

AIX®

“From Strength to Strength” A summary of upgrade benefits for AIX, Bonus Pack and Expansion Pack April 2001 Edition

This reference document summarizes the functional enhancements and new system support added at each update of AIX, the Bonus Pack, and the Expansion Pack. Information contained is for initial guidance only — the IBM Portable configurator for RS/6000® together with full announcement information should be used prior to any system orders being placed.

Upgrades within releases of AIX (e.g. 4.3.1 to 4.3.3) are available to licensed users at no additional license charge, while upgrades between versions (e.g. 4.3 to 5.1) are available for a license upgrade charge. Additional media charges may apply in some geographies. Software Subscription for AIX (5692-SSO) is available in some geographies to assist customers in maintaining software version and release currency. This offering includes base license and additional license upgrades in a one-year term agreement that helps enable management of software migration at a known cost.

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AIX History from Release to Release

AIX 5L for POWER Version 5.1 (Announced 17-APR-01, GA 04-MAY-01)

Scalability and Capacity

- Increased number of processors supported from 24-way to 32-way and memory support from 96 GB to 256 GB
- Workload Manager - accounting subsystem performing resource usage accounting per WLM class in addition to the standard accounting per user or group.
- Adds JFS2, a new file system type providing the capability to store 1 terabyte files. JF2 is the default file system for the 64-bit kernel

Networking Performance and Technology

- Dynamic Feedback Protocol (DFP) is a way to provide load statistics to a load manager (Cisco LocalDirector) so that load elements can be balanced by sending subsequent connections to servers that are more available
- Sendmail Version 8.11 adds multiple queues, memory-buffered pseudo-files and more control over resolver time outs
- TCP/IP performance over congested networks is improved through increased initial windows, explicit congestion notification and limited transmit mechanism functions which are configurable by a system administrator
- Adds TCP splicing which helps push the data relaying function of a proxy application into the kernel
- New Network Interface Takeover option which allows the configuration of multiple adapters such that one or more may be designated as a backup
- Adds Token Ring emulation support for the AIX Multiple-Protocol Over ATM (MPOA) which provides improved management of an ATM LAN Emulation network by combining multiple edge routers into a single router image
- Adds MPOA IP packet fragmentation support
- Adds enhancements to the ATM LANE and MPOA statistics and trace tools to improve serviceability
- Virtual LAN (VLAN) provides the ability to connect multiple physical LANs or segment physical LANs into virtual LANs
- Adds Gigabit EtherChannel support - providing the functionality to aggregate a bandwidth of multiple Ethernet interfaces

Reliability, Availability & Serviceability (RAS)

- New core dump naming - saving as many core dumps as systems allow.
- Enhancement to the dd command - writing data to multiple tapes.
- Support for ANSI terminal

- Kernel debugger enhancements
 - Disable paging of long outputs
 - Print threads and processes in a long format when the entire table is printed
 - User command aliases
 - Have multiple commands on a single line

System Security

- AIX LDAP security audit plug-in - providing an additional audit service to the IBM SecureWay Directory server within the AIX audit system.
- Pluggable Authentication Mechanism - supporting the need for a native AIX implementation of the X Single Sign-On (XSSO)/Pluggable Authentication Mechanism (PAM)

System Management

- Reliable Scalable Cluster Technology (RSCT) provides the capability for an administrator to monitor system resources including file systems, programs, processors, adapters, and kernel information. These resources can be monitored around the clock and automatic responses run if resource values reach certain levels or thresholds
- Enhancements to the Input Method Editor for the GBK locale
- Adds Korean 103 keyboard support
- Additional ISO8859-15 locales are added into the code set so that certain countries that are not part of the European Monetary Union (EMU) may still conduct business with EMU countries.

Interoperability

- In conjunction with the AIX Toolbox for Linux Applications packaged on separate media, new Application Program Interfaces (APIs) are added to AIX so that recompiled Linux applications using these routines do not have to supply their own libraries
- AIX Fast Connect Version 3.1.0 is available as a licensed program providing file and print services for Windows and OS/2 clients on AIX

Graphics Enhancements

- OpenGL on GXT4000P and GXT6000P supports 64-bit direct window access (DWA) - boosting performance for 64-bit OpenGL applications by allowing them to use the OpenGL protocol directly rather than going through the Xserver and GLX Extension.

Base / Standards

- The argument list limit is increased from 24K to 512K allowing users to specify a higher limit for their applications
- The number of concurrent groups per process has been increased from 32 to 64 - greater flexibility in classifying and protecting system resources.
- Extensible Markup Language (XML) parser for Java, Version 3.1.1

Development Tools & Performance

- Performance Analysis tools included in AIX base - new tools or enhancements to existing tools
 - wlmmn - a new tool, a Java-based graphical user interface for generating trend report on the last 24-hours of WLM activity by resource.
 - PERSTAT API - a new set of APIs, providing easy access to kernel performance metrics
 - tprof - enhancement to existing tool, supporting the profiling of Java applications through the Java Virtual Machines Performance Interface (JVMPi)
- Performance Toolbox Version 3.0 is available as a licensed program.
- Enhancements to dbx
 - Enhancements to the POSIX threads debug library
 - Locks owned by a particular thread or process
 - Resources a thread is waiting for
 - Information on fork and cleanup handlers registered to a user thread
 - Pthread signal contexts

AIX 5L for POWER Version 5.0 (Announced 17-OCT-00, PRPQ #P91191 24-OCT-00)

Scalability and Capacity

- Adds new scalable full 64-bit kernel capable of supporting increased system resources and larger application workloads on 64-bit hardware
- Adds scalable application binary interface (ABI) for 64-bit applications. Scalable ABI is supported by the 32-bit kernel as well as the 64-bit kernel
- AIX Workload Manager is enhanced to provide system resource management to include:
 - ♦ Disk I/O Bandwidth control in addition to existing CPU resource and memory control
 - ♦ Application Programming Interface (API) enables external applications to modify system behaviors
 - ♦ Manual reclassification of processes independent of the classification rules
 - ♦ More application isolation and control
 - ♦ Fully dynamic operation allows entire configuration to be changed while it is running
- Very large program support for 32-bit "maxdata" programs
- Very large file support handles files larger than 2GB

System Security

- Native Kerberos V5 KDC Server/Client support
- IBM SecureWay® Directory Version 3.2 with fine-grained access control, performance enhancement, event notification support, security audit support, transaction support and Kerberos V5 support

Network Security

- Implementation of the cryptographic API PKCS#11 version 2.01 which is enhanced to utilize future IBM cryptographic hardware devices through the same shared library
- Internet Key Exchange (IKE) protocol to provide Virtual Private Networking (VPN) support is enhanced to enable the use of Certificate Revocation Lists (CRLs), simplify initial IKE tunnel definition, simplify the configuration of networks utilizing dynamic IP addresses and include IP Version 6 protocols
- Name resolver routines are enhanced to include resolving host names through a LDAP (Lightweight Directory Access Protocol) server

Networking Performance and Technology

- IP Multipath Routing is added to allow users to specify multiple routes to a destination and specify multiple default gateways while auto detecting failure of "next hop" gateways listed in its route cache and routing data through alternate gateways
- New program interfaces (APIs) provided by Fast Response Cache Architecture (FRCA) permit web serving through the kernel reducing path length for e-business applications
- Packet Capture Library APIs are added permitting users to write applications that monitor or capture network traffic they wish to examine
- Virtual IP Address (VIPA) allows administrators to define a host virtual IP address and decouple the address associated with physical interfaces. Helps user connection remain available if interfaces go down
- Quality of Service Phase II permits policy addition, removal, modification, listing and prioritization from the command line

Reliability, Availability and Serviceability (RAS) / Storage

- New command function (shdaemon) provides SMIT-configurable mechanism to detect system hangs and initiate configured action
- Error log is enhanced to detect consecutive duplicate errors and report number of occurrences of the error
- Automatic dump analysis tool helps early diagnosis of problems through auto retrieval of dump data which is forwarded as an e-mail attachment
- Error log retrieval API for diagnostics permits error reports to combine error and diagnostics analysis
- Dump reliability improvements help ensure that system dumps are consistent and reliable
- Capability to generate application core files without requiring application termination helps increase application availability and serviceability
- Logical Volume Manager (LVM) scalability is improved to allow variable Logical Track Group (LTG) sizes at volume group creation time
- Mirror Write Consistency (MWC) handling may be accomplished by either an active or passive method
- Hot spare disk support and hot spot management support in LVM help increase availability of data
- Enhancements and additions to development and performance analysis tools. Includes support for tracing system calls, Inventory Scout and identifying sources for performance degradation

System Management

- Web-based System Manager is enhanced to include:
 - ♦ New unified management console capable of managing multiple hosts

- ♦ Improved scalability of the graphical user interface with features to handle large numbers of managed objects
- ♦ Simplified logon with customizable preferences for administrators
- ♦ Resource Monitoring and Control (RMC) subsystem supports dynamic status updates, e-mail notification and unattended responses to system events
- Web-based System Manager application plug-ins include function of prior releases with new functions and enhancements
- Added basic support and enablement for Hindi characters

Interoperability

- AIX Fast Connect Release 3.0 adds file and print serving for Windows and OS/2 clients while supporting the SMB/CIFS protocol using TCP/IP

Base / Standards

- IBM AIX Developer Kit, Java™ 2 Technology Edition, Version 1.3.0
- Optional buckets-based extension of the default memory allocator (Malloc) helps improve performance of applications that issue large numbers of small allocation requests
- UNIX System V Release 4 file spooling subsystem is available as an option
- New /proc file system helps administrators more easily review system processes and workloads

AIX 4.3.3 Update (Announced 17-APR-01 GA 20-APR-01)

- **Additional IBM UNIX Systems Supported*****
 - ♦ IBM @server pSeries 620 Model 6F1 Server
 - ♦ IBM @server pSeries 660 Model 6H1 Server

Other

- Maintenance tuning of Workload Manager
- Support for a broad range of I/O adapters for graphics, storage, networking and secure communication
- Bonus Pack* updated

AIX 4.3.3 Update (Announced 03-OCT-00, GA 13-OCT-00)

- **Additional IBM UNIX Systems Supported*****
 - ♦ 7026-B80 rack-optimized high density server
 - ♦ 7017-S85 high performance enterprise server

Other

- Support for new GXT4000P and GXT6000P 3D Graphics Accelerators
- AIXLink (X.25 LPP): AIX 4.3.3 update enables more than 8 adapters
- Support for a broad range of I/O adapters for storage, networking and secure communication
- Bonus Pack* updated

IBM AIX Developer Kit , Java™2 Technology Edition, GA Version 1.3.0 available for download from

- www6.software.ibm.com/dl/dka/dka-p

AIX 4.3.3 Update (Announced 07-FEB-00, GA 12-FEB-00)

- IBM eliminated additional user charges for the AIX operating system. RS/6000 systems will now come standard with an unlimited user license for the current release of AIX. Also, with this announcement, existing AIX V4 user licenses allow an unlimited number of users, and release upgrades from AIX 3.2, 4.1 and 4.2 to AIX 4.3 will now be for unlimited users. Customers upgrading AIX on their SP systems now use the same upgrade feature as other RS/6000 models, ordering one upgrade for each SP node on which the new level of AIX will be installed. Existing AIX Software Subscription customers are now entitled to unlimited users.
- AIX 4.3, recommended maintenance level 4330-02/APAR IY06844
 - ♦ Additional Workload Manager (WLM) functionality including classification of existing processes (no longer a need to stop and restart applications when stopping and restarting WLM), passive mode (WLM classifies all processes and gathers statistics about their resource usage, but does not regulate resource allocation), and management of application file names (ending restrictions on starting WLM).
 - ♦ Dynamic CPU Deallocation supported on Models S80, 270, and 375 MHz POWER3 SMP Thin/Wide Nodes.
 - ♦ PCI hot-plug support for a broad range of PCI adapters in the SP Expansion I/O Unit.

Download of IBM AIX Developer Kit, Java™ 2 Technology Edition, Version 1.2.2 for AIX Version 4.3.3 from the IBM Java Developer Kit site (Announced 22-Dec-99)

- <http://www6.software.ibm.com/dl/dka/dka-p>

AIX 4.3.3 Update (Announced 02-Nov-99, GA 05-Nov-99)

- Bonus Pack* updated

AIX 4.3.3 (Announced 13-Sep-99, GA 17-Sep-99)

Scalability and Capacity

- Doubling of number of processors supported from 12-way to 24-way and memory support from 32 GB to 64 GB
- Performance enhancements including a combination of improvements to processor performance, SMP Design, kernel scalability and cache hit rate
- AIX Workload Management system provides a policy-based method for managing system workload and system resources, including:
 - ◆ System resource allocation with fine granularity to specific jobs
 - ◆ Logical job separation on the server
 - ◆ Permits applications to remain in memory for more predictable performance
 - ◆ Resource targets and resource limits
 - ◆ Policies can be set by the system administrator once, with no further interaction required. The system will automatically apply the specified policies and adjust for changing conditions
 - ◆ Control options include minimum and maximum percentage limits, shares, or a combination of both

System Security

- AIX Directory Exploitation allows AIX user and group information to be optionally stored, replicated and retrieved in an IBM SecureWay® Directory for fast access (local or remote), expandability and reliability
- IBM SecureWay Directory 3.1.1 (an open, cross platform server, optimized to support Lightweight Directory Access Protocol-enabled applications that integrate enterprise systems)
- A port of the Sun Solaris 2 NIS+ network information management system is provided in addition to the current NIS support, which remains unchanged. This new naming service provides enhanced capabilities for security management in a distributed system environment
- Sendmail upgraded to V8.9.3 which features anti-spamming

Network Security

- User/group security information can be configured to reside in an LDAP directory, the IBM SecureWay Directory. Any number of AIX systems can be configured to retrieve the user/group information from the LDAP, thus sharing the common view and central administration of the user information for that "collection" of AIX systems.
- IP Security enhancements include:
 - ◆ Dynamic tunnels can be defined at one time then only activated when traffic matching criterion is sent or received, thus reducing overhead.
 - ◆ IKE (Internet Key Exchange) Tunnels can be created over multiple IP addresses
 - ◆ Web-based System Manager interface for filters and managing manual tunnels is now consistent across IP Security and is NLS enabled
 - ◆ Logic allows better tracing of the IP Security and IKE messages to better determine security attacks
 - ◆ Certificate-based use of Digital Signatures for IKE authentication scheduled to ship in November, 1999 through service
- AIX SOCKS API allows generic TCP/IP applications to connect to hosts through a generic TCP/IP proxy using V5 of the SOCKS protocol

Java™ Security

- The Security Migration Aid provides the more robust policy-based security model of the Java 2 platform in the Java 1 platform

Networking Performance and Scalability

- Increased the performance and scalability of e-business support with web serving acceleration, implementation of Cisco's EtherChannel, and Quality of Service (QoS) administration and support
- The Dynamic Host Configuration Protocol product has been enhanced with a programming interface to the DHCP server for user extension or third party software integration
- New kernel extension HTTP GET Engine enhances performance of web serving by serving web pages from the AIX network file cache
- New Dynamic Load Name Resolver APIs included in AIX 4.3.3 allow users to define their own Name Resolver module in addition to the existing Name Resolver methods such as local, DNS/Bind, NIS, and NIS+. Users can create a module which may have one or all the following five map types: services, protocols, hosts, networks and netgroup
- TCP/IP network interfaces support the new thread mode on SMP systems, which allows IP incoming packets to be queued and picked by threads, thus shortening interrupt time
- TCP connections tuned on a "per interface" basis in order to benefit from the unique characteristics of the network's physical layers

- ARP (Address Resolution Protocol) capability will propagate hardware address changes and let AIX manage duplicate IP address assignment
- TCP Checksum Offload for PCI Gigabit Ethernet Adapter along with zero copy network file cache capability will result in Non Data Touching (by CPU) architecture. This functionality should greatly benefit applications that transmit large blocks
- Path Maximum Transmission Unit (PMTU) discovery is now the default
- TCP Selective Acknowledgments (SACK) helps TCP recover from multiple packet losses within the TCP window
- Multiple-protocol over ATM (MPOA) provides improved management and performance of an ATM LAN Emulation network

Reliability, Availability and Serviceability (RAS) / Storage

- Central Service extended to 31 December 2003
- Improvement in system availability with support for concurrent striping and mirroring (RAID 0 + 1) in software
- Online Journal File System (JFS) backup will enable the backup of a mirrored file system while it is still in use
- The restriction that a dump device can not be a mirrored logical volume has been removed by allowing the dump to be written to and read from the primary mirror of a mirrored logical volume
- AIX treats system console messages as critical system information, logging them to a file with timestamps
- The file system, system dump processor, and other areas have been enhanced to make it easier to diagnose problems when they occur
- Enhanced AIX Diagnostic package with new Diagnostic Event Log.
- Diagnostic exerciser added for processors to enhance problem determination
- Enhancements to performance analysis tools, including support for workload management and upgrading of Performance Toolbox Agent (PTX) with the ability to process performance metrics by activity, rather than by a fixed name
- Enhancements to programming support including Replaceable Malloc, AIX support for KDB, Fast Single Instruction Patch and Pthread debug library
- AIX 4.3.3 includes an additional option with the sar command: the -d option will provide useful statistics such as throughput, average queue depth, etc.

System Management

- Enhanced ease of use capabilities including SMIT and Web-based System Manager interface support for: NIS+, IBM SecureWay Directory (directory exploitation — users and group information), Logical Volumes (RAID 0 + 1), AIX Workload Management, and Web QoS (Differentiated Services and RSVP). New web-based System Manager TaskGuides include Base Operating System (BOS) install, creating a system backup on CD-ROM, and software updates on both standalone AIX systems and RS/6000 SP systems
- Documentation library services which support the reading, navigating and searching of HTML documentation. AIX and customer written HTML documentation can be registered and used
- Support of AIX system backup (mksysb) onto recordable CDs
- AIX 4.3.3 provides some building blocks to begin to unite the install solutions across the RS/6000 family. Improvements are being put in place in the network installation manager (NIM) by adding scalability features such as replication of resources and improved NIM master process handling
- Perl 5, a popular free scripting language, ships with AIX. Perl is often used in system management tasks and for Web development
- Enhancements to National Language Support including IBM Internationalized Classes for Unicode and support for ISO8895-15
- Enhancements made to Taiwanese Input Method and Korean Input Method
- Addition of four new locales: Italian-Switzerland, English-Australian, English-Belgium and English-South Africa
- AIX 4.3.3 integrates various Japanese fixed fonts and Japanese printers support previously provided by separate LPP, Japan Kit V2 (5607-E30) which is available for Japan only

Interoperability

- AIX Fast Connect Release 2.1.1 for Windows and OS/2 includes integration with DCE/DFS.

Base / Standards

- IBM AIX Developer Kit, Java™ Technology Edition, Version 1.1.8

Graphics

- X11R6.3 — the “Broadway release” — allows a web server to run X Windows system client applications on a remote host
- GLX support of V1.3, the latest level approved by the OpenGL Architectural Review Board, available on GXT2000 & GXT3000 graphics adapters. New functionality includes rendering access to offscreen adapter memory and enhanced X visual and resource selection and management
- OpenGL performance enhancements, including improved positional lighting and additional extensions
- OpenGL applications thread enablement
- graPHIGS enhancements include improved CPU utilization during swaps, faster clipping, increased large program support and full input and output support of the Japanese IBM 943 encoding

Other

- Bonus Pack* updated
- **Additional RS/6000 Systems Supported*****
 - ◆ RS/6000 7017-S80 Enterprise Server S80
 - ◆ RS/6000 7046 Model B50

AIX 4.3.2 Update (Announced 08-Jun-99, GA 18-Jun-99)

- Bonus Pack* updated

AIX 4.3.2 Update (Announced 16-Mar-99, GA 26-Mar-99)

- AIX Fast Connect for Windows and AIX Fast Connect for OS/2 — separately priced higher-performance file and print features of AIX 4.3.2 or later that support Microsoft Windows 95, 98, and NT and/or OS/2 clients. Using AIX services for efficiency, scalability, and reliability with throughput among the fastest of the file and print servers commercially available on AIX.
- ISAKMP, also known as Internet Key Exchange (IKE), now supported under IPv4. IKE dynamically changes session keys for IP security tunnels. Available initially on IPv4 — not supported yet in IPv6.
- IPv6 Gateway capability now supported as well as IPv4. Routing and forwarding capabilities added to the host capability initially shipped.
- AIX 4.3.1 with B1/EST-X V2.0.1 from Groupe Bull is under evaluation at EAL4/F-B1 security level (Common Criteria V2.0). Groupe Bull B1/EST-X Version 2.0.2 for AIX Version 4.3.2 is available as a PRPQ from IBM to complement the security features of AIX.
- AIX 4.3.1 TCSEC Evaluated C2 Security PRPQ is available to provide a US Department of Defense 5200.28.STD C2 evaluated version of AIX V4. This PRPQ is a specific offering of an operational subset of AIX 4.3.1 which has been evaluated.
- Tape media options for new-products/upgrades withdrawn 18-Jun-99 for AIX products (except RS/6000 SP products announced on tape only).
- Note: On 18-Jan-99, AIX 4.3.1 was certified at C2 Security level of trust, assessed under rigorous standards in accordance with TCSEC.
- Bonus Pack* updated

AIX 4.3.2 Update (Announced 01-Dec-98, GA 11-Dec-98)

- Bonus Pack* updated

AIX 4.3.2 (Announced 05-Oct-98, GA 23-Oct-98)

- Scaleability is significantly enhanced in a number of complementary functions:
 - ◆ 32 GB of real memory tested and supported on 64-bit SMP servers.
 - ◆ Deferred paging space algorithm significantly decreases paging space required with large physical memory.
 - ◆ Maximum networking buffer pool (thewall) from 128 MB to 1 GB.
 - ◆ Maximum data space for kernel data from 256 MB to 512 MB.
 - ◆ Message queues, semaphores, and shared memory regions from 4,096 to 131,072 each.
 - ◆ LVM maximum disks in Volume Group (VG) from 32 to 128, maximum logical volumes in VG from 256 to 512. Up to 130,048 physical partitions per VG (relaxes 1,016 LVM partitions limit).
 - ◆ Improved scheduler responsiveness to control in managing heavy CPU users on heavily loaded systems — scheduler treats value of the AIX “nice” command as directive instead of suggestion.
 - ◆ ODM database enables up to 1,000 device configurations.
 - ◆ Print queue management now has six digit job numbers.
 - ◆ Enhancements made in base operating system to improve Java performance, scaleability, and robustness.
- Lightweight Directory Access Protocol (LDAP) upgraded to V2.1 with enhancements in these major areas:
 - ◆ DB2® V5 included for use of the directory data storage facility

- ◆ Aliases now supported
- ◆ Concept II GUI
- ◆ Web servers Apache, Lotus Domino Go, Netscape FastTrack and Netscape Enterprise supported for LDAP administration
- ◆ Improved search and ACL support
- ◆ Improvements to scaleability, replication and performance
- ◆ Millions of entries supported with peak sub-second response time for searches
- Binder library (libld.a) supports operations on 32-bit objects from 64-bit applications and on 64-bit objects from 32-bit applications.
- Networking subsystem enhanced:
 - ◆ New PCI network device drivers
 - ◆ Automatic memory of mapping from virtual addresses to physical addresses for entire networking buffer pool
 - ◆ “Zero copy network file cache” send_file reuses cached data
 - ◆ “Thundering herd” wasted CPU cycles problem overcome
 - ◆ V6.0 of Merit GateD now supported in IPv4 and IPv6.
- LVM Online Mirror Backup enhanced with concurrent mode support (when using HACMP™) together with special device file support for the designated online backup copy that allows filesystem access and access using standard commands and programming interfaces.
- Network Installation Manager (NIM) enhanced for system installations and customizations of NIM groups - allowing a limit for machines being installed/customized at a single time and a time limit for processing.
- Standard AIX messaging facility can be used for 1,000 byte NLS-enabled messages in error log templates.
- TTY remote reboot allows systems administrator to reboot a remote system.
- RS/6000 Welcome Center enhanced in content with interface options for boot sequence assistance and day-to-day use. Optional areas such as the arcade demonstration may be uninstalled to reclaim disk space.
- HTML-based configuration applications can be launched from AIX Web-based System Manager interface via command line or AIX-supplied GUI.
- Application added to Web-based System Manager interface to format/certify some hard disks and read-write optical media, and run hardware problem determination.
- “Tivoli Ready” capabilities when Tivoli Management Agent (TMA) installed from Bonus Pack.
- Error log analysis allows specification of previous days to analyze from 1 to 60 days.
- BIND package is upgraded to V8.1.2.
- C++ Runtime V3.6.4 included
- JDK V1.1.6 with the IBM JIT Compiler V3.0 includes euro currency symbol support and performance enhancements.
- Enhancements to graphics capabilities:
 - ◆ POWER GXT3000P™ 3D PCI Graphics Accelerator supported (using either OpenGL or graPHIGS)
 - ◆ OpenGL (V1.1 and 1.2) and graPHIGS have been enhanced to improve performance in several areas, especially rendering of primitives.
 - ◆ OpenGL has added support for OpenGL V1.2 (only on the GXT3000P) and new extensions: MultiDraw Array, Texture Mirrored Repeat, and Color Blend.
 - ◆ Virtual Frame Buffer rendering now supported on the SP.
- AIX 4.3.2 is EuroReady and respects the euro currency formatting conventions, including the euro symbol.
 - ◆ Strategic euro currency symbol support based on new Unicode locales. Microsoft code page 1252 (extension of Latin-1 ISO 8859-1) euro currency symbol supported as a single byte migration option.
 - ◆ Supplied locales include keyboard definitions using the euro currency symbol. Tools and facilities provided for customers to create their own custom locale.
- Unicode - equivalent set (to existing AIX locales) of locales based on UTF-8 (File System Safe Transformation Format for Unicode) provided.
- Code Page 943 provided to support interoperability with Microsoft Windows clients in Japan.
- AIX Documentation Search extended to add capability to search specified DBCS codesets in Japanese, Korean, Simplified Chinese, and Traditional Chinese.
- AIX 4.3.2 is Year 2000 ready.

- AIX 4.3.2 branded UNIX 98 by The Open Group: this mandates requirements to support standardized threads, real-time, large file system APIs, its Year 2000-ready, 64-bit clean, and architecturally neutral.
- AIX 4.3 re-evaluated and re-certified at the European E3/F-C2 security level with strength of mechanisms "high" according to ITSEC.
- AIX 4.3 has become first server operating system to receive ICSA VPN certification.
- Bonus Pack* updated

■ **Additional support for High Availability Cluster Multi-Processing (HACMP)**

- ◆ AIX 4.3.2 Supports HACMP 4.3 capabilities that include scaling to 32 nodes and the new RS/6000 Cluster Technology (RSCT), which allows customers to define their own high-availability events and become proactive with their clusters instead of just reactive. Developers can use this technology to make their applications more cluster-aware and take advantage of event monitoring and group services provided by HACMP 4.3.

■ **Additional RS/6000 Systems Supported*****

- ◆ RS/6000 701X-S7A Enterprise Server S70 Advanced
- ◆ RS/6000 43P Models 150 and 260 (7043-150, 7043-260) SP Systems supported natively by AIX 4.3.2

AIX 4.3.1 Update (Announced 23-Jun-98, GA 31-Jul-98)

- Bonus Pack* updated

AIX 4.3.1 (Announced 06-Apr-98, GA 24-Apr-98)

- Conforms to The Open Group UNIX98 Specification
- IEEE POSIX 1003.1-1996 (1003.1c) threads support, including M:N threads
- Web-based System Manager (full release)
- eNetwork™ LDAP Directory V1.1.1 (full release) supports up to 4 million directory entries
- Scaleability enhancements:
 - ◆ Total open files per system from 200,000 to 1,000,000
 - ◆ Open files per process from 2,000 to 32,767
 - ◆ Threads per process from 512 to 32,767 (M:N)
 - ◆ Maximum size for shared or mapped files from 256 MB to 2 GB
 - ◆ Mbuf size limit from 64 MB to 128 MB
 - ◆ IPSEC filtering from limited to unlimited rules
 - ◆ Threaded support makes DHCP server more scaleable.
- JDK V1.1.4 and IBM's JIT Compiler V2.01
- LVM online backup
- Streamlined JFS locking where two processes concurrently read different parts of the same file
- AutoFS
- Additional printer support
- IP Security enhancements
- Kerberos 5 authentication support for several TCP/IP commands
- NFS performance improvements
- Sendmail 8.8.8
- cm CP enhancements including support of classless interdomain routing (CIDR)
- Graphics enhance - 64-bit indirect rendering OpenGL support
- Graphics enhance - Virtual Frame Buffer rendering
- HTML-based publications can be mounted and installed
- Additional value added to AIX 4.3.1 base (content varies by geography): IP security (IP Sec), LDAP with DB2, Concurrent IPv6 and IPv4, Stand-alone performance tools, Mountable publications, JDK and JIT compiler, Systems Management
- Bonus Pack* updated

AIX 4.3 (Announced 06-Oct-97, GA 31-Oct-97)

- Program number 5765-C34
- 64-bit hardware and application support
- 32-bit/64-bit application coexistence and concurrent execution
- Binary compatibility with AIX 3.2.5, 4.1 and 4.2.x environments
- Creation of 64-bit applications on all supported systems, execution/debugging of 64-bit applications on 64-bit hardware
- 16 GB Real memory support on RS/6000 S70
- Designed to support UNIX98
- Central service provided until 31 December 2001
- AIXwindows environment is upgraded to X11R6.1 and Motif 2.1

- OpenGL/GL 3.2 for AIX 4.3 and PHIGS for AIX 4.3 included as part of base AIX V4.3 (PEX API removed and not supported)
- IP V6 support containing 128-bit IP addresses, dynamic autoconfiguration and redundant routing
- IP security supporting network authentication and encryption for IPv4 and IPv6 and IP filtering
- CacheFS from the ONC+ suite included
- Alternate disk installation for new release or maintenance level of AIX
- LVM creation of logical volumes in concurrent mode (performance of mirror resynchronization in concurrent mode improved)
- Tools, formerly in Performance Toolbox, now at no additional charge: bf, fdpr, filemon, fileplace, lockstat, netpmon, rrmss, stem, svmon, tprof
- Unicode enhanced with broader support for Unicode 2.0, Unicode TrueType font and Java 1.1 Unicode classes
- IBM AIX Developer Kit, Java Technology Edition, V1.1.2 with IBM Just-in-Time Compiler
- New Configuration Assistant providing a TaskGuide application
- Telnet server performance significantly improved
- Login performance significantly improved for very large numbers of user accounts
- Direct I/O supported bypassing the normal I/O buffers
- IBM Network Computer and Network Station™ Management support
- Network Station Manager support of "carry your environment"
- RS/6000 Welcome Center update themed "RS/6000 on Mars"
- Most RS/6000 online documentation libraries converted to HTML and provided on documentation CDs
- HTML documentation library and search support in base AIX can be used to support management of custom HTML documentation
- LDAP Directory V1.1 (as initial technology release)
- Web-based, Java-based System Manager (as initial technology release)
- Bonus Pack* included
- **Additional RS/6000 Systems Supported*****
 - ◆ RS/6000 701X-S70 Enterprise Server; 397 Desktop
 - ◆ SP Systems supported (in binary compatible mode only) on AIX 4.3 from 06-Mar-98
 - ◆ Note: ThinkPad® Power Series 7247-821, 7247-822, 7247-823, 7249-851, and Notebook 7249-860 — NOT SUPPORTED

AIX 4.2.1 Update (Announced 02-Nov-99, GA 05-Nov-99)

- Bonus Pack* updated

AIX 4.2.1 Update (Announced 13-Sep-99, GA 24-Sep-99)

- Bonus Pack* updated

AIX 4.2.1 Update (Announced 16-Mar-99, GA 26-Mar-99)

- Bonus Pack* updated

AIX 4.2.1 Update (Announced 01-Dec-98, GA 11-Dec-98)

- Bonus Pack* updated

AIX 4.2.1 Update (Announced 05-Oct-98, GA 23-Oct-98)

- Bonus Pack* updated

AIX 4.2.1 Update (Announced 23-Jun-98, GA 31-Jul-98)

- Bonus Pack* updated

AIX 4.2.1 Update (Announced 06-Apr-98, GA 24-Apr-98)

- AIX 4.2.1 to be withdrawn from marketing effective 31-Dec-99
- Normal program service will cease on 31-Mar-2000 (or 30-Jun-2000 for Scaleable POWERparallel® Systems "SP")
- Limited fee-based program service extension available beginning 1-Apr-2000 and ending no sooner than 30-Sep-2001**
- Bonus Pack* updated

AIX 4.2.1 Update (Announced 06-Oct-97, GA 31-Oct-97)

- Bonus Pack* updated

AIX 4.2.1 Update (Announced 26-Aug-97, GA 29-Aug-97)

- AIX V4 update CDs can be ordered under 5692-AIX product number
- Printer support for IBM Network Station on V4 update CD
- Bonus Pack* updated

AIX 4.2.1 Update (Announced 24-Jun-97, GA 27-Jun-97)

- Bonus Pack* updated

AIX 4.2.1 (Announced 15-Apr-97, GA 25-Apr-97)

- New terms, conditions and program number (5765-C34):

- ◆ Most RS/6000 systems include 1-2 user full-function AIX 4 at no additional charge
- ◆ Usage payment caps, above which users are no-charge, set for Processor Group: D5 = 40; E5, F5 and G5 = 80; P5 = 160
- NFS updated to include support for NFS V3, NFS over TCP, Multi-threaded NFS server, WebNFS, improved file locking and improved performance
- TCP/IP enhanced to support: Multicast IP routing, Path MTU Discovery for Internet Protocols, Multilink PPP, PPP BSD protocol data compression and PPP SNMP MIBS function
- Mail server enhanced to support POP3 and IMAP4
- Network Install Manager (NIM) supports software installation over ATM and TCP/IP-based networks
- Web browser diagnostic interface GUI allows remote diagnostic of AIX
- Native AIX security enhanced via Administrative Roles function
- A number of AIX system libraries are thread-safe
- Asynchronous I/O supports greater than 2 GB of memory.
- Shared memory regions enhanced
- IBM Network Station supported as network boot server, dynamic network configuration server, and emerging application servers
- Bonus Pack* updated
- **Additional RS/6000 Systems Supported*****
 - ◆ J50, R50, F40, F50, H10, 140, 240, F3L

AIX 4.2 Update (Announced 08-Oct-96, GA 22-Nov-96)

- Program Services for AIX 4.2 and Ultimedia Services V2.1 (when running with AIX 4.2) extended to 31 December 1999
- Run-time components for run-time linking, dynamic module handling and Shared Library Hookable Symbols PRPQ included
- Bonus Pack* updated
- **Additional RS/6000 Systems Supported*****
 - ◆ 595; 166 MHz 604e processor for Models E20, E30, F30, and 43P (Models 100, 120, 132)
 - ◆ SP Systems supported on AIX 4.2 from 17-Dec-96

AIX 4.2 (Announced 23-Apr-96, GA 17-May-96)

- Program number 5765-655 (later superseded by 5765-C34)
- Data Files greater than 2 GB
- Program executables greater than 256 MB
- Designed for device support up to 1 terabyte.
- Dynamic loading APIs
- LVM and CLVM functions merged
- Supports XOpen's UNIX95 (Spec 1170)
- Central service provided until 31 December 1999
- Common Desktop Environment 1.0 (CDE) X/Open branded
- Graphical Workspace Manager enhances CDE usability and management.
- X Window System XTEST Extension allows automated testing
- NIM enhanced to manage groups of logically-related machines and resources
- System backup image over the network using NIM
- SMIT screens assist NIM in software installation/maintenance
- Albanian, Estonian, Latvian and Lithuanian language support
- Traditional Chinese Code Page 950 (Big5) support
- PPP Authentication support
- Network Time Protocol
- Sendmail update to V8.7
- Async supports speeds on native serial ports up to 115.2 Kbps
- Entry Client Package — reduced function client at lower price.
- Bonus Pack* included

AIX 4.1.5 Update (Announced 06-Apr-98, GA 24-Apr-98)

- AIX 4.1.5 to be withdrawn from marketing effective 31-Dec-98
- Normal program service will cease on 31-Mar-99 (or 30-Sep-99 for Scalable POWERparallel Systems "SP")
- Limited fee-based program service extension available beginning 1-Apr-99 and ending no sooner than 31-Jan-2001**
- Value Option* updated

AIX 4.1.5 Update (Announced 06-Oct-97, GA 31-Oct-97)

- Value Option* updated

AIX 4.1.5 Update (Announced 26-Aug-97, GA 28-Aug-97)

- IBM AIX Developer Kit, Java Technology Edition, V1.1.2, with IBM's JIT compiler included
- AIX 4 Update CDs can be ordered under 5692-AIX product number
- Printer support for IBM Network Station on AIX 4 update CD

AIX 4.1.5 Update (Announced 15-Apr-97, GA 25-Apr-97)

- New terms, conditions and program number (5765-C34):
 - ◆ Most RS/6000 systems include 1-2 user full-function AIX 4 at no additional charge
 - ◆ Usage payment caps, above which users are no-charge, set for Processor Group: D5 = 40; E5, F5 and G5 = 80; P5 = 160
- Value Option* updated

AIX 4.1.5 (Announced 08-Oct-96, GA 08-Nov-96)

- Program Services extended to 31 December 1998
- Run-time components for run-time linking, dynamic module handling and Shared Library Hookable Symbols PRPQ included
- RS/6000 Welcome Center optionally pre-installed
- Value Option* introduced
- **Additional RS/6000 Systems Supported*****
 - ◆ 595, F40, 140, 240, Notebook 860; 166 MHz 604e Processor for E20, E30, F30, and 43P (Models 100, 120, 132)

AIX 4.1.4 (Announced 10-Oct-95, GA 20-Oct-95)

- Asynchronous PPP and DHCP protocols
- TCP/IP Point-to-Point Protocol (PPP)
- TCP/IP Dynamic Host Configuration Protocol (DHCP)
- Diskless/dataless support of RS/6000 40P
- Double Buffer Extension V1.0 (DBE) for X-Windows
- **Additional RS/6000 Systems Supported*****
 - ◆ E20

AIX 4.1.3 (Announced 19-Jun-95, GA 07-Jul-95)

- Further performance tuning for the G30, J30, and R30
- Support added for 6-way and 8-way J30 and R30 systems
- Data Link Protocol Interface - LLC type 2 function
- Extends concurrent users from 2 to 16 users for base server licenses on Processor Group D5
- CDE includes Development Environment plus fully supported Mail, Calendar, and Terminal Emulator
- AIX CDE 1.0 is default graphical interface for AIX V4.1.3.
- Simplified Chinese and Catalan languages
- Base services of DCE and DFS now included:
 - ◆ DCE Client Configuration Runtime, DCE Client Security Runtime, DCE Client Cell Directory Services Runtime, DCE Client Time Services Runtime, DCE Client RPC Runtime, DCE Client Time Zone Runtime, DCE Client Administration Runtime, DCE Distributed File System (DFS) Base Services
- **Additional RS/6000 Systems Supported*****
 - ◆ Personal Computer Power Series 800; ThinkPad Power Series 850 and 820; 42T, 42W, C20 and 43P Series (Models 100, 120, 132)
 - ◆ SP Systems supported on AIX 4.1.3 from 18-Aug-95

AIX 4.1.2 (service update only)

AIX 4.1.1 (Announced 04-Oct-94, GA 28-Oct-94)

- Software support for SMP hardware
- Brazilian Portuguese language support
- Full international language support
- **Additional RS/6000 Systems Supported*****
 - ◆ G30, J30, R30

AIX 4.1 (Announced 26-Jul-94, GA 12-Aug-94)

- Program number 5765-393 (later superseded by 5765-C34)
- Support for greater than 2 GB file systems
- JFS fragmentation and compression
- Disk Striping available in LVM
- Security improvements including enhancements to password management and login controls
- Performance analysis and monitoring tools
- Network Install Manager (NIM)
- Many components automatically installed via hardware detection
- Systems Object Model (SOM) Base Toolkit included

- National Language Support enhancement
- Improvements to loader, binder, and linker functions
- AIX kernel threads included enabling SMP capabilities
- TTY function changed to a streams base
- FDDI function included (previously ordered separately)
- Functions packaged (previously charged for): X Station Manager, AIXwindows 2D
- New GUI based on the Common Desktop Environment
- Migration tools to assist in migrating from AIX 3.2
- Standards compliance now includes: POSIX 1003.1, POSIX 1003.2, POSIX 1003.4a Draft 7 and XPG4

AIX 3.2.5 (Announced 21-Sep-93, GA 15-Oct-93)

- Program number 5756-030
- AIX Version 3 original announce date 15 February 1990
- Withdrawn from marketing 31 January 1997
- Central service ended 31 December 1997
- AIX 4 is supported on all adequately configured RS/6000 systems except:
 - ◆ RS/6000 7016 POWERserver® Model 730
 - ◆ RS/6000 7007 Notebook Workstation Model N40
 - ◆ POWERnetwork Dataserver 7051
 - ◆ RS/6000 7249 Models 851 and 860
 - ◆ RS/6000 7247 Models 821, 822, and 823

AIX Expansion Packs and Bonus Packs

AIX Expansion Packs (beginning with AIX 5L) and Bonus Packs (named "Value Option" on AIX 4.1.5) complement the AIX product offering. One of each is delivered at no additional charge when IBM @server pSeries and IBM RS/6000 systems are ordered with media. Expansion Packs or Bonus Packs can be ordered or updated separately for existing AIX licensees for a modest media refresh charge. You benefit from packaged software and additional value for AIX. Updated versions are published with new releases of the contents. Expansion Pack and Bonus Pack announcements and shipments are not tied to AIX. Their content can vary by country or geography.

Typical releases include:

- Development tools
 - Software supporting e-business
 - Interoperability
 - Browsers
 - Java and Internet application development
 - Evaluation software
 - Network management utilities
 - Country-specific security encryption
-

Expansion Pack and Bonus Pack History from Release to Release

AIX 5L for POWER Version 5.1 New (Announced 17-Apr-01, GA 04-May-01)

Expansion Pack* included edition '04/2001'

- AIX Certificate and Security Support V4.0
- AIX Certificate and Security Support V5.0
- Data Encryption Standard Library Routines for AIX V5.1
- IBM HTTP Server Version 1.3.12.2
- IP Security V5.0
- Netscape® Communicator™ 4.76
- Network Authentication Service Version 1.1
- Encryption support for IBM SecureWay Directory Services V3.2.1
- Tools to build secure Java applications
- Web-based System Manager Security V5.1

AIX 5L for POWER Version 5.1 New (Announced 17-Apr-01, GA 04-May-01)

Bonus Pack* included edition '04/2001'

- Adobe® Acrobat® Reader 4.05
- Chinese Simplified, Chinese Traditional, Korean font packs for Adobe Acrobat Reader
- AIX Fast Connect Version 3.1.0.0, Evaluation Software
- SCO Tarantella® Version 1.4.1, Evaluation Software

AIX 4.3.3 Update (Announced 17-Apr-01, GA 20-Apr-01)

Bonus Pack* updated to edition '04/2001'

- Tools to build secure Java applications added
- Chili!Soft ASP™ Evaluation Software updated to Version 3.6
- Netscape® Communicator™ updated to 4.76
- IBM HTTP Server updated to Version 1.3.12.2
- AIX Certificate and Security Support updated to Version 4.0
- Geodesic Systems Great Circle® Enterprise Evaluation Software updated to Version 4.1.1.0
- SecureWay Directory updated to Version 3.2.1
- Encryption for IBM SecureWay Directory Services updated to V3.2.1

AIX 4.3.3 Update (Announced 05-DEC-00, GA 08-Dec-00)

Bonus Pack* updated to edition '12/2000'

- System V Commands and Tools for AIX V1.0 added
- Adobe® Acrobat® Reader updated to 4.05
- Chinese Simplified, Chinese Traditional, Korean font packs for Adobe Acrobat Reader added

- Netscape® Communicator updated to 4.75
- Removed Novell Network Services 4.1 for AIX, Version 2.2.2, Evaluation Software
- Supplemental CD with Oracle8i Server 30 day trial software removed 05-Jan-01
- Tivoli® Management Agent V3.2 Service End Date extended to 30-Jun-01

AIX 4.3.3 Update (Announced 03-Oct-00, GA 13-Oct-00)

Bonus Pack* updated to edition '10/2000'

- IBM SecureWay Directory Services V3.2 added
- Encryption for IBM SecureWay Directory Services V3.2 added
- Network Authentication Service V1.1 added
- WebSphere® Application Server, Standard Edition updated to V3.5
- IBM HTTP Server updated to V1.3.12
- IBM AIX Developer Kit, Java™2 Technology Edition updated to V1.3
- IBM techexplorer Hypermedia Browser (Introductory Edition) updated to V3.0
- SCO Tarantella® Version Evaluation Software updated to V1.4.1
- Netscape® Communicator updated to 4.73
- Chili!Soft ASP™ V3.0 (Developer's Edition) updated to V3.0.4
- AIX Fast Connect, "Try and Buy" updated to V2.1.2

AIX 4.3.3 Update (Announced 20-Jun-00, GA 30-Jun-00)

Bonus Pack* updated to edition '6/2000'

- DB2® Universal Database™ and OLAP Starter Kits updated to V7.1 (Starter Kits are for unlimited development and testing purposes)
- Novell Network Services 4.1 for AIX, Evaluation Software V2.2.2 service extended to 31-Mar-01
- Removed VisualAge® for Java Entry V2.0.0.3

AIX 4.3.3 Update (Announced 18-Apr-00, GA 21-Apr-00)

Bonus Pack* updated to edition '4/2000'

- Feature Code for export of strong encryption added
- IBM AIX Developer Kit, Java™2 Technology Edition, V1.2.2 added
- Geodesic Systems' Great Circle, Eval. Software updated to V4.0.6.1
- SecureWay-SSL updated to V3.3
- AIX Fast Connect, "Try and Buy" updated to V2.1.1
- Netscape Communicator updated to 4.7
- Novell Network Services 4.1 for AIX, Evaluation Software updated to V2.2.2
- SCO Tarantella Version Evaluation Software updated to V1.4.0.8
- The Kernel Group ZeroFault Dynamic Debugger, Evaluation Software updated to V2.5

AIX 4.3.3 Update (Announced 02-Nov-99, GA 05-Nov-99)

Bonus Pack* updated to edition '9911'

- Netscape Communicator updated to 4.61
- Ultimedia Services updated to V2.3
- WebSphere Application Server updated to V3.0, Standard Edition with IBM HTTP Server updated to V1.3.6.1
- IP Security V4.3.3, 56-bit encryption worldwide including France
- SecureWay-SSL V3.3 (for use with IBM SecureWay Directory V3.1.1), 56-bit encryption worldwide including France
- SecureWay Directory Client Software Developer Kit (SDK) Encryption V 3.1.1 (for use with IBM SecureWay Directory V3.1.1, Software Developer Kit), 40-bit and 56-bit encryption worldwide including France
- IBM techexplorer Hypermedia Browser (Introductory Edition) updated to V2.5
- Syntax TotalNET Advanced Server V5.3, Evaluation **removed**

AIX 4.3.3 (Announced 13-Sep-99, GA 17-Sep-99)

Bonus Pack* updated to edition '9909'

- Chili!Soft ASP V3.0 (Developer's Edition) added
- SCO Tarantella V1.4.0.0 (evaluation software) added
- AIX Fast Connect (60 day evaluation software) updated to Release 2.1.1
- Netscape Communicator updated to 4.51
- DB2 Universal Database (evaluation software) updated to V6.1
- The Kernel Group ZeroFault Dynamic Debugger updated to V2.4 (Evaluation Software)
- Support for enhanced AIX Version 4.3.3 security functions

AIX 4.3.2 Update (Announced 08-Jun-99, GA 18-Jun-99)

Bonus Pack* updated to edition '9906'

- AIX Fast Connect V2.1 (60 day evaluation Software) added

- WebSphere™ Application Server V2.02, Standard Edition (with IBM HTTP Server V1.3.3) added
- GraphOn GO-Joe V2.2.0.0 and GraphOn GlobalHost V1.0.8.0 added
- Web-based System Manager V4.3.2 now available in France
- Java Media Framework updated to V1.1.0.1
- Novell Network Services 4.1 for AIX (evaluation software) updated to V2.2.1
- DCE Client V2.1 **removed**
- IBM WorkGroup Conferencing for AIX **removed**

AIX 4.3.2 Update (Announced 16-Mar-99, GA 26-Mar-99)

Bonus Pack* updated to edition '9903'

- Geodesic Systems Great Circle 3.1 (Try and Buy) added
- The Kernel Group ZeroFault Dynamic Debugger V2.3, Evaluation Software added
- Oracle8 Server, 30-Day Trial Software added as supplemental program
- VisualAge for Java Entry updated to V2.0.0.3 (EuroReady)
- IBM Java Media Framework (JMF) updated to V1.1.0.1
- IBM WorkGroup Conferencing for AIX updated to V1.1.0.3
- Netscape Navigator, with IBM techexplorer Hypermedia Browser Introductory Edition V2.0 plug-in, updated to 4.08
- Netscape Communicator, with IBM techexplorer Hypermedia Browser Introductory Edition V2.0 plug-in, updated to 4.08
- Ultimedia Services updated to V2.2.1.2

AIX 4.3.2 Update (Announced 01-Dec-98, GA 11-Dec-98)

Bonus Pack* updated to edition '9812'

- DB2 Universal Database V5.2 for AIX - Evaluation Software
- Java Media Framework V1.1
- Netscape Communicator 4.07 with IBM techexplorer Hypermedia Browser Introductory Edition V2.0 plug-in
- IBM WorkGroup Conferencing for AIX updated to V1.1.0.2
- Netscape Navigator, with IBM techexplorer Hypermedia Browser Introductory Edition V2.0 plug-in, updated to V4.07
- ADSTAR® Distributed Storage Manager (ADSM) for AIX **removed**

AIX 4.3.2 (Announced 05-Oct-98, GA 23-Oct-98)

Bonus Pack* updated to edition '9810'

- Tivoli Management Agent (TMA) V3.2 added
- techexplorer Hypermedia Browser Introductory Edition V2.0 plug-in added (packaged with Netscape Navigator)
- VisualAge® for Java Entry, V2.0 added (availability 12/98)
- Web-based System Manager Security V4.3.2 added
- WorkGroup Conferencing for AIX V1.1.0 added
- Netscape Navigator updated to V4.0.6
- Ultimedia Services (UMS) updated to V2.2.1
- TotalNET Advanced Server (TAS) Evaluation Software updated to V5.3
- Novell Network Services 4.1 for AIX Evaluation Software updated to V2.1.1
- Lotus Domino Go Webserver updated to 4.6.2.5
- Netscape Navigator V3.0.4 **removed**
- Netscape FastTrack Server V3 **removed 12/98**

AIX 4.3.1 Update (Announced 23-Jun-98, GA 31-Jul-98)

Bonus Pack* updated to edition '9807'

- Netscape FastTrack Server updated to V3
- Lotus Domino Go Webserver updated to 4.6.2.3
- ADSTAR Distributed Storage Manager (ADSM) for AIX, V3.1 Evaluation Software added
- Network Station Manager removed and replaced by Network Station Manager V1.3 available as a no-charge licensed program (5648-C05).

AIX 4.3.1 (Announced 06-Apr-98, GA 24-Apr-98)

Bonus Pack* updated to edition '9804'

- Adobe Acrobat Reader updated to 3.0.1
- Lotus Domino GO Webserver updated to 4.6.1
- Netscape Navigator updated to 3.0.4
- Netscape Navigator updated to 4.0.4
- Ultimedia Services updated to 2.2.0.1
- Novell Network Services 4.1 for AIX V2.2 added (Evaluation Software)
- Syntax TotalNET Advanced Server V5.2 added (Evaluation Software)

AIX 4.3 (Announced 06-Oct-97, GA 31-Oct-97)

Bonus Pack* included

- Ultimedia Services V2.2
- Adobe Acrobat Reader, V2.01
- Lotus Domino Go Webserver 4.6 (was IBM ICSS)
- Network Station Manager (NSM) V1.2
- DCE Client V2.1
- IP Security, 40-bit DES
- LDAP-SSL V3, 40-bit Encryption
- Netscape Navigator 4.0.3 (browser only)
- Netscape Navigator 3.0.3
- Netscape FastTrack Server 2.01

AIX 4.2.1 Update (Announced 02-Nov-99, GA 05-Nov-99)

Bonus Pack* updated to edition '9911'

- Netscape Communicator updated to 4.61
- Ultimedia Services updated to V2.3
- IBM techexplorer Hypermedia Browser (Introductory Edition) updated to V2.5
- Syntax TotalNET Advanced Server Version 5.3, Evaluation **removed**

AIX 4.2.1 Update (Announced 13-Sep-99, GA 17-Sep-99)

Bonus Pack* updated to edition '9909'

- IBM AIX Developer Kit, Java Technology Edition, updated to V1.1.8 with Just-in-Time updated to V3.1
- Netscape Communicator updated to 4.51
- DB2 Universal Database (evaluation software) updated to V6.1
- The Kernel Group ZeroFault Dynamic Debugger updated to V2.4 (Evaluation Software)

AIX 4.2.1 Update (Announced 16-Mar-99, GA 26-Mar-99)

Bonus Pack* updated to edition '9903'

- Geodesic Systems Great Circle 3.1 (Try and Buy) added
- The Kernel Group ZeroFault Dynamic Debugger V2.3, Evaluation Software added
- Oracle8 Server, 30-Day Trial Software added as supplemental program
- VisualAge for Java Entry updated to V2.0.0.3 (EuroReady)
- IBM Java Media Framework (JMF) updated to V1.1.0.1
- Netscape Navigator, with IBM techexplorer Hypermedia Browser Introductory Edition V2.0 plug-in, updated to 4.08
- Netscape Communicator, with IBM techexplorer Hypermedia Browser Introductory Edition V2.0 plug-in, updated to 4.08
- Ultimedia Services updated to V2.2.1.2

AIX 4.2.1 Update (Announced 01-Dec-98, GA 11-Dec-98)

Bonus Pack* updated to edition '9812'

- DB2 Universal Database V5.2 for AIX - Evaluation Software
- Java Media Framework V1.1
- Netscape Communicator 4.07 with IBM techexplorer Hypermedia Browser Introductory Edition V2.0 plug-in
- IBM AIX Developer Kit, Java Technology Edition, updated to V1.1.6
- Netscape Navigator, with IBM techexplorer Hypermedia Browser Introductory Edition V2.0 plug-in, updated to V4.07
- ADSTAR Distributed Storage Manager (ADSM) for AIX **removed**

AIX 4.2.1 Update (Announced 05-Oct-98, GA 23-Oct-98)

Bonus Pack* updated to edition '9810'

- Tivoli Management Agent (TMA), V3.2 added
- techexplorer Hypermedia Browser Introductory Edition, V2.0 plug-in added (packaged with Netscape Navigator)
- VisualAge for Java Entry, V2.0 added (availability 12/98)
- Netscape Navigator updated to V4.0.6
- Ultimedia Services (UMS), updated to V2.2.1
- TotalNET Advanced Server (TAS) Evaluation Software updated to V5.3
- Novell Network Services 4.1 for AIX Evaluation Software updated to V2.1.1
- Lotus Domino Go Webserver updated to 4.6.2.5
- IBM AIX Developer Kit, Java Technology Edition, updated to V1.1.6 with Just-In-Time updated to V3.0
- eNetwork LDAP Directory, updated to V2.1
- Netscape Navigator V3.0.4 **removed**
- Netscape FastTrack Server V3 removed 12/98

AIX 4.2.1 Update (Announced 23-Jun-98, GA 31-Jul-98)

Bonus Pack* updated to edition '9807'

- Netscape FastTrack Server updated to V3

- Lotus Domino Go Webserver updated to 4.6.2.3
- ADSTAR Distributed Storage Manager (ADSM) for AIX, V3.1 Evaluation Software added
- Network Station Manager removed and replaced by Network Station Manager V1.3 available as a no-charge licensed program (5648-C05).

AIX 4.2.1 Update (Announced 06-Apr-98, GA 24-Apr-98)

Bonus Pack* updated to edition '9804'

- Adobe Acrobat Reader updated to 3.0.1
- IBM AIX Developer Kit, Java Technology Edition, updated to V1.1.4 with IBM's JIT 2.01
- Netscape Navigator updated to 3.0.4
- Netscape Navigator updated to 4.0.4
- Ultimedia Services updated to 2.2.0.1
- Lotus Domino GO Webserver 4.6.1 added
- IBM eNetwork LDAP Directory V1.1.1 added
- LDAP-SSL V3 added
- Novell Network Services 4.1 for AIX, V2.2 added (Evaluation Software)
- Syntax TotalNET Advanced Server V5.2 added (Evaluation Software)
- Internet Connections Secure Server V4.2.1 removed

AIX 4.2.1 Update (Announced 06-Oct-97, GA 31-Oct-97)

Bonus Pack* updated

- Ultimedia Services updated to V2.2
- Network Station Manager V1.2 added
- Netscape Navigator 4.0.3 (browser only) added
- Netscape Navigator 3.0.3 updated

AIX 4.2.1 Update (Announced 26-Aug-97, GA 29-Aug-97)

Bonus Pack* updated

- IBM AIX Developer Kit, Java Technology Edition, updated to V1.1.2 and includes IBM's JIT compiler

AIX 4.2.1 Update (Announced 24-Jun-97, GA 27-Jun-97)

Bonus Pack* updated

- NLS support for Internet Connection Secure Servers V4.2
- IBM AIX Developer Kit, Java Technology Edition, updated to V1.1.1

AIX 4.2.1 (Announced 15-Apr-97, GA 25-Apr-97)

Bonus Pack* updated

- Netscape Navigator 3.0 supports German and French
- Netscape FastTrack Server updated to 2.0.1
- includes a 60-day evaluation copy of ADSM
- IBM Internet Connection Secure Server updated to V4.2
- Ultimedia Services updated to V2.1.6

AIX 4.2 Update (Announced 08-Oct-96, GA 22-Nov-96)

Bonus Pack* updated

- Ultimedia Services V2.1.5 with speech dictation included
- Netscape Navigator updated from V2.0 to V3.0
- Netscape FastTrack Server
- IBM AIX Developer Kit, Java Technology Edition, updated to V1.02 and includes IBM's Just-in-Time (JIT) compiler

AIX 4.2 (Announced 23-Apr-96, GA 17-May-96)

Bonus Pack* included

- IBM Ultimedia Services V2.1.4
- Netscape Navigator V2.01
- Sun's Java programming environment V.1.0
- Adobe Acrobat Reader V.2.1
- Netscape FastTrack Server
- IBM Internet Connection Secure Server (ICSS)

AIX 4.1.5 Update (Announced 06-Apr-98, GA 24-Apr-98)

Value Option* updated

- IBM AIX Developer Kit, Java Technology Edition, updated to V1.1.4 with IBM's JIT 2.01
- Netscape Navigator updated to 3.0.4
- Netscape Navigator updated to 4.0.4
- Ultimedia Services updated to V2.2.0.1

AIX 4.1.5 Update (Announced 06-Oct-97, GA 31-Oct-97)

Value Option* updated

- Ultimedia Services updated to V2.2
- Netscape Navigator updated to V3.0.3

AIX 4.1.5 Update (Announced 15-Apr-97, GA 25-Apr-97)

Value Option* updated

- Netscape Navigator 3.0 supports German and French
- 60-day evaluation copy of ADSM included
- IBM Internet Connection Secure Server updated to V4.2
- Ultimedia Services updated to V2.1.6

AIX 4.1.5 (Announced 08-Oct-96, GA 08-Nov-96)

Value Option* introduced

- IBM Ultimedia Services V2.1.5
- Netscape Navigator V3.0

Programs From Other Program Suppliers

The following programs contained in current AIX Expansion Pack or Bonus Pack are licensed under the terms and conditions of the program supplier:

- Netscape Communicator 4.76
- Adobe Acrobat Reader 4.05
- Geodesic Great Circle V4.1.1.0 , Evaluation Software
- The Kernel Group ZeroFault Dynamic Debugger V2.5, Evaluation SW
- GraphOn GO-Joe V2.2.0.0
- GraphOn GlobalHost V1.0.8.0
- Chili!Soft ASP V3.6 Developer's Edition
- SCO Tarantella V1.4.1, Evaluation Software

Trial software and evaluation software provided by program suppliers may contain a disabling device that will prevent it from being used at the expiration of the license

Limited Warranty

The following products are not warranted by IBM. Warranty, if any, is provided by the program supplier. IBM makes no warranties, express or implied, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose.

- Netscape Communicator 4.76
- Adobe Acrobat Reader 4.05
- Geodesic Great Circle V4.1.1.0 , Evaluation Software
- The Kernel Group ZeroFault Dynamic Debugger V2.5, Evaluation SW
- GraphOn GO-Joe V2.2.0.0
- GraphOn GlobalHost V1.0.8.0
- Chili!Soft ASP V3.6 Developer's Edition
- SCO Tarantella V1.4.1, Evaluation Software

Delivery Method Changes

This Table shows the status of selected AIX functions which changed delivery method from AIX 4.3.1 onwards.

(LPP= Licensed Program, BP = Bonus Pack, VO =Value Option)

Content	AIX 4.3.1+	AIX 4.2.1	AIX 4.1.5
■ IP security (IP Sec)	in base§	N/A	N/A
■ LDAP with DB2	in base & BP	N/A	N/A
■ Concurrent IPv6 & IPv4	in base	IPv4 only	IPv4 only
■ Stand-alone perf tools	in base	LPP	LPP
■ Mountable publications	in base	LPP	LPP
■ JDK and JIT compiler	in base & BP	BP	VO
■ OpenGL & PHIGS APIs	in base	LPP	LPP
■ Systems Management	Web+SMIT	SMIT	SMIT
■ Publications	HTML(base)	Private	Private
■ DCE 2.1 Client	BP	in base	in base
■ WorkGroup Conf'ing	BP (4.3.2)	N/A	N/A

(§) Was previously in the AIX 4.3.0 Bonus Pack

Notes:

* The AIX Expansion Pack and Bonus Pack are a collection of extra software included at no additional charge with purchases of AIX licenses when media is selected. Customers who already have AIX Expansion Packs or Bonus Packs may request current Expansion Packs or Bonus Packs by contacting their IBM Representative, IBM Business Partner or through Shop IBM. An additional media charge for Expansion Packs or Bonus Pack updates may be required in some countries.

** Customers may be asked to agree in advance to pay the prevailing AIX Support Line fees for researching and/or resolving the reported problem if it is determined that the reported problem is not an AIX Year 2000 problem.

All versions of AIX from 3.2.5 onwards can be made Year 2000 ready with the addition of the appropriate PTFs.

***New system support is only shown for the major release unless a specific update is also announced for previous releases. To keep this document to a manageable size, feature-level support information is generally not included.

Additional Summary Information

Volume Limits	AIX 4.3.1	AIX 4.3.2 and later
Max Disks in VG	32	128
Max Logical Volumes in VG	256	512
Max Physical Partitions per VG	32,512	130,048

4.3.1 & 4.3.2 factor	Partitions per disk	4.3.1 Max # disks	4.3.2 and later Max # disks
1	1016	17-32	65-128
2	2032	9-16	33- 64
4	4064	5- 8	17- 32
8	8128	3- 4	9- 16
16	16256	1- 2	5- 8
32	32512		3- 4
64	65024		1- 2

Physical Partitions per AIX 4.3.1 Volume Group Limit

= 32 x 1016 = 32,512 partitions

Physical Partitions per AIX 4.3.2 and later Volume Group Limit

= 128 x 1016 = 130,048 partitions

AIX 4.3 functions not supported on SP systems

- Alternate disk installation while AIX is running — this is a process that involves installing a mksysb (install) image onto an alternate disk using NIM or a mksysb tape. Customers planning on integrating an S70/S70 Advanced into an SP system will not be able to make use of this capability.
- C2 Security Evaluation - This is support for 64-bit system and auditing enhancements. It is supported on the SP system with limitations. These functions can only be invoked under a C2 predefined configuration. The SP system is not part of the evaluated system and therefore the new functions cannot be installed or invoked by SP programs. These functions are supported as part of the base AIX evaluated system.
- IPv6 - IPv6 is the next generation Internet Engineering Task Force (IETF) networking protocol that is becoming the industry standard network protocol for the Internet. IPv6 extends the maximum number of Internet addresses to handle the ever increasing Internet user population. No IPv6 networks (or IPv6 gateway capability via "gated") can be run on SP nodes. IPv6 should not be configured on S70/S70 Advanced systems that are to be integrated into an RS/6000 SP system.

Information Pointers

Detailed announcement information can be found via Offerings Information at www.ibm.com/ibm.com/. For information relating to versions of other IBM software products for AIX and the IBM @server pSeries and IBM RS/6000, please refer to the Availability List at www.ibm.com/servers/aix/products/ibmsw/list which is regularly updated. For general information, news and recent announcements concerning IBM @server pSeries and IBM RS/6000, visit the server home page at www.ibm.com/eserver/pseries.

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