

AIX 5L for POWER Version 5.1



Release Notes

AIX 5L for POWER Version 5.1



Release Notes

Note

Before using this information and the product it supports, read the information in Appendix B, "Notices", on page 33.

Seventh Edition (May 2003)

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Chapter 1. Read This Before Installation

Note: AIX 5L for POWER Version 5.1 Release Notes contains information that will aid you in the installation of AIX 5L Version 5.1. To view the most current version of the Release Notes, go to the online Release Notes in the Information Center. The Information Center is located at the following Web address:

http://publib16.boulder.ibm.com/pseries/en_US/infocenter/base

Required Hardware

IBM eServer POWER4 pSeries Machines

Required Levels of Hardware Management Console (HMC) and Firmware

The following items are required for using AIX 5L for POWER Version 5.1.

- **Platform Firmware:** Version 2 firmware or later (Version 3). To determine your platform firmware level, do the following:
 1. At the command prompt, type:

```
lscfg -vp | grep -p Platform
```
 2. The last 6 digits of the ROM level represent the Platform Firmware date in the format: *YYMMDD*. Firmware with dates between 04/13/2002 and 10/24/2002 or has firmware level *2xYYMMDD* is considered Version 2.
Firmware with dates between 10/25/2002 and 03/24/2003 or has firmware level *3xYYMMDD* is considered Version 3.
- **HMC:** Release 2 Version 1.0 or later is required for Platform Firmware Version 2.
Release 3 Version 2.0 is required for Platform Firmware Version 3.

Known Limitations

- In Full System Partition mode, only one graphics adapter and one USB adapter with one keyboard and one mouse are allowed per system. Only one graphics adapter and one USB adapter with one keyboard and one mouse are allowed per logical partition. A maximum of 8 logical partitions (which have one graphics adapter and one USB adapter) are allowed.
- The eServer pSeries 690 model 681 (7040-681) supports a maximum system memory size of 512 GB with appropriate memory Feature Codes installed.
The maximum logical partition memory size for AIX Version 5.1 partitions is 256 GB. Attempts to create greater than 256 GB AIX Version 5.1 logical partitions will result in an insufficient real mode memory error. AIX Version 5.1 partitions also require that the **Small Real Mode Address Region** option not be chosen on the HMC partition profile memory panel.

Some AIX Systems Might Not Boot From CD-ROM

AIX systems might not be able to boot from a CD-ROM drive. 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 *Part Number* is 04N2964 and *ROS Level and ID* is less than or equal to 1_04 (for example, 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.

Where to Find AIX 5L for POWER Version 5.1 Documentation

Information Center

The pSeries Information Center is an information portal for AIX and pSeries customers. From this site, you can access the following:

- AIX 4.3, AIX 5.1, and AIX 5.2 documentation
- Hardware documentation
- Message database for 7-digit error codes, LEDS, and error identifiers
- 5.2 How-to's and FAQs
- Links to Redbooks, White Papers, and related products

To access the Information Center, go to the following Web site:

http://publib16.boulder.ibm.com/pseries/en_US/infocenter/base

AIX 5L for POWER Version 5.1 Installation Documentation

AIX 5L for POWER Version 5.1 with the 5100-04 Recommended Maintenance package (APAR IY39794) documentation is only available through the Information Center. It is not contained on the AIX documentation CD.

AIX 5L for POWER Version 5.1 documentation is 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.

Note: The documentation contained on the CD may not be as current as the documentation on the Information Center Web site.

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 printed 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.

Configuring the Documentation Server using 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
```

Known Problems and Limitations

Language Fix for Taiwan Only

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

The **resolve_links** Command

The **resolve_links** command is not supported.

Updating a 5.1 System to 5.1.0.50

Before Updating Systems Using JFS2 in rootvg

When updating an existing AIX 5.1 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 the system for the updates to take effect.

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

<http://www.ibm.com/server/support>

Update the bos.rte.install Fileset First

When updating an existing AIX 5.1 system, first update to the latest level of the **bos.rte.install** fileset. To install the **bos.rte.install** update from media in the **/dev/cd0** directory, run the following at the command line as the root user:

```
installp -acgXd /dev/cd0 bos.rte.install
```

This will apply and commit this update (the recommended method of installation). If, however, you only want to apply (not commit) this update, omit the **-c** flag. Do this when using either Update or Product Media.

Updating the Base Operating System

To upgrade your system, the following interfaces can be used:

- The SMIT interface (such as the **smit update_all** or **smit install_latest** commands)
- The Web-based System Manager interface.
- The **install_all_updates** command. This command installs all updates to currently installed software and verifies that you are at the latest known recommended maintenance level. The following are examples for using the **install_all_updates** command:
 - To run a preview installation on media in the **/dev/cd0** directory, run the following at the command line:

```
install_all_updates -p -d /dev/cd0
```
 - To apply all relevant updates on media in **/dev/cd0**, run the following at the command line:

```
install_all_updates -d /dev/cd0
```
 - To apply and commit all relevant updates in the **/mnt** source directory, run the following at the command line:

```
install_all_updates -c -d /mnt
```
 - To list all available option flags, run the following at the command line:

```
install_all_updates -?
```

Migration

Minimum Memory Requirements

The minimum memory requirement for AIX 5.1 is 64 MB. However, when migrating from an AIX 4.3 system with 64 MB or less, the migration might not complete successfully in some cases. It is recommended that the system undergoing migration be upgraded to 128 MB.

xlC.rte Fileset

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

```
ls1pp -L xlC.rte
```

If the level is earlier than 5.0.2.x, 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 Electronic Fix Distribution Site as follows:

<http://www.ibm.com/server/support>

Trusted Computing Base (TCB)

Known Problems and Workarounds

/dev/dlcqllc: If on a migrated system with TCB enabled, you have the following error from the `tcbck -n tree` command, the following is displayed:

```
3001-020 The file /dev/dlcqllc was not found
```

Run the following command to recreate the **/dev/dlcqllc** device:

```
# mkdev -c dlc -s dlc -t x25_qllc
```

Migration Installations from AIX Version 4.3 to AIX Version 5.1

If an AIX Version 4.3 system was Trusted Computing Base (TCB) enabled, and has been upgraded to 4.3.3.75 through updates, after a migration to AIX Version 5.1, the following files may have **tcbck** errors when you run the the following command,

```
# tcbck -n tree
```

This applies to the following files:

- **/usr/lib/drivers/wgcn**
- **/usr/lib/methods/cfgsf**
- **/usr/lib/methods/cfgwgcn**
- **/usr/lib/drivers/sf**

The permissions on the above files will be removed. To correct this problem, run the following commands:

```
# tcbck -a /usr/lib/drivers/wgcn size checksum
# tcbck -a /usr/lib/methods/cfgsf size checksum
# tcbck -a /usr/lib/methods/cfgwgcn size checksum
# tcbck -a /usr/lib/drivers/sf size checksum
# tcbck -y /usr/lib/drivers/wgcn /usr/lib/methods/cfgsf /usr/lib/methods/cfgwgcn /usr/lib/drivers/sf
```

After running the `tcbck -y` command, you will get the following errors:

```
3001-023 The file /usr/lib/methods/cfgwgcn has the wrong file mode.
3001-023 The file /usr/lib/drivers/wgcn has the wrong file mode.
3001-023 The file /usr/lib/methods/cfgsf has the wrong file mode.
```

However, the file modes will be corrected. Running `tcbck -n tree` again will confirm this.

sysck Errors on the X11.loc.nl_BE.Dt.rte Fileset

Users of the **nl_BE** language fileset might experience **syschk** error messages during migration to AIX 5L Version 5.2. If this is encountered, please perform a force installation of the **X11.loc.nl_BE.Dt.rte** fileset.

Performance Monitoring (PM) API

The Performance Monitoring API is contained in the **bos.pmap** fileset. A beta version of the same code was made available to selected customers, and also through alphaWorks, under the name *pmtoolkit*.

When migrating from any level of AIX with any level of the beta fileset installed, you must uninstall the **pmtoolkit** fileset, and reboot the machine before installing the **bos.pmap** fileset. If you do not do this, the machine will crash when it attempts to load the **pmtoolkit** fileset's kernel extension.

Check whether the **pmtoolkit** fileset is installed by typing the following at the command line:

```
lslpp -l pmtoolkit
```

- If you get the following output:

```
lslpp: 0504-132 Fileset pmtoolkit not installed
```

You can safely install the **bos.pmap** fileset.

- If you get the following output:

Fileset	Level	State	Description

Path: /usr/lib/objrepos			
pmtoolkit	1.3.1.6	COMMITTED	Performance Monitor Toolkit 1.3.1

1. Run the following command:

```
installp -u pmtoolkit
```

2. Reboot the machine. After the machine reboots, you can safely install the **bos.pmap** fileset.

Note: Read "Using the Performance Monitor API on a Partitioned Machine" on page 18 in the *Performance Analysis Tools* section of the Release Notes.

AIX Toolbox for Linux Application Migration Information

Note: AIX 4.3.3 Toolbox applications will not run correctly on AIX 5L Version 5.1 unless the following actions are performed:

- If you previously installed the AIX Toolbox for Linux Applications and the level of the **rpm.rte** fileset is less than 3.0.5.20, 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 overwritten during a preservation installation. To remove your existing **RPMS** directory, use the **destroyRPMS** tool available in the **/contrib** directory on the AIX Toolbox for Linux Applications CD by typing the following:

```
mount -vcd rfs -oro /dev/cd0 /mnt  
/mnt/contrib/destroyRPMS
```

Additional information is also available on the AIX Toolbox for Linux Applications CD in the **/README.TXT** file.

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 Version 5.1 Installation Guide* 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 by 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 is not supported.

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.

For more information on migration, see the Migration section of this document.

New Base Operating System Installation Menus

When performing a base operating system (BOS) installation, if you select **2 Change/Show Installation Settings and Install** from the Welcome to Base Operating System Installation and Maintenance menu, note that 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
```

If there are more than 50 disks on the system, the disks are ordinarily grouped by adapter in the Base Operating System installation menus. However, for some types of disks, the grouping will be slightly different:

SCSI disks	Disks may be grouped by adapter or scsi bus
IBM TotalStorage FASTT Storage Servers	Disks are grouped by disk array controller (DAC)

In each case, the user can select the adapter, SCSI bus, or DAC by name and see the associated disks. The physical location of the adapter, SCSI bus, or DAC is also displayed.

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.

Graphics Systems

The **Desktop** choices are CDE, KDE, GNOME, and NONE. If you select NONE, the following are installed:

- X11
- Java
- Perl
- SMIT
- 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
- 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 MB of physical memory.

Paging Space Requirements

AIX 5L Version 5.1 requires the initial paging space (`/dev/hd6`) to be a minimum of 64 MB 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.

Notes:

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

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 for POWER Version 5.1 Allocated (Used)
<code>/</code>	4MB (1.8MB)	16MB (2.9MB)	4MB (2.5MB)	8MB (6MB)
<code>/usr</code>	140MB (134.3MB)	156MB (143.5MB)	294MB (279MB)	552MB (534MB)
<code>/var</code>	4MB (0.4MB)	16MB (0.9MB)	4MB (1.3MB)	16MB (4MB)

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 for POWER Version 5.1 Allocated (Used)
/tmp	8MB (0.3MB)	16MB (0.5MB)	16MB (0.6MB)	24MB (0.8MB) see note
/opt	N/A	N/A	N/A	24MB (7MB)

2. If **/tmp** is less than 32 MB, it will be increased to 32 MB during a migration installation 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**, 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

Installation Packaging Formats

AIX 5L for POWER Version 5.1 supports the following installation-packaging formats:

- **installp** (AIX system installation command and packaging format)
- RPM (Linux installation command and packaging format)
- ISMP (InstallShield Multi-Platform packaging format)

By using the **geninstall** command, you can list and install from media that contain installation images that were packaged in any of these formats. The **geninstall** and **gencopy** commands recognize the non-**installp** installation formats and call the appropriate installers or copy the images, respectively.

The AIX 5L for POWER Version 5.1 product media contain **installp** packages and RPM packages that are installed during a BOS installation. The **installp** packages are located in the following path:

```
/mount_point/installp/ppc
```

The RPM packages are located in the following path:

```
/mount_point/RPMS/ppc
```

If you have media that contain ISMP packages for AIX 5.1, the ISMP packages are located in the following path:

```
/mount_point/ISMP/ppc
```

The **installp**, **bffcreate**, **geninstall**, **gencopy** and **nim** commands recognize this media structure.

Example:

If you are calling the **bffcreate** command (or a user interface) to copy images from a 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 the **bffcreate** command was **/usr/sys/inst.images**.

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

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

The default target directory would be `/usr/sys/inst.images/installp/ppc`.

To use the **gencopy** command, type the following:

```
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 by typing the following:

```
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 any custom scripts in which image locations are hardcoded.

Configuration Assistant

The configuration assistant does not support the installation of `http_server 1.3.19.4`. If you wish to use this web server with the Unified Library Services, you must install `http_server 1.3.19.4` and configure the Documentation Library Services using SMIT.

DVD-RAM Drive Support for System Backup

Functionality was added in AIX 5.1 to support backing up to DVD-RAM. System backups (such as with the **mksysb** and **savevg** commands) have a limitation in that they expect the media to be 4.7 GB or larger per side. They will not process the next volume until they write over 4 GB on the current volume, thus the use of smaller media would result in corruption when going beyond the media's capacity. The other commands (such as **tar**, **cpio**, **backup**) do not have this size constraint.

For more information on creating CD and DVD backups, refer to the `/usr/lpp/bos.sysmgmt/mkcd.README.txt` file.

Base Operating System (BOS) Installation Support for Fibre Channel Boot

BOS installation supports installation to fibre channel-attached disks. Either bootable AIX 5.1 installation media or NIM resources prepared from such media are required. The fibre channel-attached 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 the following:

```
lsattr -E -0 -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 using the following as an example:

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

In the above example, (World Wide Port Name) and (Logical Unit ID) are each in the format returned by the **lsattr** command, 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 disks.

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, AIX 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.

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 system dump to a dump device set to `/dev/sysdumpnull`, the system will crash, but no dump will occur.

The dump is 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. To change the time that **dumpcheck** runs, see the root **crontab** file. 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 stored in the system error log.

Network Installation Management (NIM)

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 Customize Operation for RPM Packages
- Steps Necessary For Adding GNOME -or- KDE Desktop Support

Reliable Scalable Cluster Technology (RSCT)

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 is located at `/usr/sbin/rsct/README/rsct.core.README`. The readme file contains additional information about the RMC application.

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 the following:

```
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 pressing the F1 key 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 GB 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 the **e** parameter (which corresponds to **edge**) 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 GB boundary of the hard disk.

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 past the 4 GB address on the hard disk.

An example of this calculation follows:

1. Run **lsvg rootvg** to determine PP SIZE.

On a 4.5 GB hard disk, the default PP SIZE is 8 MB. Make a note of this size.

2. Run **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 MB, the boot logical volume must not use any physical partition above 511. ($512 * 8 = 4096$, which is 4 GB). Similarly, if the PP SIZE is 16 MB, the boot image must not use any partition above 255, and if the PP SIZE is 4 MB, 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 past the 4 GB boundary.

Listing and Previewing 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 performing the actual installation. A preview installation provides the preinstallation information that will occur during a regular installation, however, no software will be installed.

When you select a package or fileset to be installed with the preview installation process, you will see a list containing all the requisite packages and filesets required 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 preview software functions from the the SMIT interface, or the Web-based System Manager interface.

Listing and Previewing Software from the ASCII SMIT Interface

1. Log in as the root user.
2. List available software on media using the **smitty install_update** command.
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. 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 plus (+) sign, then it is available to be installed. If the fileset is preceded by an at (@) sign, then the fileset is already installed at the level shown or later.

7. Select the package or fileset you want to install by scrolling to that package or fileset, and pressing the F7 key to select it. 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.

Listing and Previewing Software from 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 + (plus sign) to the left of the client you want to manage.
4. Select the **Software** icon by clicking once on the + (plus 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 **Advanced 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 plus sign to the left of the icon.

Note: If the software is already installed, you will see a small check mark 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.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.

Service

Fixes and Problem-Solving Databases

You can download AIX fixes from the following IBM Server Support Web site:

<http://www.ibm.com/server/support>

You can also search technical databases, including:

- APARS
- Tips for AIX administrators

Chapter 2. AIX 5L for POWER Version 5.1

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 for POWER Version 5.1. The maximum real memory supported by a 32-bit kernel system (or partition) is 96 GB.

System Support

For information about supported and unsupported items, see Appendix A, “AIX 5L Version 5.1 Supported and Unsupported Items”, on page 31.

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 the following 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.

Power Management: Power management is provided only 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” on page 6 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 doing the following:

1. Modify the `/usr/lib/boot/unix` and `/unix` files to be a symbolic link to the binary for the desired kernel.
2. Run the `bosboot` command to write a new system boot image
3. Reboot the system.

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`.

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 typing the following command:

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

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.

Note: Unlike the JFS file system, the JFS2 file system will not allow the `link` subroutine 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 TB	1 TB
Maximum file size	1 TB	64 GB
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

Functions	JFS2	JFS
Compression	No	Yes
Quotas	No	Yes
Deferred update	No	Yes

Known Problems with ksh

For the **ksh** command, when multiple shells have the **noclobber** option set and they redirect output to the same file, there could be a race condition which may result in multiple shell processes writing to the file. The shell does not detect or prevent such race conditions.

If the right-hand pattern of a regular expression contains the at (@) or split vertical bar (|) characters used with their special meaning, the expression may not be properly evaluated. In this case use the enhanced Korn shell, **/usr/bin/ksh93**.

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 the following Web site:
<http://www.perl.com/language/misc/Artistic.html>

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

Note: IBM continues to ship Perl, but does not support it.

For more information about Perl, see the following Web site:
<http://www.perl.org>

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 1.4 is supported only when running on Common Reference Hardware Platform (CHRP) systems (see <http://www.ibm.com/developerworks/java/jdk/aix> for more information). Both 32-bit and 64-bit versions of Java 1.4 are available. Please install all the Java service refreshes. See the **How and where to get fixes** link from the Java 1.4 download page (click on the **Download** link at <http://www.ibm.com/developerworks/java/jdk/aix>; then select the **1.4** link for the 32-bit version or the **1.4 64-bit** link for the 64-bit version).

Both 32-bit and 64-bit versions of Java 1.3.1 are supported. Please install all the Java service refreshes. See the **How and where to get fixes** link from the Java 1.3.1 download page (click on the **Download** link at <http://www.ibm.com/developerworks/java/jdk/aix>; then select the **1.3.1** link for the 32-bit version or the **1.3.1 64-bit** link for the 64-bit version link).

Java 1.2.2 is supported. Please install all the Java service refreshes. See the **How and where to get fixes** link from the Java 1.2.2 download page (click on the **Download** link at <http://www.ibm.com/developerworks/java/jdk/aix>; then select the **1.2.2** link).

Java 1.1.8 is supported. Please install all the Java service refreshes. Please read the **How and where to get fixes** link from the Java 1.1.8 download page (select the **Download** link at <http://www.ibm.com/developerworks/java/jdk/aix>; then select the **1.1.8** link).

Location Change for License Use Management (LUM) Commands

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

Note: To configure LUM, use the **i4cfg -script** command.

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

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

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

Using the Performance Monitor API on a Partitioned Machine

The Performance Monitoring API is not supported on partitioned configurations before **bos.pmapi** level 5.1.0.17, and at that level it is only supported on firmware level RH020305 and later.

Check your **bos.pmapi** level by typing `lslpp -l bos.pmapi`, and your firmware level by typing `lscfg -vp | grep -p Platform` at the command line.

chmod Command

A change was made to the **chmod** command to allow the Set Group ID (SGID) bit on a directory to be changed using either symbolic or octal mode. If the filesystem object is a directory, the user may either specify the mode symbolically or use an explicit 4-character octal with a leading 0 (for example 0755) to remove the SGID bit.

localedef Command

The **localedef** command takes a method file as one of its inputs. The method file specifies user-supplied subroutines that override existing definitions, and a path name for the library containing the specified subroutine.

If a 64-bit locale is to be created, the method file must specify the path of the library as a single archive that has two shared objects, one 32-bit and the other 64-bit, containing the specified routines. Specifying separate paths to the 32-bit and 64-bit shared objects will result in the **localedef** command failing due to incompatible **XCOFF** file format.

mksysb

If your system fails to boot from a **mksysb** tape, you may have encountered a problem which can be identified and resolved with these instructions. Affected systems include all CHRP architecture systems, which started with the model F50. To fix this problem, do the following:

1. Access the firmware command line prompt, which usually appears as an option in the SMS menus.
2. At the firmware command line prompt, type the following two commands:

```
setenv real-base 1000000
reset-all
```

The system will then reboot, and you will be able to boot from tape, assuming that you have an otherwise valid boot image on your tape media.

mksysb Command

The way the **mksysb** command restores data has changed.

Enhancements have been added to more fully restore customized data so that a system more closely resembles the system at the time the backup was performed. This happens when you restore a backup on the system the backup originated from. These enhancements were added to reduce the amount of additional work that sometimes needs to be done to restore devices to their customized configuration at the time a backup is performed.

If devices were removed or replaced from the system after the backup was created, their information will be restored when installing a backup, and the system will show these devices in a defined state.

These enhancements do not affect cloning (installing the backup onto other systems).

rpc.mountd Daemon

There has been a new flag added to the **rpc.mountd** daemon. The following describes the new flag:

-N Denies mount requests originating from non-privileged ports. This is the opposite of using the **-n** flag.

New Flag for the mklv Command

-T O Uses a new device sub type of logical volume. An application (such as a database) may use this new device sub type as an indication that it may safely stop skipping the logical volume control block (lvcb) at the beginning of the logical volume (lv).

Communications, Networking, and I/O

Networking Technology Feature Enhancements

- Multipath routing was added in AIX 5L Version 5.1. This allows 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 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 was 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 has been added to allow 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 (maximum transmission units) exist and for network configurations where normal MTU Path Discovery is not available.

- Virtual LAN (VLAN) support based on the IEEE 802.1Q standard has been added. 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 can be enabled using the new SMIT adapter configuration menu option, titled Enable hardware transmit TCP resegmentation. The default value for this option is No. 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 over 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.

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.) and 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 about 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 parallel input output (PIO) calls that the device driver will make to the adapter every few milliseconds while it determines the link status.

Enhanced Error Handling (EEH)

EEH is an error-recovery mechanism for errors that occur during load and store operations on the PCI bus. Information about the faulty component and nature of the error (recoverable versus permanent) is logged in the AIX Error log.

In order for EEH to work, the following conditions must be met:

- Must have AIX kernel support. AIX 5L for POWER Version 5.1 with the 5100-04 Recommended Maintenance package (APAR IY39794) has the latest EEH services.
- Must have AIX device driver support (dds). Most dds have full EEH recovery (with a few exceptions).
- Must have EEH capable hardware.
- Must have appropriate system firmware levels.

Certain hardware and firmware requirements must be met for EEH to work on a given system. Refer to your system guides to find out if EEH will work on your system.

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:
 - Fibre Channel (6227)
 - Fibre Channel (6228)
 - Fibre Channel (6239)
 - PCI SCSI RAID Devices
 - PCI Ultra SCSI Devices
 - PCI Dual Channel Ultra3 SCSI Adapter (FC 6203)
 - PCI Dual Channel Ultra2 SCSI Adapter (FC 6205)
- Communications and connectivity (PCI bus type):
 - Token-Ring PCI 4/16 Adapter (FC 2920 and 4959)
 - IBM Ethernet 10/100 Mbps (FC 2968)
 - 10/100 Mbps Ethernet PCI Adapter II (FC 4962)
 - IBM 4-Port 10/100 Base-TX Ethernet PCI Adapter (FC 4961)
 - 10/100/1000 Base-T Ethernet PCI Adapter (FC 2975)
 - Gigabit Ethernet (FC 2969)
 - TURBOWAYS 622 Mbps PCI MMF ATM Adapter (FC 2946)
 - 2-Port Multiprotocol PCI Adapter (FC 2962)
 - 8-Port and 128-Port 232/422 Async PCI Adapters (FC 2943 and 2944)
 - IBM Gigabit Ethernet-SX PCI-X Adapter (FC 5700)
 - IBM 10/100/1000 Base-TX Ethernet PCI-X Adapter (FC 5701)
 - IBM 2-Port 10/100/1000 Base-TX Ethernet PCI-X Adapter (FC 5706)
 - IBM 2-Port Gigabit Ethernet-SX PCI-X Adapter (FC 5707)
 - S/390 ESCON CHANNEL PCI ADAPTER (FC 2751)
 - IBM ARTIC960HX 4-PORT PCI ADAPTER (FC 2947)
 - IBM ARTIC960RXD QUAD DIGITAL TRUNK ADAPTER (FC 6310)
- Encryption adapters:
 - IBM PCI 4758 Cryptographic Coprocessor Card (FC 4958 and 4963) *
 - IBM Crypto Accelerator (FC 4960) *
- Graphics and miscellaneous
 - GXT135P Graphics Adapter (FC 2848) *
 - USB Open Host Controller (FC 2737) *

Note: The devices above that are denoted with an asterisk (*) require the user to intervene and manually recover the device after a bus error is encountered (for example, through device reconfiguration and hot-plug operations). You must reboot graphics and USB devices because those devices will

not completely recover when you are using the hot-plug manager. If the device encounters an error during the configuration process, the device will be left in the defined state until there is a subsequent configuration attempt.

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** command output for the **devices.pci.14100401** fileset (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
```

TCP Checksum Offload Feature

There is a known issue with the 10/100 Mbps Ethernet PCI Adapter II (1410ff01) when the adapter's transmit TCP checksum offload feature is enabled. Occasionally, the adapter may not compute the TCP checksum correctly for transmitted TCP/IP packets. This can cause degraded performance. In order to avoid (or remedy) this problem, the user should disable this option using the **ifconfig** command.

For example, to disable the transmit TCP checksum offload feature on interface *en0*, run the following command:

```
ifconfig en0 -checksum_offload
```

The user can also use the **ifconfig** command to check the current status of the transmit TCP checksum offload feature. For example, to check the status of this feature on interface *en0*, run the following command:

```
ifconfig en0
```

The following is returned:

```
en0: flags=7e080863,10<UP,BROADCAST,NOTRAILERS,RUNNING,SIMPLEX,MULTICAST,GROUPRT,64BIT,CHECKSUM_OFFLOAD,
CHECKSUM_SUPPORT,PSEG>
```

The **CHECKSUM_OFFLOAD** flag shown above indicates that the transmit TCP checksum offload feature is currently enabled for interface *en0*. If this feature is disabled, the **CHECKSUM_OFFLOAD** flag will not be present.

IP Security Hardware Acceleration

The 10/100 Ethernet PCI Adapter II (Feature Code 4962) offers standards-based IP security and is designed to offload IP Security functions from the AIX base operating system. When the 10/100 Ethernet PCI Adapter II is present in the AIX system, IP Security offload must be enabled. This can be done through SMIT.

After it is enabled, the IP Security stack uses the following capabilities of the adapter:

- Encryption and decryption using DES or Triple DES algorithms
- Authentication using the MD5 or SHA-1 algorithms
- Storage of the security association information

The functions on the adapter will be used instead of the software algorithms. The IP Security hardware acceleration feature is available on level 5.1.0.25 or later of the **bos.net.ipsec.rte** and **devices.pci.1410ff01.rte** software.

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.

devices.artic960.5.1.0.0 Fileset

The **devices.artic960.5.1.0.0** fileset provides support for the following IBM ARTIC960 adapters:

- PCI ESCON Adapter (FC 2751)
- IBM ARTIC960Hx 4-Port Selectable PCI Adapter (FC 2947)
- IBM ARTIC960RxD Quad Digital Trunk Adapter (FC 6310)

The **devices.artic960.5.1.0.0** fileset includes EEH support and 64-bit support for the above adapters. If an additional fileset is installed to access a particular IBM ARTIC960 adapter, full EEH and 64-bit support depends on the ability of the additional fileset to support EEH and 64-bit.

Support will be pre-loaded on factory shipped machines that ship with AIX 5L Version 5.1 with the 5100-04 Recommended Maintenance Package, and on the AIX 5.1 with the 5100-04 CD.

For customers running AIX 5L Version 5.1 who desire to install a new PCI IBM ARTIC960 adapter, support will be provided on an Additional Device Software Support (MES) CD that will be shipped with the PCI IBM ARTIC960 adapter. The **bos.rte** fileset must be upgraded to 5.1.0.50.

Previous versions of the **devices.artic960** fileset need to be uninstalled before installing the **devices.artic960.5.1.0.0** fileset.

Included with the **devices.artic960.5.1.0.0** fileset are the following filesets:

- **devices.artic960.rte**, IBM ARTIC960 Runtime Support
- **devices.artic960.unicode**, IBM ARTIC960 Adapter Software
- **devices.artic960.diag**, IBM ARTIC960 Adapter Diagnostics

When the **devices.artic960.5.1.0.0** fileset is installed, several pseudo-filesets will also be installed to aid in the automatic creation of various ARTIC devices. Those new filesets are:

- **devices.pci.14104300.rte**, IBM ARTIC960 Device Runtime Support
- **devices.pci.14103600.rte**, IBM ARTIC960 PCI Device Runtime Support
- **devices.pci.14107800.rte**, ARTIC960 PCIHX (ARTIC960Hx) Device Runtime Support
- **devices.pci.86806019.rte**, ARTIC960 RP/RXD (ARTIC960RxD) Device Runtime Support

When a PCI I/O error occurs on an IBM PCI ARTIC960 adapter, the adapter slot becomes frozen and the IBM ARTIC960 adapter can be reset. Following an EEH error, the adapter software needs to be downloaded to the adapter again.

To determine if an EEH error occurred on the IBM ARTIC960 adapter, inspection of the error log is necessary. A temporary EEH error on an IBM ARTIC960 adapter is logged as a temporary EEH error followed by I/O errors specific to the IBM ARTIC960 adapter. Recovery from a temporary EEH error is accomplished by removing and making the IBM ARTIC960 device driver using the **rmdev** and **mkdev** command. This process will load the necessary adapter software onto the adapter.

If the error log shows a permanent EEH error, it is necessary to use the hotplug manager to remove and make the adapter again.

devices.pci.14108c00 Fileset

The **devices.pci.14108c00** fileset provides support for SDLC and bisynchronous protocols on the IBM ARTIC960Hx 4-Port Selectable PCI Adapter, (FC 2947). When combined with the installation of the **devices.artic960.5.1.0.0** fileset, EEH support is provided. For SDLC and bisynchronous communications, 32-bit support continues to be provided.

Removal of Support for Devices

The following devices are not supported on AIX 5L for POWER Version 5.1 with the 5100-04 Recommended Maintenance package (APAR IY39794):

- **PCI FDDI I/O** (FC 2741, FC 2742, and FC 2743) is not supported on AIX 5.1 with 5100-04 or later.
- **devices.pci.b7105090**

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 when AIX 5L Version 5.1 is installed and 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 the **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 -d1 device`, where *device* is the name of the device you want to remove.

For more information, view the service hints section within diagnostics when you are 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.

SecureWay Directory (LDAP)

To access the latest SecureWay Directory Version 3.2.2 product information, go to the following Web site:

<http://www.software.ibm.com/network/directory>

Installation and Configuration

For information specific to SecureWay installation and configuration, go to the following Web site:

<http://www.software.ibm.com/network/directory/library>

From this Web site, read the following documents:

- *IBM SecureWay Directory Version 3.2.2 for AIX Installation and Configuration Guide*

- *IBM SecureWay Directory Version 3.2.2 Server Readme*
- *IBM SecureWay Directory Version 3.2.2 Client Readme*
- *IBM SecureWay Directory Version 3.2.2 Readme Addendum*

Note: When installing the **ldap.max_crypto.client** file, you may see **lppchk** errors. These errors will not affect the installation or operation of SecureWay Directory.

Before starting **ldapxcfg**, verify that the following links exist, as follows:

- If you have db2_07_01 installed:

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

- If you have db2_06_01 installed:

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

If these links are not present, create the links as follows:

- If you have db2_07_01 installed:

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

- If you have db2_06_01 installed:

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

Installing DB2 UDB7.2: If reinstalling, force-installing, or installing an update to the DB2 UDB 7.2 fileset **db2_07_01.msg.ja_JP**, you should first remove the **db2_07_01.msg.Ja_JP** and **db2_07_01.msg.ja_JP** filesets.

Directory Management Tool (DMT): It is strongly recommended that DMT is run when you are logged in as a user without root authority.

Migration

The **/usr/ldap/etc/V3.ldapsyntaxes** file will not be saved during migration to SecureWay Directory Version 3.2.2 and should be saved by issuing the following command as the root user:

```
cp -p /usr/ldap/etc/V3.ldapsyntaxes /tmp/V3.ldapsyntaxes
```

After successfully installing SecureWay Directory Version 3.2.2, copy the **/usr/ldap/etc/V3.ldapsyntaxes** file to the **LDAPSAVEDIR** directory (see the following list), by running the following command as the root user:

```
cp -p /tmp/V3.ldapsyntaxes /usr/ldap/etc/LDAPSAVEDIR
```

The **LDAPSAVEDIR** directory should be replaced by one of the following values:

- If LDAP version is 3115, then LDAPSAVEDIR = ldapV31.
- If LDAP version is 3200, then LDAPSAVEDIR = userV32.
- If LDAP version is 3110, then LDAPSAVEDIR = userV311.
- If LDAP version is 3210, then LDAPSAVEDIR = userV321.

Administration

After installation of the **ldap.client** package, change the file permissions of the **/usr/ldap/etc/dmtSearch.obj** file to 660 by running the following command as the root user:

```
chmod 660 /usr/ldap/etc/dmtSearch.obj
```

Installing SecureWay Directory Version 3.1.1.5 Encryption Filesets

When installing SecureWay Directory Version 3.1.1.5 encryption filesets, you must specify the fileset names and levels because the encryption filesets of both Version 3.1.1.5 and Version 3.2.2 reside on the same CD.

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 the following:

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

System Management

Cluster Systems Management (CSM)

You can access the CSM documentation (*Cluster Systems Management (CSM) for AIX 5L: Hardware Control Guide (SA22-7920-01)*, *Cluster Systems Management (CSM) for AIX 5L: Planning and Installation Guide (SA22-7919-01)*, and the *Cluster Systems Management (CSM) for AIX 5L: Administration Guide (SA22-7918-01)*) by going to one of the following Web sites:

<http://www.ibm.com/shop/publications/order>

OR

<http://www.ibm.com/servers/eserver/clusters/library>

Note: Before installing CSM, it is imperative that you obtain and read the *Cluster Systems Management (CSM) for AIX 5L: Planning and Installation Guide (SA22-7919-01)* for specific procedural steps to use when installing CSM. Installation of this product will be impossible if you do not use the documented procedures in this book.

Software Requirements

The following software is required for CSM:

- CSM FOR AIX 5L (5765-F67)

The following APAR is required for CSM on AIX 5L V5.1:

- IY34707

The cluster management server must be a pSeries machine running AIX 5L Version 5.2. The other machines within the cluster are referred to as managed nodes and can be pSeries machines running AIX 5L Version 5.2, or AIX 5L for POWER Version 5.1 with the 5100-03 Recommended Maintenance package.

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/>

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 after 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.

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.

Viewing Remote Queue Status

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 status indicating that the queue is ready, printing will function normally.

Inventory Scout

Inventory Scout Version 2.1 adds a new Web-based System Manager GUI function to aid customers with the maintenance of systems and device firmware. Inventory Scout can be enabled by installing the **invscout.websm** fileset.

Tivoli Management Agent (TMA), Version 3.7.1.0

Starting in AIX 5L for POWER Version 5.1, TMA 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>

JA_JP Font Changes

The **X11.fnt.ucs.ttf** file, Version 5.1.0.11 or later, includes changes in the size of the CDE desktop fonts for the JA_JP locale. The desktop font sizes have been reduced. Because of the change in font sizes, the Java GUI application does not display characters correctly with JDK1.1.8 in JA_JP locale. It is recommended that you use JDK1.3.0 or later in the JA_JP locale. The original and new fonts are as follows.

Original:

```

-dt-interface system-medium-r-normal-xxs-14-100-100-100-p-136-ucs2.cjk_japan-0
-dt-interface system-medium-r-normal-xs-17-120-100-100-p-165-ucs2.cjk_japan-0
-dt-interface system-medium-r-normal-s-19-140-100-100-p-184-ucs2.cjk_japan-0
-dt-interface system-medium-r-normal-m-22-160-100-100-p-214-ucs2.cjk_japan-0
-dt-interface system-medium-r-normal-l-28-200-100-100-p-272-ucs2.cjk_japan-0
-dt-interface system-medium-r-normal-xl-33-240-100-100-p-321-ucs2.cjk_japan-0
-dt-interface system-medium-r-normal-xxl-44-320-100-100-p-428-ucs2.cjk_japan-0
-dt-interface user-medium-r-normal-xxs-14-100-100-100-m-136-ucs2.cjk_japan-0
-dt-interface user-medium-r-normal-xs-18-130-100-100-m-175-ucs2.cjk_japan-0
-dt-interface user-medium-r-normal-s-20-145-100-100-m-195-ucs2.cjk_japan-0
-dt-interface user-medium-r-normal-m-24-170-100-100-m-234-ucs2.cjk_japan-0
-dt-interface user-medium-r-normal-l-28-200-100-100-m-273-ucs2.cjk_japan-0
-dt-interface user-medium-r-normal-xl-32-230-100-100-m-312-ucs2.cjk_japan-0
-dt-interface user-medium-r-normal-xxl-40-290-100-100-m-390-ucs2.cjk_japan-0

```

New:

```

-dt-interface system-medium-r-normal-xxs-12-87-100-100-p-115-ucs2.cjk_japan-0
-dt-interface system-medium-r-normal-xs-14-101-100-100-p-134-ucs2.cjk_japan-0
-dt-interface system-medium-r-normal-s-16-116-100-100-p-153-ucs2.cjk_japan-0
-dt-interface system-medium-r-normal-m-18-130-100-100-p-173-ucs2.cjk_japan-0
-dt-interface system-medium-r-normal-l-20-145-100-100-p-192-ucs2.cjk_japan-0
-dt-interface system-medium-r-normal-xl-22-159-100-100-p-211-ucs2.cjk_japan-0
-dt-interface system-medium-r-normal-xxl-32-231-100-100-p-308-ucs2.cjk_japan-0
-dt-interface user-medium-r-normal-xxs-12-87-100-100-m-116-ucs2.cjk_japan-0
-dt-interface user-medium-r-normal-xs-14-101-100-100-m-135-ucs2.cjk_japan-0
-dt-interface user-medium-r-normal-s-16-116-100-100-m-154-ucs2.cjk_japan-0
-dt-interface user-medium-r-normal-m-18-130-100-100-m-174-ucs2.cjk_japan-0
-dt-interface user-medium-r-normal-l-20-145-100-100-m-193-ucs2.cjk_japan-0
-dt-interface user-medium-r-normal-xl-22-159-100-100-m-213-ucs2.cjk_japan-0
-dt-interface user-medium-r-normal-xxl-32-231-100-100-m-309-ucs2.cjk_japan-0

```

Other Software

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

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

Compilers

VisualAge C++ Professional for AIX

VisualAge C++ Professional for AIX, V6.0.0, is a fully-supported version of this product.

VisualAge C++ Professional for AIX, V5.0.2, is a fully-supported version of this product.

C for AIX

C for AIX, V6.0.0, is a fully-supported version of this product.

C for AIX, V5.0.2, is a fully-supported version of this product.

XL Fortran for AIX

XL Fortran for AIX, Version 8.1, is a fully-supported version of this product.

XL Fortran for AIX, Version 7.1.1, is a fully-supported version of this product.

AIXlink/X.25

AIXlink/X.25 Version 2.0.2

AIXlink/X.25 Version 2.0.2 is supported on AIX 5L Version 5.1 with the 5100-04 Recommended Maintenance package or later which is included on the 5/2003 or later AIX update CD.

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*

AIXlink/X.25 Version 1.1.5

AIXlink/X.25 Version 1.1.5 is not supported on AIX 5L.

AIX Fast Connect Version 3.1.2

AIX Fast Connect documentation is available at the following Web site:

http://publib16.boulder.ibm.com/pseries/en_US/aixbman/fastcon/fastconfm.htm

The latest updates of the product are described in the **/etc/cifs/README** file, which is installed with AIX Fast Connect.

Quick Start

1. Install AIX Fast Connect from the distribution CD using the **smitty install_all** fast path.
2. Use the **smitty smb** fast path to access AIX Fast Connect SMIT menus.
3. Configure AIX Fast Connect for encrypted passwords and add a user.
4. 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.

Communications Server

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

- Communications Server for AIX, Version 6.1 (6.1.0.0 or later)

Note that the AnyNet functions of CS/AIX are not supported on the 64-bit kernel.

DCE for AIX

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

Removal of Support for the libipfx.a IPFX Library

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.

It is possible that an application may still require these services. One indication is that the application fails to load with an error message indicating that it cannot find or load the **libipfx.a** library. In this case, IBM provides an unsupported copy of the **ipfx.rte** fileset at the following Web site:

<ftp://aix.software.ibm.com/aix/efixes/ipfxrte/>

This fileset is provided as a convenience only. There is no support for this fileset on AIX 5L.

Appendix A. AIX 5L Version 5.1 Supported and Unsupported Items

System Support

The 64-bit kernel supports 64-bit processors such as (but not limited to) 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, 6H0
- eServer pSeries 660 Model 6M1, 6M0
- eServer pSeries 620 Model 6F1
- eServer pSeries 690
- eServer pSeries 610 Model 6C1
- eServer pSeries 610 Model 6E1
- eServer pSeries 670
- eServer pSeries 630 Model 6C4
- eServer pSeries 630 Model 6E4
- eServer pSeries 650 Model 6M2
- eServer pSeries 655 Model 651

I/O Support

For a list of supported 64-bit I/O adapters, go to the following Web site:

<http://www.ibm.com/servers/aix/os/adapters/51.html>

AIX 5L Version 5.1 Unsupported Devices and Machines

The following devices and machines are not supported on AIX 5L Version 5.1:

- AIX Ultimeia Services Audio and Video devices
- PCMCIA device support
- 2707 Eicon ISDN DIVA MCA Adapter
- 2708 Eicon ISDN DIVA PRO 2.0 PCI S/T Adapter

AIX 5L Version 5.1 Unsupported Functions and Filesets

The following functions and filesets are not supported on AIX 5L Version 5.1:

- 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
- libipfx.a
- The 7318 Serial Communications Network Server that provides serial and parallel connectivity to Ethernet Networks
- Network Terminal Accelerator
- The 9333 Serial Link DASD Subsystem
- devices.pci.b7105090
- devices.mca.6336
- devices.pci.331101e0

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Printed in the USA.

GI10-0729-06

