



IBM US Announcement Supplemental Information

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Additional Product Information

Scalability and Capacity

64-bit Kernel

In addition to providing a 32-bit kernel, AIX® 5.1 offers a scalable, 64-bit kernel capable of supporting increased system resources and much larger application workloads on 64-bit hardware. The 64-bit kernel offers scalable kernel extension interfaces, allowing kernel extensions and device drivers to make full use of the kernel's system resources and capabilities.

The expanded capabilities of the 64-bit kernel improve the ability to run an expanding application workload on a single system. This ability is important for a number of reasons.

- First, data sharing and I/O device sharing are simplified if multiple applications can be run on the same system.
- Second, using more powerful systems will reduce the number of systems needed by an organization, reducing the cost and complexity of system administration.

Server consolidation and workload scalability will continue to require higher capacity hardware systems that support more memory and additional I/O devices. The 64-bit kernel is designed to support these requirements for years to come.

Kernel extensions and device drivers must be compiled in 64-bit mode to be loaded into the 64-bit kernel. The 64-bit kernel, combined with header files and libraries, provides the environment for porting and developing kernel extensions.

64-bit Application Scalability

AIX 5.1 provides a scalable ABI for 64-bit applications. This scalability:

- Is provided by changing the sizes of some fundamental data types for 64-bit applications
- Will allow these applications to take advantage of the expanded capabilities of the 64-bit kernel

The scalable 64-bit ABI is supported by the 32-bit kernel and the 64-bit kernel.

For example, the 64-bit kernel is designed to support file sizes larger than 1 terabyte. By using the scalable 64-bit ABI, 64-bit applications will be able to use existing interfaces to process these large files. To take advantage of the scalability improvements to 64-bit programs, all 64-bit programs and libraries must be recompiled for AIX 5.1. In addition, existing 32-bit kernel extensions and device drivers used by 64-bit applications may have to be modified in order to support the new 64-bit ABI.

Workload Manager Enhancements

Workload Manager is enhanced to:

- Provide the continuation of those functions required to manage subsets of workload
- Control subsets of total system resources
- Add more sophistication to the externals for categorization of work in the system and for the specification of policy
- Use an alternative approach to divide up system resources and schedule a portion of the installation's total workload against a subset of the system resources

Additional capabilities which, Workload Manager offers are:

- Disk I/O Bandwidth, a new resource type, is introduced in addition to existing resources such as CPU cycles and real memory.
- An API enables external applications to modify system behaviors.
- System administrators can manually reclassify processes independent of the classification rules.

This function enables multiple instances of the same application to exist in different classes. Using Application Tag API, applications can enable automatic assignment of multiple instances of the same application in different classes.

- More application isolation and control are offered.
 - New subclasses add ten times the granularity of control (from 27 classes to 270 controllable classes).
 - System administrators can delegate subclass management to users or groups.
- Now fully dynamic, Workload Manager allows an entire configuration to be changed while it is running.
- Application path name extends wild card flexibility to user name and group name.
- The Accounting subsystem, a new feature, allows users to perform resource usage accounting per WLM class in addition to the standard accounting per user or group.
- The AIX accounting system utility allows system administrators to collect and report the use of various system resources by user, group, or WLM class.
 - When process accounting is turned-on, AIX records statistics about the process resource usage in an accounting file when the process exits.

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The Kerberos authentication option is used for not only user authentication, but also used for the authentication option for Server replication.

Kerberos-based authentication enables LDAP applications and AIX 5.1 users to participate in a single-signon environment within the Kerberos realm. This enhancement will enforce network security by not transporting the password on the wire.

Kerberos authentication is used for authenticated referrals. This helps to secure/validate the LDAP referral operation by using Kerberos-based authentication.

By using Kerberos cross-realm authentication support, the LDAP application can establish a transient trust with already established Kerberos authentication.

Network Security

- PKCS Support

AIX 5.1 offers an implementation of the cryptographic API PKCS#11 Version 2.01. PKCS#11 is a de facto industry standard for accessing cryptographic hardware devices.

In addition, AIX 5.1 offers support for IBM 4758 Model 2 cryptographic coprocessor under the operating system PKCS#11 shared object. The PKCS#11 implementation is enhanced to utilize future IBM cryptographic hardware devices through the same shared library.

Applications available to utilize PKCS#11 include the iPlanet server suite. For additional information on PKCS#11, refer to the RSA Laboratories Web site at: <http://www.rsasecurity.com/rsalabs/pkcs/pkcs-11/>

- IP Key Encryption Security

The Internet Key Exchange protocol to provide VPN support is enhanced to enable the use of CRL when authenticating remote users or devices.

This is an improvement to scalability of VPNs through the use of Digital Certificates for a large number of users. When CRLs are used, digital certificates provide credentials for authentication, and individual users may be revoked by specifying their certificate number to the CRL.

This simplifies network management by allowing one policy to be defined at the server level, and verifies that the certificate is valid and not contained in the CRL. CRLs may be fetched through HTTP or LDAP using socks4 or socks5 protocol.

The Web-based System Manager user interface for setting up tunnels has been streamlined and simplified. A full-function wizard guides the user through initial IKE tunnel definition. Policy information has been reorganized to make IP Security tunnel configuration more intuitive and require fewer steps.

Other IKE enhancements include the use of the commit bit to synchronize the use of Security Associations, the definition of default policies to simplify the configuration for networks using dynamic IP addresses or DHCP.

System administrators can define a Virtual Private network by one policy and a list of group members. They can also define default policies to specify the

security parameters that are to be used when the addresses are dynamically assigned.

IKE support has also been extended to include IP Version 6 protocols. The IP Security functions for AIX 5.1 now include the definition of static filters for IP Versions 4 and 6, manually and dynamically defined private tunnels using IP Security protocol over IP Version 4 and 6 networks.

IKE enhancements include VPN functionality enabling users to import IKE tunnel configurations between Linux and AIX platforms. The `ikeconvert` script will process a Linux configuration file into an XML format suitable for loading into AIX.

User group definition in IKE databases is optimized through the use of the new `ikedb` command. This command will take XML text as input to create a group definition in the IKE databases. The group name can then be used in a Key or Data Management tunnel definition.

Maintenance and ease-of-use in configuring IKE groups are enhanced through the implementation of an IKE tunnel default policy. This policy, when configured, permits a system default to be invoked in the absence of a separate configuration.

- Directory-based Resolvers

Name resolver routines have been enhanced to include resolving hostnames through an LDAP server. The ordering of name resolution services can be specified in any of the following formats:

- `/etc/netsvc.conf` file
- `/etc/irs.conf` file
- NSORDER environment variable, for example, `NSORDER=bind,ldap`

Schema defines the rules for ordering data on a LDAP server. The IBM-HostTable object class, the proposed schema, was accepted by the SecureWay Directory product.

A new command, `hosts2ldif`, was created to produce an LDIF (LDAP Data Interchange Format) file from `/etc/hosts`. This LDIF file is used to populate the hosts database on the LDAP server. The LDAP client uses `/etc/resolv.ldap` to access the information from the LDAP server.

Interoperability

Enhancements to Increase Affinity with Linux

In conjunction with the AIX Toolbox for Linux Applications packaged on separate media, new APIs are added to AIX so that Linux applications using these routines do not have to supply their own libraries.

The goal is to have "compile and go" operability for Linux applications. This does not extend to the kernel and device driver layers.

AIX Toolbox for Linux Applications

The AIX Toolbox for Linux Applications provides the ability to build and execute applications commonly found in Linux distributions. It supports a wide variety of software, including:

- Application development tools
- Desktop environments
- System utilities

- Languages
- Graphics applications
- Text editors
- Shells
- Window managers

Featured software includes:

- RPM
- GNU tools
- GNOME
- KDE
- Samba

Other features:

- The AIX Toolbox for Linux Applications is a collection of open source software commonly found with Linux distributions. There are over 160 different items available for installation.

These are packaged using the open source RPM package manager, which reduces the time to produce a package for AIX since most open source applications have already been packaged with RPM. Source RPMs are available for customer use.

- The Toolbox applications will be installed under /opt/freeware directory with symbolic links created where possible into standard directory paths to make the software immediately available for use.
- If conflicts arise between identically named AIX and Toolbox commands or libraries, the Toolbox will generate links under /usr/linux rather than in the standard locations. Users can get Linux behavior for commands such as make, awk, and sed by placing /usr/linux/bin ahead of /usr/bin in their PATH.
- The AIX Toolbox for Linux Applications is packaged on separate media and distributed as a convenience at no charge. It is also available from the AIX Toolbox for Linux Applications Web site at:

<http://www.ibm.com/servers/aix/products/aixos/linux/>

Updates to the Web site are expected on a frequent basis.

- The AIX Toolbox for Linux Applications is not supported by IBM and is provided "as is," under the terms and conditions of the license on the AIX Toolbox CD or Web site.

Base Operating System

NFS Statd Multithreading

The status monitor provides a general framework for collecting network status information. Implemented as a daemon that runs on all NFS configured machines, the status monitor provides a simple protocol that allows applications to easily monitor the status of other machines.

Deactivating Active Paging Spaces

This function provides new flexibility without rebooting after:

- Changing configurations
- Moving paging space to another drive
- Dividing paging space between drives

Until this release, allocated and activated paging space had to remain active until the next reboot. With this release, paging space can be deactivated without rebooting by using the new "swapoff" command. A new "shrinkps" command:

- Creates a new, temporary space
- Deactivates the original
- Changes the original to be smaller and reactivates it
- Deactivates the temporary space and returns it to logical volume status

The use of a shell script reduces the possibility of an unbootable state because users will not be allowed to run out of adequate paging space. The script checks paging space actually in use and adds a buffer for paging space warning threshold.

Malloc Enhancements

AIX 5.1 provides an optional buckets-based extension of the default memory allocator (the malloc subsystem) that improves performance for applications that issue large numbers of small allocation requests.

Each bucket consists of a block of memory that is subdivided into a predetermined number of smaller allocatable blocks of uniform size. Organizing allocatable memory in this fashion often provides faster access for allocation requests falling within the range of sizes defined by the buckets.

When this capability is enabled, allocation requests that fall within a predefined range of block sizes are processed by Malloc Buckets. All other requests (for example, those outside the defined range of sizes) are processed in the usual manner by the default allocator. Up to 128 buckets are available per heap (refer to the Malloc Multiheap documentation for details on this capability).

Number of buckets, bucket sizing factor, and other configuration values are specified via an environment variable prior to process startup. More information on configuring the MALLOCTYPE and MALLOCBUCKETS environment variables is available in the book "General Programming Concepts: Writing and Debugging Programs."

SVR4 Printing Subsystem

AIX 5.1 provides the UNIX® System V style file spooling subsystem and makes it available as an administrator configurable option. Enabling this option allows users who are more comfortable with System V printer utilities to more easily use AIX 5.1.

System V Packaging Commands

System V Packaging Commands are available for customers to create and install a package in the System V packaging format. These commands are:

- pkgmk: to create a package in System V packaging format
- pkgadd: to install a System V packaging format package
- pkgrm: to remove the package
- pkginfo: to display information about the package
- pkgtrans: translate package format to a datastream
- pkgparam: display package parameter values
- pkgask: store answers to a request script