's purchase price, and its maintenance, its cables and the 2U of space in the rack.

- Or another more complex example, assume you use one pair of #5903 PCIe SAS adapters in two PCIe slots to run eight #1890/1910 69GB SSD units located in a #5802 12X I/O Drawer. Assume you use RAID-5 protection with all eight drives in the array, for an effective total is 483 GB. Compare this to two PCIe RAID & SSD SAS Adapters each with four 177GB SSD Modules where you mirror the two adapters for redundancy providing 707GB located in a #5877 12X Diskless I/O Drawer. In this example, there is no rack space savings, but you save the price of the diskless #5877 vs disk-capable #5802 and more importantly the associated maintenance. With this comparison, you have redundancy in the PCI adapters.
- Of course there are many other factors. Mirroring the SSD modules of one PCIe RAID & SAS SSD Adapter against SSD modules in another adapter instead of using two adapters each running RAID-5 can provide more than 50% more transactions per second. The #5903 has write cache, which can help with performance depending on the workload. such that RAID-5 performance vs mirroring performance is not as different as seen with the PCIe RAID & SAS SSD Adapter. A PCI-X #5904/8 1.5GB large write cache controller could be used instead of a pair of PCIe #5903 adapters and their smaller write cache. You might assume the number of available PCIe slots are limited and PCI-X slots are available for your configuration or vice versa.

For larger PCIe RAID & SSD SAS Adapter configurations the 5-adapter, 20-module package provides a list price and maintenance price advantage over the non-package configuration.

Statement of general direction

IBM plans to enhance its Power Systems Enterprise Class SSD solutions with technology designed to continue to provide significant improvements in performance and storage density over time. IBM plans for these IBM Power Systems enhancements to include both SAS-bay-based and PCIe-based SSD product offerings that will leverage IBM's investments in its SSD optimized Enterprise Class RAID Storage Controllers.

IBM plans to support the 177GB SSD Module with eMLC (#1995), PCIe RAID and SSD SAS Adapter 3Gb (#2054), PCIe RAID and SSD SAS Adapter 3Gb w/ Blind Swap Cassette (#2055), and Package 5X #2055 and 20X #1995 (#4367) with the following AIX technology levels.

- AIX V6.1, with the 6100-05 Technology Level and Service Pack 3, or later
- AIX V6.1, with the 6100-04 Technology Level and Service Pack 7, or later
- AIX V6.1, with the 6100-03 Technology Level and Service Pack 7, or later

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

Product number

The following are newly announced features on the specific models of the IBM Power Systems 8233, 8236, 9117, 9179, 9406 machine type:

Description	MT	Model	Feature
#1996 Load Source Specify	8233	E8B	0724
	9117	MMB	
	9179	MHB	
#1911 Load Source Specify	8233	E8B	0856
	9117	MMB	
	9179	MHB	
283GB 10K RPM SFF SAS Disk Drive (IBM i)	8233	E8B	1911
	9117	MMB	
	9179	MHB	
177GB SSD Module with eMLC (AIX/Linux)	8233	E8B	1995
	8236	E8C	
	9117	MMB	
177GB SSD Module with eMLC (IBM i)	9179	MHB	
	8233	E8B	1996
	9117	MMB	
9179	MHB		
PCIe RAID & SSD SAS Adapter 3Gb	8233	E8B	2054
	8236	E8C	
PCIe RAID & SSD SAS Adapter 3Gb w/ Blind Swap Cassette	8233	E8B	2055
	9117	MMB	
	9179	MHB	
Package 5X #2055 & 20X #1995 (AIX/Linux)	8233	E8B	4367
	9117	MMB	
	9179	MHB	
Package 5X #2055 & 20X #1996 (IBM i)	8233	E8B	4377
	9117	MMB	
	9179	MHB	
Activation of 100 GB DDR2 POWER6 Memory	9406	MMA	5684
4-Port 10/100/1000 Base-TX PCI-X Adapter Quantity 150 of #1911	8233	E8B	5740
	9117	MMB	7557
	9179	MHB	

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

Description	MT	Model	Feature
Rack Content Specify: 9179-MHB, 4U	7014	B42	0384
Rack Content Specify: 9179-MHB, 8U	7014	B42	0385
Rack Content Specify: 9179-MHB, 12U	7014	B42	0386
Rack Content Specify: 9179-MHB, 16U	7014	B42	0387

Feature conversions

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

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

The following conversions are available to customers:

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

From feature conversion	To feature conversion	Return parts
5626 - System CEC Enclosure with IBM Bezel	5659 - System CEC Enclosure with IBM BEZEL, I/O Backplane, and System Midplane	Yes
5683 - System Chassis - 4 EIA	5659 - System CEC Enclosure with IBM BEZEL, I/O Backplane, and System Midplane	Yes
5627 - System CEC Enclosure with OEM Bezel + Labels	5669 - System CEC Enclosure with OEM BEZEL, I/O Backplane, and System Midplane	Yes

Feature conversions for 9117-MMA to 9179-MHB rack-related features

From feature conversion	To feature conversion	Return parts
5626 - System CEC Enclosure with IBM Bezel	5597 - System CEC Enclosure with IBM BEZEL, I/O Backplane, and System Midplane	Yes
5683 - System Chassis - 4 EIA	5597 - System CEC Enclosure with IBM BEZEL, I/O Backplane, and System Midplane	Yes
5627 - System CEC Enclosure with OEM Bezel + Labels	5598 - System CEC Enclosure with OEM BEZEL, I/O Backplane, and System Midplane	Yes

Business Partner information

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

<https://www.ibm.com/partnerworld/mem/sla.jsp?num=110-150>

Publications

No publications are shipped with these features.

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

Software requirements

Refer to the specific feature description for the required operating system level support.

Security, auditability, and control

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

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

IBM Electronic Services

Electronic Service Agent™ and the IBM Electronic Support web portal are dedicated to providing fast, exceptional support to IBM Systems customers. The IBM Electronic Service Agent tool is a no-additional-charge tool that proactively monitors and reports hardware events, such as system errors, performance issues, and inventory. The Electronic Service Agent tool can help you stay focused on your company's strategic business initiatives, save time, and spend less effort managing day-to-day IT maintenance issues. Servers enabled with this tool can be monitored remotely around the clock by IBM Support all at no additional cost to you.

Now integrated into the base operating system of AIX 5.3, AIX 6.1, and AIX 7.1, Electronic Service Agent is designed to automatically and electronically report system failures and utilization issues to IBM, which can result in faster problem resolution and increased availability. System configuration and inventory information collected by the Electronic Service Agent tool also can be viewed on the secure Electronic Support web portal, and used to improve problem determination and resolution by you and the IBM support team. To access the tool main menu, simply type "smitty esa_main", and select "Configure Electronic Service Agent." In addition, ESA now includes a powerful Web user interface, giving the administrator easy access to status, tool settings, problem information, and filters. For more information and documentation on how to configure and use Electronic Service Agent, refer to

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

The IBM Electronic Support portal is a single Internet entry point that replaces the multiple entry points traditionally used to access IBM Internet services and support. This portal enables you to gain easier access to IBM resources for assistance in

resolving technical problems. The My Systems and Premium Search functions make it even easier for Electronic Service Agent tool-enabled customers to track system inventory and find pertinent fixes.

Benefits

Increased uptime: The Electronic Service Agent tool is designed to enhance the Warranty or Maintenance Agreement by providing faster hardware error reporting and uploading system information to IBM Support. This can translate to less wasted time monitoring the "symptoms," diagnosing the error, and manually calling IBM Support to open a problem record. Its 24 x 7 monitoring and reporting mean no more dependence on human intervention or off-hours customer personnel when errors are encountered in the middle of the night.

Security: The Electronic Service Agent tool is designed to be secure in monitoring, reporting, and storing the data at IBM. The Electronic Service Agent tool securely transmits either via the Internet (HTTPS or VPN) or modem, and can be configured to communicate securely through gateways to provide customers a single point of exit from their site. Communication is one way. Activating Electronic Service Agent does not enable IBM to call into a customer's system. System inventory information is stored in a secure database, which is protected behind IBM firewalls. It is viewable only by the customer and IBM. The customer's business applications or business data is never transmitted to IBM.

More accurate reporting: Since system information and error logs are automatically uploaded to the IBM Support center in conjunction with the service request, customers are not required to find and send system information, decreasing the risk of misreported or misdiagnosed errors. Once inside IBM, problem error data is run through a data knowledge management system and knowledge articles are appended to the problem record.

Customized support: Using the IBM ID entered during activation, customers can view system and support information in the "My Systems" and "Premium Search" sections of the Electronic Support Web site at

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

My Systems provides valuable reports of installed hardware and software using information collected from the systems by Electronic Service Agent. Reports are available for any system associated with the customer's IBM ID. Premium Search combines the function of search and the value of Electronic Service Agent information, providing advanced search of the technical support knowledgebase. Using Premium Search and the Electronic Service Agent information that has been collected from your system, customers are able to see search results that apply specifically to their systems.

For more information on how to utilize the power of IBM Electronic Services, contact your IBM Systems Services Representative, or visit

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

Terms and conditions

MES discount applicable

Equal to the volume commitment discount

Field-installable feature

Yes

Warranty period

One year. 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.

For warranty service within the U.S.A. and Canada, call toll free 1-888-426-6334 (1-888-IBM-MEDIA), to receive warranty service and or product information. Or, contact the seller of IBM Data Storage Products.

Customer setup

Yes, except for 1995, 1996.

Machine code

Same license terms and conditions as base machine

Pricing

For additional information and current prices, contact your local IBM representative.

The following are newly announced features on the specific models of the IBM Power Systems 8233, 8236, 9117, 9179, 9406 machine type:

Description	Model	Feature	Initial/ MES/ Both/ Support	RP CSU MES
Machine Type	8233	Number	Numbers	
#1996 Load Source Specify	E8B	0724	Initial	N/A No
#1911 Load Source Specify	E8B	0856	Both	Yes No
283GB 10K RPM SFF SAS Disk Drive (IBM i)	E8B	1911	Both	Yes No
177GB SSD Module with eMLC (AIX/Linux)	E8B	1995	Both	No No
177GB SSD Module with eMLC (IBM i)	E8B	1996	Both	No No
PCIe RAID & SSD SAS Adapter 3Gb	E8B	2054	Both	Yes No
PCIe RAID & SSD SAS Adapter 3Gb w/ Blind Swap Cassette	E8B	2055	Both	Yes No
Package 5X #2055 & 20X #1995 (AIX/Linux)	E8B	4367	Both	Yes No
Package 5X #2055 & 20X #1996 (IBM i)	E8B	4377	Both	Yes No
4-Port 10/100/1000 Base-TX PCI-X Adapter	E8B	5740	Both	Yes No
177GB SSD Module with eMLC (AIX/Linux)	E8C	1995	Both	No No
PCIe RAID & SSD SAS Adapter 3Gb	E8C	2054	Both	Yes No
#1996 Load Source Specify	MMB	0724	Initial	N/A No
#1911 Load Source Specify	MMB	0856	Both	Yes No
283GB 10K RPM SFF SAS Disk Drive (IBM i)	MMB	1911	Both	Yes No
177GB SSD Module with eMLC (AIX/Linux)				

MMB	1995	Both	No	No
177GB SSD Module with eMLC (IBM i)				
MMB	1996	Both	No	No
PCIe RAID & SSD SAS Adapter 3Gb w/ Blind Swap				
MMB	2055	Both	Yes	No
Package 5X #2055 & 20X #1995 (AIX/Linux)				
MMB	4367	Both	Yes	No
Package 5X #2055 & 20X #1996 (IBM i)				
MMB	4377	Both	Yes	No
Quantity 150 of #1911				
MMB	7557	Both	Yes	No
#1996 Load Source Specify				
MHB	0724	Initial	N/A	No
#1911 Load Source Specify				
MHB	0856	Both	Yes	No
283GB 10K RPM SFF SAS Disk Drive (IBM i)				
MHB	1911	Both	Yes	No
177GB SSD Module with eMLC (AIX/Linux)				
MHB	1995	Both	No	No
177GB SSD Module with eMLC (IBM i)				
MHB	1996	Both	No	No
PCIe RAID & SSD SAS Adapter 3Gb w/ Blind Swap				
MMB	2055	Both	Yes	No
Package 5X #2055 & 20X #1995 (AIX/Linux)				
MHB	4367	Both	Yes	No
Package 5X #2055 & 20X #1996 (IBM i)				
MHB	4377	Both	Yes	No
Quantity 150 of #1911				
MHB	7557	Both	Yes	No
Activation of 100 GB DDR2 POWER6 Memory				
MMA	5684	MES	Yes	No

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

Rack Content Specify: 9179-MHB, 4U				
B42	0384	Initial	N/A	No
Rack Content Specify: 9179-MHB, 8U				
B42	0385	Initial	N/A	No
Rack Content Specify: 9179-MHB, 12U				
B42	0386	Initial	N/A	No
Rack Content Specify: 9179-MHB, 16U				
B42	0387	Initial	N/A	No

MT	Model	Feature	Description	List
8233	E8B	0724	1996 Load Source Specify	\$0
8233	E8B	0856	1911 Load Source Specify	0
8233	E8B	1911	283GB 10K SFF Disk(IBMi)	1,050
8233	E8B	1995	177GB SSD Mod(AIX/Linux)	4,400
8233	E8B	1996	177GB SSD Mod(IBM i)	4,400
8233	E8B	2054	PCIe RAID & SSD Adapt 3GB	3,054
8233	E8B	2055	PCIe RAID & SSD 3GB w/ BSC	3,054
8233	E8B	4367	BDL 5x2055 20x1995 AIX/Lin	74,904
8233	E8B	4377	BDL 5x2055 20x1996 IBMi	74,904
8233	E8B	5740	4 Port 10/100/1000 Base TX	830

8236	E8C	1995	177GB SSD Mod(AIX/ Linux)	4,400
8236	E8C	2054	PCIe RAID & SSD Adapt 3GB	3,054
9117	MMB	0724	1996 Load Source Specify	0
9117	MMB	0856	1911 Load Source Specify	0
9117	MMB	1911	283GB 10K SFF Disk(IBMi)	1,376
9117	MMB	1995	177GB SSD Mod(AIX/ Linux)	5,763
9117	MMB	1996	177GB SSD Mod(IBM i)	5,763
9117	MMB	2055	PCIe RAID & SSD 3GB w/ BSC	4,000
9117	MMB	4367	BDL 5x2055 20x1995 AIX/ Lin	98,114
9117	MMB	4377	BDL 5x2055 20x1996 IBMi	98,114
9117	MMB	7557	Quantity 150 of #1911	206,400
9179	MHB	0724	1996 Load Source Specify	0
9179	MHB	0856	1911 Load Source Specify	0
9179	MHB	1911	283GB 10K SFF Disk(IBMi)	1,376
9179	MHB	1995	177GB SSD Mod(AIX/ Linux)	5,763
9179	MHB	1996	177GB SSD Mod(IBM i)	5,763
9179	MHB	2055	PCIe RAID & SSD 3GB w/ BSC	4,000
9179	MHB	4367	BDL 5x2055 20x1995 AIX/ Lin	98,114
9179	MHB	4377	BDL 5x2055 20x1996 IBMi	98,114
9179	MHB	7557	Quantity 150 of #1911	206,400
9406	MMA	5684	Act of 100GB of DDR2 Mem	32,500
7014	B42	0384	Rack Content Specify 4U	0
7014	B42	0385	Rack Content Specify 8U	0
7014	B42	0386	Rack Content Specify 12U	0
7014	B42	0387	Rack Content Specify 16U	0
MT	Model	Part number	Description	List
9117	MMB	911756265659	Feat conv 5626 to 5659	7,800
9117	MMB	911756835659	Feat conv 5683 to 5659	7,800
9117	MMB	911756275669	Feat conv 5627 to 5669	7,800
9179	MHB	911756265597	Feat conv 5626 to 5597	7,800

9179	MHB	911756835597	Feat conv 5683 to 5597	7,800
9179	MHB	911756275598	Feat conv 5627 to 5598	7,800

Feature conversions

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

From feature conversion	To feature conversion	Parts Returned
5626 - System CEC Enclosure with IBM Bezel	5659 - System CEC Enclosure with IBM BEZEL, I/O Backplane, and System Midplane	Yes
5683 - System Chassis - 4 EIA	5659 - System CEC Enclosure with IBM BEZEL, I/O Backplane, and System Midplane	Yes
5627 - System CEC Enclosure with OEM Bezel + Labels	5669 - System CEC Enclosure with OEM BEZEL, I/O Backplane, and System Midplane	Yes

Feature conversions for 9117-MMA to 9179-MHB rack-related features

From feature conversion	To feature conversion	Parts Returned
5626 - System CEC Enclosure with IBM Bezel	5597 - System CEC Enclosure with IBM BEZEL, I/O Backplane, and System Midplane	Yes
5683 - System Chassis - 4 EIA	5597 - System CEC Enclosure with IBM BEZEL, I/O Backplane, and System Midplane	Yes
5627 - System CEC Enclosure with OEM Bezel + Labels	5598 - System CEC Enclosure with OEM BEZEL, I/O Backplane, and System Midplane	Yes

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