



# IBM Parallel Environment Runtime Edition for AIX , V1.2 offers parallel development enhancements

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## At a glance

IBM® Parallel Environment (PE) Runtime Edition for AIX® , V1.2 offers multiple enhancements to scaling and usability.

For ordering, contact your IBM representative, an IBM Business Partner, or IBM Americas Call Centers at 800-IBM-CALL (Reference: RE001).

## Overview

IBM PE Runtime Edition for AIX , V1.2 provides the core components a user needs to develop, debug, and execute parallel applications such as applications using the industry-standard MPI.

Release 2 provides the following additional enhancements:

- Improved scaling during job launch and runtime communication
- Enabled signal, lockless, and reliable protocol libraries for faster run time
- Tuned performance and reduced memory footprint
- Various debugger enhancements

## Key prerequisites

- IBM AIX 7.1 with the latest service level
- IBM Power Systems™ ( POWER7® ) servers or IBM Flex System™ servers (based on POWER7 technology)

## Planned availability date

- November 30, 2012: IBM PE Runtime Edition for AIX
- December 14, 2012: Updated support on IBM Power® 775 solution

## Description

IBM PE Runtime Edition for AIX , V1 is a capability-rich development and execution environment for parallel applications. IBM PE Runtime Edition for AIX offers parallel

application programming interfaces, such as MPI and Parallel Active Messaging Interface (PAMI), an execution environment for parallel applications.

The following enhancements are available with Version 1.2:

- Scaling enhancements are provided during job launch and communication, which includes reducing user information queries, paralleling the child process launch, and initial message sending. This includes error handling of the Parallel Operating Environment, SCI scaling, and message aggregation optimization for Parallel Operating Environment.
- Improved run time by providing protocol libraries that enable signal, lockless, and unreliable protocol libraries. The user can choose between different modes at run time, depending on the application or user setting.
- Tuned performance and reduced memory footprint of PAMI and MPI. IBM PE Runtime Edition will measure memory consumption to certain scale and extrapolate to full scale. As a result, it can report numbers before and after the tuning effort.
- Adds various debugger enhancements, which include:
  - Enabling the PDB shell script or binary to have the ability to execute the external non-IBM debugger's internal command.
  - PDB stat function and pdb\_stat binary are used to dump the skeleton of the all-task's all-thread stack information. It can help the user find the erroneous task.
  - PDB partial attach function enables the user to attach partial tasks among all the MPI tasks so that the user has the ability to attach only the tasks they are interested in.
  - A PDB shell script wrapper enables the user to debug the MPI program, which is wrapped by one shell script in launch mode and attach mode.
  - The addition of some smart tools such as pdb\_pstack to dump one active process in a thread stack, and pdb\_pcore, which is designed to automatically decide one core's binary path and name, and then dump the environment, and all thread stack information when the core happened.

As previously noted, the following are components of IBM PE Runtime Edition:

- Multiple-level support
- Industry-standard MPI interface
- IBM MPI over PAMI
- Parallel Operating Environment, which provides:
  - OS Jitter mitigation through coscheduling capability
  - Affinity support of processes to CPU and memory
  - User-controlled workflow/subjob support
  - Lightweight core file support
  - Serial and parallel job launch
  - Support running Single Process, Multiple Data (SPMD), and Multiple Process, Multiple Data (MPMD) programs
  - Support running without a separate scheduler or resource manager
- Converged messaging API, PAMI, which covers both point-to-point and collective communications
- Command line parallel debugger

### **Accessibility by people with disabilities**

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

[http://www.ibm.com/able/product\\_accessibility/index.html](http://www.ibm.com/able/product_accessibility/index.html)

## Section 508 of the US Rehabilitation Act

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IBM PE Runtime Edition for AIX is capable as of November 30, 2012, when used in accordance with IBM's associated documentation, of satisfying the applicable requirements of Section 508 of the Rehabilitation Act, provided that any assistive technology used with the product properly interoperates with it. A US Section 508 Voluntary Product Accessibility Template (VPAT) can be requested at

[http://www.ibm.com/able/product\\_accessibility/index.html](http://www.ibm.com/able/product_accessibility/index.html)

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## Product positioning

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IBM PE Runtime Edition V1 is a must for high performance computing cluster customers who demand effective tools for developing, tuning, and running parallel applications that use the industry-standard MPI. IBM PE MPI is MPI 2.2 compliant. It is designed to scale to over one million cores and optimized to maximize application performance on IBM Power Systems ( POWER7 ) clusters.

IBM PE Runtime Edition also offers a way to improve resource utilization and reduce time to solution in a cluster environment. IBM PE Runtime Edition can offer high performance and fast turnaround time for numerically intensive and demanding scientific, technical, and strategic business applications.

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## Program number

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Program number	VRM	Program name
5765-PER	1.2.0	IBM PE Runtime Edition for AIX

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## Product identification number

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Program PID number	Maintenance 1-year PID number	Maintenance 3-year PID number
5765-PER	5660-PER 5661-PER	5663-PER 5664-PER 5662-PER

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## Offering Information

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Product information is available via the Offering Information website

<http://www.ibm.com/common/ssi>

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## Business Partner information

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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=212-422>

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## Publications

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No publications are shipped with this program. The following publications are available from the web:

Parallel Environment Runtime Edition for AIX V1.2:

- Installation, SC23-6780
- LAPI Programming Guide, SA23-2272
- Messages, SC23-6782
- MPI Programming Guide, SC23-6783
- MPI Subroutine Reference, SC23-6784
- NRT API Programming Guide, SC23-6785
- Operation and Use, SC23-6781
- PAMI Programming Guide, SA23-2273

To access the most recent documentation listed above, in PDF or HTML format, visit the IBM Cluster Information Center website

<http://publib.boulder.ibm.com/infocenter/clresctr/vxrx/index.jsp>

or the IBM Publications Center

<http://www.ibm.com/shop/publications/order>

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## Technical information

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### Specified operating environment

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#### **Hardware requirements**

One of the following:

- IBM Power 775 clusters using the Host Fabric Interface (HFI)
- IBM Flex System p260 or p460 with the InfiniBand solution or running stand-alone or connected with a LAN supporting IP
- Power Systems or Flex System servers (based on POWER7 technology) running stand-alone or connected with a LAN supporting IP

**Note:** For supported levels, compatibility, and limitations, refer to the applicable readme located under documentation and IBM High Performance Computing Clusters Service Packs at

<https://www.ibm.com/developerworks/wikis/display/hpccentral/HPC+Central>

#### **Software requirements**

Operating environment: AIX 7.1, with the latest service level

For compiling, one of these:

- IBM XL Fortran Enterprise Edition V13.1 for AIX or V14.1 for AIX with the latest service levels
- IBM XL C/C++ Enterprise Edition V11.1 for AIX or V12.1 for AIX with the latest service levels

For running, one of these:

- IBM XL Fortran Run-Time Environment V13.1 or V14.1 for AIX provided with the IBM XL Fortran Enterprise Edition for AIX

- IBM XL C/C++ Run-time Environment V11.1 or V12.1 for AIX provided with the IBM XL C/C++ Enterprise Edition V11.1 for AIX

To run Parallel Operating Environment jobs, any job scheduler or TWS LoadLeveler® for AIX , V5.1 is required.

**Note:** The common resource manager interfaces used by Parallel Operating Environment allow the use of schedulers other than LoadLeveler if those schedulers utilize the LoadLeveler resource manager interfaces.

The program's specifications and specified operating environment information may be found in documentation accompanying the program, if available, such as a readme file, or other information published by IBM , such as an announcement letter. Documentation and other program content may be supplied only in the English language.

### ***Companion products***

The following products could be purchased with this product:

- IBM Parallel ESSL for AIX , V4.2 (5765-ESX)
- IBM General Parallel File System for AIX , V3.5 (5765-G66)
- IBM Platform LSF® V8.3 (5725-G82)
- IBM Tivoli® Workload Scheduler LoadLeveler for AIX , V5.1 (5765-L50)

The benefits to the customer are:

Parallel Engineering and Scientific Subroutine Library (Parallel ESSL) is a scalable mathematical subroutine library that provides outstanding performance through simple subroutine calls for engineering and scientific MPI applications on clusters of Power Systems servers using the IBM MPI library for communication.

General Parallel File System ( GPFS™ ) is beneficial because MPI-IO depends on the underlying file system's ability to maintain file consistency when multiple tasks modify a file. An MPI job distributes tasks across many nodes, and these tasks commonly do large amounts of concurrent and even coordinated file I/O.

IBM Platform LSF provides intelligent workload allocation based on policy and system architecture, designed to maximize performance for the most demanding compute-intensive or data-intensive applications. Unifying multiple systems, it cost effectively creates a single, dedicated HPC infrastructure with maximum compute power. By providing optimal utilization of existing IT infrastructures, more work is done with fewer resources, reducing infrastructure and administration costs, and providing low total cost of ownership.

IBM Tivoli Workload Scheduler LoadLeveler can be used to manage parallel workload, maximize resource utilization, and minimize job completion time. LoadLeveler schedules jobs, and provides functions for building, submitting, and processing jobs quickly and efficiently in a dynamic environment.

### ***Compatibility***

Due to AIX binary compatibility support, applications compiled under previous versions of the AIX operating system and IBM Parallel Environment for AIX are supported and compatible with IBM PE Runtime Edition for AIX .

### ***IBM Electronic Support***

The IBM Support Portal is your gateway to technical support. This includes IBM Electronic Support tools and resources, for software and hardware, to help save time and simplify support. The Electronic Support tools can help you find answers to questions, download fixes, troubleshoot, automate data collection, submit and track problems through the Service Request online tool, and build skills. All these tools are made available through your IBM support agreement, at no additional charge.

- Read about the Electronic Support portfolio of tools:

- <http://ibm.com/electronicssupport>
- Access the IBM Support Portal:  
<http://ibm.com/support>
- Access the online Service Request tool:  
<http://ibm.com/support/servicerequest>

## **Planning information**

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This is the last release of IBM PE Runtime Edition for AIX to ship the LAPI programming interface. PAMI is the replacement interface, already included with IBM PE Runtime Edition for AIX , V1.2.

### ***Installability***

If you have the IBM Parallel Environment for AIX , V5 product installed in your environment, you need to uninstall it prior to installing IBM PE Runtime Edition for AIX , V1.

### ***Packaging***

IBM PE Runtime Edition for AIX is distributed as a single package available on DVD media with the following:

- IBM International Program License Agreement in multilanguage booklet on DVD (LC23-5108) and its License Information in multiple languages (ppe.loc.license)
- Proof of Entitlement
- Product readme file that describes the program's specified operating environment and program specifications
- Program filesets:  
IBM PE Runtime Edition filesets (ppe.rte, ppe.samples, ppe.man, and ppe.loc.license)

## **Security, auditability, and control**

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IBM PE Runtime Edition for AIX uses the security and auditability features of the AIX 7 operating system.

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

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## **Software Services**

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IBM Software Services has the breadth, depth, and reach to manage your services needs. You can leverage the deep technical skills of our lab-based, software services team and the business consulting, project management, and infrastructure expertise of our IBM Global Services team. Also, we extend our IBM Software Services reach through IBM Business Partners to provide an extensive portfolio of capabilities. Together, we provide the global reach, intellectual capital, industry insight, and technology leadership to support a wide range of critical business needs.

To learn more about IBM Software Services or to contact a Software Services sales specialist, visit

<http://www.ibm.com/software/sw-services/>

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## Ordering information

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### Charge metric

Program name	Part number or PID number	Charge metric
IBM PE Runtime Edition for AIX	5765-PER	Per install - small, medium, or large server including one year SWMA
1-year SWMA: Registration and Renewal	5660-PER	Per install - small, medium, or large server
1-year SWMA: After-license	5661-PER	Per install - small, medium, or large server
3-year SWMA: Registration	5662-PER	Per install - small, medium, or large server
3-year SWMA: Renewal	5663-PER	Per install - small, medium, or large server
3-year SWMA: After-license	5664-PER	Per install - small, medium, or large server

### Install

Install is a unit of measure by which the program can be licensed. An *install* is an installed copy of the program on a physical or virtual disk made available to be executed on a computer. Licensee must obtain an entitlement for each install of the program.

**Note:** No changes to ordering information for this release.

This software license includes one year of Software Maintenance. Extending coverage for a total of three years from the date of acquisition may be elected. Order the program number, feature number, and quantity to extend coverage for your software licenses. If maintenance has expired, specify the after-license feature number.

Refer to Software Announcement [211-237](#), dated July 12, 2011 .

**System Program Order (SPO):** An order for SPO 5692-A6P is mandatory for shipments of program distribution. The individual licensed program orders are for registration and billing purposes only. No shipment occurs under these orders.

To receive shipment of machine-readable materials the order needs to include SPO 5692-A6P for IBM PE Runtime Edition for AIX . The individual licensed program order (for example, 5765-PER) must still be ordered but will be for registration and billing purposes only and will not result in shipment of materials.

Program number	Program/Function name	Feature number
5692-A6P	IBM PE Runtime Edition for AIX, v1.2	2287

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The information provided in this announcement letter is for reference and convenience purposes only. The terms and conditions that govern any transaction with IBM are contained in the applicable contract documents such as the IBM

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### ***License Information form number***

L-RHAN-8UYPKY

The program's License Information will be available for review on the IBM Software License Agreement website

<http://www.ibm.com/software/sla/sladb.nsf>

### ***Limited warranty applies***

Yes

### ***Limited warranty***

IBM warrants that when the program is used in the specified operating environment, it will conform to its specifications. The warranty applies only to the unmodified portion of the program. IBM does not warrant uninterrupted or error-free operation of the program or that IBM will correct all program defects. You are responsible for the results obtained from the use of the program.

IBM provides you with access to IBM databases containing information on known program defects, defect corrections, restrictions, and bypasses at no additional charge. For further information, consult the IBM Software Support Handbook found at

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IBM will maintain this information for at least one year after the original licensee acquires the program (warranty period).

### ***Program technical support***

Technical support of a program product version or release will be available for a minimum of three years from the general availability date, as long as your Software Subscription and Support (also referred to as Software Maintenance) is in effect. This technical support allows you to obtain assistance (via telephone or



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***Money-back guarantee***

If for any reason you are dissatisfied with the program and you are the original licensee, you may obtain a refund of the amount you paid for it, if within 30 days of your invoice date you return the program and its PoE to the party from whom you obtained it. If you downloaded the program, you may contact the party from whom you acquired it for instructions on how to obtain the refund.

For clarification, note that for programs acquired under any of IBM's On/Off Capacity on Demand (On/Off CoD) software offerings, this term does not apply since these offerings apply to programs already acquired and in use by you.

***Volume orders (IVO)***

Yes. Contact your IBM representative.

***Passport Advantage applies***

No

***Software Subscription and Support applies***

Yes. All distributed software licenses include Software Subscription and Support for a period of 12 months from the date of acquisition, providing a streamlined way to acquire IBM software and assure technical support coverage for all licenses. Extending coverage for a total of three years from date of acquisition may be elected.

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Software Subscription and Support does not include assistance for the design and development of applications, your use of programs in other than their specified operating environment, or failures caused by products for which IBM is not responsible under this agreement.

***IBM Operational Support Services -- SoftwareXcel***

No

***Other support***

Power Systems SWMA

***System i Software Maintenance applies***

No

### **Variable charges apply**

No

### **Educational allowance available**

Yes. A 15% education allowance applies to qualified education institution customers.

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## **Statement of good security practices**

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IT system security involves protecting systems and information through prevention, detection, and response to improper access from within and outside your enterprise. Improper access can result in information being altered, destroyed, or misappropriated or can result in misuse of your systems to attack others. Without a comprehensive approach to security, no IT system or product should be considered completely secure and no single product or security measure can be completely effective in preventing improper access. IBM systems and products are designed to be part of a comprehensive security approach, which will necessarily involve additional operational procedures, and may require other systems, products, or services to be most effective. IBM does not warrant that systems and products are immune from the malicious or illegal conduct of any party.

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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**

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**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 website 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

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## Prices

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

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Choose the option entitled Purchase/upgrade tools.

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Fax: 800-2IBM-FAX (242-6329)  
For IBM representative: [callserv@ca.ibm.com](mailto:callserv@ca.ibm.com)  
For IBM Business Partner: [pwswna@us.ibm.com](mailto:pwswna@us.ibm.com)  
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Reference: RE001

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