IBM AIX V7.1 and IBM PowerVM V2.2 offer new functions for virtualization, security, reliability, and system management for mission-critical, core business applications

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At a glance

IBM® is offering a new AIX® V7.1 with three editions: Express®, Standard, and Enterprise. AIX V7.1, the IBM strategic UNIX® operating system for mission-critical, core business applications, offers:

- Workload partitions -- software-based virtualization

- 64-bit kernel for higher scalability and performance

- Live Application Mobility that requires the purchase of IBM PowerVM™ Workload Partitions Manager™ for AIX or the purchase of the AIX V7 Enterprise Edition which includes IBM PowerVM Workload Partitions Manager for AIX

- Dynamic logical partitioning and Micro-Partitioning™

- Automated load balancing

- Online addition or removal of processors, memory, and I/O resources

- Support for dedicated and shared processor logical partition (LPAR)

Overview

The AIX operating system is an open standards-based UNIX operating system that provides the enterprise-class IT infrastructure for thousands of clients around the world. IBM is making available a new version, AIX 7, which will include significant new capabilities for virtualization, security, availability, and manageability. AIX V7.1 is the first generally available version of AIX 7.

Applications from earlier AIX releases

Applications created on previous versions of AIX V5 and V6 should run on AIX V7.1 without recompilation as long as those programs do not use nonportable programming techniques.

Additional information on binary compatibility can be found at

http://www.ibm.com/systems/power/software/aix/compatibility/

Businesses are turning to IBM PowerVM virtualization to consolidate multiple workloads onto fewer systems, increasing server utilization and reducing cost.

PowerVM provides a secure and scalable virtualization environment for AIX, IBM i, and Linux® applications built upon the advanced reliability, availability, and serviceability (RAS) features and leading performance of the IBM Power Systems™ platform.

The Power Systems family of servers includes proven server consolidation platforms that help you control costs while improving overall performance, availability, and energy efficiency. With these servers and PowerVM virtualization solutions, your business can consolidate applications and servers, virtualize its system resources, and provide a more flexible, dynamic IT infrastructure.

PowerVM delivers industrial-strength virtualization for AIX, IBM i, and Linux environments on IBM POWER processor-based systems. Power Systems servers coupled with PowerVM technology are designed to help clients build a dynamic infrastructure, reducing costs, managing risk, and improving service levels.

PowerVM offers a secure virtualization environment, built on the advanced RAS features and leadership performance of the Power Systems platform.

IBM PowerVM V2.2 contains the following enhancements:

- Role Based Access Control (RBAC)
- Support for up to 80 virtual processors on Power® 710 and 720
- Support for up to 160 virtual processors on Power 730, 740, 750, 770, and 780
- Support for up to 254 virtual partitions on Power 795
- Support for Concurrent Add of VLANs
- PowerVM support for sub-chip per-core licensing on Power 710, 720, 730, and 740

IBM PowerVM Workload Partitions Manager for AIX, V2.2.1 has the following enhancements:

- When used with AIX V6.1 Technology Level 6:
  - Support for exporting VIOS SCSI disk into a WPAR. Compatibility analysis and mobility of WPARs with VIOS SCSI disk. In addition to fibre channel devices, now VIOS SCSI disks can be exported into a workload partition (WPAR).
  - WPAR Manager Command-Line Interface (CLI). The WPAR Manager CLI allows federated management of WPARs across multiple systems via command line.
  - Support for workload partition definitions. WPAR definitions can be preserved after WPARs are deleted. These definitions can be deployed at a later time to any WPAR-capable system.
- In addition to the feature supported on AIX V6.1 Technology Level 6, the following applies to AIX V7.1:
  - Support for AIX V5.2 Workload Partitions for AIX 7. Life cycle management and mobility enablement for AIX V5.2 TL10 SP8 Version WPARs.
  - Support for trusted kernel extension loading and configuration from WPARs. Enables exporting a list of kernel extensions that can then be loaded inside a WPAR, yet maintaining isolation.

Key prerequisites

AIX V7.1 supports IBM systems based on the following processor technologies:

- IBM PPC-970
- IBM POWER4™
- IBM POWER5™
- IBM POWER6™
- IBM POWER7™

Planned availability date

September 10, 2010

Description

IBM is offering the next version of the AIX operating system, AIX 7, and new releases of PowerVM and PowerHA™ SystemMirror for AIX. These new offerings are designed to help companies reduce cost, improve service, and lower the risk of deploying and migrating applications to AIX on Power Systems.

The new capabilities planned for AIX 7 are designed to expand the scalability, reliability, and manageability of the AIX operating system and the applications running on the AIX operating system. Key features will provide greater vertical scalability of up to 1,024 threads or 256 cores in a single partition, and a clustering infrastructure designed to provide highly availability applications with PowerHA SystemMirror and to simplify management of scale-out workloads. In addition, AIX 7 will include new management capabilities based on IBM Systems Director that are designed to simplify the management of AIX system configuration. Finally, AIX 7 will support the ability to run AIX V5.2 inside of a workload partition to allow consolidation of old workloads on new systems. This capability will require an additional product, AIX 5.2 Workload Partitions for AIX 7.

AIX 7 is supported on Power System servers based on PPC970, POWER4, POWER5, POWER6, and POWER7 processors. AIX 7 includes exploitation that takes full advantage of POWER7 processor-based servers.

AIX 7, like AIX 6, is planned to provide binary compatibility for application programs developed on previous versions of AIX as long as the programs comply with reasonable programming standards.

Additional information on binary compatibility can be found at

   http://www.ibm.com/systems/power/software/aix/compatibility/

AIX 7 continues the evolution of UNIX that began more than 25 years ago with the release of AIX V2.1 and builds on the earlier generations of AIX in a nondisruptive evolutionary approach.

AIX 7, with the planned new releases of PowerVM and PowerHA SystemMirror, is designed to deliver the intelligent, interconnected information technology infrastructure needed for a smarter planet.

Base operating system and integration

Virtualization

AIX 5.2 Workload Partitions for AIX 7

AIX 5.2 Workload Partitions for AIX 7 is supported on AIX 7.1 for POWER7. This is a separate product that leverages AIX 7 capabilities to provide the capability to create a workload partition (WPAR) that provides an AIX V5.2 TL10 SP8 runtime environment for the workload running in the WPAR. This allows a simple migration path for an AIX V5.2 workload running on older hardware to move to POWER7. All that is required is to create a mksysb image of the AIX V5.2 system and then provide this image when creating the WPAR on AIX V7.1 running on POWER7 hardware. This offering also supports Live Application Mobility of the AIX V5.2 WPAR between POWER7 systems running AIX V7.1. Live Application Mobility requires the purchase of IBM PowerVM Workload Partitions Manager for AIX or the purchase of AIX V7 Enterprise Edition, which includes IBM PowerVM Workload Partitions Manager for AIX.

Support for export of fibre channel adapters to WPARs

AIX V7.1 includes support for exporting a virtual or physical fibre channel adapter to a WPAR. The adapter is exported to the WPAR in the same manner as storage devices. When the WPAR is started, all child devices will be discovered and configured inside the WPAR, which provides several advantages. SAN devices can be directly provisioned to the WPAR's N-port with no need to provision to the global partition first and then export to the WPAR. Multipath management can be done within the WPAR. Fibre channel tape systems using the "atape" driver are also supported inside the WPAR in this configuration.

VIOS disk support in a WPAR

With this release of AIX, vSCSI disks are now supported in a WPAR in the same manner as fibre channel disks. VIO SCSI disks configured in the global partition can be exported to a WPAR for use as a data disk or as the rootvg for the WPAR. Any disk type supported by the VIOS can be exported in this manner to a WPAR. In addition, Live Application Mobility is supported for a rootvg WPAR on vSCSI disks as long as the source and target LPARs are both clients of VIO servers with access to the disks. This feature is available on both AIX V7.1 and AIX V6.1 with the 6100-06 Technology Level.

Trusted kernel extension loading and config from WPAR

AIX V7.1 provides the capability for a global administrator to export specific kernel extensions for a WPAR administrator to have the ability to load and configure from inside the WPAR. A signature for the specified extensions is computed at the time of export to ensure only the exported extensions can be loaded. The exported extensions can be specified as to whether they are loaded in a local WPAR namespace, or globally, and therefore accessible by the global and other WPARs. This capability removes a barrier for some application stacks that require a kernel extension so that they can function in a WPAR environment. For AIX V7.1, Live Application Mobility for a WPAR with an exported kernel extension is not supported.

AIX Performance tool topas enhancements for Active Memory™ Expansion

AIX V7.1 provides additional performance monitoring capabilities when Active Memory Expansion is being used. Active Memory Expansion is an innovative POWER7 feature that uses in-memory data compression to expand the memory capacity of POWER7 servers. The AIX topas performance monitoring tool has been enhanced to report Active Memory Expansion metrics across all of the LPARs on a server when the CEC view is used. The libperfstat library has also been enhanced to report Active Memory Expansion metrics. This function is also available on AIX V6.1 with the 6100-06 Technology Level.

Operating system and integration

AIX 7 is designed to comply with Open Group Single UNIX Specification Version 4

The Open Group is a standards body that publishes the Single UNIX Specification, defining standards for UNIX behavior. Newly updated versions of the standard are published every few years. AIX V7.1 has been enhanced and designed to conform to the latest published version of the UNIX standard, the Single UNIX Specification Version 4 (SUSv4). The new SUSv4 defines incremental changes over the prior standard. Among the new features defined by SUSv4 are some new options to commands such as diff, ls, find, and others; new thread-specific locale APIs; and new file-handling APIs that are based on file descriptors. For complete information on the SUSv4 standard, visit The Open Group Web site at

http://www.opengroup.org

ksh93 enhancements

AIX V7.1 now provides a newly updated version of the ksh93 shell environment. AIX V6.1 provided a ksh93 based upon the "ksh93e" version of the popular shell, while

AIX V7.1 now updates ksh93 to become based upon "ksh93t." In providing this update, users now have access to a variety of new enhancements and improvements made over the past several years by the Korn shell community, resulting in a more robust shell programming experience. Additional details and documentation about the Korn shell can be found at

http://www.kornshell.org

DWARF debugging support

AIX V7.1 adds support for the standard DWARF debugging format. DWARF is a modern standard for controlling the format of debugging information in executables, and it is used by a wide variety of operating systems. It provides greater extensibility and compactness. The widespread use of DWARF also increases the portability of software for developers of compilers and other debugging tools between AIX and other operating systems. Information about the DWARF standard can be found at the Web site of the DWARF Standards Committee at

http://www.dwarfstd.org

User Direct Access Programming Library V1.2

AIX V7.1 provides you with the User Direct Access Programming Library (uDAPL) V1.2. The uDAPL V1.2 will enable applications to directly leverage the InfiniBand infrastructure for zero-copy, low latency, and high performance. With AIX uDAPL, customers will be able to incorporate the features provided by the API, including the capability to do Remote DMA. Performance-sensitive applications will have a new avenue for direct exploitation of transport capabilities of IB but without the requirement of being tied to a particular transport. Both GX Dual-port SDR Host Channel Adapter and GX Dual-port DDR Host Channel Adapter and Mellanox ConnectX Single/Dual-Port InfiniBand adapters are supported with uDAPL V1.2. The uDAPL V1.2 is also available on AIX V6.1 with the 6100-06 Technology Level.

Hardware enablement and support

Shared Memory Interface to Barrier Synchronous Register

AIX V7.1 provides support for accessing the POWER7 Barrier Synchronous Register (BSR) via shared memory interfaces from user space. This allows utilization of the BSR without requiring a kernel extension to be loaded. This support is also available on AIX V6.1 with the 6100-06 Technology Level.

CPU interrupt disablement

AIX V7.1 includes the ability to disable external interrupts on a specific set of CPUs on which a workload is deployed. When enabled, this feature will route certain hardware level interrupts to other CPUs, thereby resulting in less interruption to the workload. This function is also available on AIX V6.1 with the 6100-06 Technology Level.

AIX kernel memory pinning

AIX V7.1 pins kernel memory by default and includes support allowing applications to pin their kernel stack. Pinning kernel memory and the kernel stack for applications with real-time requirements can provide performance improvements by ensuring that the kernel memory and kernel stack for an application is not paged out. This feature can also be enabled in AIX V6.1 with the 6100-06 Technology Level.

Logical Volume Manager enhanced support for solid-state disks

AIX V7.1 includes enhanced support in the AIX Logical Volume Manager (LVM) and JFS2 filesystem for solid-state disks (SSDs). This includes the capability for LVM to restrict a volume group (VG) to only contain SSDs and the ability to report that a VG only contains SSDs. JFS2 has been enhanced with the capability to capture and report per-file statistics related to hot-file detection that can be used to determine

if a file should be placed on an SSD. These capabilities allow for applications to monitor and determine optimal file placement. This feature is also available on AIX V6.1 with the 6100-06 Technology Level.

Documented kernel sockets API

AIX V7.1 provides an API for kernel extensions to access TCP sockets within the kernel. This allows kernel extensions to act as network clients or servers. This feature is also available on AIX V6.1 with the 6100-06 Technology Level.

xntp Version 4.2.1 support in AIX

The Network Time Protocol implementation is updated to xntp V4.2.1. The xntp V4.2.1 includes support for IPv6, new server discovery schemes, orphan mode, and other improvements. This function is available on both AIX V7.1 and AIX V6.1 with the 6100-06 Technology Level.

EtherChannel enhancement

AIX V7.1 enhances EtherChannel support for 802.3AD protocol and makes sure that a link is LACP ready before sending data packets. This function is also available on AIX V6.1 with the 6100-06 Technology Level.

RNIC Support

AIX V7.1 provides users with Internet Wide Area RDMA Protocol (iWARP RDMA) over the 10 Gigabit Ethernet-CX4 PCI Express and 10 Gigabit Ethernet-SR PCI Express Adapters. This support includes the porting to AIX of the Open Fabrics 1.4 iWARP stack for Ethernet. This enhancement lays the framework in allowing for future exploitation of RDMA over Ethernet. This function is also available on AIX V6.1 with the 6100-06 Technology Level.

Performance and scalability

1024-way scalability

AIX V7.1 adds scalability enhancements to the base kernel, drivers, and libraries to scale up to 1024-way partitions, which are partitions with 256 processor cores and four hardware threads per core. Large workloads/applications that scale well are expected to benefit from this feature.

AIX terabyte segment support

AIX V7.1 and AIX V6.1 with the 6100-06 Technology Level introduce a new memory scaling feature that exploits the Power Memory Management Unit (MMU) and reduces Segment Lookaside Buffer (SLB) misses. Large memory workloads running on POWER7 systems will benefit the most from this feature.

Cluster Aware Perfstat Library Interfaces

AIX V7.1 and AIX V6.1 with the 6100-06 Technology Level provide the capability for application developers to retrieve performance statistics of a remote node, participating in a cluster, via a new set of APIs exported as part of the standard perfstat library. The new interfaces are supported only on nodes that are part of the AIX Cluster Infrastructure. Applications need to use the libperfstat headerfile that are shipped as part of AIX V7.1 and AIX V6.1 with the 6100-06 Technology Level to use the new interfaces and data structures.

Firewall support for clients that use Performance AIDE

AIX V7.1 and AIX V6.1 with the 6100-06 Technology Level provide the capability for system administrators to choose a range of ports that can be used by the Performance Monitoring Application that monitors the remote nodes using the Remote Statistic Interface provided by Performance Aide (perfagent.server fileset).

Performance Aide and Topas recording capability changes

From AIX V7.1 the default location of the recording files generated by Topas persistent recording (topasrec tool) are changed from "/etc/perf" to "/var/perf". The log files generated by Performance Aide are also changed to "/var/perf".

AIX security

Domains support in Role Based Access Control

In today's growing complex data center/cloud computing environment, isolation of resources is one of the key security requirements. The Domains support provides this key feature to augment the functionality provided by the Role Based Access Control (RBAC). RBAC provided the capability to let a non-root user -- with proper authorization -- to perform specific system administration tasks.

Domains, a new RBAC feature, can be used to provide isolation for the following resources: network interfaces and ports, Logical Volume Manager (includes volume groups and file systems), files, and devices (that have /dev entries). This function is available on both AIX V7.1 and AIX V6.1 with the 6100-06 Technology Level.

Enable hardware acceleration support for Encrypted File Systems, IPSec, and Trusted Execution

The innovative security technologies implemented in the earlier versions of AIX, namely the Encrypted File Systems (EFS), IP security (IPSec) and Trusted Execution, used software-based cryptographic algorithms. The AIX Cryptographic Framework (ACF) is a cryptographic provider in the AIX operating system. This feature enables these key security technologies to exploit the hardware cryptographic acceleration facility provided by the ACF.

ProPolice, AIX enablement for new XLC compiler V11

AIX V7.1 enables the stack smashing protection provided by ProPolice, using XLC compiler V11. ProPolice is a stack smashing protector developed by IBM. This option will be used to minimize the risk of security vulnerabilities in the AIX operating system. All the SUID bit commands and programs shipped in AIX V7.1 will have this feature enabled automatically and no further configuration will be required from an end user. This function is also available on AIX V6.1 with the 6100-06 Technology Level.

ODM directory permission changes and general security update

AIX V7.1 provides user group scalability and security enhancements such as new password policies and access restriction to ODM directories.

Maximum number of groups increased

Prior to AIX V7.1, the maximum number of groups per user was limited to 128. Now that limit has increased to 2,048 and also is configurable for end users to customize this limit. This enhancement is also available on AIX V6.1 with the 6100-06 Technology Level.

AIX 7 designed to comply with Common Criteria CAPP/EAL4+ Security Certification

AIX 7 was designed to provide security EAL4+ certification from Common Criteria using Operating Systems Protection Profile (OSPP) for AIX V7.1.

IBM Compliance Expert Express Edition

The IBM Compliance Expert Express Edition (5765-G82) has been updated to include a new security profile designed to aid compliance with the Sarbanes Oxley / COBIT standard.

AIX Profile Manager

AIX Profile Manager is an advanced manager (plug-in) of IBM Systems Director 6.2. It is provided as a feature of AIX, distributed with Standard and Enterprise Editions. AIX Profile Manager provides "dashboard" views and runtime configuration profile management over groups of networked systems. The profile management capability includes capturing the runtime configurations, applying the new runtime control values, and comparing the runtime configurations with a given profile or between systems. AIX Profile Manager manages the client AIX systems using the AIX Runtime Expert technology. It also provides "copy machine" like simplicity for distributing operating system properties to many systems. Profile Manager installs on all supported Director server platforms (Windows®, Linux, AIX).

The Profile Manager leverages the AIX Runtime Expert infrastructure first introduced with AIX 6 Technology Level 4. AIX Runtime Expert provides a simplified solution for managing runtime properties of one or more AIX instances. AIX Runtime Expert in AIX V7.1 provides several enhancements, including improvement in performance, the ability to set the version of the configuration profiles to maintain multiple versions, and the ability to set customized descriptors to the profiles. It also provides the ability to be managed by AIX Profile Manager from an IBM Systems Director. This feature is also available on AIX V6.1 with the 6100-06 Technology Level.

AIX Event Infrastructure

AIX V7.1 introduces the AIX Event Infrastructure. Implemented as a pseudo file system, the AIX Event Infrastructure simplifies monitoring of events by using one existing API (file system calls such as open(), read(), and write()) to monitor many different types of events. Applications may use this infrastructure to monitor predefined system events, such as filesystem utilization, changes to system-tunable parameters, or average wait time of page-in or page-out activity, or customers may define their own events to monitor through the same interface. Customers using the AIX Event Infrastructure will benefit from its simple API, immediate notification of events without the need for constant polling, and the extensibility to monitor their own and third-party events. This function is also available from AIX V6.1 with the 6100-06 Technology Level.

Network Installation Manager (NIM) Thin Server support

NIM Thin Server helps add support for NFS4 and IPv6 in NIM for thin servers (diskless and dataless machines). NIM currently supports NFS4 and IPv6 for stand-alone machines. Although it is possible to allocate resources to a diskless or dataless client using NFS4, the client will not boot because the diskless/dataless boot script does not know how to handle NFS4 filesystems during boot. Similarly, a diskless or dataless client defined with an IPv6 address will fail to boot. This feature is available on both AIX V7.1 and AIX V6.1 with the 6100-06 Technology Level.

Distributed Systems Management

A new feature called Distributed Systems Management was introduced with AIX V6.1 with the 6100-03 Technology Level. Distributed Systems Management (DSM) refers to a collection of programs used to enhance the capabilities of the AIX Network Installation Manager. These programs will allow an administrator to collect network adapter information and monitor installation progress for NIM client machines, and will also enable bare-metal installation of the AIX operating system on clients with no operating system previously installed.

System Management Console Support

System Management functions previously available using the Web-based System Manager (WebSM) application are now available through the IBM Systems Director Console for AIX. The IBM Systems Director Console for AIX is a Web-based management console that provides centralized access to system administrators. Through this interface, system administrators can view, monitor, and manage

systems in a distributed environment. Administrators have access to aggregated views, grouping functions, distributed command execution, health, and status information, as well as the ability to manage individual systems through familiar interfaces such as the System Management Interface Tool (SMIT).

Reliability, availability, and serviceability

Cluster Aware AIX

AIX 7.1 (Standard Edition and Enterprise Edition) supports built-in clustering capabilities. Administrators can use the operating system-provided primitives to cluster a set of AIX nodes and take advantage of the capabilities of the clustering. Some of the functions supported by Cluster Aware AIX include:

- Commands to create the cluster across a set of AIX systems: Kernel-based heartbeats and messages provide a robust cluster infrastructure and by default exploit multi-channel communication between the nodes using the network and SAN physical links.
- Advanced cluster-wide event management: AIX event management is enhanced to support cluster-wide event notifications for certain events (for example, network/disk errors).
- Global Device View support: When managed by Cluster Aware AIX, device files associated with the disks shared across the nodes in the cluster will have a common name across the nodes in the cluster that have access to the disks.
- Cluster-wide command operation: Many of the security- and storage-related AIX commands have been enhanced to support the operation across the cluster.

These clustering capabilities are also available on AIX V6.1 with the 6100-06 Technology Level when using PowerHA SystemMirror V7.1 (formerly known as HACMP™).

User keys enhancement

AIX V7.1 provides a facility for a user with sufficient privileges to modify the number of hardware keys available for user keys. This allows more segmentation of user memory. It provides a smitty option to exercise this facility with the right set of options. Updating number of user keys in this manner will require a bosboot and a subsequent system reboot to become effective. This facility is available on both AIX V7.1 and AIX V6.1 with the 6100-06 Technology Level.

Multi-node First Failure Data Capture

AIX V7.1 provides a framework called *Clustering Data Aggregation Tool* for enabling more rapid analysis and root cause identification for problems that arise in workloads that span multiple operating system instances. It provides a single point from which to launch RAS debug and monitoring actions and to collect problem determination data for a collection of nodes. It consolidates RAS data to a single node, supports "pushing" out data-gathering tools to nodes, reduces overhead work for system admin, debugger, or preinstallation on each remote node, and provides the extensible plug-in feature for First Failure Data Capture (FFDC) user new defined data type collection. It has simple configuration and secure communication with integrating RBAC to enable non-root users to collect FFDC data. It is controlled via command line and SMIT panel. The Clustering Data Aggregation Tool is also available on AIX V6.1 with the 6100-06 Technology Level.

Firmware-assisted dump

AIX V7.1 extends firmware-assisted dump capabilities to make it the default system dump method if it is supported by the platform. It provides flexibility for users being able to change the dump type back to a traditional system dump after installation. Firmware-assisted dump also supports arbitrary non-boot iSCSI disk and provides that system is booted over the network from either another iSCSI disk or by using BOOTP/TFTP to load the kernel images and NFS to mount the root file system. The primary dump device is the entire iSCSI physical volume. These capabilities are also

available on AIX V6.1 with the 6100-06 Technology Level though firmware-assisted dump will not be the default on AIX V6.1.

Enhanced probevue functionality

With AIX V7.1, users can probe function exits, probe functions in specific modules, probe Fortran executables using probevue. Probevue has also been enhanced to probe specific processes at intervals. Users can access specific fields from the process, thread, user, and mst structures. Probevue has also been enhanced to provide associative arrays to store and analyze data as part of the scripting language. This feature is also available on AIX V6.1 with the 6100-06 Technology Level.

Globalization

Unicode 5.2 support

AIX V7.1 now provides a powerful multilingual environment for storage servers and supports 61 languages and more than 250 locales based on the latest Unicode technology. Unicode encodings and algorithms are used for internal and external communications in the AIX system. The latest version (Unicode 5.2) provides standardized character positions for over 6,648 additional glyphs and 107,156 glyphs in all. AIX 7 enhances the existing language and locales, bringing them up to compliance with the latest version (Unicode 5.2).

Alias code set name support

AIX V7.1 adds a code set alias mapping function to enhance code set conversion in libiconv. The code set conversion is one of the fundamental globalization services in most platforms. As a multilingual storage server, AIX provides more than 1,600 modules for code set conversion services. In a cloud computing environment, code set name compliance problems may cause data corruption, application exceptions, system crashing, poor portability, and conversion failures. The alias code set name support will minimize code set name compliance problems and enhance quality on the code set conversion. When the AIX code set conversion function gets a request with non-AIX code set names, the alias mapping function will attempt to map suitable AIX code set names for the request.

Accessibility by people with disabilities

A U.S. 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

Product positioning

Industrial-strength features and functions of the AIX operating system have been proven in a wide variety of computing environments from small one- or two-processor systems for small workloads to large 64-processor systems to meet the demanding requirements for vertically scaled applications such as databases.

AIX V7.1 features include:

- Workload partitions -- software-based virtualization
- Live Application Mobility that requires the purchase of IBM PowerVM Workload Partitions Manager for AIX or the purchase of the AIX V7 Enterprise Edition which includes IBM PowerVM Workload Partitions Manager for AIX
- 64-bit kernel for higher scalability and performance
- Dynamic logical partitioning and Micro-Partitioning support
  - Automated load balancing
  - Online addition or removal of processors, memory, and I/O resources

- Support for dedicated and shared processor LPAR groups
- Trusted AIX: Multi-level, compartmentalized security
- Integrated Role Based Access Control
- Encrypting JFS2 file system
- Exploitation of POWER7 storage keys with enhanced protection and reliability
- Concurrent AIX kernel updates, which can reduce need for planned outages
- Dynamic tracing with probevue
- Designed to comply with the Open Group SUSv4 standard
- Robust journaled file system and Logical Volume Manager (LVM) software, including integrated file system snapshot
- Tools for managing your systems environment -- SMIT and the Systems Director Console for AIX

AIX V7.1 represents the most advanced version of the AIX operating system. AIX V7.1 builds on a solid heritage of supplying integrated, enterprise-class support for IBM Power Systems servers.

Statement of direction

IBM intends for PowerVM Lx86 to support the next major release of Red Hat Enterprise Linux on IBM Power Systems.

All statements regarding IBM's future direction and intent are subject to change or withdrawal without notice, and represents goals and 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.

Reference information

- Refer to Software Announcement ZP10-0248, dated August 17, 2010, IBM PowerHA SystemMirror V7.
- Refer to Software Announcement ZP10-0247, dated August 17, 2010, AIX V5.2 Workload Partitions Manager for AIX 7.

Program number

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Program
number    VRM       Program name

5765-G97  7.1.0     IBM AIX Express Edition
5765-G98  7.1.0     IBM AIX Standard Edition
5765-G99  7.1.0     IBM AIX Enterprise Edition
5765-PVX  2.2.0     IBM PowerVM Express Edition *
5765-PVS  2.2.0     IBM PowerVM Standard Edition *
5765-PVE  2.2.0     IBM PowerVM Enterprise Edition *
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* These offerings already have programs and features announced.

The software maintenance (SWMA) program numbers (577x-xxx) have been previously announced.

Product identification number

Program PID number	Maintenance 1-year PID number	Maintenance 3-year PID number
5765-G97	5771-G90 5771-G91	5773-G90
5765-G98	5771-SWM 5771-ALC	5773-SM3
5765-G99	5771-AEZ 5771-ALZ	5773-AEZ
5765-PVX	5771-PVX	5773-PVX
5765-PVS	5771-PVS 5771-ALS	5773-PVS
5765-PVE	5771-PVE 5771-EAL	5773-PVE

Evaluation software

IBM PowerVM Workload Partitions Manager for AIX (WPAR Manager)

	Electronic (preferred)	Physical
At announcement	No	No
By planned availability	Yes	No

Is there support available? No

Ordering process and support availability:

If you download from the Web, you are offered the product to evaluate the WPAR Manager functions for up to 60 days under the terms of the IBM International License Agreement for Evaluation of Programs (ILAE). During the evaluation period, an option to purchase a permanent license will be offered.

If a permanent license is purchased, a keyfile will be shipped on a CD-ROM to enable WPAR Manager functions to remain active. When installing the keyfile, no changes are made to WPAR Manager and everything will continue to work as it did. If a permanent license is not purchased and installed, then the WPAR Manager functions will be disabled when the evaluation periods ends.

IBM PowerVM Workload Partitions Manager for AIX may be downloaded from

http://www-03.ibm.com/systems/software/director/downloads/plugins.html

Offering Information

Product information is available via the Offering Information Web site

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

Publications

No hardcopy publications are shipped with these programs.

License Information will display automatically when AIX V7.1 is installed. The following publications are supplied on a DVD with the basic machine-readable material.

```
Title                   Number

AIX Base O/S            LK4T-1710-00
AIX Expansion Pack      LK4T-1712-00
```

Technical information

Specified operating environment

Hardware requirements

AIX V7.1 supports the following systems:

- IBM systems that run on the POWER4, PPC970, POWER5, POWER6, or POWER7 technology-based processors, including the IBM System p®, System p5®, eServer™ p5, System i®, and System i5® servers
- IBM eServer pSeries® server product lines based on POWER4 and POWER5 processors
- IBM BladeCenter® JS2x blades and IntelliStation® POWER workstations

AIX V7.1 only supports the 64-bit kernel. Both 32-bit and 64-bit applications will continue to run unchanged on AIX V7.1, but 32-bit device drivers or kernel extensions are not supported on AIX V7.1.

Software requirements

Systems operating on AIX V7.1 are supported only when used within the system operating environments described in the appropriate hardware announcements and when used within the specified operating environment. When systems operating on AIX V7.1 are used with other software or software in later announcements, other limitations may be included.

AIX V7.1 minimum current memory requirements vary, based on the configuration.

AIX V7.1 supports systems and partitions with at least 512 MB of physical memory. The recommended minimum memory requirement for the AIX V7.1 operating system is 1 GB. A smaller minimum current memory requirement may support a configuration with a very small number of devices or a small maximum memory configuration.

AIX V7.1 requires the minimum current memory requirement to increase as the maximum memory configuration or the number of devices scales upward, or both. Larger maximum memory configurations or additional devices scale up the minimum current memory requirement. If the minimum memory requirement is not increased along with the maximum memory configuration, the partition hangs during the initial program load (IPL).

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.

Limitations

AIX Standard Edition and AIX Enterprise Edition are limited to a maximum partition size of 256 cores and 1,024 threads.

AIX Express Edition is limited to a maximum partition size of four processor cores and 8 GB of memory per core.

AIX Express Edition is limited to a maximum partition size of four processor cores and 8 GB of memory per core and does not include the AIX Profile Manager and Cluster Aware AIX capabilities.

Planning information

Packaging

The following program packages contain one DVD per program that includes program installation documentation and files.

IBM AIX Express Edition V7.1
IBM AIX Standard Edition V7.1
IBM AIX Enterprise Edition V7.1

Your Proof of Entitlement (PoE) for this program is a copy of a paid sales receipt, purchase order, invoice, or other sales record from IBM or its authorized reseller from whom you acquired the program, provided that it states the license charge unit (the characteristics of intended use of the program, number of processors, number of users) and quantity acquired.

Information about how you may obtain program services will be provided by the party (either IBM or its authorized reseller) from whom you acquired the program. This program, when downloaded from a Web site, contains the applicable IBM license agreement and License Information, if appropriate, and will be presented for acceptance at the time of installation of the program. For future reference, the license and License Information will be stored in a directory such as LICENSE.TXT.

Security, auditability, and control

AIX V7.1 uses the system and network security features for security and auditability. These features are:

- System security:
  - Role Based Access Control
  - Trusted AIX: Multi-level security
  - AIX Security Expert
  - Trusted Execution
  - Native Kerberos V5 KDC Server/Client Support
  - Trusted Computing Base available as an optional preinstallation feature
  - AIX LDAP Security Audit plug-in
  - Pluggable Authentication Mechanism
  - IBM SecureWay® Directory V3.2.1
- Network security:
  - PKCS support
  - IP Key Encryption Security
  - Directory-based resolvers

AIX V7.1 introduces new security extensions to FTP based on RFC 4217. These extensions provide data and control channel integrity by means of the TLS/SSL (Transport Layer Security and Secure Socket Layer) protocols.

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

Global Technology Services

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

Ordering information

Consult your IBM representative.

Charge metric

```
Program name                      PID number  Charge metric

IBM AIX Express Edition V7.1       5765-G97    Per processor core
                                              Small, Medium, Large
IBM AIX Standard Edition V7.1      5765-G98    Per processor core
                                              Small, Medium, Large
IBM AIX Enterprise Edition V7.1    5765-G99    Per processor core
                                              Small, Medium, Large
```

Processor

Processor is a unit of measure by which the program can be licensed. A *processor* (commonly called a *processor core* or *CPU*) is a functional unit within a computing device that interprets and executes instructions. A processor consists of at least an instruction control unit and one or more arithmetic or logic unit. With multi-core technology, each core is considered a processor. A Proof of Entitlement (PoE) must be acquired for all activated processor cores available for use on the server.

Notes:

• Some programs may require licenses for the program and what is being managed. In that case, the following applies: In addition to the entitlements required for the program directly, Licensee must obtain entitlements for this program sufficient to cover the processor cores managed by the program.

• Some programs may be licensed on a managed basis only. In that case, the following applies: Instead of the entitlements required for the program directly, Licensee must obtain entitlements for this program sufficient to cover the processor cores managed by program.

The server products in the table below are associated with the small, medium, or large licenses as indicated.

Definition of server category:

• Small server

  – IBM Power Systems, System p models in Processor Groups C5, D5, and E5

  – IBM Power Systems, System i models in Processor Groups P05, P10, and P20

• Medium server

  – IBM Power Systems, System p models in Processor Group F5

  – IBM Power Systems, System i models in Processor Groups P30 and P40

• Large server

  – IBM Power Systems, System p models in Processor Groups G5 and H5

  – IBM Power Systems, System i models in Processor Groups P50 and P60

Orders may be placed beginning with configurator availability.

For new orders, select from the following table:

```
5765-G97  IBM AIX Express Edition V7.1
                                           Processor-
                                           based
                                           OTC
                                           feature
          Description                      number

          Per processor - small           V7UKBG
```

```
Per processor - small POWER7                    T7ULA5
Per processor - medium                          V7UMBG
Upgrade small to medium                         XZE3BG
Per processor - medium POWER7                   T7UNA5
Upgrade small POWER7 to medium POWER7           XZE59B
Upgrade small to medium POWER7                  XZE49B
Per processor - large                           V7UPBG
Upgrade small to large                          XZE6BG
Upgrade medium to large                         XZE7BG
Per processor - large POWER7                    T7URA5
Upgrade small POWER7 to large POWER7            XZE99B
Upgrade medium POWER7 to large POWER7           XZF19B
Upgrade small  to large POWER7                  XZE89B
Upgrade medium to large POWER7                  XZF09B
```

5765-G98 IBM AIX Standard Edition V7.1

Description	Processor-based OTC feature number
Per processor - small	V7USBG
Per processor - small POWER7	T7UTA5
Per processor - medium	V7UUBG
Upgrade small to medium	XZF4BG
Per processor - medium POWER7	T7UVA5
Upgrade small POWER7 to medium POWER7	XZF79B
Upgrade small to medium POWER7	XZF69B
Per processor - large	V7UWBG
Upgrade small to large	XZF9BG
Upgrade medium to large	XZG0BG
Per processor - large POWER7	T7UXA5
Upgrade small POWER7 to large POWER7	XZG39B
Upgrade medium POWER7 to large POWER7	XZG59B
Upgrade small to large POWER7	XZG29B
Upgrade medium to large POWER7	XZJ89B

5765-G99 IBM AIX Enterprise Edition V7.1

Description	Processor-based OTC feature number
Per processor - small	V7UYBG
Per processor - small POWER7	T7UZA5
Per processor - medium	V7U0BG
Upgrade small to medium	XZH2BG
Per processor - medium POWER7	T7U1A5
Upgrade small POWER7 to medium POWER7	XZH59B
Upgrade small to medium POWER7	XZH49B
Per processor - large	V7U2BG
Upgrade small to large	XZH8BG
Upgrade medium to large	XZH9BG
Per processor - large POWER7	T7U3A5
Upgrade small POWER7 to large POWER7	XZJ39B
Upgrade medium POWER7 to large POWER7	XZJ59B
Upgrade small to large POWER7	XZJ29B
Upgrade medium to large POWER7	XZJ49B

Upgrades

Upgrade to Standard Edition 5765-G98 from AIX Express Edition

Description	5765-G98 Upgrade To Feature number
Per processor small system from Express	XZF2BG
Per processor small system from Express POWER7	XZF39B

```
Per processor medium system from Express          XZF5BG
Per processor medium system from Express POWER7   XZF89B
Per processor large system from Express           XZG1BG
Per processor large system from Express POWER7    XZG69B
```

Upgrade to Enterprise Edition 5765-G99 from Express Edition

Description	5765-G99 Upgrade To Feature number
Per processor small system from Express	XZG8BG
Per processor small system from Express POWER7	XZH09B
Per processor medium system from Express	XZH3BG
Per processor medium system from Express POWER7	XZH79B
Per processor large system from Express	XZJ1BG
Per processor large system from Express POWER7	XZJ79B

Upgrade to Enterprise Edition 5765-G99 from Standard Edition

Description	5765-G99 Upgrade To Feature number
Per processor small system from Standard	XZG7BG
Per processor small system from Standard POWER7	XZG99B
Per processor medium system from Standard	XZH1BG
Per processor medium system from Standard POWER7	XZH69B
Per processor large system from Standard	XZJ0BG
Per processor large system from Standard POWER7	XZJ69B

AIX Editions V6 Upgrades

Upgrade to AIX Standard Edition 5765-G62 from AIX Express Edition V6

Description	5765-G62 Upgrade to Feature number
Per processor small system from Express	XZL8BG
Per processor small system POWER7 from Express	XZL99B
Per processor medium system from Express	XZM0BG
Per processor medium system POWER7 from Express	XZM19B
Per processor large system from Express	XZM2BG
Per processor large system POWER7 from Express	XZM39B

Upgrade to Enterprise Edition 5765-AEZ AIX Express Edition V6

Description	5765-AEZ Upgrade to Feature number
Per processor small system from Express	XZL1BG
Per processor small system POWER7 from Express	XZL29B
Per processor medium system from Express	XZL3BG
Per processor medium system POWER7 from Express	XZL49B
Per processor large system from Express	XZL5BG
Per processor large system POWER7 from Express	XZL69B

Software Maintenance

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

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.

The Software Maintenance programs and feature numbers for AIX Express, Standard, and Enterprise Editions V7.1 have been previously announced and priced.

```
Program
number      Program description

5771-G90    SW Maintenance Registration/Renewal 1 Year
5771-G91    SW Maintenance After License Charge
5773-G90    SW Maintenance Regist/Renewal Support 3 Year

5771-SWM    SW Maintenance Registration/Renewal 1 Year
5771-ALC    SW Maintenance After License Charge
5773-SM3    SW Maintenance Regist/Renewal Support 3 Year

5771-AEZ    SW Maintenance Regist/Renewal Support 1 Year
5771-ALZ    SW Maintenance After License Charge
5773-AEZ    SW Maintenance Regist/Renewal Support 3 Year
```

The following SWMA features are upgrades from AIX Express V6 to AIX Standard and Enterprise Editions.

```
Upgrade from AIX Express 5771-G90 to 5771-SWM

                                              5771-SWM
                                              Upgrade
                                              to
                                              Feature
Description                                   number

Upgrade per processor core on small Reg       XZN847
Upgrade per processor core on small Renewal   XZN844
Upgrade per processor core on small Pwr7 Reg  XZN99F
Upgrade per processor core on small Pwr7 Renewal  XZN99G
Upgrade per processor core on medium Reg      XZP047
Upgrade per processor core on medium Renewal  XZP044
Upgrade per processor core on medium Reg Pwr7 XZP19F
Upgrade per processor core on medium Pwr7 Renewal  XZP19G
Upgrade per processor core on large Reg       XZP247
Upgrade per processor core on large Renewal   XZP244
Upgrade per processor core on large Pwr7 Reg  XZP39F
Upgrade per processor core on large Pwr7 Renewal  XZP39G


Upgrade from AIX Express 5773-G90 to 5773-SM3

                                              5773-SM3
                                              Upgrade
                                              to
                                              Feature
Description                                   number

Upgrade per processor core on small Reg       XZP55F
Upgrade per processor core on small Renewal   XZP55G
Upgrade per processor core on small Pwr7 Reg  XZP69C
Upgrade per processor core on small Pwr7 Renewal  XZP69D
Upgrade per processor core on medium Reg      XZP75F
Upgrade per processor core on medium Renewal  XZP75G
Upgrade per processor core on medium Reg Pwr7 XZP89C
Upgrade per processor core on medium Pwr7 Renewal  XZP89D
Upgrade per processor core on large Reg       XZP95F
Upgrade per processor core on large Renewal   XZP95G
Upgrade per processor core on large Pwr7 Reg  XZR09C
Upgrade per processor core on large Pwr7 Renewal  XZR09D
```

```
Upgrade from AIX Express 5771-G90 to 5771-AEZ
```

	5771-AEZ Upgrade to
Description	Feature number
Upgrade per processor core on small Reg	XZR247
Upgrade per processor core on small Renewal	XZR244
Upgrade per processor core on small Pwr7 Reg	XZR39F
Upgrade per processor core on small Pwr7 Renewal	XZR39G
Upgrade per processor core on medium Reg	XZR447
Upgrade per processor core on medium Renewal	XZR444
Upgrade per processor core on medium Reg Pwr7	XZR59F
Upgrade per processor core on medium Pwr7 Renewal	XZR59G
Upgrade per processor core on large Reg	XZR647
Upgrade per processor core on large Renewal	XZR644
Upgrade per processor core on large Pwr7 Reg	XZR79F
Upgrade per processor core on large Pwr7 Renewal	XZR79G

```
Upgrade from AIX Express 5773-G90 to 5773-AEZ
```

	5773-AEZ Upgrade to
Description	Feature number
Upgrade per processor core on small Reg	XZR95F
Upgrade per processor core on small Renewal	XZR95G
Upgrade per processor core on small Pwr7 Reg	XZS09C
Upgrade per processor core on small Pwr7 Renewal	XZS09D
Upgrade per processor core on medium Reg	XZS15F
Upgrade per processor core on medium Renewal	XZS15G
Upgrade per processor core on medium Reg Pwr7	XZS29C
Upgrade per processor core on medium Pwr7 Renewal	XZS29D
Upgrade per processor core on large Reg	XZS35F
Upgrade per processor core on large Renewal	XZS35G
Upgrade per processor core on large Pwr7 Reg	XZS49C
Upgrade per processor core on large Pwr7 Renewal	XZS49D

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.

Machine-readable materials are only available on DVD. To receive shipment of machine-readable materials, the order needs to include SPO 5692-A6P. The individual licensed program order (for example, 5765-G98) 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	AIX Express/Standard Edition V7.1 Base	2271
5692-A6P	AIX Express/Standard Edition V7.1 Update CD	2272
5692-A6P	AIX Express/Standard Edition V7.1 Exp Pack	2273
5692-A6P	AIX Enterprise Edition V7.1 Base	2274
5692-A6P	AIX Enterprise Edition V7.1 Update CD	2275
5692-A6P	AIX Enterprise Edition V7.1 Exp Pack	2276
5692-A6P	AIX Profile Manager	2270

Basic machine-readable material

Select one of the following priced feature numbers for media type under 5692-A6P.

New media type available on SPO 5692-A6P.

Media type	Media feature number	Media process charges feature number	
DVD	3435	1100	Media Charge
DVD	3435	1101	Media No-charge

Documentation

The amount of translation varies by language. Translated softcopy documentation general availability varies by language and manufacturing geography. Translations will become available, over time, as translations are released by language-specific country translation centers. The documentation is also available at

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

Preinstallation

The preinstallion option is only valid if accompanied by a hardware system order for the preinstalled AIX V7.1 operating system specifying the preinstallation option. AIX Express is not available for preinstallation.

It is recommended that backup media be chosen with preinstalled orders. Not all of the software offered under the licensed program will be preinstalled on the system disk. To take delivery of backup media, media feature 3435 must be specified. Software preinstalled on the hard disk does not include all of the function included on the media.

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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 International Program License Agreement, IBM International Passport Advantage® Agreement, and the IBM Agreement for Acquisition of Software Maintenance.

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IBM International Program License Agreement including the License Information document and Proof of Entitlement (PoE) govern your use of the program. PoEs are required for all authorized use.

This software license includes Software Subscription and Support (also referred to as Software Maintenance).

Agreement for Acquisition of Software Maintenance

The IBM Agreement for Acquisition of Software Maintenance (Z125-6011) agreement applies for subscription and support (also referred to as Software Maintenance) and does not require customer signatures.

These programs are licensed under the IBM Program License Agreement (IPLA) and the associated Agreement for Acquisition of Software Maintenance, which provide for support with ongoing access to releases and versions of the program. IBM includes one year of Software Subscription and Support with the initial license acquisition of each program acquired. The initial period of Software Subscription and Support can be extended by the purchase of a renewal option, if available. These programs have a one-time license charge for use of the program and an annual renewable charge for the enhanced support that includes telephone assistance (voice support for defects during normal business hours), as well as access to updates, releases, and versions of the program as long as support is in effect.

License Information form numbers

LC23-5092 IBM AIX Express Edition V7.1
LC23-5092 IBM AIX Standard Edition V7.1
LC23-5076 IBM AIX Enterprise Edition V7.1

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

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

http://www.ibm.com/support/handbook

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

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.

Authorization for use on home/portable computer

You may not copy and use this program on another computer without paying additional license fees.

Volume orders (IVO)

Yes. Contact your IBM representative.

Passport Advantage applies

No

Usage restrictions

Yes.

AIX Standard Edition and AIX Enterprise Edition are limited to a maximum partition size of 256 cores and 1,024 threads.

AIX Express Edition is limited to a maximum partition size of four processor cores and 8 GB of memory per core.

AIX Express Edition is limited to a maximum partition size of four processor cores and 8 GB of memory per core and does not include the AIX Profile Manager and Cluster Aware AIX capabilities.

Software Subscription and Support applies

Yes. All distributed software licenses include Software Subscription and Support (also referred to as Software Maintenance) 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 Subscription and Support 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 information systems (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, consult your IBM Software Support Handbook at

   http://www.ibm.com/support/handbook

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.

System i Software Maintenance applies

No

Variable charges apply

Yes

Educational allowance available

Yes. When ordering through the program number process, a 15% education allowance applies to qualified education institution customers.

Education Software Allowance Program applies when ordering through the program number process.

ESAP available

Yes, to qualified customers.

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

Prices

For all local charges, contact your IBM representative.

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http://www-03.ibm.com/financing/us/index.html

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Announcement countries

All European, Middle Eastern, and African countries.

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http://www.ibm.com/legal/us/en/

For the most current information regarding IBM products, consult your IBM representative or reseller, or visit the IBM worldwide contacts page

http://www.ibm.com/planetwide/

Corrections

(Corrected on September 14, 2010)
In the Overview section, the modification level of IBM PowerVM Workload Partitions Manager for AIX was changed from V2.2 to V2.2.1. The Limitations and Usage restrictions sections were revised.