IBM Parallel Engineering and Scientific Subroutine Library for AIX 5L V3.2 offers scientific subroutines for optimum performance on new hardware

Overview

Parallel Engineering and Scientific Subroutine Library (Parallel ESSL) is a scalable mathematical subroutine library that supports parallel processing applications. Parallel ESSL for AIX® 5L V3.2 adds support for clusters of IBM POWER5™ servers connected with an IBM @server® pSeries® High Performance Switch (HPS), and BladeCenter™ JS20 processors and POWER5 servers connected with a Myrinet-2000 Switch with Myrinet/PCI-X adapters running the AIX 5L V5.2 64-bit kernel.

The AIX 5L V5.3 (32-bit and 64-bit kernels) and V5.2 (32-bit kernel) are only supported on stand-alone clusters or clusters connected via a LAN supporting Internet Protocol (IP).

For communication, Parallel ESSL includes Basic Linear Algebra Communications Subprograms (BLACS), which use the Message Passing Interface (MPI). For computations, Parallel ESSL uses ESSL for AIX 5L subroutines.

The Parallel ESSL SMP Libraries are provided for use with the Parallel Environment MPI threads library. You can run single or multithreaded user space (US) or IP applications on all types of nodes. However, you cannot simultaneously call Parallel ESSL from multiple threads.

The Parallel ESSL GM libraries are provided for use with the MPICH-GM library and the Myrinet-2000 Switch with Myrinet/PCI-X adapters. IP is not supported.

The Parallel ESSL for AIX 5L libraries support both 32-bit and 64-bit environment applications. The subroutines can be called from applications written in Fortran, C, and C++.

Parallel ESSL for AIX 5L:
- Runs under the AIX 5L V5.2 and V5.3 operating systems
- Provides support for the new Fortran and C compilers
- Supports the C interface for the BLACS

This is the last release of Parallel ESSL for AIX 5L that will support Parallel Systems Support Programs (PSSP) and the SP Switch™.

Parallel ESSL V3.2 does not support the SP Switch.

Key prerequisites

- Operating system: AIX 5L V5.2 or V5.3
- Hardware: IBM @server® BladeCenter JS20, Cluster 1600 or IBM POWER™ servers, IBM @server® pSeries HPS, SP Switch2, or Myrinet-2000 Switch with Myrinet/PCI-X adapters
- Software products:
  - ESSL for AIX 5L V4.2 (5765-F82)
  - IBM XL Fortran Enterprise Edition V9.1 for AIX (5724-108)
  - IBM XL C Enterprise Edition for AIX V7.0 (5724-110)
  - IBM XL C/C++ Enterprise Edition V7.0 for AIX (5724-111)
  - Parallel Environment V4.2 (pSeries HPS, SP Switch2, IP mode)
  - GM 2.1, or later, and MPICH-GM 1.2.6.14-1 (Myrinet-2000 Switch)

At a glance

Parallel ESSL for AIX 5L V3.2 is tuned for optimum performance on clusters of POWER4™ and POWER5 servers connected with the IBM @server® pSeries High Performance Switch, and tuned for BladeCenter JS20 processors and POWER5 servers connected with a Myrinet-2000 Switch with Myrinet/PCI-X adapters.
- Callable from Fortran, C, and C++
- 32- and 64-bit application support
- Easy-to-use call interface
- Informative error-handling capabilities

For ordering, contact: Your IBM representative, an IBM Business Partner, or the Americas Call Centers at 800-IBM-CALL

Reference: RE001

Planned availability date

April 29, 2005

This announcement is provided for your information only. For additional information, contact your IBM representative, call 800-IBM-4YOU, or visit the IBM home page at: http://www.ibm.com.
**Description**

Parallel ESSL is a scalable mathematical subroutine library that supports parallel processing applications running on the following clusters under the AIX 5L V5.2 64-bit kernel:

- Clusters of POWER4 servers connected with the IBM eServer pSeries High Performance Switch
- Clusters of POWER5 servers connected with the IBM eServer pSeries High Performance Switch
- Clusters of POWER3m and POWER4 servers connected with an SP Switch2
- Clusters of BladeCenter JS20 processors and POWER5 servers connected with a Myrinet-2000 Switch with Myrinet/PCI-X adapters

**Note:** Parallel ESSL V3.2 running AIX 5L V5.3 (32-bit and 64-bit kernels) and AIX 5L V5.2 (32-bit kernel) are only supported on stand-alone clusters or clusters connected via a LAN supporting IP.

Parallel ESSL for AIX V3.2 is a functional enhancement and complete replacement of Parallel ESSL for AIX V3.1.

Parallel ESSL supports the Single Program Multiple Data (SPMD) programming model.

Parallel ESSL for AIX 5L provides over 125 subroutines in six major areas of mathematical computations:

- Level 2 Parallel Basic Linear Algebra Subprograms (PBLAS)
- Level 3 PBLAS
- Linear algebraic equations
- Eigensystem analysis and singular value analysis
- Fourier transforms
- Random number generation

For communication, Parallel ESSL includes Basic Linear Algebra Communications Subprograms (BLACS), which use the Message Passing Interface (MPI). For computations, Parallel ESSL uses ESSL for AIX 5L subroutines.

The Parallel ESSL SMP Libraries are provided for use with the Parallel Environment MPI threads library. You can run single or multithreaded user space (US) or IP applications on all types of nodes. However, you cannot simultaneously call Parallel ESSL from multiple threads.

The Parallel ESSL GM libraries are provided for use with the MPICH-GM library and the Myrinet-2000 Switch with Myrinet/PCI-X adapters. IP is not supported.

The Parallel ESSL for AIX 5L libraries support both 32-bit and 64-bit environment applications. The subroutines can be called from application programs written in Fortran, C, and C++.

Parallel ESSL for AIX 5L:

- Runs under the AIX 5L V5.2 and V5.3 operating systems
- Provides support for the new Fortran and C compilers
- Supports the C Interface for the BLACS.

This is the last release of Parallel ESSL for AIX 5L that will support Parallel Systems Support Programs (PSSP) and the SP Switch2.

**Accessibility by people with disabilities**

The following features support use by people with disabilities: Operation by keyboard alone.

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**Section 508 of the U.S. Rehabilitation Act**

Parallel Engineering and Scientific Subroutine Library for AIX 5L V3.2 is capable as of April 29, 2005, 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.

**Product positioning**

Use Parallel ESSL for AIX 5L when you need optimum performance through simple subroutine calls from floating-point engineering and scientific MPI applications running on POWER4, POWER5, and BladeCenter JS20 servers.

**Reference information**

- Parallel ESSL for AIX V3.1 Software Announcement 203-268, dated October 14, 2003
- Parallel ESSL for Linux V3.2 Software Announcement 204-299, dated December 7, 2004
- ESSL V4.2 for AIX and Linux on POWER Software Announcement 204-231, dated September 28, 2004
- pSeries SW On/Off CoD for AIX 5L and LPs Software Announcement 204-298, dated December 7, 2004

**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).

BP Attachment for Announcement Letter 205-090


**Trademarks**

POWER5, BladeCenter, SP, POWER, POWER4, and POWER3 are trademarks of International Business Machines Corporation in the United States or other countries or both. The e-business logo, AIX, pSeries, and eServer are registered trademarks of International Business Machines Corporation in the United States or other countries or both. Linux is a trademark of Linus Torvalds in the United States, other countries or both. Other company, product, and service names may be trademarks or service marks of others.
Offering Information

Product information is available via the Offering Information Web site

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

Publications

Documentation supporting the Parallel Engineering and Scientific Subroutine Library for AIX® 5L V3.2 licensed program is not available from IBM in hardcopy format.

You can view, search, and print available documentation from the IBM eServer® Cluster Information Center

http://publib.boulder.ibm.com/clresctr/library

For more information, visit

http://publib.boulder.ibm.com/clresctr/

You can also download ESSL documentation from the IBM Publications Center


The Parallel ESSL licensed product consists of the following publications:

<table>
<thead>
<tr>
<th>Title</th>
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<tr>
<td>Parallel Engineering and Scientific</td>
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<td>Subroutine Library for AIX, Version 3 Release 2 and</td>
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<td>GA22-7953</td>
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<td>Parallel Engineering and Scientific</td>
<td></td>
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<td>Subroutine Library for AIX 5L, Version 3 Release 2 Installation Guide</td>
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Technical information

Hardware requirements: Parallel ESSL is supported on clusters of POWER4™ or POWER5™ servers connected with the pSeries® High Performance Switch, POWER3™ and POWER4 servers connected with an SP™ Switch2 and BladeCenter™ JS20 processors, and POWER5 servers connected with a Myrinet-2000 Switch with Myrinet/PCI-X adapters running AIX 5L V5.2 64-bit kernel. The AIX 5L V5.3 (32-bit and 64-bit kernels) and V5.2 (32-bit kernel) are only supported on stand-alone clusters or clusters connected via a LAN supporting IP.

Parallel ESSL V3.2 GM Libraries support clusters running up to 128 Message Passing Interface (MPI) tasks.

Software requirements: Operating system:

- AIX 5L V5.2 5200-04, or later (Myrinet Switch)
- AIX 5L V5.2 5200-05, or later (pSeries HPS, stand-alone, and IP mode)
- AIX 5L V5.2 5200-05, or later (SP Switch2)

Parallel System Support Programs (PSSP) V3.5 (5765-D51), with APAR IY49007 (PSSP V3.5 support for cluster software products running AIX 5L V5.2), or later, when running on an SP system. PSSP is not required when Parallel ESSL is used stand-alone or in a cluster of pSeries or eServer p5 servers.

- AIX 5L V5.3 5300-01, or later (stand-alone, and IP mode)

Software products:

- For compiling (one of these):
  - IBM XL Fortran Enterprise Edition V9.1 for AIX (5724-I08)
  - IBM XL C Enterprise Edition for AIX V7.0 (5724-I10)
  - IBM XL C/C++ Enterprise Edition V7.0 for AIX (5724-I11)

- For linking, loading, or running on AIX:
  - IBM XL Fortran Run-Time Environment V9.1 for AIX, or later, provided with the IBM XL Fortran Enterprise Edition V9.1 for AIX (5724-I08) or downloadable from
    http://www.ibm.com/software/awdtools/fortran
  - IBM XL C libraries (included in the AIX 5L V5 Application Development Toolkit)
  - ESSL for AIX 5L V4.2 (5765-F82)
  - Parallel Environment V4.2 (pSeries HPS, SP Switch2, IP mode)
  - GM 2.1, or later (Myrinet-2000 Switch only), which can be downloaded in binary form at
    http://www.myri.com/scs
  - MPICH-GM 1.2.6..14-1 (Myrinet-2000 Switch only). To learn how to obtain the instructions for building MPICH-GM libraries for AIX, see the Parallel ESSL FAQs on the IBM eServer Cluster Information Center at
    http://publib.boulder.ibm.com/infocenter/clresctr/index.jsp

Note: From V9.1, IBM will not provide a separate media package offering for the XL Fortran Run-Time Environment product.

This announcement is provided for your information only. For additional information, contact your IBM representative, call 800-IBM-4YOU, or visit the IBM home page at: http://www.ibm.com.
Parallel ESSL V3.2 does not support the SP Switch. The Parallel ESSL GM Libraries do not support IP. AIX 5L V5.2 (32-bit kernel) and V5.3 are only supported systems and communication facilities. To find additional details on the IBM XL Fortran compiler, visit http://www.ibm.com/software/awdtools/fortran

**Compatibility:** Parallel ESSL for AIX V3.2 is a functional enhancement and complete replacement of Parallel ESSL for AIX V3.1. End of service for Parallel ESSL for AIX V3.1 is not affected by this announcement.

Parallel ESSL V3.2 contains calling sequences that are identical to Parallel ESSL V3.1. Existing application programs will work without source code changes if you are migrating from Parallel ESSL V3.1 to Parallel ESSL V3.2.

**Limitations**

- Parallel ESSL is not thread-safe. However, the Parallel ESSL SMP libraries are thread-tolerant and can therefore be called from a single thread of a multithreaded application. The Parallel ESSL GM libraries are not thread-tolerant and do not support multiple computational threads. Multiple simultaneous calls to Parallel ESSL from different threads of a single process causes unpredictable results.
- AIX 5L V5.2 (32-bit kernel) and V5.3 are only supported on stand-alone clusters or clusters connected with a LAN supporting IP.
- The Parallel ESSL GM Libraries do not support IP.
- Parallel ESSL V3.2 does not support the SP Switch.

**Planning information**

**Direct customer support:** Eligible customers can obtain installation and usage assistance from the AIX Support Family line at 800-225-5249.

To obtain customer eligibility and registration procedures, contact the appropriate support center.

**Packaging:** Parallel ESSL for AIX 5L V3.2 is distributed on one CD-ROM, LCD4-6649.

**Security, auditability, and control**

Parallel ESSL for AIX 5L uses the security and auditability features of the AIX 5L V5.2 and V5.3 operating systems. 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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**Ordering information**

Parallel ESSL for AIX 5L V3.2 (5765-F84) is a product with one charge unit: number of active processors. One license is required for each active processor on each of the systems on which Parallel ESSL for AIX 5L will be installed and run.

Software Maintenance for Parallel ESSL for AIX 5L V3.2 (5771-G18 or 5773-G18) should be ordered in a quantity equal to the sum of the active processors on each of the POWER systems on which Parallel ESSL for AIX 5L will be installed and run.

For each server or cluster on which Parallel ESSL for AIX 5L will be run, new users of Parallel ESSL for AIX 5L V3.2 should specify machine type 5765, model F84, and the defined feature numbers with quantity equal to the total number of processors on which Parallel ESSL for AIX 5L will be installed or run. For example, if ordering Parallel ESSL for AIX 5L V3.2 for a medium server (F5 or G5) that has 12 processors, order System Product Offering media feature number 0989 and the one-time charge (OTC) feature number (U.S. — 0007) with a quantity of 12.

**Note:** Throughout the following tables:

- “Small” means small-capacity processors (processor groups D5 and E5).
- “Medium” means medium-capacity processors (processor groups F5 and G5).
- “Large” means large-capacity processors (processor groups H5 and P5).

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<th>Large</th>
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<table>
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<th>Description</th>
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<tr>
<td>Number of processors</td>
<td>0005, 0007, 0009</td>
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<tr>
<td>Block of 250 processors</td>
<td>0006, 0008, 0010</td>
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<td>Media</td>
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**Note:** The feature number for a block of 250 processors is provided for convenience with large orders. For example, a quantity of one for feature number 0006 will order 250 small processor licenses.

**Availability extension of 5765-G17 and 5765-G18**

ESSL for Linux on POWER V4.1 (5765-G17) (SPO feature 0984) and Parallel ESSL for Linux on POWER V3.1 (5765-G18) (SPO feature 0988) will continue to be marketed until August 26, 2005.

**Withdrawal of feature numbers**

The following feature numbers are withdrawn as of April 12, 2005.

<table>
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<tr>
<th>Description</th>
<th>Program</th>
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<td>Per processor</td>
<td>5765 F84</td>
<td>0001, 0003</td>
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<tr>
<td>Per 250 processors</td>
<td>5765 F84</td>
<td>0002, 0004</td>
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</tbody>
</table>

This software license includes Software Maintenance, previously referred to as Software Subscription and Technical Support.
Extending coverage for a total of three years from 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.

**Parallel ESSL for AIX 5L**

**Maintenance IASP PID: 1-Year 5771-PES**

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<th>Large OTC feature number</th>
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<td>Use Authorizations (Ordered in quantity of processors)</td>
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<td>0858</td>
<td>0866</td>
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<td>SW Maintenance No Charge Registration</td>
<td>0852</td>
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<td>0868</td>
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<td>SW Maintenance 1 Year</td>
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**250 Use Authorizations (Ordered in quantities of 250 processors)**

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<td>SW Maintenance 1 Year</td>
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**Maintenance IASP PID: 3-Year 5773-PES**

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<td>SW Maintenance 3 Year Registration</td>
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**Withdrawing of SWMA feature numbers**

The following feature numbers are withdrawn as of April 12, 2005.

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<tr>
<th>Description</th>
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<tr>
<td>1 year Reg per processor</td>
<td>5771 PES</td>
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<td>1 year Reg per 250 processors</td>
<td>5771 PES</td>
<td>0417</td>
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<tr>
<td>3 year Reg per processor</td>
<td>5773 PES</td>
<td>0392</td>
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<td>3 year Reg per 250 processors</td>
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<td>1 year MAL per processor</td>
<td>5771 PES</td>
<td>0420</td>
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<td>1 year MAL per 250 processors</td>
<td>5771 PES</td>
<td>0421</td>
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<td>3 year MAL per processor</td>
<td>5773 PES</td>
<td>0396</td>
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<td>3 year MAL per 250 processors</td>
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<td>1 year 24 x 7 support, per processor</td>
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<td>3 year 24 x 7 support, per 250 proc</td>
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<td>0564</td>
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</table>

**System Program Order (SPO) (5692-A5L):** A 5692-A5L SPO is mandatory for shipments of program distribution and publications. The individual licensed program orders are for registration and billing purposes only. No shipment occurs under these orders.

Machine-readable materials are only available on CD-ROM. To receive shipment of machine-readable materials under SPO (5692-A5L), order the CD-ROM media.

Specify feature number 3410. Billing for the media is generated under the SPO. To prevent additional billing expenses, place only one SPO order per machine.

Select one of the following (5692-A5L) features for the licensed program hardcopy entitled publications.

**Terms and conditions**

**Agreement:** IBM International Program License Agreement. Proofs of Entitlement are required for all authorized use.

This software license includes Software Maintenance, previously referred to as Software Subscription and Technical Support.

The following agreement applies for maintenance and does not require customer signatures: IBM Agreement for Acquisition of Software Maintenance (Z125-6011).

**Limited warranty applies:** Yes

**Warranty:** This program has warranty for a minimum of one year from acquisition from IBM or authorized IBM Business Partner. The warranty provided to the customer, for at least one year from acquisition, is access to databases (read Web sites) for program information and FAQs, including any known fixes to defects, which the
customer can download or obtain otherwise and install at leisure.

Money-back guarantee: If for any reason you are dissatisfied with the program, return it within 30 days from the invoice date to the party (either IBM or its reseller) from whom you acquired it for a refund. For clarification, note that

1. This term applies only to your first acquisition of the program.
2. 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 the customer.

Copy and use on home/portable computer: No

Volume orders (IVO): Yes; contact your IBM representative.

Passport Advantage® applies: No

Software Maintenance applies: Yes

All distributed software licenses include Software Maintenance (Software Subscription and Technical 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.

While your Software Maintenance is in effect, IBM provides you assistance for your routine, short-duration installation and usage (how-to) questions and code-related questions. IBM provides assistance via telephone and, if available, electronic access, only to your IS technical support personnel during the normal business hours (published prime shift hours) of your IBM support center. (This assistance is not available to your end users.) IBM provides Severity 1 assistance 24 hours a day, every day of the year. For additional details, visit http://techsupport.services.ibm.com/guides/handbook.html

Software Maintenance does not include assistance for:

• The design and development of applications
• Your use of programs in other than their specified operating environments
• Failures caused by products for which IBM is not responsible under this agreement

For additional information, refer to Changes to Selected Distributed Software Products acquired through IBM or Business Partners who remarket iSeries™ and pSeries Software Announcement 201-201, dated July 10, 2001. Stand-alone upgrades to this product/release and its future versions and releases will be considered only on a special request basis from IBM.


IBM Operational Support Services — SoftwareXcel: No

Other support: pSeries SW Maintenance

iSeries Software Maintenance applies: No

Variable charges apply: No

Educational allowance available: Yes, 15% education allowance applies to qualified education institution customers.

Sub-capacity pricing terms and conditions

To be eligible for sub-capacity pricing, the machine on which the eligible products are installed and running must be eligible for sub-capacity pricing terms and conditions. Software pricing at less than full machine capacity for eligible products apply when running:

• AIX 5L V5.1, or later, on an IBM eServer pSeries 690 or equivalent partition-capable operating system and machine
• OS/400® V5.1, or later, running on an IBM eServer iSeries Server
• Linux running in an LPAR under AIX 5L V5.1, OS/400 V5.1, or in a partition on an equivalent partition-capable operating system and server

Sub-capacity pricing for eligible products is based on the current program pricing methodology, but the number of processors will be determined based on the sum of processors for all partitions where the program is defined (used). To obtain pricing at less than full machine capacity for eligible products, you are required to:

• Install and use, when available, IBM’s license use management program, which installs with eligible IBM programs.
• Install available updates to the operating system and eligible products such that license use can be accurately managed.
• If the use of sub-capacity pricing terms results in a reduced requirement for entitlements, you can reallocate the entitlement difference by distributing entitlements across a larger or different set of systems, or reserve then for future growth. There will be no refunds for these “freed up” entitlements. Subscription, Software Maintenance, and Support volumes and entitlements for existing contracts will continue at the same levels as the acquired licenses.

On/Off Capacity on Demand

To be eligible for On/Off Capacity on Demand pricing, customers must be enabled for temporary capacity on the corresponding hardware and the required contract — Z125-6907, Amendment for iSeries and pSeries Temporary Capacity On Demand — Software — must be signed prior to use.
Prices

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<th>Description</th>
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<td>Small group</td>
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<td>OOCoD for Parallel ESSL for AIX 5L (5765-F84)</td>
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<td>Per Processor Day OOCoD Temp Use Chrg (250)</td>
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Software Maintenance

This software license includes Software Maintenance, previously referred to as Software Subscription and Technical Support.

Note: Throughout the following tables:

- “Small” means small-capacity processors (Processor Groups D5 and E5).
- “Medium” means medium-capacity processors (Processor Groups F5 and G5).
- “Large” means large-capacity processors (Processor Groups H5 and P5).

Maintenance IASP PID: 1-Year 5771-PES

Use Authorizations
(Ordered in quantity of processors)

SW Maintenance No-Charge Registration
Small group
- 1 processor: 0850 N/C
- 250 processors: 0851 N/C
Medium group
- 1 processor: 0858 N/C
- 250 processors: 0859 N/C
Large group
- 1 processor: 0866 N/C
- 250 processors: 0867 N/C

SW Maintenance 1-Year 7 x 24 support
Small group 7 x 24 support
- 1 processor: 0852 $ 2
- 250 processors: 0853 500
Medium group 7 x 24 support
- 1 processor: 0860 2
- 250 processors: 0861 500
Large group 7 x 24 support
- 1 processor: 0868 2
- 250 processors: 0869 500

SW Maintenance 1-Year After License
Small group
- 1 processor: 0856 36
- 250 processors: 0857 9,000
Medium group
- 1 processor: 0864 36
- 250 processors: 0865 9,000
Large group
- 1 processor: 0872 36
- 250 processors: 0873 9,000

Maintenance IASP PID: 3-Year 5773-PES

Use Authorizations
(Ordered in quantity of processors)

SW Maintenance 3-Year Registration
Small group
- 1 processor: 0823 41
- 250 processors: 0824 10,250
Medium group
- 1 processor: 0831 41
- 250 processors: 0832 10,250
Large group
- 1 processor: 0839 41
- 250 processors: 0840 10,250

SW Maintenance 3-Year 7 x 24 support
Small group 7 x 24 support
- 1 processor: 0825 5
- 250 processors: 0826 1,250
Medium group 7 x 24 support
- 1 processor: 0833 5
- 250 processors: 0834 1,250
Large group 7 x 24 support
- 1 processor: 0841 5
- 250 processors: 0842 1,250
OTC billing feature number

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Variable charges: The applicable processor-based one-time charge will be based on the group of the designated machine on which the program is licensed for use. If the program is designated to a processor in a group for which no charge is listed, the charge of the next higher group listed applies. For movement to a machine in a higher group, an upgrade charge equal to the difference in the then-current charges between the two groups will apply. For movement to a machine in a lower group, there will be no adjustment or refund of charges paid.

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