

*AIX Version 4.1*

# ***Release Notes***

**FXRNA/IS2**



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## Second Edition (July 1997)

This edition of *Release Notes* applies to AIX 4.1 and to all subsequent releases of this product until otherwise indicated in new releases or technical newsletters.

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## Purpose

The *AIX 4.1.5 Software Release Notes* contains information on new, changed, or removed functionality of the AIX operating system that was not available at the time of publication of the AIX documentation, and contains additional information not documented in other publications. The *Release Notes* also contain information on the functionality of FX Series systems and of VME boards and systems.

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# Scope

*AIX 4.1 Release Notes* contains information for all supported platforms on:

- general notes about AIX 4.1, including new or changed features
- known problems in this release of the AIX 4.1 operating system
- notes concerning VME systems and products
- notes concerning FX Series systems
- changes and corrections to documents in the AIX 4.1 product library

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## Prerequisites

Some instructions in this guide assume that you are familiar with:

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

For general information about these concepts, refer to the *AIX Version 4.1 System Management Guide: Operating System and Devices*. Use this guide in conjunction with *AIX 4.1 Installation Guide*, *AIX 4.1 Quick Installation Guide* and *The AIX Version 4 Network Installation Management Guide and Reference*.

For FX-specific information, refer to *Administering Your Fault Tolerant System* and *Managing System Storage*, in conjunction with the *FX Series Hardware Installation* and *FX Series Operating System Installation* guides.

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## Overview of Contents

The *Installation Guide* is organized as follows in the table below.

<b>This Chapter...</b>	<b>Discusses...</b>
Chapter 2, "All AIX 4.1 Systems"	features, notes, and known problems that apply to all Motorola Systems.
Chapter 3, "Commercial System Desktops and Servers"	features, notes, and known problems that apply to Motorola commercial systems only.
Chapter 4, "VME Systems and Board-level Products"	features, notes, and known problems that apply to VME systems and boards only
Chapter 5, "FX Series Systems"	information and guidelines concerning FX Series systems
Chapter 6, "Documentation Changes"	changes to the documentation library



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## Related Information

### Optional Software Information

Licensed programs include AIX 4.1 and optionally purchased products. Each program can have one or more separately installable filesets. The Package Installation Database for Current Media is an InfoExplorer database that contains information about the contents of these separately installable filesets.

### README Files

For information on how to view the README files for the base operating system (BOS) and optional software products, refer to the *AIX 4.1 Installation Guide*.

Some README files are shipped in separate directories that are not accessible if you follow the procedure described in the *AIX 4.1 Installation Guide*. To find the README files installed on your machine, use this command:

```
find /usr -name "*README" -print
```

### Softcopy Documentation

The majority of the IBM AIX documentation library is shipped electronically with the BOS CDs with the InfoExplorer help system. Refer to the *Installation Guide* for directions on installing InfoExplorer. Once installed, InfoExplorer can be invoked by typing **info** at the command line.

### Hardcopy Documentation

Custom hardcopy documentation for general AIX and for FX Series systems can be ordered by calling the Motorola Computer Group Literature Center at 888-432-1877 or at 602-804-7378.

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## AIX Version 4.1 Documentation for all Systems

**The following hardcopy AIX documentation ships with your system (non FX):**

- *AIX 4.1 Release Notes*
- *AIX 4.1 Installation Guide*
- *AIX System Diagnostics (ASD) Quick Reference*
- *Installing and Configuring NCDware*

**The following documents may be especially useful to novice AIX users:**

- *Guide to System Information*
- *Getting Started*
- *Quick Reference*
- *iFOR/LS System Management Guide*
- *iFOR/LS Tips and Techniques*
- *Problem Solving Guide*
- *Messages Guide and Reference*
- *Performance Tuning Guide*

**Other MCG titles for generic AIX include:**

- *Installation Checklist*
- *Quick Installation Guide*
- *Network Installation Management Guide and Reference*
- *Network Installation Management Tips and Techniques*
- *VMEbus Device Driver Reference*
- *SVR4 Porting Guide*

- 
- *Managing System Storage*
  - *Configuring and Maintaining the System*

## **FX Series Documentation**

Additional hardcopy FX documentation includes:

- *Administering your Fault Tolerant System*
- *Managing System Storage*
- *Motorola FX Series Fault Tolerant Architecture Overview*
- *Configuring and Maintaining the System*
- *Operating System Installation Guide*
- *Operating System Installation Troubleshooting*
- *FX Series Diagnostics and Troubleshooting*
- *FX Series LED and Alarm Quick Reference*
- *Making and Using Backups*
- *FX Series System Hardware Installation Guide*

**Note** *Managing System Storage* and *Configuring and Maintaining the System* have been listed under both AIX documentation and FX Series documentation, because while they treat generic AIX, they also have sections which are specific to the FX Series.

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## Getting Help for System Problems

If you encounter difficulties with AIX 4.1 on your system or on a supported board, contact your Value Added Reseller (VAR) or distributor first. If further assistance is needed, you can contact the Motorola Computer Group Sales office or Motorola Computer Group's customer support group at:

- U.S.A. 1-800-551-1016
- Canada 1-800-387-2416
- Maidenhead, U.K. 44-1628-39121
- Paris, France 33-1-467-43560
- Duesseldorf, Germany 49-211-65899-55

When you call, please be prepared to provide the following information:

- the type of system (Series E, Series EX, RISC PC, or RISC PC Plus, or FX Series) or motherboard (MVME, Ultra, Atlas, or XR Series) you are using with AIX 4.1
- your system or board ID or serial number
- the name of your company, your name, and a telephone number
- a brief description of the problem, including the severity of its impact on your ongoing efforts

This information is forwarded to the appropriate technical engineering contact, who will return your call promptly.

# All AIX 4.1 Systems 2

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## Overview

This chapter describes AIX 4.1 information common to all platforms supported by AIX 4.1 systems. For information specifically relating to your specific platform, see the appropriate chapter:

- Chapter 3, “Commercial System Desktops and Servers”
- Chapter 4, “VME Systems and Board-Level Products”
- Chapter 5, “FX Series Systems”

This chapter includes information on:

- what’s new in this release
- value-added features specific to Motorola’s AIX 4.1 product
- general guidelines about AIX 4.1
- known problems along with workarounds where possible

---

## What's New in this Release

The following features have been implemented in AIX 4.1.5:

- support for IBM's version of AIX 4.1.5
- ability to upgrade operating system from AIX 4.1.4 (AOS 1.3) and later versions
- installation and booting of multiprocessor systems
- support for MVME2600, MVME3600, and MVME4600 boards
- bridge crash dump capability
- support for 100BaseT Ethernet PMC card
- support for single-ended and differential SCSI PMC cards
- support for 512MB and 1GB expansion memory
- support for FDDI PMC card
- support for VME transition cards
- Netscape Navigator value pack
- Year 2000 support

## Value-Added Features

The AIX 4.1 product is based on IBM's AIX 4.1 operating system. Motorola has made changes to this product to support Motorola-specific hardware platforms, while retaining the functionality and command structure of IBM's AIX 4.1 operating system. This section describes value-added features that are specific to all systems running Motorola's version of the AIX 4.1 operating system.

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## **xdiff Utility Available**

The `xdiff` program is available in AIX 4.1 Service Level AOS1.2 and later releases. `xdiff` is a graphical interface to the `diff` command that allows side-by-side viewing of differences between files and automated merging of selected differences to create a new version of a file.

`xdiff` is automatically installed with the Personal Productivity bundle. Alternatively, you can install it directly from the `X11.apps.motorola` fileset.

## **Environmental Monitor Commands**

These new commands are used with the environmental monitor and are supported on all systems except RISC PC (and RISC PC Plus) and FX systems:

- `envctl`
- `envdiag`
- `rc.motpowerfail`

These commands are documented in the manual pages in section 1M. You must use the `man` command to access these manual pages; they are not available through InfoExplorer.

## **Environmental Monitor Special Files (Devices)**

These pages describe aspects of environmental monitor special files (devices) and are supported on all systems except RISC PC, RISC PC Plus, PowerStack II, and FX systems:

- `envmon`
- `envmon_msg`
- `envmon_odm`

---

You can find these manual pages in section 7. You must use the `man` command to access these manual pages; they are not available through InfoExplorer.



## AIX 4.1 Release Naming Conventions

The naming convention for Motorola AIX 4.1 releases has changed as of release AIX 4.1.4r4.

Releases of AIX 4.1 are named as follows:

**Table 2-1. AIX 4.1 Release Naming Conventions**

Description	Naming Convention	Product ID for TAR Reporting	Based on IBM Release...
First release of AIX 4.1	AOS1.0	AOS1.0	AIX 4.1.1
Second release of AIX4.1	AOS1.1	AOS1.1	AIX 4.1.2
Third release of AIX 4.1	AOS1.2	AOS1.2	AIX 4.1.3
Fourth release of AIX 4.1	AOS1.3	AOS1.3	AIX 4.1.4
Fifth release of AIX 4.1	AOS1.3.1	AOS1.3.1	AIX 4.1.4
Sixth release of AIX 4.1	AOS1.3.11	AOS1.311	AIX 4.1.4
Seventh release of AIX 4.1	AIX 4.1.4r4	AOS1.4	AIX 4.1.4
Eight release of AIX 4.1	AIX 4.1.4r5	AIX414R5	AIX 4.1.4
Ninth release of AIX 4.1	AIX 4.1.4r6	AIX414R6	AIX 4.1.4
Tenth release of AIX 4.1	AIX 4.1.5r1	AIX415R1	AIX 4.1.5
Current release of AIX4.1	AIX 4.1.5r2	AIX 4.1.5R2	AIX 4.1.5

---

# Installation

## Installation Resources

For more detailed descriptions of general AIX installation procedures and troubleshooting help, see the *Installation Guide* and the *Quick Installation Guide*. For FX Series Systems, see the *FX Series Operating System Installation Guide*, the *FX Series Operating System Installation Troubleshooting Guide*, and the *FX Series System Hardware Installation Guide*.

## AIX 4.1.5 Shipped on Multiple CD-ROMS

AIX 4.1.5 is shipped on multiple media. The BOS and some additional software is installed on Volume 1. The DCE and additional software are installed on Volume 2. There are also two value added CDs.

## Installing AIX 4.1.5 on an Existing AIX System

To avoid problems during installation, place the entire system in a dormant state by:

- making sure that all users are logged off
- stopping all applications

If applications are left running, unpredictable results may occur and some updates may not be applied.

## Updating from an Earlier Version of AIX 4.1

Updates to AIX 4.1.5 are available for systems which are currently running Version AOS 1.3 and later. For information on how to update your system from an earlier version of the AIX 4.1 operating system, refer to the *Installation Guide*.

---

After updating your system, be sure to reboot the system to resynchronize the libraries and the login program. If you do not reboot, you are not able to log in. Existing sessions are not affected.

## Installing AIX 4.1 on an AIX 4.2 System:

If you are installing AIX 4.1.5 or any other level of AIX 4.1 on a system previously installed with AIX 4.2, you should do a complete overwrite install.

If a preservation install is attempted, the log for the journaled file system in the rootvg (/dev/hd8) must be reinitialized to be compatible with AIX 4.1. The logform command which does this destroys all log records on existing log devices, which may result in data loss.

Preservation installs of AIX 4.1 on existing 4.2 systems will fail with the following message:

```
BOS Install: After saving all the data from the
previous system into /tmp, it was discovered
that there will not be enough free space in /tmp
to make the boot image. Please reboot in normal
mode and increase the size of /tmp or reduce the
number of files to save as listed in the
/etc/preserve.list file.
```

```
ID# OPTION
```

```
1 Continue
```

```
2 Perform System Maintenance and Then Continue
```

```
Enter ID number:
```

Follow this procedure:

1: Enter ID# 2.

2: At the '#' prompt type:

---

```
logform /dev/hd8
```

and press Enter. You will be prompted as follows:

```
logform: destroy /dev/hd8 (Y)?
```

3: Type 'y' and press Enter.

4: At the next '#' prompt, type:

```
exit
```

The preservation install should continue successfully.

## Updating to AIX 4.1.5. in a NIM Environment

If you are updating a NIM environment from a version of AIX 4.1 earlier than Service Level AOS1.2, you should first update the NIM software on the master, clients, and SPOTs. As a result, you will have access to a function that permits an easier update using NIM. The enhanced update facilities are described in the *Network Installation Guide and Reference*.

## Do Not Install devices.xrft with Network Installation Management

If you are using Network Installation Management (NIM) on your systems, do not install the fileset(s) `devices.xrft` into a NIM "spot" or an `lpp_source` resource. This fileset is incompatible with the NIM environment and is not used on most systems.

## Migration of Diskless/Dataless Clients and NIM SPOTs

Migration to a new level of AIX currently is not supported for diskless and dataless clients. Also, migration of a SPOT that is not a converted `/usr` file system is not supported.

---

## **bos.content\_list Fileset**

AIX 4.1.5 includes a new, optionally installable fileset, `bos.contents_list` that lists all installable files and the filesets/packages that contain them. The fileset includes one file, `/usr/lpp/bos/AIX_file_list`.

## **Trusted Computing Base (TCB)**

AIX 4.1.5 contains some changes to permissions of files for security reasons. For example, the `/etc/passwd` file has changed permissions from 664 to 644. Because of a problem with reject and Trusted Computing Base (TCB), we recommend that you commit the 4.1.5 updates if you have the TCB enabled on your system.

To determine whether TCB is enabled or not, run the `tcbck` command as root. If TCB is enabled, `tcbck` displays a syntax message. If TCB is not enabled, an error message displays.

## **Installing NetWare**

When installing NetWare for AIX on your system using a language other than English, do the following:

1. At the system prompt, type  

```
locale
```
2. Note the value of the `LC_ALL` variable.
3. Set the `LC_ALL` variable to `en_US` using the command:  

```
export LC_ALL=en_US
```
4. Install NetWare.
5. After installing NetWare, reset the `LC_ALL` variable to the original value noted in step 2.

---

## Node-locked Licenses Unavailable for Some Products

The *iFOR/LS System Management Guide* and *iFOR/LS Tips and Techniques* include information about and references to node-locked licenses. However, node-locked licenses are not available for some products that are NetLS license-enabled. Only concurrent access licenses are generated for these products.

Motorola products that this affects are:

- C for AIX
- C Set ++
- XL FORTRAN
- XL Pascal
- IBM COBOL Set for AIX
- Configuration Management Version Control (CMVC)

You must use a concurrent access license with the above products.

---

# Base Operating System

## New splitlvcopy Command

The `splitlvcopy` command has been added for AIX 4.1.5. This command splits copies from one logical volume and creates a new logical volume for them.

To use this command, you must either have root user authority or be a member of the system group.



### Caution

Although the `splitlvcopy` command can split logical volumes that are open, including logical volumes containing mounted file systems, this is not recommended. You may lose consistency between `LogicalVolume` and `NewLogicalVolume` if the logical volume is accessed by multiple processes simultaneously. When splitting an open logical volume, you implicitly accept the risk of potential data loss and data corruption associated with this action. To avoid the potential corruption, close logical volumes and unmount file systems before splitting.

You cannot use SMIT to run this command. Message catalogs are not supported for this command and therefore the error messages are provided in English only with no message catalog numbers. Documentation for `splitlvcopy` consists of the man page. No additional information for `splitlvcopy` exists in InfoExplorer.

---

## New pppstat Command

The `pppstat` command has been added for AIX 4.1.5. This command extracts and displays the RAS (Reliability, Availability, and Serviceability) information of the PPP (Point to Point Protocol) subsystem. This command only applies to AIX 4.1.5.

## `getattr()` Routine Does Not Release Memory

The `getattr()` routine allocates memory for the `CuAt` structures that are returned. This memory is automatically freed when your application exits. However, you need to free this memory in your application if it invokes `getattr()` routine several times and runs for a long time.



# National Language Support (NLS)

## Korean, Chinese (Traditional), and Latin American Spanish Keyboards

The mappings and input methods for Korean, traditional Chinese, and Latin American Spanish locales have been enhanced to support the new PS/2 keyboards. However, because these keyboard options do not appear under the Manage Language Environments menus in SMIT, you need the following information to configure the system with these keyboards:

**Table 2-2. Keyboard Configuration Information**

Language	Command
Korean	<code>chkbd /usr/lib/nls/loc/KW@alt.lftkeymap &lt; /dev/lft0</code>
Traditional Chinese	<code>chkbd /usr/lib/nls/loc/zh_TW@alt.lftkeymap &lt; /dev/lft0</code>
LA Spanish	<code>chkbd /usr/lib/nls/loc/es_LA.lftkeymap &lt; /dev/lft0</code>

## Chinese (Simplified) Keyboard Translate Table

In AOS1.3 and later releases of AIX 4.1, you can view the keyboard information for the Simplified Chinese Keyboard (Code Set IBM-eucUCS) in the file:

```
/usr/lpp/X11/defaults/xmodmap/zh_CN/keyboard
```

If you are running with the ZH\_CN locale (UTF-8 codeset), this keyboard information is located in the file:

```
/usr/lpp/X11/defaults/xmodmap/ZH_CN/keyboard
```

---

## Chinese (Simplified) Input Method Support

As of the AOS 1.3 release of AIX 4.1, support for the 5-stroke input method has been removed. Pressing Shift-F5 and Shift-F6 no longer invokes the 5-stroke input method under the simplified Chinese (zh\_CN) locale.

## Error Logging with `errpt` Command

When you run the `errpt` command under a non-English language environment, in some cases the system may return a 4-digit hexadecimal value instead of the error message text. This indicates that the system cannot find a message number for that message in your language's codepoint catalog.

Change the language environment setting to English with the following command:

```
LANG=C
```

and then run the `errpt` command. The English text for the error message is displayed.

---

## Known Problems on All Systems

This section contains information on known problems in this release of AIX 4.1. Workarounds have been provided whenever they are available.

For additional troubleshooting information, refer to *Installation Troubleshooting and Problem Solving Guide and Reference*.

### lscfg and lsdev Commands Do Not Return Memory Size

#### Tracking Number

TAR 1-39744 and TAR 1-39647

#### Problem

As of AIX 4.1 Service Level AOS1.2, the `lscfg` and `lsdev` commands no longer return the system memory size.

#### Workaround

To obtain the total size of memory available on your system, use any of the following commands:

- `lsattr -E -l sys0 -a realmem`
- `lsattr -E -l mem0`
- `bootinfo -r`

**Note** You must have root access to use the `bootinfo -r` command.

---

## SMIT Options Incorrect for SNA Protocol

### Tracking Number

TAR 1-46856

### Problem

The SMIT interface for selecting the protocol to be run on the integrated SCC ports has changed, causing a minor change to the SMIT procedure for configuring these ports for Express SNA communications only. The SMIT default value “hdlc, sna” is not valid.

### Workaround

Manually type in the protocol you want, i.e. “sna” or “hdlc.”

---

## InfoExplorer May Hang with more than 64 Databases

### Problem

If you try to read a CD with more than 64 InfoExplorer databases, InfoExplorer may core dump.

### Workaround

To prevent the core dump, you should run the following command before invoking InfoExplorer:

```
export MALLOCTYPE=3.1
```

## Known AIX 4.1 Problems Filed with the Vendor

Motorola's AIX 4.1 operating system release is based on IBM's AIX 4.1 release.

The following problems have been filed with IBM. Resolutions of these problems are pending fixes from IBM

**Table 2-3. TARs Filed with IBM**

<b>TAR Number</b>	<b>Description</b>
1-43408	makestack has hard-coded list of tape devices.
1-37149	Insufficient physically contiguous memory is available.
1-39425	You cannot print more than 999 files correctly.
1-39587	The network boot hard codes device uniquetypes.
1-39647	Refer to "lscfg and lsdev Commands Do Not Return Memory Size" on page 2-15 for details.
1-39768, 1-38533	Refer to "InfoExplorer May Hang with more than 64 Databases" on page 2-17 for details.
1-42956	The stress tests crash the system.

# Commercial System Desktops and Servers **3**

---

## Overview

This chapter describes AIX 4.1 information specific to Commercial System Desktops and Servers, including:

- what's new for Commercial System Desktops and Servers in AIX 4.1.5.
- general guidelines about AIX 4.1 for Commercial System Desktops and Servers
- resolved problems on Commercial System Desktops and Servers
- known problems on Commercial System Desktops and Servers, along with a workaround where possible

*Commercial System Desktops and Servers* refers to these Motorola Family of Commercial System Desktops and Servers:

- RISC PC systems
- RISC PC Plus systems
- Series E systems
- Series EX systems
- PowerStack II systems

For more information about standard features in AIX 4.1, refer to the *AIX 4.1 Product Description*.

---

## Installation

This section contains information about and guidelines for the AIX 4.1 operating system running on Commercial System Desktops and Servers.

### Updating from a System Running the AIXwindows Desktop

AIX Common Desktop Environment (CDE) is the default desktop shipped with AIX 4.1 Service Level AOS1.2 and later releases. AIXwindows Desktop was the default desktop shipped with earlier versions of the AIX 4.1 operating system.

An on-line help document is provided to assist you in migrating from the AIXwindows Desktop to AIX CDE 1.0. If you have previously logged on to the AIXwindows desktop on an AOS1.0 or AOS1.1 Service Level release, this help document is displayed automatically the first time you log on to AIX CDE 1.0. You can also view this help by selecting `Welcome to AIX CDE 1.0` from the Help Manager subpanel.

Refer to “Updating from a Customized AIXwindows Desktop” on page 3-2 for more information on updating an AIXwindows Desktop environment to AIX CDE 1.0.

### Updating from a Customized AIXwindows Desktop

If you are migrating to the Common Desktop Environment 1.0 (CDE) from an AIXwindows Desktop environment and you have made any customizations to your desktop, you may encounter some compatibility problems in the desktop’s front panel. For example, icons on the front panel may not execute properly, icons may be missing, or desktop actions may not be found.

In order to update a customize AIXwindows desktop, follow these steps:

1. Install the `X11.Dt.compat` filesset to assist in the transition from AIXwindows Desktop to the AIX CDE 1.0 desktop.



---

The `X11.Dt.compat` fileset contains executables, icons, action and data type definitions, and symbolic links to maintain compatibility with previous versions of the CDE desktop. This fileset also contains the Migrate Actions icon and its associated action definition.

The “Welcome to AIX Common Desktop Environment 1.0” help volume contains additional information about the contents of `X11.Dt.compat`. This fileset can be deinstalled later when you no longer need it.

2. If you have done any of the following:

- customized desktop action definition files
- customized data type definition files (`*.dt`)
- customized front panel definition files
- installed icons on the front panel

then you need to migrate the customizations to the new desktop by entering the following commands at the system prompt:

```
/usr/dt/migrate/bin/dtmigrate $HOME/.dt/types  
/usr/dt/migrate/bin/dtmigrate $HOME/.dt/types/fp_dynamic
```

3. If you need to share:

- customized desktop actions
- customized data types
- a customized front panel
- a Calendar resource file (`.desksetdefaults`)

between AIXwindows Desktop and AIX CDE 1.0 environments, refer to the “Welcome to AIX Common Desktop Environment 1.0” help volume for details on special actions you must take.

---

## Running the AIX Common Desktop Environment

If after migrating to AIX CDE 1.0 from AIXwindows desktop on AIX Service Level 1.0 or 1.1, you have problems with the desktop (for example, icons on the front panel that do not execute properly, icons are missing, or actions cannot be found), check that the following has been done:

1. The `X11.Dt.compat` fileset has been installed.
2. Action, data type and front panel definitions in personal directories have been migrated to a valid format for AIX CDE 1.0

The “Welcome to CDE 1.0” help volume contains information about these steps and other useful information to aid in the transition to AIX CDE 1.0.

## Existing Applications and CDE 1.0

AIX Common Desktop Environment (CDE) 1.0 is the default desktop environment for AIX 4.1.5. People using AIX applications that are tightly integrated with CDE may need to upgrade to the most current version of those applications in order to run under CDE 1.0, and to fully capitalize on CDE’s capabilities.

AIX applications requiring updates include IBM UIM/X, IBM Ultimedia Services for AIX 4.1, and the Software Development Environment (SDE, the graphical toolkit packaged with AIX compilers).

Updates for SDE are included on the AIX 4.1.5 product media and will be automatically installed when customers upgrade to AIX 4.1.5 with the default CDE 1.0 desktop, or when customers upgrade their AIX 4.1 desktops to CDE 1.0

All new orders for UIM/X, Ultimedia Services, CSet++, and Fortran compilers for AIX 4.1 come ready to run with CDE 1.0.

---

## Common Desktop Environment (CDE) Manual Pages Directory Not in MANPATH

The Common Desktop Environment (CDE) manual pages are in the directory `/usr/dt/man`. This directory is not normally part of the defined path for manual pages (`MANPATH`). The `man` command is unable to find these CDE manual pages until you add this directory to your `MANPATH`.

Add these lines to your `$HOME/.profile` file to add the `/usr/dt/man` directory to the `MANPATH` variable:

```
MANPATH=$MANPATH:/usr/dt/man
export MANPATH
```

## Ensuring Sufficient Disk Space in /var/dt

The Common Desktop Environment (CDE) writes log and error files to the `/var/dt` directory. If this directory is full, the desktop commands do not work correctly.

Verify that the `/var/dt` desktop is not full before starting the desktop. If this directory is full or close to full, you must delete some files from this directory before you start the desktop.

## Series EX Support Requires PPCOF1.1

To run AIX 4.1.4r4 or AIX 4.1.4r5 on a Series EX system, your system must be running on Power PC Open Firmware PPCOF1.1 or later.

---

## Series EX and PowerStack II Pro 2000/3000 Systems Require Software Relicensing after Upgrade

If your current system is a Series EX or PowerStack II Pro 2000/3000 and you are running AIX 4.1.4r4 or an earlier release, you must obtain new software licenses after upgrading to AIX 4.1.4r5 or to AIX 4.1.5, unless PTF #M000047 has been installed over the original operating system.

AIX 4.1.4 r4 generated the system serial number incorrectly on these systems. This problem was corrected in AIX 4.1.4r5. Because the correction causes the system serial numbers to change, your licensed software will no longer work after AIX414r5 or AIX4.1.5 is installed. Thus, you must obtain new license keys from the licensed software vendors after AIX414r5 or AIX 4.1.5 is installed.

## PowerStack II Legacy ISA Slave DMA Limitations

PowerStack II systems can only perform legacy ISA slave DMA using compatibility timing. A device driver that requests a faster timing mode is forced to use compatibility timing as well. This can affect the performance and throughput of an ISA device that uses legacy ISA slave DMA. Scatter/gather ISA DMA is not affected by this limitation.

---

## Upgraded Driver Firmware Necessary for Conner Tape Drive

In order to run existing Conner 2GB QIC Wide Data Cassette Tape drives (model CMT3200x-S) under AIX 4.1.5, you must upgrade the drive firmware to version 7.15.

## Installing a PCI Expansion Chassis on a PowerStack II Series EX System

When installing a PCI expansion chassis on a PowerStack II Series EX system with the AIX 4.1 operating system already running, you must follow this procedure or your system will hang during boot:

1. Remove any cards from the PCI Expansion Chassis before the system is rebooted or the first time.
2. Start `smit`.
3. Select `Devices`.
4. Select `Install/Configure Devices Added after IPL`.
5. Put the installation CD-ROM in the CD-ROM device.
6. In the `INPUT device/directory` field, enter the CD-ROM as the input device (usually `/dev/cd0`).
7. Finally, shutdown system, install chosen cards in the PCI Expansion Chassis and reboot.

## Multiple Beep Volume Settings Not Supported

The hardware that generates the system's "beep" does not support multiple volume settings for the beep. Thus, the user's volume setting is ignored, except to check whether the setting is `Off`.

---

## Remote Dump Over ISA Ethernet

Remote dump is not supported over ISA Ethernet. Therefore, an error will occur under either of these conditions:

- booting a diskless NIM client over ISA ethernet with a dump resource allocated
- issuing the `sysdumpdev` command with a remote dump location specified as the argument

This is the error message you will receive:

```
Cannot set primary dump device host/location  
Operation not supported on socket
```

where *host/location* is the remote location at which you are attempting to set the dump device.

## IRQs 14 and 15 Available for Plug-In ISA Cards

### New PCI Interrupt Line Routing

Commercial System Desktops and Servers have four PCI interrupt lines. Each line can be independently routed to an interrupt line on the system interrupt controller. Before AOS1.2, some PCI interrupt lines were routed to IRQs 14 and 15.

In AOS1.2 and later releases, PCI interrupt lines on systems with ISA slots are routed as shown in Table 3-1. This change makes IRQs 14 and 15 available for use by plug-in ISA cards (as well as IRQ 5 and IRQ 7, which were always available).

**Table 3-1. PCI Interrupt Routing on Systems with ISA Slots**

Interrupt Line	Routed to IRQ
PIRQ0	9
PIRQ1	9
PIRQ2	11
PIRQ3	11

The above settings are the default settings, programmed by the firmware.

**Note** This information applies only to systems with ISA slots.

### Modifying Mapping with PPCBug Firmware

To modify this mapping on a system running PPCBug firmware, use the `env` command at the `PPC1-Diag` firmware prompt to change the `PCI Interrupts Route Control Registers` environment variable. For more information, refer to the *PPCBug Firmware Package User's Manual, Part 1 of 2*.

---

## Modifying Mapping with PowerPC Open Firmware

To modify this mapping on a system running PowerPC Open Firmware, you can use the `setenv` command at the `ok` firmware prompt to change the `pirq-route` environment variable. For information on how to access the `ok` prompt, refer to the *Open Firmware User's Manual*.

### Changing the `pirq-route` Variable

To change the `pirq-route` variable, enter the following command at the `ok` prompt:

```
setenv pirq-route 0xddccbbaa
```

where *dd*, *cc*, *bb*, and *aa* correspond to the two-digit hexadecimal equivalents of the IRQs for PIRQ3, PIRQ2, PIRQ1, and PIRQ0, respectively. (Note the inverse order of the IRQs specified.)

For example, to route PIRQ0, PIRQ1, PIRQ2, and PIRQ3 to IRQs 5, 9, 14, and 11, respectively, you would enter the following command at the PPCOF `ok` prompt:

```
setenv pirq-route 0x0B0E0905
```

### Reverting to the Default Mapping

To revert to the default mapping after the `pirq-route` variable has been added, enter the following command at the `ok` prompt to remove the `pirq-route` variable:

```
unset pirq-route
```

## System Dump

A new item, called **Always Allow System Dump**, has been added to the System Dump SMIT menu. The default value is false. If set to true, the CTL-ALT-numpad1 and CTL-ALT-numpad2 key sequences will work to start a system dump to the primary and secondary dump devices.



---

This value can also be set with **sysdumpdev -K**. You must be root to set this attribute from either SMIT or the command line.

We strongly suggest that users of AIX systems which do not have a front display panel or LEDs set the **Automatically REBOOT the system after a crash** attribute to true.

This attribute is found by selecting the following SMIT options:

1: **System Environments**

2: **Change/Show Characteristics of Operating System.**

Without LEDs flashing 888 after the system dump has taken place, the system appears to be hung and there is no way to know that it has crashed.

This attribute can also be set using the command

**chdev -a 'autorestart=true' -l sys0**. You must have root access to change this value from either SMIT or the command line.

---

# Graphics

## 3

### Starting the X Server on Machines with Planar Graphics Capabilities

When you start an X server, all graphics adapters in the system, including the planar graphics subsystem, are used. If you do not have a display attached to your planar graphics subsystem and you wish to tell the system to ignore the planar graphics subsystem, use the standard AIX X Server start-up flag `-P`. For more information about using the `-P` flag, refer to the `X` and `xinit` man pages.

In the following example, the `cvga0` adapter is the planar graphics subsystem. This screen shows a typical example of the use of the `-P` flag:

```
# lsdisp
DEV_NAME  SLOT  BUS  ADPT_NAME  DESCRIPTION
=====  =====
gga0      06    pci  S15        IBM Personal Computer Power Series
                               S15 Graphics Adapter
cvga0     07    pci  Cirrus     Standard Graphics Adapter
                               Default display = gga0

# xinit -- -P11 gga0
```

---

# Communications

## Support Added for 3270 Key Mappings for dtterm Terminals

The **tn** and **telnet** commands allow connections to Host systems that require 3270 Terminal support. To add mappings for dtterm, and modification of the **/etc/3270.keys** file is needed and a new file called **/etc/3270keys.dtterm** is needed. These 3270 mappings for dtterm allow dtterm terminals to be used when using the command **tn** or **telnet** to connect to Host systems that require 3270 Terminal support.

**Note:** To clear the Host screen with these mappings, you must type **CTL-z**.

Modify the **/etc/3270.keys** file by inserting the following information:

```
if hft or hft-m or ibm5151 or ibm6153 of ibm5154
or ibm6153-90
    or ibm6153-40 or ibm6154 or ibm6154-90 or
    ibm6154-40 or ibm6155 or ibm6155-113 or
    ibm6155-56 or ibm5081 or ibm 5081-113 or
    ibm5081-56 or hft.U or ibm5151.U or ibm6153.U
    or ibm5154.U or ibm6153-90.U or ibm6154-40.U
    or ibm6155.U or ibm6155.113.U of
    ibm6155.56.U or ibm5081.U or aixterm or
    aixterm-m or jaixterm or jaixterm-m or
    ibm5081-113.U or ibm5081-56.U or hft-m-old
    or aixterm-m-old or lft or aixterm-old or
    hft-nam-old or hft-c-old or hft-old
    load/etc/3270keys.hft
else if dtterm load /etc/3270keys.dtterm /*new
    line to insert*/
else pring NOBINDINGS
```

The following is the new file called **/etc/3270keys.dtterm**

```
#
#COMPONENT_NAME: TCPIP 3270keys.dtterm
```

---

#  
#FUNCTIONS: Enter  
#  
#ORIGINS: 27 38  
#(C) COPYRIGHT International Business Machines Corp. 1985, 1989  
#All Rights Reserved  
#Licensed Materials - Property of IBM  
#

---

## Resolved Problems in This Release

This section provides you with a list of previously known problems that have been corrected for commercial systems in this release of AIX 4.1.

**Table 3-2. Corrected Problems**

TAR Number	Description
1-43304	bus resolve conflict

---

## Known Problems on Commercial System Desktops and Servers

This section contains information on known problems in this release of AIX 4.1 specific to Commercial System Desktops and Servers. Workarounds have been provided whenever they are available.

For additional troubleshooting information, refer to *AIX 4.1 Installation Troubleshooting* and *AIX 4.1 Problem Solving Guide and Reference*.

### Highest Resolution Not Available on Systems with 1MB Display Memory for Cirrus Adapters

#### Tracking Number

TAR 1-39833

#### Problem

If your system contains only 1MB of display memory for Cirrus adapters (either on the motherboard or on a PCI card), the highest resolution you are able to use is 1024x768 mode. SMIT allows you to select a higher mode (1280x1024), but your system does not support it and defaults to 1024x768 resolution mode.

#### Workaround

If you must use a higher resolution than 1024x768 mode, you need to add display memory or add a card with more than 1MB of display memory to your system.

---

## Operating System Won't Boot with Attached SCSI Terminal Server

### Tracking Number

TAR 1-44080

### Problem

When AIX 4.1.4r4, AIX 4.1.4r5, or AIX 4.1.5 is installed on a system with the Central Data SCSI Terminal Server (STS) hardware, and the STS support software is subsequently installed, a driver bug causes the system to hang when the system is rebooted or the STS configuration method is activated.

### Workaround

Obtain SCML #6803 and upgrade driver software (EGB1.2 version of SCSTerminal driver).

For additional information contact your local Value Added Reseller (VAR) or distributor.

## Audio Device Driver Incompatible with beep

### Tracking Number

TAR 1-46827

### Problem

When the audio driver is present on a commercial system, the system beep does not work. For this reason, the device driver is not present on the base system CD for AIX 4.1.5.

---

## Workaround

The audio device driver is available on the value-pack CD. If you want to use the driver, you can install it separately. Once you do so, however, the audio driver, the system beep will not work any more

## Ultimedia System Audio Driver Does Not Support PowerStack II Pro4000 Systems

### Tracking Number

TAR 1-46827

### Problem

The audio driver available on the second AIX 4.1.5 CD as part of the Ultimedia System does not support the audio chip used on PowerStack II Pro4000 systems.

### Workaround

Obtain SCML 21443, which contains an alternate audio driver, in the devices.isa\_sio.baud.rte 4.2.1.1 fileset. You will need the M441221 devices.sys.pci.rte 4.1.4.1 fileset in order to install the audio driver.

For additional information, contact your local Value Added Reseller (VAR) or distributor.

## System Boot Appears to Halt with stop timed out error on PowerStack II Pro4000 Systems

### Tracking Number

TAR 1-48971



---

## Problem

System boots slowly. If you have pinned the debugger, you will see an error message similar to:

```
Stop timed out: devp=06CB5000 unit=1
```

This problem most likely reflects a networking error. It is generally caused by the network attempting to configure an AUI style port when the board doesn't have an interface for AUI. This occurs when the interface type is set to auto and the system is unable to recognize the network device (when a cable has been dropped, for example). The driver looks in the SROM, tries the specified combinations, and if it doesn't find any activity, it tries to guess at the configuration. Frequently, the system assumes an AUI interface, because they are notoriously hard to identify. Once the system configures itself for an AUI interface, the DEC chip no longer has a clock, and is thus prevented from entering the stopped state which the driver requires during initialization. Thereafter, the system periodically attempts to autosense the attached medium. This process, which can take several seconds, occurs with interrupts off, and thus gives the appearance of a dead system.

## Workaround

Reattach the cable to a live hub.

Or

Change the network configuration from auto to tx by using the CD-ROM maintenance mode or by doing a non-networked service boot.

## Floppy Drives Do Not Detect Disk Density

### Tracking Number

TAR 1-44804

---

## Problem

Floppy disk drives included in Motorola AIX systems support only 1.44Mb floppy media. The drives are not able to distinguish between low density (720Kb) and high density (1.44Mb) disks. If the **fdformat** command is run without the **-h** option, the system will try to format the high density disk as a low density floppy. This will put the floppy drive in a state where it cannot be accessed until the system is rebooted.

## Workaround:

Always use the **fdformat** command in the following fashion.

```
fdformat /dev/fd0 -h
```

## Memory Leak Exists in Motif Version 1.2.3

### Tracking Number

TAR 1-48103

### Problem

Version 1.2.3 and earlier versions of the Motif graphical user interface contain a bug which causes a leak in system memory.

### Workaround

Upgrade to version 1.2.4 or later of Motif.

or

Apply PTF U445774, which is available in Motorola's SCML library as #21051.

# VME Systems and Board-Level Products **4**

---

## Overview

This chapter describes AIX 4.1 information specific to VME systems and board-level products, including:

- value-added features specific to Motorola's AIX 4.1 product for VME systems and board-level products
- general guidelines about AIX 4.1 for VME systems and board-level products
- Known problems on VME systems

*VME systems and board-level products* refer to these Motorola systems:

- MVME boards
- Ultra boards
- Atlas boards
- XR Series boards

---

## Value-Added Features on VME Systems

This section describes value-added features that are specific to VME systems running Motorola's version of the AIX 4.1 operating system.

### MVME332XT Driver Command

The `m332xctl` command is used with the MVME332XT driver. It is documented in the manual pages in section 1M. You must use the `man` command to access this manual page; it is not available through InfoExplorer.

### VMEbus Device Driver Kernel Service Calls

These kernel service calls are used by VMEbus device drivers:

- `get_fixed_map_vme()`
- `i_init_vme()`, `i_clear_vme()`, `i_mask_vme()`,  
`i_unmask_vme()`
- `iomem_att_vme()`, `iomem_det_vme()`
- `vdma_start()`, `vdma_immed()`, `vdma_wait()`, `vdma_halt()`
- `vme_src2pri()`
- `vmeget()`, `vmeput()`

These kernel service calls are documented in the manual pages in section 2. You must use the `man` command to access these manual pages; they are not available through InfoExplorer.

### VMEbus Device Configuration Library Routines

These library routines are used in configuring VMEbus devices:

- `busresolve_vme()`
- `define_device()`

- 
- `set_attr_by_name()`, `set_attr_by_type()`

These library routines are documented in the manual pages in section 3. You must use the `man` command to access these manual pages; they are not available through InfoExplorer.

## VMEbus Special Files (Devices)

These manual pages describe special files (devices):

- `vme`
- `mvme332xt`

The `vme` manual page describes a device special file that can be used to access a VMEbus device driver. The `mvme332xt` manual page describes the MVME332XT driver.

These manual pages are found in section 7 of the manual pages. You must use the `man` command to access these manual pages; they are not available through InfoExplorer.

## Alarm Transition Module

The XR712-129 Alarm Transition Module provides an interface to the alarm subsystem on XR Series systems. The module provides user notification of system or application failures and the ability to prevent hardware damage or the loss of data in cases where system failure or shutdown is imminent.

To accomplish these goals, the module provides software access to system readiness and condition parameters--such as chassis temperature and hardware availability.

The module provides the capability to report problems via software interface, an audible buzzer, LEDs, and closed contact relays. Outputs are similar to the Bellcore Alarm Requirements for compatibility with most remote alarm systems.

---

# Installation

## Required Firmware Upgrade for VME Systems

If you are upgrading a VME system from an earlier version of AIX 4.1 to AIX 4.1.5, you must upgrade your firmware to PPC1BUG version. 3.3.

## MVME1603 and MVME1604 Enabled

As of the AIX 4.1 AOS1.2 release, VMEbus access is enabled as provided by the VME2PCI and VMEchip2 ASICs on Motorola's MVME1603 and MVME1604 single-board computers.

Booting over the VMEbus is not supported.

## MVME332XT Does Not Support All `ioctl`s

The following `ioctl`s are not supported on the MVME332XT in AIX 4.1.4r4, AIX 4.1.4r5, or AIX 4.1.5.

- `TIOCOUTQ`
- `TCLOOP`
- `TIOCSOCDTR`
- `TCGETX`
- `TIOCCDTR`
- `TCSETX`
- `TIOCMBIS`
- `TCSETXW`
- `TIOCMBIC`
- `TCSETXF`
- `TIOCMSET`

The `TCSAK` `ioctl` is accepted and does not return an error, but it does not have any effect. Also, a "secure attention" key sequence (Ctrl-X, Ctrl-R) received on an mvme332XT port does not invoke this `ioctl`, but is ignored.

---

## MVME332XT Hardware Flow Control Configuration

You cannot use `ioctl`s to configure hardware flow control on an MVME332XT in AIX 4.1.4r4, AIX 4.1.4r5, or AIX 4.1.5.

You must use the `m332xctl` control program to configure hardware flow control.

## ODM Entries for CLARiiON Telco RAID

ODM entries have been added to AIX 4.1.5 in order to support CLARiiON's Telco RAID. These entries allow you to use the RAID device without installing the CLARiiON software. If you want to use the CLARiiON software, you must delete the default entries and reconfigure the RAID, using the following steps:

1. Unconfigure the RAID.
  - Use `'lsdev -C -s scsi'` to get a listing of the devices.
  - Use `'rmdev -d -l hdiskN'`  
where *N* is the disk number for the RAID.
2. Remove the ODM entries.
  - `odmdelete -q "uniqueytp=disk/scsi/dgcrraid" -o PdDv`
  - `odmdelete -q "uniqueytp=disk/scsi/dgcrraid" -o PdAt`
3. Do a bosboot.
  - `bosboot -a -D -d /dev/ipldevice`
4. Reconfigure the RAID.
  - Either reboot or use `'cfgmgr'`

---

# Known Problems on VME Systems and Board-Level Products

4

## Tracking Number:

TAR 1-12525

## Problem:

Sending Large Data Packets to the TTY Driver may cause the System to Hang.

## Solution:

Contact your service provider to obtain the appropriate Program Temporary Fix (PTF).



# FX Series Systems 5

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## Overview

AIX 4.1.5r2 contains special functionality for FX Series System Release 1.1. Motorola has made changes to IBM's AIX 4.1.5 OS in order to support Motorola-specific hardware platforms and to add fault tolerance, while retaining the functionality and command structure of IBM's AIX 4.1 operating system.

This chapter describes information about and guidelines for the FX Series systems.

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# FX Series Operating System

The following issues are related to FX Series operating system.

## Paging Space Values

When AIX reaches or exceeds the paging space warning level, it may kill processes, including all the system daemons. Make sure that paging space is set to the recommended value in SMIT. The SMIT screen shows you the current value and the recommended value.

FX Series daemons do not handle the `SIGDANGER` signal and will be killed like any other AIX process.

**Note** The behavior of paging space on an FX Series system is no different than on any other AIX 4.1 system.

Refer to the *Managing System Storage* guide for additional information on paging space.

## Default Dump Devices

The default primary dump device for FX Series systems is in the `/dev/sysdump0` logical volume. This default is different from the default of the other Motorola AIX 4.1 systems.

To recover the dump, use the standard dump recovery procedures from a logical volume.

## System Reboots after a System Dump Taken

The default value of the `sys0` attribute, `autorestart` is `true`. This causes the FX Series system to reboot once a system dump is taken.

**Note** This behavior is different from that of our other AIX 4.1 systems.

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## Network Installation Management Not Supported

Support for Network Installation Management is not available on FX Series systems.

## Tape Devices Diagnostic Not Supported

AIX System Diagnostics are supported. However, the diagnostic for tape devices is not supported.

## Data Integrity Checker

Future releases of the AIX operating system may include support for the Data Integrity Checker (DIC). The DIC will compute checksums on all fixed disk transfers and generate errors on checksum errors. Approximately one percent of the disk space on every fixed disk attached to the system is appropriated for this anticipated functionality.

## On-Demand Diagnostics

On-Demand Diagnostics have been added to AIX 4.1.5 as a new functionality on FX Series systems. This feature allows system administrators to do bug-level diagnostics on individual modules from the AIX command line using either the **offtest** or the **vterm** utilities. On-Demand Diagnostics are currently available for CPU modules, Asynchronous I/O Modules, MFIO modules, and Ethernet controller modules.

Administrators may want to use **offtest** to diagnose modules which have been off-lined by the Configuration Management System (CMS) and to decide whether to try reintegrating the modules or to replace them. The **offtest** utility can also be used to periodically test modules in order to detect any potential problems before the modules fail. Modules must be taken off line prior to running the On-Demand Diagnostics.

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Once invoked, either from the command line or from an automated script such as a **cron** job, **offtest** accesses a script of bug-level diagnostic commands and runs them sequentially. If the module passes all tests, **offtest** returns a value of 0; a non-zero return value indicates that the module failed one or more of the diagnostics.

The default test scripts, which are located in the `/etc/ft` directory, include a combination of bug diagnostic commands and higher level test commands, which are preceded by '!'. In general, the scripts:

- turn the module's power off,
- turn the power back on after a brief delay,
- set the bug's MPCR register offset,
- set the bug's FIFO register offset,
- establish a virtual terminal connection to the module,
- mimic the appropriate bug prompts on the console,
- run maintenance bus commands,
- run bug diagnostic commands, and
- log messages.

Meanwhile, the **offtest** utility analyzes the response from the bug testing, terminates the testing, and reports the overall result to the log file or to standard output.

The scripts, which contain information about the purpose and the duration of each test, may be easily modified using any standard text editor, or you can instruct the **offtest** utility to use a separate script altogether. An example of where this may be useful is if you would like to run abbreviated scripts on a regular basis, but also want recourse to the entire suite of tests available in the default scripts.

When run in verbose mode, **offtest** provides a list of the bug-level tests that have been run and the results of each test. Operators are able to use a **-L** option to redirect output to a log file. Log file data will be similar to what appears on the console. The following example is a section of the log file from a CPU test:

```
Fri Jun 27 10:15:00 1997: Testing 01-W1566B03D,
                        serial number FP999, in Slot c1-f10
Fri Jun 27 10:15:00 1997: Using: test script
                        /etc/ft/CPU.offtest
Fri Jun 27 10:15:00 1997: TEST STARTED
Fri Jun 27 10:15:00 1997: Ensure power is off
Fri Jun 27 10:15:14 1997: Turning power on
Fri Jun 27 10:15:48 1997: Opening virtual
                        terminal connection
Fri Jun 27 10:15:51 1997: Virtual Terminal
                        Opened for 0xCF100000
Fri Jun 27 10:15:58 1997: --Break Detected--
Fri Jun 27 10:15:58 1997: FX-Bug>sd
Fri Jun 27 10:16:00 1997: sd
Fri Jun 27 10:16:02 1997: ver
Fri Jun 27 10:16:02 1997: Debugger/Diagnostics
                        Type/Revision.....=FX Series/1.2
Fri Jun 27 10:16:02 1997: Debugger/Diagnostics
                        Revision Date.....=05/05/97 (RM01)
Fri Jun 27 10:16:02 1997: MicroProcessor
                        Version/Revision.....=0004/0305
Fri Jun 27 10:16:02 1997: CPU Module Baseboard
                        Artwork Revision.....=6
Fri Jun 27 10:16:02 1997: CPU Module Baseboard
                        PLD Major/Minor Revision.....=02/08
Fri Jun 27 10:16:02 1997: Checking the BUG Version
                        by looking for "RM01"
Fri Jun 27 10:16:02 1997: Checking the Memory Size
Fri Jun 27 10:16:04 1997: md 0x8e230000:1;b
Fri Jun 27 10:16:04 1997: 8E230000 3A
                        :
Fri Jun 27 10:16:04 1997: Memory Size from CPU:
                        0x8000000 (134217728) bank 0 0x8000000 bank 1 0
Fri Jun 27 10:16:04 1997: ** Switching to the
                        FX-Bug Diagnostics **
Fri Jun 27 10:16:06 1997: sd
```

---

```
Fri Jun 27 10:16:08 1997: cf
Fri Jun 27 10:16:08 1997: RAM Configuration Data:
Fri Jun 27 10:16:10 1997: N ?
Fri Jun 27 10:16:10 1997: y
Fri Jun 27 10:16:12 1997: 00000000 ?
Fri Jun 27 10:16:12 1997: 00004000
Fri Jun 27 10:16:14 1997: 01000000 ?
Fri Jun 27 10:16:14 1997: .
Fri Jun 27 10:16:16 1997: onb dirty
Fri Jun 27 10:16:16 1997: ONB DIRTY:
        Dirty RAM..... Running ---> PASSED
Fri Jun 27 10:16:18 1997: onb edc_cb
Fri Jun 27 10:16:18 1997: ONB EDC_CB: EDC Check
        Bit Test..... Running ---> PASSED
```

The **vterm** utility provides direct access to the bug, so that individual diagnostics can be run directly from the command line. This may be useful, for example, when the error log shows that the module has failed a single test, and you would like to run the single test again. Some bug-level tests, including “onb dirty,” may return false results under the **vterm** utility because of conflicts over system resources.

For more information on On-Demand Diagnostics, see the **offtest** and the **vterm** manpages.

## New rpthours utility available for FX Series Systems

A **rpthours** utility has been added to AIX 4.1.5r2 to provide information on the availability of FX system modules. The script is intended to be run by the system administrator on a monthly basis.

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## AIX commands added for FX Functionality

The following commands, and their manpages, have been added to standard AIX in order to support FX Series functions.

**Table 5-1. AIX Commands added for FX Series Systems**

autopair_gen	changed	chftvg
cmsnotify	defcms	eeprogram
eprom	errtrans	ftctl
lightsd	lsdomain	lsmatch
lsmod	lsmodparent	lsstate
mkftvg	modcfgmgr	modchange
modconvert	modundefine	offtest
phonehome	pmftstat	powerd
rotlog	rpthours	vterm

---

## General Hardware Notes

The following issues are related to FX Series system hardware.

### Setting up Telco Alarms

You can classify the severity of a fault by noting the Telco status LED that is lit. These LEDs are found on the front of the Fan Trays. In addition you can hook up the corresponding alarm relay found on the back of the InterConnect Module to the Central Office Alarm bus. If you have a Model 626, do NOT connect the alarm relays on the back of InterConnect Module in the Expansion Chassis. Use the alarm relays on the back of the InterConnect Module in the Main Chassis only.

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### Use ESD Mitigating Procedures

ESD mitigating procedures should be used at all times when working around the FX series. It is especially important to use this protection when inserting tapes into the tape drive.

### Offlining Personality Modules Not Recommended

Do not offline a personality module directly. Instead offline the personality module's associated module. This offlines both the controller and the personality module in a safe and consistent manner.

### Hot Pull Support

You can hot pull, hot insert, and hot integrate most modules on FX Series systems. To hot pull, hot insert, and hot integrate means that you can remove, insert, and integrate any of these modules without power cycling, rebooting, or otherwise stopping the system. We do however, recommend that you offline the module before you remove the module. Refer to *Hardware Installation* for more information.



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# CPU Module Subsystem

The following issues are related to the CPU module subsystem.

## Set Time on New CPU Modules

If you bring the system down to replace any of the CPU modules with a new CPU module, make sure that the time on the clocks in the new CPU modules is set to the current time. If the system boots with the time set to a time earlier than the shutdown time, the change daemon replays all changes recorded since the new time from the error log. This can result in modules powering off and other problems with the system.

If a new CPU module is added to a running system, then we highly recommend that the Real Time Clock be initialized previously using some other chassis. There is a minor but potential risk that this problem can cause future problems even if the CPU module is replaced when AIX is running. Refer to “CPU Module’s Battery Backed Real Time Clock Not Copied During PRI” on page 5-24 for more information.

To check and set the clock on a CPU module, follow these steps:

1. Stop the reboot in the bug if it is set to autoboot on power on.
2. At the bug prompt check that the time on the master CPU is correct:

```
FX-Bug>time
```

3. If the time is not correct, set it using the `set` command:

```
FX-Bug>set mmddyyhhmm
```

where the format for the time is “month month day day year year hour hour minute minute.” So that the time comes up correctly once the system boots, you must set the time in Greenwich Mean Time (GMT), not local time. For example, Mountain Standard Time (MST) is 7 hours earlier than GMT.

---

Once the system boots, make sure all the CPU modules are in sync so they all have their clocks set to the same time.

If you replace a single CPU module while the system is down, make sure it is not the master during boot by leaving it unlatched. Reintegrate the module after boot and its clock will be set to the current time.

If the system is booted with an earlier time, then booted with the correct time later, entries in the error log are out of time order. The mixture of times, later-earlier-later, can make it impossible for the change daemon to retrieve error reports correctly. If this happens, follow these procedures:

1. Stop the change daemon.
2. Save a copy of the error log.
3. Clean the error log to empty it out.
4. Restart the change daemon.

Don't remove the error log as this can prevent error logging from operating correctly.

## CPU Module Status after a Reboot

The AIX4.1.5r2 installation process is designed to automatically bring online and integrate all CPU modules found in the system. CPU modules retain their state across reboots of the system. CPU modules that are online and integrated before a reboot are automatically brought back online and integrated after the reboot and CPU modules which are offline before a reboot remain offline after the reboot, except in the case where booting manually was forced off of a previously off-lined CPU module.

The process of onlining and integrating all CPU modules will not complete until several minutes after the login prompt is displayed.

---

## Do Not Use `ftctl` Program to Online and Offline CPU Modules

Use the SMIT interfaces or if desired the `modchange` command to online, offline, and acknowledge faults in the CPU modules. Do not use the `ftctl` program included in the FX Series to online and offline CPU modules. `ftctl` may leave your machine in an undesirable state that is difficult to recover from without rebooting. The `ftctl` command can still be used to view CPU module information (that is, `ftctl -status`).

## OS Watchdog

The OS watchdog timer is currently set to 1 second. The operating system; however, refreshes the timer every .5 second.

## ECC Parity Handling

An ECC hard error encountered on a simplex system results in a panic. A CPU module reporting an ECC hard error in a DMR or TMR system is taken offline and powered down.

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# MFIO Module

The following issues are related to the MFIO module.

## Upgrading Disks from 2Gb to 4Gb

### Overview

5

MFIO modules are now available which contain 4Gb hard drives. It is possible to upgrade existing MFIOs, which contain 2Gb hard drives, to the newer module without interrupting service.

The following procedures show two options for upgrading an existing MFIO to a new MFIO with a 4Gb hard drive without rebooting the system.

The key step is to replace the old MFIO definition in the ODM database with the new one for the MFIO containing the larger drive. In the first procedure below, this includes converting a fault tolerant volume group to a non-fault tolerant volume group, and later converting it back into a fault tolerant volume group. In the second procedure, the ODM attributes are changed directly from the command line. Because the first procedure may involve taking multiple MFIO modules off-line, it may take longer than the second. However, it may be a better procedure for those who are unfamiliar with ODM.

The general steps for both procedures are to:

- make sure all the functionality provided by the module is mirrored before you start
- take the module (or modules) offline
- remove the devices on the module from their logical devices
- remove the module from the database
- replace the module, and add it as a new module
- add the newly created devices to the logical devices

---

## Procedure 1--Upgrading Disks Using a Volume Group Type Conversion

**Note** For this procedure to work, the mirrored volume group must be made simplex. This means that all mirrored drives in the same I/O domain and same volume group as the MFIO module you are upgrading must be offlined.

### 1. Make sure that /tmp has at least 10 MB of free space by running

```
df /tmp
```

This space is needed during step 11.

### 2. Gather disk information for the volume group by running

```
lsscsi -v NAMEvg
```

where *NAME* is a variable for the name you have given the volume group. Make sure that the volume group is properly mirrored as a fault tolerant volume group by verifying that the CMS state is “ft\_full.”

### 3. Take the MFIO module offline

- Check to see what modules are included in the volume group by running

```
lsvg -p NAMEvg
```

- Take the appropriate modules offline using SMIT.  
smit cms => Modules => Manage Modules => Take Module Offline  
Select appropriate MFIO module.

- Confirm that the module has been taken offline and that the volume group is “ft-partial” by running

```
lsscsi -v NAMEvg
```

It is essential that you do not proceed until autolvmfix has completed and the lsvg command shows that all appropriate disks have been offlined.

---

**4. Determine whether the module contains an ethernet device by running**

```
lsent
```

**5. If the module does contain an ethernet controller which is configured as part of a logical ethernet device, remove the physical device from the logical ethernet device using SMIT.**

```
smit enet => Logical Ethernet Device => Change/Show a Logical Ethernet Device
```

Select the appropriate logical device and then delete the appropriate physical device.

**6. Convert rootvg to non FTVG type using SMIT.**

```
smit lvm => Volume Groups => Set Characteristics of a Volume Group => Change a Volume Group
```

Enter “NAMEvg” for “VOLUME GROUP name,” and change “Fault Tolerant Volume Group (FTVG)?” to no. (Use F4 to select options.)

**7. Remove the MFIO from the ODM database using SMIT.**

```
smit cms => Modules => Manage Modules => Remove Module from Database
```

Select appropriate MFIO module.

Then, run `lsmmod -Dl Moduleid` to verify that the module has been removed from ODM.

**8. Physically replace the existing MFIO module with the new module containing the 4Gb hard drive.**

**9. Configure the new MFIO device using SMIT.**

```
smit cms => Modules => Manage Modules => Add Module
```

Select MFIO1 as the template and specify the module location or Slotid, for example c1-f13.

---

Then, verify that the module has been integrated by running

```
lsdev -C | grep Slotid
```

where *Slotid* is the number of the slot containing the newly integrated module.

**10. Add the hard drive to the root volume group using SMIT and the hard drive identifier (such as “hdisk1”) from step 9.**

```
smit lvm => Volume Groups => Set Characteristics of a Volume Group => Add a Physical Volume to a Volume Group
```

**11. Convert the volume group back to type FTVG using SMIT.**

```
smit lvm => Volume Groups => Set Characteristics of a Volume Group => Change a Volume Group
```

Enter “*NAMEvg*” for “VOLUME GROUP name” and change “Fault Tolerant Volume Group (FTVG)?” to yes. (Use F4 to select options.)

**Note** It may take more than 30 minutes per disk to mirror data. If the console terminal is needed, do this step from a shell script running in the background.

**12. If applicable, add the physical ethernet device to the logical ethernet device.**

**13. Verify the result by running**

```
lsscsi -v NAMEvg
```

**14. Repeat the process in order to upgrade the hard drive in the other I/O domain.**

---

## Procedure 2--Upgrade Disks by Changing ODM Attributes Directly

In this second procedure, it is not necessary to take all the disks in one side of the volume group out of the FTVG. Therefore, this procedure may be faster, because it is not necessary to reestablish mirroring on multiple disks.

**1-5. The first five steps are identical to those in procedure 1.**

**6. Fix the logical volume dependency on the disk or disks you are upgrading (hdiskx, where x stands for the appropriate number) in ODM.**

```
> odmgget -q "dependency=hdiskx" CuDep
```

CuDep:

```
name = "l_NAMEvg"
dependency = "hdiskx"
```

```
> odmdelete -q "dependency=hdisk1" -o CuDep
```

**Note** Step number 6 needs to be performed on all hard disks on the MFIO module which you are removing. For example, if I/O-1 contains hdisk1 and hdisk2, then you need to perform the procedure on both hdisk1 and hdisk2.

**7-9. Steps 7, 8, and 9 are identical to those in procedure 1.**

**10. Add the new disk(s) to the Volume Group.**

smit lvm => Set Characteristics of a Volume Group => Add a Physical Volume to a Volume Group

Add the appropriate hard disk to *NAMEvg*.

**11. Resync the Volume Group by taking it offline and then bringing it back online.**

smit cms => Modules => Manage Modules => Take Module Offline

Select appropriate module.



---

smit cms => Modules => Manage Modules => Bring Module Online

Select appropriate module.

**Note** This final step may take more than 30 minutes. If the console terminal is needed, do this step from a shell script running in the background.

**12-14. Steps 12, 13, and 14 are identical to those in procedure 1.**

---

## Interconnect Module (ICM)

The following issues are related to the Interconnect module.

### Any Interconnect Module Failure in a Domain Takes Down the Entire Domain

5

In systems with expansion chassis, the failure of an ICM module in either the main or expansion chassis takes down that entire IO domain. Because the IOBus does not function properly if any of the ICM modules providing power to terminate the bus fails, the system powers off all the modules in that domain.

The main chassis ICM module is listed as the module at fault even if the expansion chassis ICM module was the one that failed. Look at the failure reports in the system status log, `/var/ft/changed_log`, to determine which module actually failed.

### CPU Modules May Go Offline When an Interconnect Module Fails

If an ICM module fails due to power loss, the loss of power usually sends all significant CPU modules into E-state. The hardware must do this to prevent a possible IOBus lockup when the power loss occurs. If the system is running with:

- two CPU modules one of them reports itself offline
- three CPU modules then either:
  - one module is out-of-sync (to be automatically onlined) and one module is offline OR
  - two modules are offline

If CPU modules fail when an ICM module fails, they may be reintegrated immediately, without waiting for the ICM module to be replaced or reconnected to the power. We recommend first bringing the CPU modules back online before reintegrating the

---

ICM module. CPU modules take less time to integrate than the disk mirroring operations that start when the ICM module and its dependent modules in that domain are reintegrated.

## **Do Not Remove the Interconnect Module without Disconnecting the Power Cord**

ICMs can be pulled out with the system still running (that is hot pulled), but you must remove the power cord first. The ICM modules are the only hardware modules whose latches do not disconnect the modules from the power.



### **Caution**

Pulling the module (or putting it back in) with the power connected causes arcing on the voltage pins. Repetition of this would eventually cause pitting of the contacts, leading to unreliable operation.

---

## Power Module and Fantrays

The following issues are related to the Power module and Fantrays.

### Power Cycle the System Using Power Module Latches

The FX Series system has no on/off switch. If the system is powered using Power modules, their latches serve as the means to power cycle the system. After the system has shut itself down and powered itself off, restart it by opening and closing ALL power module latches.

### The Power Daemon Takes Time to Complete Its Shutdown

When the power daemon (`powerd`) is stopped using `stopsrc -g ft` or `stopsrc -s powerd`, the SRC command returns immediately after telling the daemon to stop. The daemon process takes 10-15 seconds to shut down completely.

If you try to start the daemon immediately using `startsrc -g ft` or `startsrc -s powerd`, you see an error message:

```
Can't start multiple instances of powerd
```

Wait 10-15 seconds, or use `lssrc -s powerd` to verify that `powerd` has terminated before trying to restart the daemon.

### Do Not Boot System with the Fantrays Removed

The FX Series system shuts itself down if both fantrays in a main or expansion chassis are removed. Do not reboot the system without replacing the fans. The system will shut itself down again after booting without the fantrays, however the system can be damaged by operating at too high of a temperature during the boot.

---

## Boot System Carefully after Failure of All Power Modules

The FX Series system shuts itself down if all the power modules in a power chassis fail. Because it is unlikely for all modules to fail at the same time, you may wish to reboot the system to check out the state of the modules before replacing them.

Normally the power module batteries stay charged during and after system shutdown. If there is any chance they may not be fully charged, allow the power modules to recharge for 40 minutes before booting the system. The system brings all the power modules online and checks to see if they are working properly. If they are not working properly, the system should shut itself down again.

You must have at least one fully functional power module for the system to operate safely. The system may be able to boot with partially functioning power, but it is not safe to operate the system that way. Check the power modules by running `pmftstat`. The output looks like the following example:

```
>>>> Power Module (POWER-0 p1-f1 Available) [ 5.3 ] <<<<
Module LED: Inservice 'ON' Outofservice 'OFF'
Alarms: Rack Alarm 'OFF'
Analog Switches: CurrA 'CLOSED' CurrB 'CLOSED'
Battery Load 'OFF' Battery Charger 'ON' Convertor 'ON'
Digital Inputs: AC 'OK' Temp 'OK' CurrA 'OK' CurrB 'OK'
Temp '48' C CurrA '4758' mA CurrB '4524' mA
Volts '55' V Batt '52' V
```

Make sure the following is true in your output:

- The two Analog Switches must be CLOSED.
- The Digital Inputs must all show OK.
- The Temp must be below 80C.
- The Volts must be greater than 52 V.

---

## Boot System Carefully after Failure of All Fantrays

The FX Series system shuts itself down if both fantrays in a main or expansion chassis fail due to low fan speed or inability to maintain a low enough system temperature. Because it is unlikely for both fantrays to have a mechanical failure at the same time, you may wish to reboot the system to check out the state of the modules before replacing them. Make sure any overheating in areas in which the system operates is corrected first.

You must have one fantray working without fault for the system to run safely. The system should shut itself down after boot if both fantrays still have faults. If it does not, and the fans are not operating properly, shut the system down immediately and replace the fantrays.

Check the fan speeds and temperatures by running `pmftstat`. The output looks like the following:

```
>>>> Fan Tray Module (FANS-0 c1-t0 Available) [ 5.4 ] <<<<
Module LED: InService 'ON' OutofService 'OFF'
System LED: InService 'ON' OutofService 'OFF'
Telco LED: Critical 'OFF' Major 'OFF' Minor 'OFF'
Fan Speed: Fan#1 '2119' RPM Fan#2 '2119' RPM Fan#3 '2200' RPM
Fan Temp: '33' C
```

Normal fan speeds are in the range 1000-3300 RPM. The temperature must be below 60 C.

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# Known Problems on FX Systems

## Overview

This section contains information on known problems with FX systems in this release of AIX 4.1. Workarounds have been provided whenever they are available.

## Unbalanced Fault Tolerant Volume Group Is Not Supported

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### Tracking Number

TAR 1-48109

### Problem

If either domain has a greater number of physical volumes than the other domain and the domain with the greater number of physical volumes fails (for example, domain power failure), the physical volumes will fail to reintegrate into the volume group.

### Workaround

When creating a fault tolerant volume group, ensure that the number of physical volumes in domain 0 equals the number of physical volumes in domain 1.

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## CPU Module's Battery Backed Real Time Clock Not Copied During PRI

### Tracking Number

TAR 1-48807

### Problem

5

The CPU module's battery backed Real Time Clock is not copied during CPU module integration (PRI).

The minor risk associated with this problem is that:

- if the Real Time Clock on a CPU module does not match the "real time"

AND

- if the system panics or reboots due to an OS Watchdog

then, the CPU module that becomes the new Master module has the erroneous Real Time Clock setting. This can cause the change daemon problems discussed in "Set Time on New CPU Modules" on page 5-9.

### Workaround

Use the `date(1)` command to set the date after the system has booted and all CPU Module integrations are complete or after replacing a CPU Module on a running system. The `date(1)` command causes the Real Time Clock to be written on all in-sync CPU Modules.



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# CPU Reintegration Has Temporary Critical Fault Under Heavy Load

## Tracking Number

TAR 1-48836

## Problem

During CPU module integration the critical Telco alarm may come on. This occurs during the final CPU integration phase or the “critical integration” time. If the system is running an application mixture that results in modifications to large numbers of DRAM pages faster than the system can copy them to the target CPU module then the critical alarm may fire. This is a temporary alarm that the system automatically clears after the CPU module integration completes.

CPU module integration happens at boot time or as the net result of fault condition(s) that occur during system operations that eventually result in operator actions to re-integrate the CPU module(s).

## Workaround

Perform CPU module integration when the system is less busy. There is no workaround if the CPU module must be integrated during a period when the application mixture is such that a large number of memory pages are modified more quickly than the system can copy them to the target CPU Module.

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## Hours in Service in Module EEPROMs may be Counted Twice

### Tracking Number

TAR 1-12765

### Problem

5

History logs are kept in module EEPROMs for FX Series modules. The hours-in-service field for each online module is updated every 25 hours by an **at job**. Occasionally, when the system is rebooted, two or more **at jobs** are started. This results in the modules being credited with double (or more) the correct in-service time.

### Workaround

After the system is rebooted, check that only a single **at job** is pending to run the “`/usr/sbin/updhours -h 25`” command. You can check the list of pending jobs using the **atq** command. It provides a list of names of files in the `/var/spool/cron/atjobs` directory. If more than one of files contains the **updhours** command, you can stop the redundant jobs using the following syntax:

```
$at -r <JobName>
```

# Documentation Changes 6

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## Overview

This chapter documents changes and corrections to various books and InfoExplorer documents in the AIX 4.1 documentation set.

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## InfoExplorer libraries

The AIX 4.1 library is available both in hardcopy and on-line in InfoExplorer. For most of the books, the information and instructions are the same in InfoExplorer as they are in hardcopy. The following books, however may have slight discrepancies between the two versions. The instructions in hardcopy should supercede those in InfoExplorer.

- *Installation Guide*
- *Network Installation and Management Guide and Reference*
- *Problem Solving Guide*
- *Performance Tuning Guide*
- *iFOR/LS Tips and Techniques*
- *iFOR/LS System Management Guide*
- *Messages Guide and Reference*

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## Location of **schedtune** Command Incorrect in InfoExplorer Libraries

The following correction applies to the InfoExplorer version of *Tuning VMM Memory Load Control*.

InfoExplorer says that the **schedtune** command is located in the **/usr/lpp/bos/samples** directory. However, the command is located in the **/usr/samples/kernel** directory.

---

## xmemout() Man Page Incorrect

The man page and InfoExplorer entries incorrectly state that the `xmemout()` kernel service can be called from the process environment only. The purpose of `xmemout()`, however, is to allow interrupt routines and other kernel processes to access a user's buffers.

The man page and InfoExplorer entries in upcoming releases will read: "The `xmemout()` kernel service can be called from the process environment **or** the interrupt environment."

---

# AIX Version 4 Installing and Configuring NCDware

The following corrections apply to the *AIX Version 4 Installing and Configuring NCDware* guide:

- In step 5 on page 8-4 and step 8 on page 8-6 the file path is listed incorrectly. The correct file path should be:

```
/etc/inetd.conf
```

- In step 2 on page 8-6 the directory is listed incorrectly. The correct command should be:

```
cd /usr/ncd/terminals/usr/lib/X11/ncd/configs
```

---

# AIX Version 4 System Management Guide: Communications and Network

## Serial Line Internet Protocol (SLIP) Documentation Error

The procedure for configuring Serial Line Internet Protocol (SLIP) over a null modem cable is incorrectly documented in the on-line (InfoExplorer) version of the *AIX Version 4 System Management Guide: Communications and Network*, available in InfoExplorer. The procedure is correctly documented in the hard copy version of this guide.

In addition the procedure for deactivating a Serial Line Internet Protocol (SLIP) connection is incorrectly documented. The paragraph beginning, "If `slattach` is accidentally killed with a `-9` flag..." should read:

"If `slattach` is accidentally killed with a `-9` flag, a slip lock may remain in `/etc/locks`. Delete this lock file to clean up after `slattach`."

The sample program on this page is also incorrect. Disregard this example.

You can also deactivate the SLIP connection, using SMIT instead of the `kill` command. Follow this procedure:

1. Enter:  

```
smit chinet
```
2. Select the SLIP interface (for example, `s10`).
3. Select the `Current STATE` field and view your choices.
4. Select either `down` or `detach`.
5. Confirm your selection to deactivate the SLIP connection.



---

## Configuring NIS Documentation Error

The *System Management Guide: Communications and Networks* incorrectly documents how to configuring NIS. The guide tells you to add the pattern '+:0:0:::' as the last line of the local `/etc/passwd` file. This is incorrect. Instead, you must add this pattern:

```
+:0:0:::
```

to the local `/etc/passwd` file in order for the NIS `/var/yp/passwd` to be checked for user entries.

If you do not do this no one is able to log in if they are not in the local `/etc/passwd` file.

---

## AIX Version 4 Commands Reference

The following corrections apply to the *AIX Version 4 Commands Reference*.

- A feature of the `bellmail` command has been changed. The `bellmail` command no longer allows the `-d` option to specify an alternate mail directory.
- The use of the `mbuf` subcommand with `crash` is incorrectly documented. The new syntax for the `mbuf` subcommand is:  
`mbuf Address`  
This subcommand displays the system `mbuf` structures at the specified *Address*.
- The `mkfs -o` and `crfs -a` commands are incorrectly documented. The specifier for the file system fragment size is listed as `fragment`. The correct specifier is `frag`.

---

# AIX Version 4 AIXwindows Programming Guide

The hardcopy version of the *AIX Version 4 AIXwindows Programming Guide* is not current as of Service Level AOS1.3. InfoExplorer does contain a current version of this guide, however. The current version on InfoExplorer contains a new Appendix E, “Display Power Management.”

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# FX Series Administering Your Fault Tolerant System

The discussion in “How CMS Uses the AIX Error Logging Facility with the Change Daemon” on page 2-15 of this guide does not apply to AIX 4.1.5r2 and later releases supporting FX Series systems. The AIX error logging facility is no longer used as the communication path between the device drivers and the change daemon. Instead, messages are now logged to and retrieved from a circular buffer in the kernel.