Read This Before Installation

AIX 5L for POWER Version 5.1 Release Notes

Subject: AIX 5L for POWER Version 5.1 Release Notes

Release Notes Version: 1.3

Enclosed is information about AIX 5L for POWER Version 5.1. **Read this information before installing AIX 5L for POWER Version 5.1**.

AIX, RS/6000 and eServer pSeries publications are available from the following Web sites:

```
http://www.ibm.com/servers/aix/library/
http://www.rs6000.ibm.com/resource/hardware_docs/
```

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Updating Systems Using JFS2 in rootvg

When updating an existing AIX 5.1 (4/2001) system using JFS2 (Enhanced Journaled File System) file systems in the root volume group (rootvg) from either the 5.1 Installation media or the Update CD, use the following procedure:
 Note: To avoid failed updates or possible file-system corruption, follow these steps explicitly.

1. Apply and commit only APAR IY19375 (bos.mp64 5.1.0.1, bos.mp 5.1.0.1 or bos.up 5.1.0.1).

2. Reboot the system.

3. Update from the Update CD.

4. Reboot for the updates to take effect.

APAR IY19375 can be obtained from the AIX Electronic Fix Distribution Site:

```
http://techsupport.services.ibm.com/server/aix.elecptforder
```

Update bos.rte.install

When updating an existing AIX 5.1 system, if bos.rte.install is not already at 5.1.0.10, install bos.rte.install first. You can check the level of bos.rte.install with the following command:

```
lslpp -l bos.rte.install
```

If the level is not at 5.1.0.10 or later, install bos.rte.install first. To install bos.rte.install, select this update from the SMIT or Web-based System Manager interfaces, or run the following at the command line:

```
installp -acgXd <installation media> bos.rte.install 5.1.0.15
```

We recommend you commit this update, however, to apply only remove the **c** flag from the command line call. Do this when using either the Update or Product Media.

Next, proceed to upgrade your system using the SMIT interface (such as SMIT update_all or SMIT install_latest) or the Web-based System Manager interface.

Migration

64 MB Systems

If the system you are migrating from has only 64 MB of memory, it is recommended that you upgrade the system to 128 MB of memory. Otherwise, the migration may hang.

xlC.rte

If migrating to AIX 5.1 from either AIX 4.1 or AIX 4.2, check the level of **xlC.rte** using the following command:

```
lslpp -L xlC.rte
```

If the level is 3.1.x.x or earlier, you must apply APAR IY17981 before migrating to AIX 5.1. Without APAR IY17981 installed, the migrated system could fail to boot.

APAR IY17981 is available from the AIX Fix Distribution Service site as follows:

```
http://techsupport.services.ibm.com/rs6k/fixdb.html
```

AIX Systems May Not Boot From CD-ROM

AIX systems may not boot from CD-ROM. To determine if your system is affected by this problem, do the following:

1. At the command prompt, type:

   ```
   lscfg  -vl  cd*
   ```

2. Examine the data that is returned.

If **Partnumber** is `04N2964` *and* **ROS Level** or **ID** is *less than or equal to* `1_04` (i.e., 1_02, 1_01, or 1_00), contact your local service representative. Tell your service representative that your system requires the CD-ROM firmware upgrade that is described in **RETAIN TIP H1332**.

If the data returned does *not* match the data described in the preceding paragraph, your system is *not* affected by this problem. This problem does not apply to your system.

Configuring Devices

The number of devices for which AIX provides support may vary from system to system, depending on several important factors.

The following factors have an impact on the file systems that support the devices:

- Configuration of more devices requires more information in the Object Database Manager (ODM) device-configuration database. It also may require more device special files. As a result, more space and i-nodes will be required of the file system.

- Some devices require more space than others in the ODM device configuration database. The number of special files or i-nodes used will also vary from device to device. As a result, the amount of space and i-nodes required of the file system is dependent on the types of devices.

- AIX includes both logical devices and physical devices in the ODM device-configuration database. Logical devices include volume groups, logical volumes, network interfaces, and so on. In some cases, the relationship between logical and physical devices can greatly affect the total number of devices supported.

  For example, if you define a volume group with two logical volumes for each physical disk that is attached to a system, this results in four AIX devices for each disk. On the other hand, if you define a volume group with six logical volumes for each physical disk, there will be eight AIX devices for each disk. Therefore, only half as many disks could be attached.

- Customization of devices by changing attributes from their default settings results in a larger ODM device-configuration database and could lead to fewer devices that can be supported.

- More devices require more real memory.

Two file systems are used by AIX in the support of devices. The first is a RAM file system used during boot in an environment with no paging space and no disk file system mounted. The RAM file system provides a maximum of 32 MB and 8960 i-nodes. If either of these resources is exceeded by the requirements of the attached devices, the system may not boot. The only recovery is to remove some of the devices.

The second file system is the root file system on disk. The space and i-nodes in this file system can be increased as long as there are unallocated partitions in the rootvg.

With AIX Version 5.1 and the minimum allowed system memory of 64 MB, it is likely that 5000 AIX devices (both physical and logical) can be configured. Depending on the various factors mentioned

above, it may be possible to handle more or (in some cases) fewer devices.

AIX 5L for POWER Version 5.1 Release Notes

AIX 5L for POWER Version 5.1 Installation Documentation

AIX 5L for POWER Version 5.1 Release Notes contains information that will aid you in the installation of AIX 5L Version 5.1.

The AIX 5L Version 5.1 documentation library is available at the following Web site:

```
http://www.ibm.com/servers/aix/library
```

AIX documentation is also contained on the AIX documentation CD. The documentation is made accessible by loading the documentation CD onto the hard disk or by mounting the CD in the CD-ROM drive.

Some of the installation instructions in this document assume knowledge of:

- AIX system administration commands
- System Management Interface Tool (SMIT)
- Software installation operations, such as **apply** and **commit**

The following publications describe AIX 5L Version 5.1 installation:

- *AIX 5L Version 5.1 Installation Guide*, order number SC23-4374
- *AIX 5L Version 5.1 Network Installation Management Guide and Reference*, available only online

The *AIX 5L Version 5.1 Installation Guide* is available both online and in hardcopy.

To order the *AIX Version 5.1 Installation Guide*, contact your point of sale, or, in the U.S., call IBM Customer Publication Support at 1-800-879-2755. Specify order number SC23-4374.

Operating System Documentation

Documentation for the AIX operating system is available either from the AIX documentation CD or from the Web.

If you ordered the AIX documentation CD with your operating system, you can access the information by loading the documentation CD onto a hard disk on your system or by mounting the AIX documentation CD in the CD-ROM drive. This CD contains the base set of documentation for the AIX operating system.

To access the complete library for AIX operating system documentation, go to:

```
http://www.ibm.com/servers/aix/library/techpubs.html
```

Hardware Documentation

Hardware documentation is available on the Web or can be ordered in printed hardcopy.

To access the hardware documentation on the Web, go to:

```
http://www.ibm.com/servers/eserver/pseries/library/hardware_docs
```

Installation, use, and service documentation is available from this Web site. To order printed versions of the books that are available in hardcopy, go to:

```
http://www.ibm.com/shop/publications/order
```

To List and Preview Installation Software

You can list the available software products, packages, and filesets on AIX media. This media can be a CD-ROM, tape, diskette, or directory. The output lists the available packages and filesets on the media. The descriptions are provided at the fileset level.

You can choose to do a preview installation before doing the actual installation. A preview installation provides the preinstallation information that occurs during a regular installation, except that no software will actually be installed.

When you select a package or fileset to be installed with the preview installation process, you will see a list that contains all the requisite packages and filesets needed by the selected package or fileset to be successfully installed.

The other information generated during the preinstallation process concerns file system-size checking. The file systems are checked to make sure there is enough free space available to install the selected package or fileset.

You can run the list software and previewing software functions from the command line, the SMIT interface, or the Web-based System Manager interface.

To list and preview software from the command line

1. Log in as the root user.

2. List the available software on the media using **installp -ld<device>**. For example, to list the software on the first CD of the base media, insert the Volume 1 CD in the first CD drive. Then type:

   ```
   installp -ld/dev/cd0 | pg
   ```

The following displays:

```
Fileset Name                      Level
        ==========================================
        IMNSearch.bld.DBCS            2.3.1.0
   #   NetQuestion DBCS Buildtime Modules

        IMNSearch.bld.SBCS            2.3.1.0
   #   NetQuestion SBCS Buildtime Modules

        ...
```

3. To do a preview installation at the command line, use the **-p** flag with the **installp** command. For example, to preview the installation of the IMNSearch.bld.DBCS fileset, type:

```
installp -aXgq -p -d/dev/cd0 IMNSearch.bld.DBCS
```

The preview option shows the filesets selected to be installed, the filesets that are pulled in by requisites, and the system resources that are used by this **installp** operation.

To list and preview software from the ASCII SMIT interface

1. Log in as the root user.

2. List available software on media using **smitty install_update**.

3. Select **Install Software**.

4. Press the F4 key to list the available input devices and select the appropriate one; or type the input device name in the blank field. Press Enter to continue.

5. To list all available software on the selected media, press the F4 key on the **SOFTWARE to Install** field.

6. Scroll through the list of software by using the arrow keys or the Page Up or Page Down keys.
    Note: The software shown in this listing are the available packages and filesets for that software product. For example, in the following output example, the software product is IMNSearch.

```
        IMNSearch.bld
                + 2.3.1.0  NetQuestion DBCS Buildtime Modules
                + 2.3.1.0  NetQuestion SBCS Buildtime Modules

        IMNSearch.rte.httpdlite
                @ 2.0.0.2  Lite NetQuestion Local Web Server
```

The two packages are IMNSearch.bld and IMNSearch.rte.httpdlite. The filesets in the IMNSearch.bld package are the NetQuestion DBCS Buildtime Modules fileset and the NetQuestion SBCS Buildtime Modules fileset. Both filesets are at the 2.3.1.0 level. Notice that the descriptions for the software product are described at the fileset level.

If the fileset is preceded by a + sign, then it is available to be installed. If the fileset is

preceded by an @ sign, then the fileset is already installed.

7. Select the package or fileset you want to install by scrolling to that package or fileset, and press the F7 key to make the selection. Press Enter to continue.

8. To preview the installation of the package or fileset that you selected, press the Tab key to select **yes** in the **PREVIEW only?** field. Press Enter.
    Note: To obtain detailed information about the installation, select **yes** in the **DETAILED output?** field. The filesets being installed are displayed in parentheses.

To list and preview software using the Web-based System Manager interface

1. Log in as the root user.

2. To initialize the environment, type **wsm &** at the command prompt.

3. In the **Navigation Area**, click on the + sign to the left of the client you want to manage.

4. Select the **Software** icon by clicking once on the + sign to the left of the **Software** icon. This action expands the **Software** tree.

5. Highlight the **Installed Software** icon.

6. At the top of the Web-based System Manager window in the menu bar, select **Software** to display the **Software** menu.

7. Select **New Software (Install/Update)**.

8. Select **Install Additional Software**.

9. Select **Advance Method**.

10. Specify or select a software source.

11. To list available software, click **Browse** to display a tree view of all the software on the media. The tree can be expanded by clicking the + sign to the left of the icon.
    Note: If the software is already installed, you will see a small checkmark to the left of the fileset description.

12. Select the package or fileset you want to install by highlighting the package or fileset.
    Note: You can select multiple packages or filesets by holding down the left mouse button while on one selection and dragging the mouse pointer up or down.

    You can also use the Ctrl key or the Shift key to select multiple items. To choose nonconsecutive selections, hold the Ctrl key while making your selections with the left mouse button. To choose consecutive selections, hold the Shift key while making your selections with the left mouse button.

13. To preview the installation of the selected package or fileset, press the **Preview** button.

Additional information about AIX-supported products is available from the following Web site:

`http://www-1.ibm.com/servers/aix/products/ibmsw/list/`

To obtain AIX 5L Version 5.1 installation hints and tips, send e-mail with a subject line of **51_Install_Tips** to `aixserv@austin.ibm.com`, the AIX Service Mail Server.

Installation

This section contains information about installing AIX 5L Version 5.1 that supplements the information contained in the AIX 5L Version 5.1 installation documentation. Refer to the publications listed in "AIX 5L for POWER Version 5.1 Installation Documentation" for complete installation instructions.

Installing AIX 5L Version 5.1

The following methods can be used to install AIX 5L Version 5.1:

- Complete overwrite installation
- Preservation installation
- Migration installation

  Notes:

  1. After installing or updating a system to 5.1.0.0, you can install a lower level of AIX by restoring a system backup or performing a new and complete overwrite with base media. Preservation installations from 5.1.0.0 to a lower level of AIX are not supported.

  2. Cloning with a system backup (mksysb) from a 64-bit enabled JFS2 system to a 32-bit system will fail.

To install AIX 5L Version 5.1, boot from the product media and follow the instructions in the *AIX 5L Version 5.1 Installation Guide*, order number SC23-4374.

Migration from AIX 4.3.3 -- Remove AIX Toolbox for Linux Application

If you previously installed the AIX Toolbox for Linux Applications and the level of **rpm.rte** is less than 3.0.5.20, then remove that software from the system before migrating to AIX 5L Version 5.1. The Toolbox software installed with **rpm.rte** levels prior to 3.0.5.20 are incompatible with software from the AIX Toolbox installed on AIX 5L Version 5.1 because of shared library restructuring.

Also remove the software if you are performing a preservation installation and you established a **/opt/freeware** file system for the Toolbox software. The files in that file system will *not* be automatically be overwritten during a preservation installation. To remove your existing RPMS, use the **destroyrpms** tool available in the **/tools** directory on the AIX Toolbox for Linux Applications CD. Additional information is also available on this CD in the **/README.TXT** file.

Note: AIX 4.3.3 Toolbox applications will not run correctly on AIX 5L Version 5.1 unless the steps in this section are performed.

```
mount -vcdrfs -oro /dev/cd0 /mnt
/mnt/tools/destroyRPMS
```

New Base Operating System Installation Menus

When doing a BOS installation, if you select **2 Change/Show Installation Settings and Install** from the Welcome to Base Operating System Installation and Maintenance menu, the third menu option has changed from **Install Trusted Computing Base** to **Advanced Options**. If you select **Advanced Options**, the **Advanced Options** menu displays the following choices:

```
  1. Desktop.......................................CDE
  2. Enable Trusted Computing Base..................no
  3. Enable 64-bit Kernel and JFS2.................no
```

ASCII Systems

You can choose either a Minimal or a Default installation on ASCII systems. If you choose the Default installation, you may be prompted for additional CDs during a BOS installation. If you do not have these additional CDs or you want to stop the BOS installation, type q on the command line to continue the installation process.

Note: If you stop the BOS installation at this point in the process, the BOS is usable.

Graphical Systems

The **Desktop** choices are CDE, KDE, GNOME, and NONE. If you select NONE, the following are installed: X11, Java, Perl, SMIT, and Web-based System Manager. If you select CDE, GNOME, or KDE, the following are installed: X11, Java, Perl, SMIT, Web-based System Manager, Documentation Library Services, and the desktop.

Note: If you select either GNOME or KDE, you will be prompted for the *Toolbox for Linux Applications* CD. If you do not have this CD or you want to continue the installation process without it, type q on the command line.

The **Enable 64-bit Kernel and JFS2** feature is introduced with AIX 5L. If you have a 64-bit system and select **Yes** for this option, the 64-bit kernel is linked so that it becomes the running kernel on the system after the installation is complete. If you choose to install the 64-bit kernel, the file system is JFS2. If you choose **No**, the 64-bit kernel is still installed on the system, but the running kernel after installation is either the 32-bit **up** or **mp** kernel, depending on the system.

Memory Requirements

AIX 5L Version 5.1 requires a minimum of 64 megabytes of physical memory.

Initial Paging Space Requirements

AIX 5L Version 5.1 requires the initial paging space (**/dev/hd6**) to be a minimum of 64 megabytes in size.

Disk Space Requirements

AIX 5L Version 5.1 requires additional disk space for the same set of installed filesets due to the increased library sizes and additional function.

Note: The following measurements are guidelines for the disk space that is required on your system when you install AIX 5L Version 5.1.

Table 1. Base AIX Installation (Graphical System with CDE--Default)

	AIX 4.1.5 Allocated (Used)	AIX 4.2.1 Allocated (Used)	AIX 4.3.3 Allocated (Used)	AIX 5L Version 5.1 Allocated (Used)
/	4MB (1.8MB)	16MB (2.9MB)	4MB (2.5MB)	8MB (5.6MB)
/usr	140MB (134.3MB)	156MB (143.5MB)	294MB (279MB)	385MB (370MB)
/var	4MB (0.4MB)	16MB (0.9MB)	4MB (1.3MB)	4MB (1.4MB)
/tmp	8MB (0.3MB)	16MB (0.5MB)	16MB (0.6MB)	20MB (0.9MB) see note
/opt	N/A	N/A	N/A	4MB (0.2MB)
Note: If /tmp is less than 32MB, it will be increased to 32MB during the migration so that the AIX 5.1 boot image is successfully created at the end of the migration.				

During a migration installation, if **/opt** exists only as a directory, and has less than 3 MB of data, then a new logical volume and file system (**/dev/hd10opt** and **/opt** respectively), will be created and the data that existed in the **/opt** directory will be moved to the new file system.

If there is more than 3 MB of data in **/opt**, then the new logical volume and file system are not created.

If any file system existed that had a mount point in the **/opt** directory, or a mount point of **/opt** itself, the new logical volume and file system are not created.

Other Installation Information

BOS Installation Support for Fibre Channel Boot

BOS installation supports installation to fibre channel-attached disks. Either bootable AIX 5.1 (updated 9/2001) installation media or NIM resources prepared from such media is required. The fibre channel-attache d disks must be attached to a fibre channel host adapter that supports boot capability.

A fibre channel-attached disk can be identified by a World Wide Port Name and Logical Unit ID. To see the format of the World Wide Port Name and Logical Unit ID, type:

```
lsattr -E -O -l DiskName
```

- In a non-prompted BOS installation, you can specify a fibre channel- attached disk in the target_disk_data stanza of the **bosinst.data** file by:

```
SAN_DISKID = (World Wide Port Name)//(Logical Unit ID)
```

where the (World Wide Port Name) and (Logical Unit ID) are each in the format returned by **lsattr**, that is, "0x" followed by 1-16 hexadecimal digits.

- In a prompted BOS Installation, the BOS menus display the list of available disks and associated information. You can select the desired disk(s).

Installation Packaging Formats

AIX 5L Version 5.1 supports multiple installation-packaging formats, including the following:

- rpm installer (a Linux tool)
- InstallShield Multi-Platform (ISMP) installer
- Uniform Device Driver Interface's (UDI's) udisetup installer
- **installp** command (AIX system installation command and packaging format)

By using the new **geninstall** command, you can list and install from media that contains installation images that were packaged in any of these formats.

To emphasize this new function and to allow for multiple supported platform types (Itanium-based and POWER-based), the media structure was changed. New subdirectories were created to contain installation images. The installp images that were previously stored in the **./usr/sys/inst.images** directory on the CD are now stored in **./installp**/*arch* where *arch* is ia64 or ppc. The rpm images are stored in **./RPMS**/*arch* and any ISMP images would be stored in **./ISMP**/*arch*. Currently there are only installp and rpm images shipping on AIX product media.

The **installp**, **bffcreate**, **geninstall**, **gencopy** and **nim** commands were updated to recognize this new structure. The **geninstall** and **gencopy** commands recognize other non-installp installation formats and will call the appropriate installers or copy the images, respectively.

Example:

If you are calling **bffcreate** (or a user interface) to copy images from CD to a directory on the disk, new subdirectories will be created in the target directory and the images will be placed in those directories.

In AIX 4.3, the default target directory for **bffcreate** was **/usr/sys/inst.images**.

In AIX 5.1, if the following command was used on a PowerPC machine:

```
bffcreate -d /dev/cd0 all
```

the default target directory would be **/usr/sys/inst.images/installp/ppc**.

If the **gencopy** command was used:

```
gencopy -d /dev/cd0 all
```

In addition to all the **installp** images, you would also get the **rpm** images that are contained on the product media:

```
cd /usr/sys/inst.images/RPMS/ppc
> find . -print
./cdrecord.aix4.3.ppc.rpm
./mkisofs.aix4.3.ppc.rpm
./mtools.aix4.3.ppc.rpm
```

Because of this change, you may have to update some of your scripts if image locations were hardcoded.

Network Installation Management (NIM) README

The Network Installation Management (NIM) includes a **README** file that is installed with the NIM Master **bos.sysmgt.nim.master** fileset. The path name of the file is **/usr/lpp/bos.sysmgt/nim/README**. The **README** file contains additional information about the AIX 5L Version 5.1 NIM product and includes the following topics:

- Restrictions on SPOT Creation for Releases Prior to 5.1 - (New LPP_SOURCE Directory structure)
- Web-based System Manager NIM May Have Problems Installing SW on Client Machines
- Restrictions on Cust Operation for RPM Packages
- Steps Necessary For Adding GNOME -or- KDE Desktop Support

Reliable Scalable Cluster Technology (RSCT) README

The RSCT Resource Monitoring and Control (RMC) application is part of RSCT. The RSCT includes a README file that is installed with the **rsct.core.utils** fileset. The file islocated at **/usr/sbin/rsct/README/rsct.core.README**. The README file contains additional information about the RMC application.

System Dump

The default system dump device is paging space. This default may not be adequate for system configurations that have large memory sizes or when system availability is a concern.

For large memory systems, IBM allocates a dedicated dump device (**/dev/lg_dumplv**) if disk space is available. The following table shows the sizes of the dump devices based on the amount of real memory present in the system.

Table 2. Dump Device Size (Based on System Real Memory)

Real Memory	Dump Device
4 GB < 12 GB	1 GB
12 GB < 24 GB	2 GB
24 GB < 48 GB	3 GB
>= 48 GB	4 GB

Note: If the root user starts a dump to a dump device set to **/dev/sysdumpnull**, the system will crash, but no dump will occur.

The dump is now copied to tape in **pax** format instead of **tar**, because **pax** supports large (greater than 2 GB) files.

The **dumpcheck** facility runs by default each day at 3:00 p.m. local time. See the root **crontab** file to change the time that **dumpcheck** runs. The **dumpcheck** facility ensures that there is enough space in the dump device and copy directory to receive the system dump. If dump compression will facilitate a system dump, it will be enabled unless you have manually turned it off. The results of **dumpcheck** are in the system error log.

New Flags for the Snap Command

The **-H** and **-C** flags have been added to the snap command.

- **-H** flag gathers system information without any checkstop/scanout data.

- **-C** flag gathers checkstop/scanout files.

Firmware Limitation

The firmware in many of the PCI bus-based RS/6000 machines is limited in regard to the region of the hard disk from which it can read a boot image. This problem will not be encountered under most circumstances. The symptom of the problem is a failure to boot from hard disk, resulting in a message from firmware similar to `unrecognized Client Program format`.

The affected machines can be identified most easily as the machines that provide access to the firmware System Management Services by means of pressing the F1 keys on the system-attached keyboard or the 1 key on a TTY keyboard.

The problem is that the firmware on the affected machines cannot read the boot image from the hard disk if any part of the boot image resides past the 4-gigabyte boundary on the hard disk. This is not a problem for most customers because the AIX installation process creates the boot logical volume at the beginning of the disk. This is achieved by using the **-a** flag with the **mklv** command and specifying **e** (which corresponds to **edge**) as the parameter for the **-a** flag. Using the **mklv** command with this parameter results in the boot logical volume being created at the edge of the hard disk, and the resulting address that the firmware uses to read the boot image will be within a safe range. The AIX installation process has always created the boot logical volume near the edge of the hard disk because that region of the hard disk has the slowest access time, and this allows other regions of the hard disk to be used by file systems that can benefit from the better performance.

The only way that you can encounter this problem is by creating and initializing a new boot logical volume that extends past the 4-gigabyte boundary of the hard disk, either in part or in entirety.

In almost all cases, you do not need to create a new boot logical volume, but if you do, use the **lsvg** and **lslv** commands to verify that the newly created boot logical volume does not reside above the 4-gigabyte address on the hard disk.

An example of this calculation follows:

1. Execute `lsvg rootvg` to determine PP SIZE.

   On a 4.5-gigabyte hard disk, the default PP SIZE is 8 megabytes. Make a note of that size.

2. Execute `lslv -m bootlv00`

Replace `bootlv00` with the name of the newly created boot logical volume. The numbers in the second, fourth, and sixth columns indicate the physical partitions that have been assigned to the boot logical volume. If the PP SIZE is 8 megabytes, the boot logical volume must not use any physical partition above 511. (512 * 8 = 4096, which is 4 gigabytes). Similarly, if the PP SIZE is 16 megabytes, the boot image must not use any partition above 255, and if the PP SIZE is 4 megabytes, the boot image must not use any partition above 1023.

As a reminder, this problem does not occur unless you have created and initialized a boot image that resides above the 4-gigabyte boundary.

sysck WARNING Errors During Installation

There are known minor limitations with the packaging of **bos.terminfo.svprint.data**. If you are installing this fileset, or any other **bos.terminfo** fileset, do not attempt to deinstall the filesets after they are installed. This could cause errors and missing functions. This limitation causes **sysck** WARNING errors on the installation of the filesets.

Base Operating System (BOS)

This section contains information about the base operating system (BOS).

64-bit Kernel

AIX 5L Version 5.1 provides a scalable 64-bit kernel that is capable of supporting large application workloads running on 64-bit hardware. The 64-bit kernel scalability is primarily provided through a larger kernel address space. This space supports larger system software applications without requiring practical bounds and kernel extension interfaces.

Note: The 32-bit kernel continues to be supported on AIX 5L Version 5.1.

System Support

The 64-bit kernel supports the following POWER-based systems:

- RS/6000 7013 Models S70, S7A
- RS/6000 7015 Models S70, S7A
- RS/6000 7017 Models S70, S7A, S80
- RS/6000 7025 Models H80, F80
- RS/6000 7026 Models H70, H80, M80
- RS/6000 7043 Models 260, 270
- RS/6000 7044 Models 170, 270
- eServer pSeries 680 Model S85
- eServer pSeries 640 Model B80
- eServer pSeries 660 Model 6H1
- eServer pSeries 620 Model 6F1
- eServer pSeries 690
- eServer pSeries 660 Model 6M1
- eServer pSeries 610 Model 6C1
- eServer pSeries 610 Model 6E1

I/O Support

The 64-bit kernel supports the following I/O devices except as noted:

- Storage Interfaces:
  - Ultra SCSI SE and Ultra SCSI Differential
  - PCI Dual Channel Ultra SCSI Adapter
  - PCI 3-Channel Ultra2 SCSI RAID Adapter
  - PCI 4-Channel Ultra2 SCSI RAID Adapter
  - PCI 4-Channel Ultra3 SCSI RAID Adapter
  - SSA Advanced Serial RAID Plus
    - 6225
  - Gigabit Fibre Channel
  - Older Fast/Wide SCSI adapters
    - 2408 (32-bit kernel only)
    - 2409 (32-bit kernel only)
    - 6208
    - 6209
  - SCSI-2 Fast/Wide PCI RAID adapter
  - SCSI Disk drives
  - SSA Disk drives
  - SCSI CD-ROM
  - SCSI Tape Drives (1/4 inch, 4 mm, 8mm, etc.)
  - Diskette Drive
  - External SCSI Disk subsystems:
    - 2104-DL1 and 2104-TL1 IBM Expandable Storage Plus Model DL1 and Model TL1
    - 7134
    - 7137
    - 7135 (32-bit kernel only)
    - 7131-105
    - 7027
    - 7203
    - 7204
  - External SCSI Tape and Optical subsystems
  - External Fibre disk & tape subsystems:
    - 2105-E10, 2105-E20, 2105-F10, and 2105-F20 IBM Enterprise Storage Server Model E10, Model E20, Model F10, and Model F20
    - 2102-F10 IBM Fibre Channel RAID Storage Server Model F10
    - 2102-D00 IBM Expandable Storage Unit Model D00

- Communications and connectivity (PCI bus type):
  - EIA RS232D/EIA RS422A
  - Token-Ring PCI 4/16 Adapter (2920 and 4959)
  - 4-port 10/100 Mbps Ethernet
  - IBM Ethernet 10/100 Mbps (2968)
  - 10/100/1000 Base-T Ethernet PCI Adapter
  - Gigabit Ethernet
  - ATM 155 Mbps
  - TURBOWAYS 622 Mbps PCI MMF ATM Adapter
  - 2port Multiprotocol PCI Adapter
  - External Ultra3 subsystem (DU3/TU3) Graphics accelerators

- Parallel Port (RS/6000 70** Models H70, H80, M80, S80, 170, 260, 270 and eServer pSeries 680 Model S85, eServer pSeries 640 Model B80, eServer pSeries 660 Model 6H1, eServer pSeries 620 Model 6F1)

All I/O devices supported by the 64-bit kernel are also supported by the 32-bit kernel. However, the following I/O devices are only supported by the 32-bit kernel:

- Communications and connectivity (PCI bus type):
  - FDDI 100 Mbps
  - X.25
  - BSC
  - Parallel Port (RS/6000 70** Models S70, S7A)
  - IBM PCI Ethernet Adapter (2968)
  - ATM 25Mbps
  - PCI Auto LANstreamer Token Ring Adapter (2979)

- MCA Adapters

Base Functionality

For the most part, the AIX 5L Version 5.1 kernels provide the same functionality, regardless of which kernel is being used. The 32-bit and 64-bit kernel systems have common base libraries, commands and utilities, and header files. Differences between 32-bit and 64-bit kernel systems are limited to these functions:

System and I/O Support: The 64-bit kernel limits support to 64-bit POWER-based systems, while the 32-bit kernel supports both 32-bit and 64-bit POWER-based systems. In addition, the 64-bit kernel does not support all I/O that is supported by the 32-bit kernel, as detailed in the "I/O Support" section.

Power Management: Power Management is only provided under the 32-bit kernel.

Application Support

The 64-bit kernel supports both 32-bit and 64-bit applications. Application source and binaries are portable between AIX 5L Version 5.1 64-bit and 32-bit kernel systems, in the absence of any application dependencies on internal kernel details or on kernel extensions that are not supported under the 64-bit kernel but are supported under the 32-bit kernel.

Binary Compatibility: Binary compatibility is provided for 32-bit applications running on earlier versions of AIX on POWER-based systems, except for applications linked statically or applications dependent on undocumented or unsupported interfaces. In addition, some system file formats have changed, and 32-bit applications processing these files may have to be recompiled.

Application Scalability: AIX 5L Version 5.1 provides a more scalable application binary interface (ABI) for 64-bit applications. To take advantage of the scalability improvements to 64-bit programs, all 64-bit applications and libraries must be recompiled on AIX 5L Version 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.

Kernel Extensions

Kernel extensions for the 64-bit kernel run in 64-bit mode and have the scalability of the larger kernel address space. Some kernel services available in the 32-bit kernel are no longer provided by the 64-bit kernel, so existing 32-bit kernel extensions may have to be ported in order to be used with the 64-bit kernel.

Existing 32-bit kernel extensions continue to be supported by the 32-bit kernel, but these kernel extensions are not usable by the 64-bit kernel. Not all of the kernel extensions supported for the 32-bit kernel are supported for the 64-bit kernel, particularly the device drivers for the I/O.

Dual-mode Kernel Extensions: AIX 5L Version 5.1 supports dual-mode kernel extensions, which can be loaded by a common configuration method, regardless of which kernel is being used. A dual-mode kernel extension is an archive file that contains both the 64-bit and 32-bit versions of the kernel extension as members.

Installation and Enablement

The 64-bit kernel is provided as part of the base AIX 5L Version 5.1 base media and is installed on all hardware systems that it supports. By default, the 32-bit kernel is enabled at base system installation. However, you can override this at installation time to enable the 64-bit kernel through the system installation panels. (See "New Base Operating System Installation Menus" for details on enabling the 64-bit kernel at BOS installation time.)

It is possible to switch between the 32-bit and 64-bit kernels without reinstalling the operating system. This can be done by modifying the **/usr/lib/boot/unix** and **/unix** to be a symbolic link to the binary for the desired kernel, running the **bosboot** command to write a new system boot image, and rebooting. The path name of the 64-bit kernel is **/usr/lib/boot/unix_64** while the path names of the uniprocessor and multiprocessor versions of the 32-bit kernel are **/usr/lib/boot/unix_up** and **/usr/lib/boot/unix_mp**.

JFS2

JFS2 (Enhanced Journaled File System) is a new file system providing the capability to store much larger files than the existing Journaled File System (JFS). Additionally, it is the default file system for the 64-bit kernel. Customers can choose to implement either JFS, which is the recommended file system for 32-bit environments, or JFS2, which offers 64-bit functionality.

Notes:

1. Cloning with a system backup (mksysb) from a 64-bit enabled JFS2 system to a 32-bit system will fail.

2. Unlike the JFS file system, the JFS2 file system will not allow the link() API to be used on files of type directory. This limitation may cause some applications that operate correctly on a JFS file system to fail on a JFS2 file system.

The following table provides a summary of JFS and JFS2 functions:

Functions	JFS2	JFS
Fragments/Block Size	512-4096 Block sizes	512-4096 Frags
Maximum file system size	1 Terabyte	1 Terabyte
Maximum file size	1 Terabyte	64 GBytes

Number of i-nodes	Dynamic, limited by disk space	Fixed, set at file system creation
Directory organization	B-tree	Linear
Online defragmentation	Yes	Yes
namefs	Yes	Yes
DMAPI	No	Yes
Compression	No	Yes
Quotas	No	Yes
Deferred update	No	Yes

AIX 5L Changes to the dd Command

The **dd** command now supports multiple volume spanning by using the *span=yes* or *span=no* options. When the *span=no* option is used, the **dd** command works as the default without spanning.

The **dd** command can span across devices if the input file is larger than the output device physical size.

Syntax

dd[**if**=*InputFile*] [**of**=*OutputFile*] [**cbs**=*Number*] [**fskip**=*Number*] [**skip**=*Number*] [**seek**=*Number*] [**count**=*Number*] [**bs**=*Number*] [**span**=**yes**|**no**] [**ibs**=*Number*] [**obs**=*Number*] [**files**=*Number*] [**conv**=**Parameter**[, ...]]

The **span=yes|no** flag allows you to span across devices if **yes** is specified. If **no** is specified, it works as the default.

Note: Use care when selecting the block size. An incorrect value can cause data inconsistency or overlap. The correct block size is a multiple of the physical volume size. In addition, label each volume consecutively so that the volumes can be restored in the correct order.

Examples

1. To copy blocks from a input file with block size set to 720b blocks into a 1.44MB size diskette, type:

   ```
   dd if=testfile of=/dev/fd0 bs=720b conv=sync span=yes
   ```

   Note: If the input file is larger than the physical size of the output device, the **dd** command will prompt you for another device.

2. To copy blocks from a input file with block size set to 32k blocks to a tape, type:

   ```
   dd if=inputfile of=/dev/rmt0 bs=32k conv=sync span=yes
   ```

3. To copy blocks of data from tape to a file in the current directory with block size set to 32k blocks, type:

   ```
   dd if=/dev/rmt0 of=outfile bs=32k conv=sync span=yes
   ```

Tivoli Management Agent (TMA), Version 3.2

Starting in AIX 5L for POWER Version 5.1, Tivoli Management Agent is installed with the base operating system.

The foundation for the Tivoli Enterprise Software product suite and third-party management products is the Tivoli Management Framework. This framework provides the graphical desktop, object-oriented databases, and base services used by other management products. TMA is a "lightweight" version of the Tivoli Management Framework for installation on client systems.

For more information about Tivoli Systems products and services, including how to become a Tivoli Systems customer, do one of the following:

- Call 1-800-2TIVOLI (to be connected to your local sales office)

- Visit the Tivoli Home page at the following Web address:

    ```
    http:// www.tivoli.com
    ```

Replaceable Malloc

The user-defined memory subsystem can be enabled by using one of the following variables:

- The **MALLOCTYPE** environment variable
- The *_malloc_user_defined_name* global variable in the user's application

To use the **MALLOCTYPE** environment variable, specify the archive containing the user-defined memory subsystem by setting the **MALLOCTYPE** environment variable to **user:***archive_name*, where *archive_name* is the application's libpath or the path specified by the **LIBPATH** environment variable.

To use the global variable *_malloc_user_defined_name*, the application must declare the global variable in the following format:

```
char * _malloc_user_defined_name="archive_name";
```

Note:

1. When a **setuid** application is executed, the **LIBPATH** environment variable is ignored, so the archive must be in the application's libpath.

2. *archive_name* cannot contain path information.

3. When both the **MALLOCTYPE** environment variable and *_malloc_user_defined_name* global variable are used to specify *archive_name*, the archive specified by **MALLOCTYPE** overrides the one specified by the global variable.

SVR4 Printing

For help with configuring and setting up this function see the *Printing for Fun and Profit under AIX 5L*

(IBM Redbook number SG24-6018-00) at the following Web site:

```
http://www.redbooks.ibm.com/
```

Viewing Remote Queue Status from Web-based System Manager

In Web-Based System Manager, the **All Print Queues** view for AIX remote printers can inaccurately indicate a problem with a remote queue. Check the actual status of the queue from the command line by typing the following command:

```
enq -q -P queue
```

If the command returns the status that the queue is ready, printing will function normally.

Parallel Printer Cable Selection

The parallel printer cable must be changed to a cable that is IEEE1284-compliant if all of the following are true:

- Your system was manufactured since 1998.
- The printer is "parallel attached".
- The attached printer is *not* a dot-matrix printer.
- The output of the **lsdev -C -l ppa0** command contains the word IEEE1284.

If the output of the **lsdev** command contains the word Standard, or the printer is a dot-matrix printer, an IEEE1284-compliant cable *is not* required.

Cables that are not IEEE1284-compliant may not correctly transmit data to high-speed printers. Loss of printer data may occur because the cables may not be capable of transmitting data at rates that are possible with newer ECP parallel ports.

IBM AIX Developer Kit, Java 2 Technology Edition, Version 1.3

IBM AIX Developer Kit, Java 2 Technology Edition, Version 1.3 is released in Java130.* filesets. For more information, see the **/usr/java130/README.HTML** file.

Java 1.2.2 on AIX 5L requires Java 1.2.2 PTF 12 and AIX 5.1 fixes on July 2001 update CD (IY21149).

Java 1.1.8 on AIX 5L requires Java 1.1.8 PTF 11 and AIX 5.1 fixes on July 2001 update CD (IY21149).

Location Change for License Use Management (LUM) Commands

The location of the License Use Management commands **i4blt**, **i4cfg**, **i4target**, and **i4tv** has changed from the **/var/ifor** directory to the **/usr/opt/ifor/ls/os/aix/bin** directory.

Note: Use the **i4cfg -script** to configure LUM.

The **/usr/lib/netls/conf** directory does not exist on AIX 5L Version 5.1. The only valid directory for the nodelock file is the **/var/ifor** directory.

Performance Analysis Tools

The following performance analysis tools and libraries are new in AIX 5L for POWER Version 5.1:

- **alstat**
- **emstat**
- **gennames**
- **locktrace**
- **Performance Monitor API** (Refer to **/usr/pmapi/README** for information on using the **Performance Monitor API** on POWER4 platforms.)
- **Perfstat Library API**
- **truss**
- **wlmmon**

In AIX 5L for POWER Version 5.1, the following commands are no longer supported:

- **bf**
- **bfrpt**
- **lockstat**
- **stem**
- **syscalls**

Limitation

The **fileplace** command does not support the JFS2 file system on AIX 5L Version 5.1. The **fileplace** command operates normally with JFS file systems. No workaround exists for this limitation.

The Performance Monitoring API is not supported on LPAR configurations.

Communications, Networking, and I/O

This section contains information about communications, networking, and I/O-related topics.

Networking Technology Feature Enhancements

- Multipath routing is added in AIX 5L Version 5.1. It allow users to specify multiple routes to a destination. The system administrator can either configure multiple routes for load balancing or set up alternative paths to direct network traffic when the best route can no longer perform its tasks. This new feature also allows a system administrator to define multiple default gateways.

- A set of APIs provided by Fast Response Cache Architecture (FRCA) enables e-business applications to cache data, such as Web content, in the Network Buffer Cache (NBC). This significantly reduces the path length and increases the performance of e-business applications.

- Latest sendmail version 8.11.

- TCP/IP now has ECN (Explicit Congestion Notification), which can improve performance when supported by routers and endpoints.

- TCP splicing is a new feature added to AIX 5L Version 5.1. It helps push the data-relaying function of a proxy application (from server-side socket to the client-side socket or vice versa) into the kernel.

- Network Interface Takeover, a new feature, allows the configuration of multiple adapters, including 10/100 Ethernet and Gigabit Ethernet adapters, so that one or more may be designated as a backup.

- Multiprotocol Over ATM (MPOA) IP packet fragmentation support in AIX provides for cases where a heterogeneous network environment with varying MTUs exists and network configurations where normal MTU Path Discovery is not available.

- Virtual LAN (VLAN) support based on IEEE 802.1Q standard. This implementation only supports VLANs using Ethernet interfaces. AIX VLAN support requires IEEE 802.1Q compliant switches.

- TCP/IP now supports hardware offload of TCP resegmentation for transmitted TCP segments in conjunction with the Gigabit Ethernet-SX PCI Adapter and IBM 10/100/1000 Base-T Ethernet PCI Adapter. This capability is enabled using an additional SMIT adapter configuration menu option, titled "Enable hardware transmit TCP resegmentation". The default value for this option is "no", but can be enabled by the user. This feature allows TCP to send a large TCP segment (up to 64K bytes) to the adapter and the adapter will then resegment this buffer into smaller 1500 byte packets to be sent on the Ethernet network.

  This reduces the AIX system overhead which lowers the CPU utilization, and releases CPU cycles to be used for other work by the server. However, the adapter must now resegment the buffer and recompute the TCP checksums, which typically reduces the raw throughput on each adapter. In laboratory measurements, system CPU utilization has been observed to drop by 10% to 60% while the raw throughput may degrade by 10% to 30% (these numbers will vary by workload). However, the raw throughput may increase when using multiple adapters by as much as 25%. This feature is not for all workloads but should be evaluated when there is a need to reduce server CPU utilization and is most useful when the server sends more data than it receives.

DVD-RAM Drive Support

AIX 5L Version 5.1 supports both R/W DVD-RAM, high-capacity DVD-ROM, and standard CD-ROM media. AIX CD-ROM device driver has been enhanced to support DVD-RAM drive. The UDF (Universal Disk Format) File System is not supported by this release. The following AIX functions are supported:

- Boot and install from CD-ROM and DVD (DVD boot on chrp platform only).
- Mount CDRFS off CD-ROM and DVD.
- Use tape utilities to read and write to DVD-RAM media (tar, cpio, backup/restore).
- mksysb on DVD-RAM media using GNU utilities (GNU utilities are automatically installed as part of the base operating system).
- mksysb on DVD-RAM also has a limitation that it expects the media to be 4.7 GB or larger per side. It will not process the next volume until it writes over 4 GB, thus the use of smaller media would result in corruption when going beyond the media's capacity. The other commands (tar, cpio, backup/restore) do not have this limitation.

DVD-RAM support is limited to IBM part numbers 04N5272 and 04N5276.

7135 RAIDiant Array for AIX Requirements (after Installing AIX 5L Version 5.1)

Customers installing AIX 5L Version 5.1 on systems with attached 7135-110 or 7135-210 RAIDiant Array subsystems must also obtain and install the latest version of controller and drive microcode. This microcode update can be obtained using hardware service channels (800-IBM-SERV in the U.S.) by requesting ECA 010. You can also order the publication for the 7135 titled *7135 Raidiant Array for AIX: Installation Guide and Reference* (order number SC23-1742), which contains information on microcode and device driver installation.

Enable Link Polling and Time Interval for Link Polling Configuration Attributes

The IBM 10/100 Mbps Ethernet PCI Adapter (23100020) does not have an interrupt-driven mechanism to tell the device driver of any changes in its link state.

To avoid this drawback, the device driver now provides an ODM attribute to determine the status of the link. This **Enable Link Polling** attribute is disabled by default. If this attribute is enabled, the device driver will poll the adapter every time period, equal to the time in milliseconds specified in the **Time interval for Link Polling** attribute, for a change in the adapter's link state.

If the adapter's link goes down for any reason, the device driver will disable its NDD_RUNNING flag. When the device driver finds that the link has come back up, it will enable this NDD_RUNNING flag.

To work successfully, protocol layer implementations such as Etherchannel need notification if the link has gone down. Enable the **Enable Link Polling** attribute for this adapter to accomplish this.

By enabling this flag, the performance of this adapter will decrease compared to when it is not enabled, because of the additional PIO calls that the device driver will make to the adapter every few milliseconds while it determines the link status.

Gigabit Ethernet-SX PCI Adapter and IBM 10/100/1000 Base-T Ethernet PCI Adapter

The Gigabit Ethernet-SX PCI Adapter and the IBM 10/100/1000 Base-T Ethernet PCI Adapter share the same device driver. Therefore, the device driver and diagnostic package can be obtained by installing the **devices.pci.14100401** fileset. The device driver conditionally switches code that is unique for either adapter.

Note: The **lslpp** output for **devices.pci.14100401** (shown below) refers to the Gigabit Ethernet-SX PCI Adapter even though the fileset is shared by both adapters.

```
# lslpp -L | grep devices.pci.14100401
  devices.pci.14100401.diag   5.1.0.0   C   Gigabit Ethernet-SX PCI Adapter
  devices.pci.14100401.rte    5.1.0.0   C   Gigabit Ethernet-SX PCI Adapter
```

Enhanced Error Handling (EEH) Device Driver Support in AIX 5L for POWER Version 5.1

EEH is an error-recovery mechanism for errors that occur during load and store operations on the PCI bus. EEH is made possible by EADS chips incorporated in newer POWER-based servers. In effect, each

PCI slot on the EADS is its own PCI bus. This allows each adapter to be isolated (which is useful if PCI bus errors occur because error recovery can occur without affecting the operation of other adapters). Isolating the failing adapter prevents a faulty component from causing problems on the system and allows continued operation of other PCI devices during error recovery.

Supported Devices

Device Driver support for EEH is limited to the following devices that are supported by AIX 5L for POWER Version 5.1:

- Storage Adapters:
  - Gigabit Fibre Channel
  - PCI SCSI RAID Devices
  - PCI Ultra SCSI Devices
- Communications and connectivity (PCI bus type):
  - Token-Ring PCI 4/16 Adapter (2920 and 4959)
  - IBM Ethernet 10/100 Mbps (2968)
  - 10/100/1000 Base-T Ethernet PCI Adapter (2975)
  - Gigabit Ethernet (2969)
  - TURBOWAYS 622 Mbps PCI MMF ATM Adapter (2946)
  - 2-Port Multiprotocol PCI Adapter (2962)
  - 8-Port and 128-Port 232/422 Async PCI Adapters (2943 and 2944)

IPX/SPX Protocol Support

IPX/SPX protocol support is provided in the ipx.base package. The ipx.base package is supported on the 32-bit kernel only.

SecureWay Directory Lightweight Directory Access Protocol (LDAP)

SecureWay Directory Version 3.2.1 is now available on AIX 5L Version 5.1. See the following Web site for the latest information about this product:

`http://www.software.ibm.com/network/directory`

The installation images for SecureWay Directory 3.2.1 include fixes for APARS IR45078 and IR45065 (ja_JP locale only).

SecureWay Directory (LDAP) Installation Considerations

Before installing the SecureWay Directory server (ldap.server), use SMIT (or smitty) to install the SecureWay Directory client package (ldap.client), messages (ldap.msg.<Primary Locale>) and documentation (ldap.html.<Primary Locale>). This will provide the documentation for installing and configuring the server. After documentation installation, point your Web browser to read the **/usr/ldap/web/LANG/getting_started.htm** file to access the documentation.

SecureWay Directory Version 3.1.1 and Version 3.2.1 provide the following additional packages and filesets on the Expansion pack. Where available, Maximum Encryption (128-bit and Triple DES) support may be enabled with the following filesets, installed with either SecureWay-SSL 3.3 or AIX Certificate and SSL Base Runtime Support 4.0 and the SecureWay Directory Base:

Package	Fileset	Description
ldap.max_crypto_server		SecureWay Directory Server (Max Encryption)
	ldap.max_crypto_server.com	SecureWay Directory Server Framework (Max Encryption)
	ldap.max_crypto_server.admin	SecureWay Directory Server Admin (Max Encryption)
ldap.max_crypto_client		SecureWay Directory Client (Max Encryption)
	ldap.max_crypto_client.rte	SecureWay Directory Client Runtime (Max Encryption)
	ldap.max_crypto_client.adt	SecureWay Directory Client SDK (Max Encryption)

Configuration

SecureWay Directory can be automatically started at boot time by adding the following statement to the **/etc/inittab** file.

```
ldap:2:once:/bin/slapd -f /etc/slapd32.conf > /dev/console 2>&1 # AutoStart LDAP
```

This action is sufficient for most locales with the exception of the DBCS (double-byte code set) locales where the SecureWay Directory has been configured in a local (Non-UTF8) code page. In this case, create an executable script with the following contents and appropriate line to the **/etc/inittab** file using the **mkitab** command.

- Create an executable slapd start script (for example **/etc/rc.ldap**) with the following contents:

  ```
  #!/bin/ksh
  export LANG=<Primary Locale>
  export LC_ALL=<Primary Locale>
  /bin/slapd -f /etc/slapd32.conf
  ```

- Add appropriate entry into **/etc/inittab** file using the **mkitab** command as root user:

  ```
  mkitab "ldap:2:once:<script name> > /dev/console 2>&1"
  ```

Note: If the **mksecldap** command has already been run, the "ldapd" entry may already exist in the **/etc/inittab** file. Therefore, the sample should use "ldapd" Ident. and issue the following command:

```
chitab "ldapd:2:once:<script name> >/dev/console 2>&1"
```

Using SecureWay Directory Version 3.2.1

If you have two or more DB2 products installed on your system prior to installing SecureWay Directory LDAP and want to use one other than the default selection, you must create two links to enable its use. At installation time, the presence of one of the following DB2 products is determined by checking and creating its corresponding link:

1. If DB2 UDB 7.1 is installed, the following links are created:

    - **/usr/ldap/db2 -> /usr/lpp/db2_07_01**

    - **/usr/ldap/lib/libdb2.a -> /usr/lpp/db2_07_01/lib/libdb2.a**

2. If DB2 UDB 6.1 is installed, the following links are created:

    - **/usr/ldap/db2 -> /usr/lpp/db2_06_01**

    - **/usr/ldap/lib/libdb2.a -> /usr/lpp/db2_06_01/lib/libdb2.a**

3. If DB2 UDB 5.0 is installed, the following links are created:

    - **/usr/ldap/db2 -> /usr/lpp/db2_05_00**

    - **/usr/ldap/lib/libdb2.a -> /usr/lpp/db2_05_00/lib/libdb2.a**

If you want to change the DB2 product used by SecureWay Directory, do one of the following:

- For DB2 UDB 7.1, enter the following commands:

```
ln -fs /usr/lpp/db2_07_01/usr/ldap/db2
ln -fs /usr/lpp/db2_07_01/lib/libdb2.a /usr/ldap/lib/libdb2.a
```

- For DB2 UDB 6.1, enter the following commands:

```
ln -fs /usr/lpp/db2_06_01 /usr/ldap/db2
ln -fs /usr/lpp/db2_06_01/lib/libdb2.a /usr/ldap/lib/libdb2.a
```

- For DB2 UDB 5.0 (5.2.0.7), enter the following commands:

```
ln -fs /usr/lpp/db2_05_01 /usr/ldap/db2
ln -fs /usr/lpp/db2_05_01/lib/libdb2.a /usr/ldap/lib/libdb2.a
```

Unsupported Functions

- The 7318 Serial Communications Network Server that provides serial and parallel connectivity to Ethernet Networks is not supported on AIX 5L Version 5.1.

- Network Terminal Accelerator is not supported on AIX 5L Version 5.1.

- The 9333 Serial Link DASD Subsystem is not supported on AIX 5L Version 5.1.

Fileset devices.pci.b7105090 is not supported in AIX 5L Version 5.1

The Ethernet adapter that is supported by the **devices.pci.b7105090** fileset in AIX versions *prior to* AIX 5L Version 5.1 is *not* supported in AIX 5L Version 5.1. After a migration to AIX 5L Version 5.1, or if AIX 5L Version 5.1 is installed when this Ethernet adapter is in the machine, the following messages may display on the console or be written to log files:

```
Method error (/usr/lib/methods/cfgv3boom -l ent1 ):
        0514-068 Cause not known.

cfgmgr: 0514-621 WARNING: The following device packages are required for
        device support but are not currently installed.

devices.pci.b7105090 Not found on the installation media.
```

Remove the unsupported Ethernet adapter from the machine. This adapter will not be configured by AIX 5L Version 5.1.

Missing Resource Processing

In a partitioned environment, missing resource processing (through **diag -a** command) is not performed for processors, memory, L2 Cache, integrated devices, or pluggable adapters that have been moved to another partition. This is done to aid configuration for resources that are moved from one partition to another partition, then moved back to the original partition.

To remove a device from the configuration, log in as the root user, and type `rmdev -dl` *device* (where *device* is the name of the device you want to remove).

For more information, view the service hints section within diagnostics (when logged in as the root user or using the CE login). You can view the service information by doing the following:

1. At the command line, type *diag*.

2. When **Diagnostic Operating Instructions** is displayed, press Enter.

3. At the **Function selection** menu choose **Task Selection**.

4. At the **Task Selection** menu select **Display Service Hints** and press Enter.

Graphics

Spaceball Installation

1. Install SpaceWare as normal.

2. After SMIT starts during installation, select **enable spaceball**. The spaceball should "beep."

3. Select **disable spaceball**.

4. Exit SMIT.

5. Open a shell. (You can use the shell that started the installation process) and type:

   ```
   /etc/SpaceWare/spaceballd -d /dev/tty0 -GL &
   ```

System Management

This section contains information about Web-based System Manager.

Web-based System Manager Limitations

Some of the Tips Help files are large and may take a long time to load. Although the console may appear to hang, the delay is due to the large size of the **Help** file.

RSCT Limitation of Japanese Entry Names

The RSCT (Reliable Scalable Cluster Technology) Monitoring plug-in of Web-based System Manager allows users to input user-specified entry names in Japanese. However, Japanese characters entered in those fields may cause unreadable characters in the mail, wall messages, and log files. Specifying the following names in Japanese is not recommended:

- Condition Name
- Response Name
- Action Name

Documentation

This section contains information about documentation changes.

AIX Documentation Libraries

The Documentation CD contains the following types of documentation:

- User guides
- System management guides
- Application programmer guides
- Commands reference volumes
- Files reference information
- Technical reference volumes used by application programmers.

This CD contains operating system documentation designed for use with an HTML 4.0 Web browser, such as the Netscape browser that is shipped with the AIX 5L for POWER Version 5.1 Expansion Pack. All books in the documentation library are also shipped in PDF format and must be viewed using the Adobe Acrobat Reader, Version 4.05 or later. To print the books, use the **Print Tool** button on the Documentation Library Service page.

The Documentation Library Service allows users to navigate, read, and search registered HTML documents using their Web browser and the library application. The library application presents documents in an expandable-tree format that can be navigated by clicking on button controls in the tree. This action opens those documents for reading and also allows users to search keywords using a search

form in the application. The Documentation Library Service searches for those words and then presents a list of results that are linked to information contained in the online documentation files.

Users can access the global library application by typing `docsearch` on the command line or by clicking the **Documentation Library** icon in the Help subpanel under the CDE Desktop front panel.

The documentation information is made accessible by installing it onto the hard disk or by mounting the documentation CD in the CD-ROM drive. While mounting the CD saves on the amount of hard disk space used, it requires that the CD be kept in the CD-ROM drive at all times. Also, searching the documentation from the hard disk is faster than searching the documentation from the CD-ROM drive.

You can install all of the AIX documentation from the Documentation CD or you can selectively install pieces of the documentation. Some documentation may have previously been installed with the operating system or other licensed products. Run the **lslpp** command to find out which packages and filesets are already installed on your system.

Language Fix for Taiwan Only

For Taiwan only, do not use the **Documentation Library** icon in the Help subpanel of the CDE desktop. Instead, always use the **Documentation Library** icon to open the manuals. If the **Documentation Library** icon fails to open the library, use the **docsearch** command on the command line to open the library.

Commands for Documentation

The man Command

The **man** command is installed with the base operating system. The man pages for the command section are available from the AIX CD-ROM in the **bos.man.en_US.cmds** fileset.To access other sections (for example: libraries or files), install the corresponding HTML documentation filesets from the documentation CD.

The resolve_links Command

The **resolve_links** command is not supported.

Configuring the Documentation Server with SMIT

If you use SMIT to configure a Web server as the documentation and search server, ensure that the Web server is installed before you configure it. If you select the IBM HTTP Server Web server and it is not installed, the following script error occurs:

```
1800-106 An error occurred:
get_server[49]:   < 1360 : 0403-057 Syntax error
```

Application Software

This section contains information about application software. Additional information about AIX-supported products is available from the following Web site:

`http://www.ibm.com/servers/aix/products/ibmsw/list/`

Viewing Information about Application Software

Licensed programs include AIX 5L for POWER Version 5.1 and optionally purchased products. Each program can have one or more separately installable filesets. Information about individual software products is available in HTML format. To view the software products information, you must have installed an HTML Version 3.2 Web browser, such as the one available on the AIX 5L for POWER Version 5.1 Expansion Pack.

AIXLink/X.25 Version 1.1.5

AIXLink/X.25 Version 1.1.5 is supported on only the AIX 5L Version 5.1 32-bit kernel.

For more information about supported adapters and about configuration and installation, see the following publications:

- *AIXLink/X.25 LPP Guide and Reference*
- *X.25 Installation and Configuration*

AIX Fast Connect Version 3.1.0

AIX Fast Connect Version 3.1.0 adds File and Print Services for Windows It supports the widely used SMB/CIFS protocol using TCP/IP. Windows clients come enabled for SMB/CIFS over TCP/IP. Therefore, no additional software is needed for the client PCs. AIX Fast Connect offers high performance, rich functions, AIX integration, as well as IBM service and support.

AIX Fast Connect Version 3.1.0 includes the following features:

- User Name Mapping
- NT Password Encryption Support
- Windows Terminal Server (WTS) Support
- Manageability Enhancements
- Ability to configure options, which were previously server-wide, on a per-share basis
- Performance Enhancements, including Directory Search Caching
- Share Level Security Support
- Messaging to PC Clients

Quick Start

1. Install AIX Fast Connect from the distribution CD using the fast path `smitty install_all`.

2. Use the `smitty smb` fast path to access AIX Fast Connect SMIT menus. Configure AIX Fast Connect for encrypted passwords and add a user.

3. Access the AIX Fast Connect server from a PC client by mapping a network drive. The server name is the same as the AIX host name, and HOME share is available by default.

DCE 3.1 for AIX

DCE 3.1 for AIX is not supported for the 64-bit kernel.

Compilers

The compilers in this section are for AIX Power systems only.

VisualAge C++ Professional for AIX

New media is required to install VisualAge C++ Professional for AIX, V5.0.2.0.

C for AIX

New media is required to install C for AIX, V5.0.2.0.

XL Fortran for AIX

XL Fortran for AIX, Version 7.1.0.2 is the fully supported version of this product. Install Version 7.1.0.2 by using your existing Version 7.1.0.0 CDs, and then apply APARs IY16228 and IY16948.

Perl

The following Perl filesets are shipped with AIX pursuant to the terms of the artistic license:

- **perl.rte** 5.6.0 (version 5.6)

- **perl.man.en_US**

For more information, run the **perl -v** command or to view the artistic license, see:

`http://www.perl.com/language/misc/Artistic.html`.

The **perl.rte** fileset will be installed automatically.

IBM will continue to ship Perl, but will not support it.

For more information about Perl, see the following Web site:

`http://www.perl.org`

AIX 5L Version 5.1 Unsupported Items

AIX 5L Version 5.1 Unsupported Functions and Filesets:

- 7318 Model P10/S20 Serial Communications Network Server
- AIX Xstation Manager

- AIX Version 3.2 Network Installation Tools
- Remote Customer Support and Services
- SOMobjects Base Toolkit
- Information Presentation Facility Runtime
- X11.vsm.helps
- X11.vsm.icons
- X11.vsm.rte

Removal of Support for libipfx.a

AIX 5L no longer provides or supports the services provided in AIX Version 4 by the IPFX (Information Presentation Facility) LPP. In particular, the interfaces provided by the **/usr/lib/libipfx.a** IPFX library are no longer present, due primarily to service and support issues.

It is possible that an application may still require these services. One indication is that the application fails to load with an error message that it cannot find/load **libipfx.a**. In this case, IBM provides an unsupported copy of the **ipfx.rte** fileset at the following Web site. This fileset is provided as a convenience only. There is no support for this fileset on AIX 5L.

```
ftp://aix.software.ibm.com/aix/efixes/ipfxrte/
```

AIX 5L Version 5.1 Unsupported Devices:

- AIX Ultimedia Services Audio and Video devices
- PCMCIA device support

Optional Software

Communications Server

If you are using Communications Server for Systems Network Architecture (SNA) support, use one of the following levels:

- Communications Server for AIX, Version 6.1 (6.1.0.0)
- Communications Server for AIX, Version 6 (6.0.1.0)

Service

Inventory Scout for AIX

AIX 5L Version 5.1 includes the following filesets:

- **invscout.rte** (Inventory Scout Runtime Environment), which contains the main function for Inventory Scout

- **invscout.ldb** (Inventory Scout Logic Database), which contains the current logic database file

Inventory Scout is a tool that surveys one or more systems for hardware and software information. The data that is gathered can be used by Web services such as:

- Microcode Discovery Service, which generates a report indicating if microcode installed on the system needs to be updated.

- VPD Capture Service, which surveys RS/6000 and eServer pSeries systems for Vital Product Data information and sends this information to IBM for customizing Miscellaneous Equipment Specifications (MES) upgrades.

For additional information about installing, configuring and running Inventory Scout, refer to the User's Guide, available on the following IBM Server Support Web site:
`http://techsupport.services.ibm.com/server/support/`.

Electronic Fix Distribution for AIX

Fixes on the Internet

IBM provides a number of mirrored sites on the Internet where you may freely download AIX-related fixes. While not every AIX-related fix is available, we are constantly adding more and more product fixes. These sites are anonymous FTP servers. Though we do not guarantee all fixes will be made available immediately, we usually update the servers within 24 hours after the fix is made available from our tape sites.

AIX fixes are mirrored at a number of sites around the globe to provide youwith faster downloads and redundancy in case you cannot reach your usual site. The servers are:

```
United States      techsupport.services.ibm.com
Germany            www.ibm.de
```

Accessing Fixes

You can download AIX 5L Version 5.1 fixes from the IBM Server Support Web site:

`http://techsupport.services.ibm.com/server/support`

Registration is required to download fixes. Registration is free, and no service agreement is necessary.

Problem-Solving Databases for AIX

IBM provides searchable technical databases through the World Wide Web. Much of the technical information is available to customers with support contracts, but we also provide a large assortment of technical information to any Web user.

You can freely search AIX related bug reports and technical tips at the following Web site:

`http://techsupport.services.ibm.com/server/support`

Known Problems and Workarounds

64-bit Applications Display Error on 32-bit Kernel

On the 32-bit kernel, 64-bit applications give a display error when the shared memory transport kernel extension is used. The default socket used by AIX is the shared memory transport. The workaround for this limitation is to export the display to a UNIX socket by using the following command:

```
export DISPLAY=unix:0.0
```

UTF-8 Locales

When UTF-8 locales are specified, text may be displayed incorrectly. UTF-8 locales are those that are described by all-uppercase letters (for example, AR_AA, EN_US, FR_FR, DE_DE, JA_JP, ES_ES). If text displays incorrectly, specify another locale (for example, ar_AA, en_US, fr_FR, de_DE, ja_JP, es_ES).

core File Format Documentation

The following additional information applies to the Description section of the **core** File Format documentation.

The unique **core** file naming will only be enabled if the **CORE_NAMING** environment variable is exported. Default naming is `core` as in previous releases. The value of the variable can be set to any value.

IBM eServer pSeries 690

Japanese Keyboards with the Hardware Management Console for pSeries

(HMC)

Customers who want to use Japanese keyboards with HMC PCs, must first do the following:

1. On HMC, modify the **/etc/sysconfig/keyboard** file from:

    ```
    KEYBOARDTYPE = "pc"

    KEYTABLE = "us"
    ```

    TO:

```
KEYBOARDTYPE = "pc"
```

```
KEYTABLE = "jp106"
```

Save and close the file.

2. Modify keymapping for XFree86 /etc/X11/XF86Config-4

   Modify Option "Xkblayout" "us" to Option "XkbLayout" "jp"

   Add the following Option line:

```
Option "XkbModel" "jp106"
```

   Save and close the file.

3. Shut down the system. Attach the Japanese PS2 Keyboard to the HMC and restart the system.

 Note: This is an example setting. It may vary somewhat according to what HMC version is used.

The use of Japanese locales within vterms is not supported in pSeries Release 1, Version 1. AIX Input Methods and Wnn6 input methods are also not supported in pSeries Release 1, Version 1.

When trying to read from the vterm after installing Japanese AIX version, type the following at the command line:

```
#export LANG=C
```

Known Limitations

- No more than four GXT135P graphics cards can be used in SMP mode. SMP mode with greater than four GXT135P graphics cards causes unpredictable behavior (hangs, crashes, etc.).

- Only 1 graphics adapter and USB adapter with 1 keyboard and mouse are allowed per system, in SMP mode, or per partition (maximum of 8 per system).

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