

AIX Version 3.2

Problem Solving Guide and Reference



Fifth Edition (October 1993)

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Problem Solving Guide and Reference

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About This Book

The *AIX Version 3.2 Problem Solving Guide and Reference* provides information to help you investigate, define, and fix problems with the operating system, software or hardware, or other programs installed on the system. Follow the procedures in Chapter 1, “Problem Solving Overview,” before placing a service call.

Note: The information in this book can also be found in the AIX and RISC System/6000 Hypertext Information Base Library. This online documentation is designed for use with the InfoExplorer hypertext retrieval system.

How to Use This Book

Note: Before beginning problem determination, make a copy of the Problem Summary Form located in Chapter 1 to record problem information.

If a three-digit value is displayed on your system unit or if a message is displayed on your screen, go directly to the *AIX Version 3.2 Messages Guide and Reference* for information about the message and recovery procedures.

This book allows you to locate problem solving instructions and tools according to your needs and knowledge level. Chapter 1 contains prerequisite information for the rest of the book including the Symptom Index and the Problem Summary Form. Chapters 2–8 provide troubleshooting procedures for specific problems. Chapters 9–12 provide tools for investigating system problems and require some programming knowledge.

If you have a problem and cannot figure out the cause, start your problem solving with Chapter 1, “Problem Solving Overview.” This chapter lists general problem symptoms in the Symptom Index and directs you to problem resolution in one of the chapters.

Overview of Contents

Directed Problem Analysis

- Chapter 1, “Problem Solving Overview,” is the starting point for specific problem determination. You locate the general symptom of your problem in the Symptom Index and are directed to problem resolution steps in one of the following chapters.
- Chapter 2, “Inactive System,” describes how to check your system hardware and the processes running on the system and then restart your system after diagnosing the problem area.
- Chapter 3, “Terminal Problems,” describes how to free a terminal taken over by processes and respond to screen messages.
- Chapter 4, “Inaccurate System Clock,” describes how to reset the system clock by testing the system battery or resetting the date and setclock commands.
- Chapter 5, “Device Problems,” describes how to check the hardware and software that could affect device performance.
- Chapter 6, “Media Problems,” describes how to check for media errors and recover data from a damaged diskette.
- Chapter 7, “Network Problems,” describes how to solve network problems by diagnosing network hardware problems, network software problems, and network communication adapter problems.

- Chapter 8, "Printing Problems," describes how to reactivate the queue daemon, clear a print queue backlog, reallocate printer resources, and delete unnecessary files in the printer directory.

Problem Solving Tools

- Chapter 9, "Hardware Diagnostics," describes how to diagnose your system by loading a diagnostics program, choosing a test option, and reporting a service request number (SRN). Information is also included to help you identify your hardware, interpret codes in the three-digit display, and gather information about your system configuration.
- Chapter 10, "Error Logging Facility," describes how the error logging facility can be used to record hardware and software problems and provide informational messages for system operation. Also included is information on error logging and alerts and programs used to run an automatic error log analysis.
- Chapter 11, "Trace Facility," describes how to use the trace facility to isolate system problems by monitoring system events.
- Chapter 12, "System Dump Facility," describes the system dump facility and how to configure a dump device, start a system dump, copy a system dump, and return to normal operations.

Reference Information

- Appendix A, "AIX Install Maintenance," describes how to start the AIX Maintenance Mode with a diskette, CD-ROM disc, 8mm tape, and other types of tape.
- Appendix B, "Software Validation," describes how to verify that an installed software product (or licensed product) has not been damaged or corrupted.
- Appendix C, "Error Identifiers for the Error Log," lists the possible error log entries by error label.

Highlighting

The following highlighting conventions are used in this book:

Bold	Identifies commands, keywords, files, directories and other items whose names are predefined by the system.
<i>Italics</i>	Identifies parameters whose actual names or values are to be supplied by the user.
Monospace	Identifies examples of specific data values, examples of text similar to what you might see displayed, examples of portions of program code similar to what you might write as a programmer, messages from the system, or information you should actually type.

Related Publications

The following books contain information about or related to problem solving:

- The operator guide for your system unit contains the checkout procedures for problem determination, system verification, and using the diagnostics.
- *AIX Version 3.2 Messages Guide and Reference*, Order Number SC23-2530.
- *AIX Version 3.2 System Management Guide: Operating System and Devices*, Order Number GC23-2486.
- *AIX Version 3.2 System Management Guide: Communications and Networks*, Order Number GC23-2487.

- *AIX Version 3.2 Performance Monitoring and Tuning Guide*, Order Number SC23-2365.
- *AIX Version 3.2 General Programming Concepts*, Order Number SC23-2205.
- *POWERstation and POWERserver Common Diagnostics and Service Guide*, Order Number SA23-2687.
- *SNA Formats*, Order Number GA27-3136.
- *AIX and RISC System/6000 Hypertext Information Base Library*, Order Number SC23-2163.

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To order additional copies of this book, use Order Number SC23-2204.

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Chapter 1. Problem Solving Overview

The Problem Solving Overview directs you to the troubleshooting information most applicable to your system's problem. Before beginning any problem solving procedures, refer to the following:

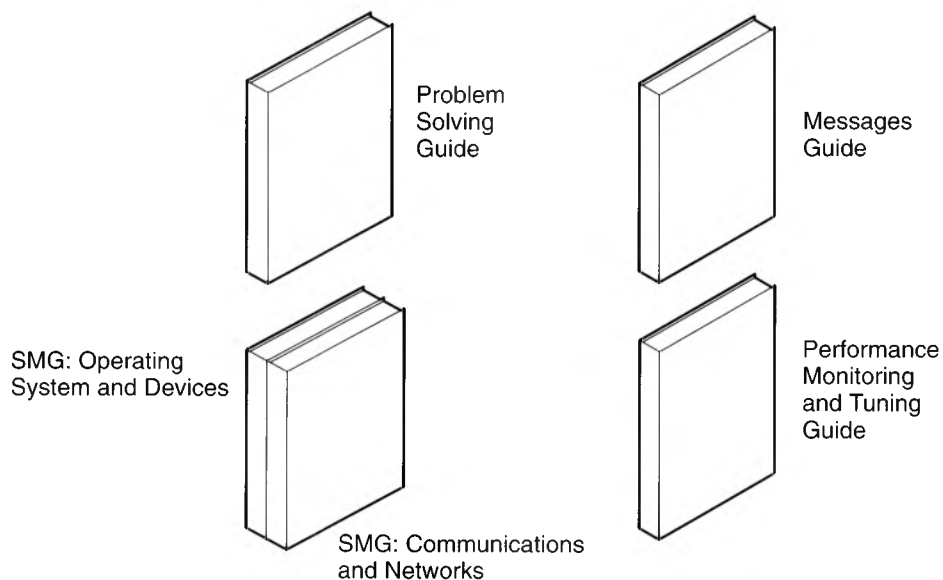
- Library Contents on page 1-1
- Symptom Index on page 1-2
- Problem Summary Form on page 1-3

Library Contents

The *AIX Version 3.2 Problem Solving Guide and Reference* addresses various system problems but is not a substitute for troubleshooting procedures included in other reference books. Other problem solving references include the *AIX Version 3.2 Messages Guide and Reference*, *AIX Version 3.2 System Management Guide: Communications and Networks*, *AIX Version 3.2 System Management Guide: Operating System and Devices*, and the *AIX Version 3.2 Performance Monitoring and Tuning Guide* as shown below.

The *AIX Version 3.2 Messages Guide and Reference* includes reference and recovery information for seven-digit error messages and three-digit values in the operator panel display. *AIX Version 3.2 System Management Guide: Operating System and Devices* contains procedures for troubleshooting logical volume, file system, system accounting, printing and general device problems. *AIX Version 3.2 System Management Guide: Communications and Networks* contains procedures for troubleshooting general communications and network problems. The *AIX Version 3.2 Performance Monitoring and Tuning Guide* provides the concepts and techniques involved in assessing and tuning the performance of AIX systems.

Refer to the Symptom Index on page 1-2 to start your problem solving procedures or to determine the best source of information for your system's problem.



Problem Solving Source Overview

Symptom Index

Use the Symptom Index as your problem solving starting point. Select the symptom most closely matching the problem with your system, record this symptom in item 3 of the Problem Summary Form, and follow the indicated problem solving procedures.

Seven-Digit Error Number with Message Text

Refer to the *AIX Version 3.2 Messages Guide and Reference*.

Three-Digit Value (in Operator Panel Display)

Refer to the *AIX Version 3.2 Messages Guide and Reference*.

Inactive System

Check the Hardware on page 2-1

Check the Processes on page 2-3

Restart the System on page 2-6

Terminal Problems

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Interpret Values in the Three-Digit Display on page 9-10

Gather Information about Your System Configuration on page 9-13

You Need to Retrieve/Generate an Error Log Report

Refer to Error Logging Facility on page 10-1

You Need to Generate a Trace Report

Refer to Trace Facility on page 11-1

You Need to Retrieve a System Dump

Refer to System Dump Facility on page 12-1

Problem Summary Form

Background Information

1. Record the Current Date and Time _____
2. Record the System Date and Time (if available) _____
3. Record the Symptom _____
4. Record the Service Request Number (SRN) _____
5. Record the Three-Digit Codes (if available) _____ - _____ - _____
6. Record the Location Codes
 - First FRU _____ - _____ - _____
 - Second FRU _____ - _____ - _____
 - Third FRU _____ - _____ - _____
 - Fourth FRU _____ - _____ - _____

Problem Description

Data Captured

(Describe data captured such as system dumps, core dumps, error IDs, error logs, or messages that need examining by your service organization.)

(After completing this form, copy it and keep it on hand for future problem solving reference.)

Chapter 2. Inactive System

A hardware problem, a software problem, or a combination of both can make your system inactive. This procedure guides you through steps to correct the problem and restart your system. If your system is still inactive after completing this procedure, refer to “Hardware Diagnostics” on page 9-1 for information about generating a service request number (SRN).

Procedures to reactivate an inactive system include the following:

- Check the Hardware on page 2-1
- Check the Processes on page 2-3
- Restart the System on page 2-6

Check the Hardware

Check your hardware by doing the following:

- Turning the Power On on page 2-1
- Checking the Three-Digit Display on page 2-1
- Activating Your Display or Terminal on page 2-1

Turning the Power On

Does the power light come on when you switch on your system?

- Yes** Go to the next question.
- No** Go to “Hardware Diagnostics” on page 9-1.

Checking the Three-Digit Display

Is the three-digit display on your system blank?

- Yes** Go to the next question.
- No** Go to the *AIX Version 3.2 Messages Guide and Reference* for information concerning three-digit displays and error messages.

Activating Your Display or Terminal

Check several parts of your display or terminal:

- Make sure the display cable is securely attached to the display and to the system unit.
- Make sure the keyboard cable is securely attached.
- Make sure the mouse cable is securely attached.
- Make sure the display is turned on and that its Power-On light is lit.
- Adjust the brightness control on the display.
- Make sure the terminal's communication settings are correct.

Is your system now active?

- Yes** Your hardware checks have corrected the problem.

No Did your system become inactive while you were trying to restart the system?

Yes Go to "Restart the System" on page 2-6.

No Go to "Check the Processes" on page 2-3.

Check the Processes

A stopped or stalled process might make your system inactive. Check your system processes by doing the following:

- Restarting Line Scrolling on page 2-3
- Using the Ctrl-C Key Sequence on page 2-3
- Ending Stalled Processes on page 2-3
- Logging In from a Remote Terminal or Host on page 2-4
- Ending Stalled Processes Remotely on page 2-4

Restarting Line Scrolling

Restart line scrolling halted by the Ctrl-S key sequence by doing the following:

1. Activate the window or shell with the problem process.
2. Press the Ctrl-Q key sequence to restart scrolling.

The Ctrl-S key sequence stops line scrolling and the Ctrl-Q key sequence restarts scrolling.

Is your system now active?

Yes Your scroll check corrected the problem with your inactive system.

No Go to the next step, “Using the Ctrl-C Key Sequence” on page 2-3.

Using the Ctrl-C Key Sequence

End a stopped process by doing the following:

1. Activate the window or shell with the problem process.
2. Press the Ctrl-C key sequence. The Ctrl-C key sequence stops the current search or filter.

Is your system now active?

Yes The Ctrl-C key sequence corrected the problem with your inactive system.

No Go to the next step, “Ending Stalled Processes” on page 2-3.

Ending Stalled Processes

End a stalled process by doing the following:

1. Switch from the window or shell with the problem process to another window or shell.

Go to “Logging In from a Remote Terminal or Host” on page 2-4 if you cannot switch shells.

2. List the active processes by entering the following **ps** command:

```
ps -ef
```

The **-e** and **-f** flags identify all active and inactive processes.

3. Identify the process ID of the stalled process.

For help identifying processes, you can use the **grep** command with a search string. For example, to quit the **xlock** process, enter the following to find the process ID:

```
ps -ef | grep xlock
```

The **grep** command allows you to search on the output from the **ps** command to identify the process ID of a specific process. The **ps u** command checks CPU usage. If a process is using excessive CPU or disk space, the process is probably stalled.

4. End the stalled process by entering the following **kill** command:

Note: You must have root user authority to issue the **kill** command on processes that you did not initiate.

```
kill -9 ProcessID
```

If you cannot identify the problem process, the most recently activated process might be the cause of your inactive system. End the most recent process if you think that is the problem.

5. Try to log off your system by pressing the Ctrl-D key sequence. You need to log in again if this action is successful.

Is your system now active?

Yes Your process checks have corrected the problem with your inactive system.

No Go to the next step, "Logging In from a Remote Terminal or Host" on page 2-4.

Logging In from a Remote Terminal or Host

Log in remotely in either of two ways:

- Log in to the system from another terminal if more than one terminal is attached to your system.
- Log in from another host on the network (if your system is connected to a network) by entering the following **tn** command:

```
tn YourSystemName
```

The system asks for your regular login name and password when you use the **tn** command.

Were you able to log in to the system from another terminal or host?

Yes Go to the next step, "Ending Stalled Processes Remotely" on page 2-4.

No Go to "Restart the System" on page 2-6.

Or, you can start a system dump to find out why your system became inactive. Go to "System Dump Facility" on page 12-1 for more information.

Ending Stalled Processes Remotely

End a stalled process from a remote terminal by doing the following:

1. List active processes by entering the following **ps** command:

```
ps -ef
```

The **-e** and **-f** flags identify all active and inactive processes.

2. Identify the process ID of the stalled process.

For help identifying processes, you can use the **grep** command with a search string. For example, to quit the **xlock** process, enter the following to find the process ID:

```
ps -ef | grep xlock
```

The **grep** command allows you to search on the output from the **ps** command to identify the process ID of a specific process.

3. End the process by entering the following **kill** command:

Note: You must have root user authority to use the **kill** command on processes you did not initiate.

```
kill -9 ProcessID
```

If you cannot identify the problem process, the most recently activated process might be the cause of your inactive system. End the most recent process if you think that is the problem.

Is your system now active?

Yes Your process checks have corrected the problem with your inactive system.

No Go to "Restart the System" on page 2-6.

Or, you can start a system dump to find out why your system became inactive. Go to "System Dump Facility" on page 12-1 for more information.

Restart the System

You need to restart your system if the first two procedures fail to correct the problem that makes your system inactive.

This procedure involves doing the following:

- Checking the Position of the Mode Switch on page 2-6
- Checking the State of the Boot Device on page 2-6
- Loading the Operating System on page 2-6
- Troubleshooting Problems with Operating Systems on page 2-7

Checking the Position of the Mode Switch

The correct position for the Mode Switch depends on the type of software you want to load.

Position the Mode Switch according to one of the following conditions:

- Use the Normal position to load the operating system.
- Use the Service position to load either *AIX Install/Maintenance* (refer to “AIX Install/Maintenance” on page A-1) or hardware diagnostics (refer to “Hardware Diagnostics” on page 9-1).

Go to “Checking the State of the Boot Device” on page 2-6.

Checking the State of the Boot Device

Your system boots with either a removable medium, an external device, a small computer system interface (SCSI) device, or a LAN network. Decide which method applies to your system and use the following instructions to check the boot device:

- For a removable medium, such as diskette or tape, make sure the medium is inserted correctly.
- For an externally attached device, such as a tape drive, make sure:
 - The power to the device is turned on.
 - The device cables are correctly attached to the device and to the system unit.
 - The ready indicator is on (if the device has one).
- For external SCSI devices, verify that the SCSI address settings are unique.
- For a LAN network, verify that the network is up and operable.

Is the boot device working correctly?

Yes Go to “Loading the Operating System” on page 2-6.

No Go to “Hardware Diagnostics” on page 9-1.

Loading the Operating System

Load your AIX operating system by doing the following:

1. Switch off your system’s power.
2. Wait 1 minute.
3. Switch on your system’s power.

4. Wait about 5 minutes while the system boots.

Did your system boot successfully?

- Yes** Your steps to restart the system have corrected the problem with your inactive system. You can either stop or go to “Troubleshooting Problems with Operating Systems” on page 2-7.
- No** If the AIX operating system failed to load, load an alternate operating system, such as *AIX Install/Maintenance* or hardware diagnostics.
- To load the *AIX Install/Maintenance* service software, refer to “AIX Install/Maintenance” on page A-1. To load hardware diagnostics, refer to “Hardware Diagnostics” on page 9-1.
- If you are still unable to restart the system, you can use an SRN to report the problem with your inactive system to your service representative. Go to “Hardware Diagnostics” on page 9-1 to learn how to get an SRN.
- Or, you can start a system dump to find an explanation for why your system became inactive. Go to “System Dump Facility” on page 12-1 for more information.

Troubleshooting Problems with Operating Systems

If one operating environment loaded successfully but another did not, determine which of the following cases is applicable and follow the procedures.

Operating System Failed to Load

Either your drive or adapter can prevent your operating system from loading. Go to “Hardware Diagnostics” on page 9-1 to test your drive and adapter.

If the diagnostics programs find a problem, record the SRN in Item 4 of the Problem Summary Form. Give the form to your hardware service representative.

If the diagnostics programs do not find a problem but you think one exists, report the problem to your software service representative.

AIX Install/Maintenance Failed to Load

Either your drive or adapter can prevent the *AIX Install/Maintenance* service software from loading. Go to “Hardware Diagnostics” on page 9-1 to test your drive and adapter.

If the diagnostics programs find a problem, record the SRN in Item 4 of the Problem Summary Form. Give the form to your hardware service representative.

If the diagnostics programs were successfully loaded from diskette or if the diagnostics did not find a problem, your *AIX Install/Maintenance* diskettes might be flawed. Report the problem to your software service representative.

Chapter 3. Terminal Problems

Processes, either stalled or unwanted, can cause problems with your terminal. Some problems produce messages on your screen that give information about possible causes.

To perform the following procedures, you must have either a second terminal (either an HFT or a CRT), a modem, or a network login. If you do not have any of these, fix the terminal problem by rebooting your machine.

Choose the appropriate procedure for fixing your terminal problem:

- Free a Terminal Taken Over by Processes on page 3-1
- Respond to Screen Messages on page 3-3

Free a Terminal Taken Over by Processes

Identify and stop stalled or unwanted processes by doing the following:

1. Determine the active processes running on the screen by using the following **ps** command:

```
ps -ef | pg
```

The **ps** command shows the process status. The **-e** flag writes information about all processes (except kernel processes), and the **-f** flag generates a full listing of processes including what the command name and parameters were when the process was created. The **pg** command limits output to a single page at a time, so information does not quickly scroll off the screen.

Suspicious processes include system or user processes that use up excessive amounts of a system resource such as CPU or disk space. System processes such as **sendmail**, **routed**, and **lpd** frequently become runaways. Use the **ps u** command to check CPU usage.

2. Determine who is running processes on this machine by using the **who** command:

```
who
```

The **who** command displays information about all users currently on this system such as login name, workstation name, date, and time of login.

3. Determine if you need to stop, suspend, or change the priority of a user process.

Note: You must have root authority to stop processes other than your own. If you terminate or change the priority of a user process, contact the process owner and explain what you have done.

- Stop the process using the **kill** command. For example:

```
kill 1883
```

The **kill** command sends a signal to a running process. To stop the execution of a process, specify the process ID (PID), which is 1883 in this example. Use the **ps** command to determine the PID number of commands.

- Suspend execution of the process and run it in the background by using the ampersand (&). For example:

```
/u/bin1/prog1 &
```

The **&** signals that you want this process run in the background. In a background process, the shell does not wait for the command to complete before returning the shell prompt. When a process requires more than a few seconds to complete, run the command in background by typing an **&** at the end of the command line. Jobs running in the background appear in the normal **ps** command.

- Change the priority of the processes that have taken over by using the following **renice** command:

```
renice 20 1883
```

The **renice** command alters the scheduling priority of one or more running processes. The higher the number, the lower the priority with 20 being the lowest priority.

In the previous example, **renice** reschedules process number 1883 to the lowest priority. It will run when there is a small amount of unused processor time available.

4. If your terminal does not return to normal operation after you complete the above procedures, follow the diagnostic procedures in “Hardware Diagnostics” on page 9-1.

Respond to Screen Messages

Respond to and recover from screen messages by doing the following:

1. If the terminal displays any error messages, look up the messages. For example, you can use the following command to look up an error number in InfoExplorer:

```
info -h errornumber
```

Use the error number that appears on your terminal in place of the *errornumber* variable in this example.

2. Make sure the **DISPLAY** environment variable is set correctly. Use either of the following methods to check the **DISPLAY** environment:

- Use the **setenv** command to display the environment variables.

```
setenv
```

The **setenv** command displays the protected state environment when you logged in.

Determine if the **DISPLAY** variable has been set. In the following example, the **DISPLAY** variable does not appear, which indicates that the **DISPLAY** variable is not set to a specific value.

```
SYSENVIRON:  
NAME=casey  
TTY=/dev/pts/5  
LOGNAME=casey  
LOGIN=casey
```

OR

- Change the value of the **DISPLAY** variable. For example, to set it to the machine named *bastet* and terminal 0, enter:

```
DISPLAY=bastet:0  
export DISPLAY
```

If not specifically set, the **DISPLAY** environment variable defaults to *unix:0* (the console). The value of the variable is in the format *name:number* where *name* is the host name of a particular machine, and *number* is the X server number on the named system.

3. Reset the terminal to its defaults using the following **stty** command:

```
stty sane
```

The **stty sane** command restores the “sanity” of the terminal drivers. The command outputs an appropriate terminal resetting code from the **/etc/termcap** file (or **/usr/share/lib/terminfo** if available).

4. If the Return key does not work correctly, reset it by entering the following command:

```
^J stty sane ^J
```

The **^J** represents the Ctrl-J key sequence.

5. If your screen does not return to normal operation after you complete the above procedures, follow the diagnostic procedures in “Hardware Diagnostics” on page 9-1.

Chapter 4. Inaccurate System Clock

The system clock records the time of system events, allows you to schedule system events (such as running hardware diagnostics at 3:00 a.m.), and tells when you first created or last saved files. To reset or reactivate an inaccurate clock, you can:

- Test the System Battery on page 4-1
- Reset the System Clock on page 4-2

Test the System Battery

If your system is losing track of time, the cause may be a depleted or disconnected battery. To determine the status of your system battery, enter the following **diag** command:

```
diag -d ioplanar0
```

When the Diagnostics main menu appears, select the **Problem Determination** option. If the battery is disconnected or depleted, a problem menu will be displayed with a service request number (SRN). Record the SRN on Item 4 of the Problem Summary Form and report the problem to your hardware service organization.

If your system battery is operational, your system time may have been reset incorrectly because either the **date** or **setclock** command was run incorrectly or unsuccessfully. Refer to "Reset the System Clock" on page 4-2 to correct the problem.

Reset the System Clock

Use the **date** command to set your system clock. Use the **setclock** command to set the time and date for a host on a network. Reset your system clock using either of the following:

- Using the date Command on page 4-2
- Using the setclock Command on page 4-2

Using the date Command

The **date** command displays or sets the date and time. Enter the following command to determine your system's date and time:

```
/usr/bin/date
```

Warning: Do not change the date when the system is running with more than one user.

The following formats can be used when setting the date with the *Date* parameter:

- *mmddHHMM[.SSyy]* (default)
- *yymmddHHMM[.SS]*
- *ddmmHHMMyy[.SS]*

The variables to the *Date* parameter are defined as follows:

<i>mm</i>	Specifies the month number.
<i>dd</i>	Specifies the number of the day in the month.
<i>HH</i>	Specifies the hour in the day (using a 24-hour clock).
<i>MM</i>	Specifies the minute number.
<i>SS</i>	Specifies the number of seconds.
<i>yy</i>	Specifies the last two numbers of the year.

Note: If the *yymmdd* format is specified, the value of the *yy* variable must be 88 to 99.

The **date** command writes the current date and time to standard output if called with no flags or with a flag list that begins with a + (plus sign). Otherwise, it sets the current date. Only a root user can change the date and time. The **date** command prints out the usage message on any unrecognized flags or input.

If you follow the **date** command with a + (plus sign) and a field descriptor, you can control the output of the command. You must precede each field descriptor with a % (percent sign). The system replaces the field descriptor with the specified value. Enter a literal % as %% (two percent signs). The **date** command copies any other characters to the output without change. The **date** command always ends the string with a new-line character.

Flags

-n	Does not set the time globally on all machines in a local area network that have their clocks synchronized.
-u	Displays or sets the time in Coordinated Universal Time (UTC).

Using the setclock Command

The **setclock** command sets the time and date for a host on a network. Enter the following command to determine your system's date and time:

```
/usr/sbin/setclock
```


The **/usr/sbin/setclock** command gets the time from a network time server, and if run by a user with root user authority, sets the local time and date accordingly.

The **setclock** command takes the first response from the time server, converts the calendar clock reading found there, and shows the local date and time. If the **setclock** command is run by the root user, it calls the standard workstation entry points to set the system date and time.

If no time server responds, or if the network is not operational, the **setclock** command displays a message to that effect and leaves the date and time settings unchanged.

Note: Any host running the **inetd** daemon can act as a time server.

Parameter

TimeServer The host name or address of a network host that services TIME requests. The **setclock** command sends an public network TIME service request to a time server host. If the *TimeServer* name is omitted, the **setclock** command sends the request to the default time server. The default time server in a DOMAIN environment is specified by the name server. Otherwise, the default time server is specified in the **/etc/hosts** file.

Chapter 5. Device Problems

Problems with devices such as drives and printers can affect your system's operation. Find the cause of your device problem by doing the following:

- Check the Device Hardware on page 5-1
- Check the Device Software on page 5-3

Check the Device Hardware

Correct a device hardware problem by doing the following:

- Checking the Device Connections on page 5-1
- Checking the Ready State of a Device on page 5-1
- Running Diagnostics on a Device on page 5-2

Checking the Device Connections

Follow these steps to check your device connections:

1. Check that power is available at the electrical outlet.
2. Check that the device power cable is correctly attached to the device and to the electrical outlet.
3. Check that the device signal cable is attached correctly to the device and to the correct connection on the system unit.
4. For SCSI devices, check that the SCSI terminator is correctly attached and the SCSI address setting is correct.
5. For communications devices, check that the device is correctly attached to the communications line.
6. Check that the device is turned on.

Refer to the publications for the specific device for cabling and configuring procedures and for further troubleshooting information.

Did you fix the device?

Yes Your checks of the device connections have corrected the problem.

No Go to the next step, "Checking the Ready State of a Device" on page 5-1.

Checking the Ready State of a Device

To determine whether the device is in a ready state:

1. Check that the device's Ready indicator is on.
2. Check that removable media, such as tape, diskette, and optical devices, are inserted correctly.
3. Check the ribbon, the paper supply, and the toner supply for printers and plotters.
4. Check that the write medium is write-enabled if you are trying to write to the device.

Did your checks correct the problem with the device?

- Yes** Your check of the device's ready state corrected the problem.
- No** Go to the next step, "Running Diagnostics on a Device" on page 5-2.

Running Diagnostics on a Device

You might have a defective device. Go to "Hardware Diagnostics" on page 9-1 to find the hardware problem with your device.

If running hardware diagnostics fails to find a problem with your device, go to "Check the Device Software" on page 5-3. If your device passes the diagnostic tests, you might have a problem with the way your device works with your system software.

Check the Device Software

Correct a device software problem by doing the following:

- Checking the Error Log on page 5-3
- Listing All Devices on page 5-3
- Checking the State of a Device on page 5-3
- Checking the Attributes of a Device on page 5-3
- Changing the Attributes of a Device on page 5-4
- Using a Device with Another Application on page 5-4
- Defining a New Device on page 5-4

Checking the Error Log

Check the error log to see whether any errors are recorded for either the device, its adapter, or the application using the device. Go to “Error Logging Facility” on page 10-1 to perform this check. Return to this step after completing the procedures.

Did you correct the problem with the device?

Yes Your check of the error log identified the problem.

No Go to the next step, “Listing All Devices” on page 5-3.

Listing All Devices

Use the **lsdev -C** command to list all defined or available devices.

The command shows the characteristics of all the devices in your system.

Is the device in the list of devices?

Yes Go to the next step, “Checking the State of a Device” on page 5-3.

No Go to “Defining a New Device” on page 5-4.

Checking the State of a Device

Find the device in the list generated from the **lsdev -C** command. Check whether the device is in the Available state.

Is the device in the Available state?

Yes Go to the next step, “Checking the Attributes of a Device” on page 5-3.

No Go to “Defining a New Device” on page 5-4.

Checking the Attributes of a Device

Enter the **lsattr -E -I DeviceName** command to list the attributes of your device.

The **lsattr** command shows attribute characteristics and possible values of attributes for devices in the system. Refer to the publications for the specific device for the correct settings.

Are the device attributes set correctly?

- Yes** Go to “Using a Device with Another Application” on page 5-4.
- No** Go to the next step, “Changing the Attributes of a Device” on page 5-4.

Changing the Attributes of a Device

Enter the **chdev -l Name -a Attribute=Value** command to change device attributes.

The **chdev** command changes the characteristics of the device you name with the **-l Name** flag. Refer to the *AIX Version 3.2 Commands Reference* for information before running this command.

Did you correct the problem?

- Yes** Changing the device attributes has corrected the problem.
- No** Go to “Using a Device with Another Application” on page 5-4.

Using a Device with Another Application

Try using the device with another application. If the device works properly with another application, there might be a problem with the first application.

Did the device work correctly with another application?

- Yes** You might have a problem with the first application. Report the problem to your software service representative.
- No** Go to “Defining a New Device” on page 5-4.

Defining a New Device

Note: You must either have root user authority or be a member of the security group to use the **mkdev** command.

Use the **mkdev** command to add a device to the system.

The **mkdev** command can either define and make available a new device or make available a device that is already defined. You can uniquely identify the predefined device by using any combination of the **-c**, **-s**, and **-t** flags. Refer to the *AIX Version 3.2 Commands Reference* for information before running this command.

Did you correct the problem with the device?

- Yes** Defining the device has corrected the problem.
- No** You can either stop and report the problem to your service representative or use a diagnostics program to test your device. If you want to diagnose the problem with your device, go to “Hardware Diagnostics” on page 9-1.

Chapter 6. Media Problems

A media error on a diskette is just like a sector error on a hard drive. Some portion of the diskette has been contaminated or destroyed and has become unusable. Damaged media should not be used to store data.

Media problems can develop in media that has exceeded its useful life. A table of tapes and their life expectancy follows:

Tape	Expectancy
4mm DAT	Five years or 650 full-tape read or write operations.
8mm DATA grade	Four years or 500 full-tape read or write operations.
1/4-inch	Not available.
1/2-inch	Not available.

The following information will enable you to:

- Check for Media Errors on page 6-1
- Recover Data from a Damaged Diskette on page 6-3

See “Logical Volumes” in *AIX Version 3.2 System Management Guide: Operating System and Devices*, for problem solving information on logical volume storage (storage system based on the hard disk drive).

Check for Media Errors

Check for media errors by doing the following:

- Reading from the Media on page 6-1
- Writing to the Media on page 6-2

Reading from the Media

Reading from the media involves detecting the data and format information on a media.

- You can use the **dd** command to check a disk or diskette.

For example, to read a diskette on drive `rfd0`, enter:

```
dd if=/dev/rfd0 of=/dev/null bs36b
```

where the **bs** flag specifies the internal buffer size for **dd**.

Note: A value of 36b for this flag greatly enhances the performance of this operation. With a buffer size of 18KB, **dd** can read both tracks of a diskette in only two revolutions of the diskette.

- You can also use the **tcopy** command to read a tape.

For example, to read a tape on device `rmt0`, enter:

```
tcopy /dev/rmt0
```

- Media errors are also recorded in the error log. For example, entries labeled `TAPE_ERR` indicate tape media error. For further information, see “Error Logging Facility” on page 10-1 and “Error Identifiers for the Error Log” on page C-1.

If the media can be read successfully with the **dd** or the **tcopy** command, a syntax or usage problem possibly exists. Syntax or usage problems could include:

- The wrong archive utility was used.
- The **cpio** backup was not written with ascii headers and the command specifies ascii headers (**-c**).
- The **tar** command has calculated a checksum different than what is recorded on the tape indicating that the wrong volume may be in the drive. (Use the **-i** flag to ignore checksums.)
- For tapes, the DEVICE block size is different than the size of the tape file's blocks.
- For tapes, the archive utility does not have enough buffer space to hold an entire block from the tape file.

Writing to the Media

Warning: The reformatting procedure destroys all data on the media.

Writing to the media also helps you check for media problems.

- Use the **format** or **dosformat** (formats a DOS diskette) commands to format diskettes.

For example, to format a diskette in the diskette drive `rfd0`, enter:

```
format -d /dev/rfd0
```

OR

```
dosformat -D /dev/rdf0
```

- Use the **dd** command to write data to a tape.

For example, to write the file `motd` to the device `rmt0`, enter:

```
dd if=/etc/motd of=/dev/rmt0
```

Note: Writing data to a tape ensures that only that portion of the tape that is written to is not damaged.

Recover Data from a Damaged Diskette

Diskettes can suffer actual physical damage (bending, folding) or internal damage. To recover data from a damaged diskette, do the following:

1. Make sure that you have a backup of the diskette.
2. Get another copy of the data on the diskette, if possible.
3. Restore as many files as possible from the diskette by determining which of the following methods you used to copy the file to the diskette.
 - If the files were written with the **tar -f** command, enter the following command to restore the file:

```
tar -xvf/dev/rfd0
```

The **tar** command writes files to or retrieves files from diskettes as well as tape media.

The **/dev/rfd0** specifies that you want to use removable floppy drive zero (**rfd0**) for your input.

If the data was written onto the diskette with relative paths, the **tar** command extracts data from a diskette in removable **rfd0** and places it in the current file system.

If the data was not written to the diskette with relative paths, then the **tar** command attempts to extract the data from the diskette in **rfd0** and place each item at the location specified by the absolute path. For example, if the relative path file is **./myfile**, the file will be written in the current directory.

If the file was written on the diskette with an absolute path, such as **/u/diane/myfile**, then the file will be copied from the diskette into **/u/diane/myfile**. If the file **/u/diane/myfile** already exists, it will be overwritten.

Note: An *absolute path name* is the full path name of the file. It begins with a slash immediately followed by the root directory and contains all the directories leading to the file. The *relative path name* starts from the current directory and is the same as its base name if the file is in the **\$HOME** directory. If the file is in a subdirectory of **\$HOME**, the relative path name is the path from the working directory to the file.

- If the files were written with the **cpio** command, enter the following command to restore the file:

```
cpio -ov > /dev/rfd0 < mylist
```

The **cpio** command copies files into and out of storage and moves directory trees.

In this example, the **cpio** command directs the output to the diskette drive **rfd0** (the **cpio** command normally directs output to standard output) and pipes a list of source names.

To read from the **cpio** format, enter:

```
cpio -iv < /dev/rfd0
```

Note that absolute path names will be written to their original locations (not to the current directory).

- If the files were written with the **dd** command, enter the following command to restore the file:

```
dd if=myfile obs=8k of=/dev/rfd0
```

The **dd** command copies files. It is most useful for reading files that are written in non-UNIX format.

- If the files were written with the **backup** command, enter the following command to restore the file:

```
restore -xvf/dev/rfd0
```

The **restore** command restores files backed up by the **backup** command.

- Use SMIT to restore the file:

```
smit restore
```

4. After restoring the file, open it and make sure it looks okay. Beware that data in a file restored from a damaged diskette may be incorrect.

Prevent your diskette data from being deleted inadvertently. Put write-protect tabs on the diskettes. Keep diskettes away from magnets, old rotary phones (they contain magnets), and the front or top of CRT screens.

Related Information

“Backup Overview” in *AIX Version 3.2 System Management Guide: Operating System and Devices*.

Chapter 7. Network Problems

Network problems could include an inability to contact a host (including name resolution problems), an inability to reach a remote network (a routing problem), or problems with accessing a particular service on an otherwise cooperative host.

Refer to the following procedures to correct your network problems:

- Resolve Network Software Problems on page 7-1
- Resolve Network Hardware Problems on page 7-6
- Resolve Communication Adapter Problems on page 7-7

Resolve Network Software Problems

Determine if your software is the source of your network problems by doing the following:

- Resolving the Host Name into an IP Address on page 7-1
- Finding Your `/etc/resolv.conf` File on page 7-2
- Correcting Your `/etc/resolv.conf` File on page 7-2
- Finding a Missing Interface on page 7-2
- Enabling the `inetd` Daemon on page 7-3
- Debugging the `inetd` Daemon on page 7-4
- Debugging the `telnetd` Daemon on page 7-4

Resolving the Host Name into an IP Address

1. Find out if you are using the `/etc/resolv.conf` file to resolve host names.

If other machines on your network have `/etc/resolv.conf` files and yours does not, you probably should have a `/etc/resolv.conf` file.

For more information about using the `/etc/resolv.conf` file to resolve host names, refer to “Understanding Domain Name Resolution” in *AIX Version 3.2 Communications Programming Concepts*.

2. Find out if you are using an NIS server to resolve host names. For example:

```
ps -ef | grep yp
```

Look for the `ypserv` and `ypbind` processes. If found, you are probably using a network information server (NIS) server to resolve host names.

You can also enter the `ypwhich` command to display the name of the NIS server for the local machine:

```
ypwhich
```

If you get the message `the domainname has not been set on this machine`, then you are probably not using NIS to resolve host names.

3. Find out if you are using the `/etc/hosts` file to resolve host names. For example:

```
ls /etc/hosts
```

If you can find the **/etc/hosts** file, you are using it to resolve host names. Check your **/etc/hosts** file to see if the host name is listed and not commented out.

Finding Your **/etc/resolv.conf** File

1. If you know you are using a **/etc/resolv.conf** file to resolve host names, make sure the file exists. For example:

```
ls /etc/resolv.conf
```

2. If your **/etc/resolv.conf** is missing and you attempt to connect to a host, you get the following message:

```
telnet: Unknown host SystemName
```

3. If your **/etc/resolv.conf** is missing and you attempt to send an echo request with the **ping** command, you get the following message:

```
ping: HostName SystemName NOT FOUND
```

The **ping** command sends an echo request to a network host. If the host is operational and on the network, it responds to the echo. By default, the **ping** command will continue to send echo requests to the display until you send an interrupt (Ctrl-C).

Correcting Your **/etc/resolv.conf** File

1. If you know you are using a **/etc/resolv.conf** file to resolve host names and the **/etc/resolv.conf** file exists, make sure it contains the correct host name and IP address.

If you have a bad **/etc/resolv.conf** file, your **ping** command hangs indefinitely when you send an echo request with the **ping** command.

Note: The **/etc/resolv.conf** file contains the IP address, or addresses, of the nameserver(s) you can use and your domain name. Your system administrator should be able to provide you with the correct domain and IP addresses.

2. To find the correct host name and IP address, use the **host** command. For example:

```
host SystemName
```

The **host** command then resolves a host name into an Internet address or an Internet address into a host name.

```
host 129.35.147.121
```

Note: If you are using **/etc/resolv.conf** to resolve host names and the **/etc/resolv.conf** file is damaged, put the host name in the **/etc/hosts** file. To get the correct host name, log in to the machine and enter:

```
host HostName
```

3. Compare this information with your **/etc/resolv.conf** file, and edit **/etc/resolv.conf** if necessary.

Finding a Missing Interface

If you know you can resolve the host name to an address and issue the **telnet** command to another machine, you get the following message if the interface is down or missing:

```
telnet: connect: Network is down
```

1. Check that all interfaces are up and none are missing by using the **netstat** command. For example:

```
netstat -i
```

The **netstat** command displays the status of interfaces on the network.

The interfaces marked with an asterisk (*) are down. Look for some kind of network interface such as `en0` for Ethernet.

2. If the interface is not up, missing, or detached, bring it up, recreate it, or attach it, respectively, by using the **ifconfig** command. For example, if the Ethernet `en0` is not up, enter:

```
ifconfig en0 inet 129.35.147.121 up
```

If the Ethernet `en0` is missing, enter:

```
ifconfig en0 129.35.147.121 netmask 255.255.255.0 up
```

The **ifconfig** command configures network interface parameters.

Enabling the `inetd` Daemon

If naming works and the interface is up and configured but you get the following message, do the procedures following the example message:

```
Trying...
telnet: connect: Connection refused.
```

1. Determine if the **inetd** daemon is up. For example:

```
telnet SystemName echo
```

If it echoes back, the **inetd** daemon is up; if it does not echo back, then you must start the **inetd** daemon.

2. Start the **inetd** daemon:

- If you are using the system reference controller (SRC), enter:

```
startsrc -s inetd
```

Note: If you are using SRC, make sure it is running:

```
ps -eaf | grep srcmst
```

- If you are not using SRC, enter:

```
/etc/inetd
```

3. If you have issued the **telnet** command and cannot make a connection, make sure the **inetd** daemon has the **telnet** service enabled by viewing the **inetd.conf** file and looking for the **telnet** service:

- a. Make sure the **telnet** service exists in the file.
- b. Make sure the line describing the **telnet** service is not commented out.
- c. Make sure the path to the **telnet** service is correct.

4. If you make edits to the **inetd.conf** file, refresh the file:

- If you are using SRC enter:

```
refresh -s inetd
```

- If you are not using SRC, kill the **inetd** daemon:

```
kill -1 'ps -e | grep /etc/inetd | cut -c1-7'
```

Debugging the inetd Daemon

If the **inetd** daemon is up and running correctly and the appropriate service seems to be correct but you still cannot connect, try running the **inetd** daemon processes through a debugger.

1. Stop the **inetd** daemon temporarily:

```
stopsrc -s inetd
```

The **stopsrc** command stops subsystems like the **inetd** daemon.

2. Edit the **syslog.conf** file to add a debugging line at the bottom. For example:

```
vi /etc/syslog.conf
```

- a. Add the line `*.debug /tmp/myfile` at the bottom of the file and exit.
- b. The file that you specify must exist (**/tmp/myfile** in this example). You can use the **touch** command to make your file exist.

3. Refresh the file:

- If you are using SRC, enter:

```
refresh -s syslogd
```

- If you are not using SRC, kill the **syslogd** daemon:

```
kill -1 'ps -e | grep /etc/syslogd | cut -c1-7'
```

4. Start the **inetd** daemon back up with debugging enabled:

```
startsrc -s inetd -a "-d"
```

The **-d** flag enables debugging.

5. Try to make a connection to log errors in the **/tmp/myfile** debugging file. For example:

```
tn bastet
Trying...
connected to bastet
login:>
Connection closed
```

6. See if anything shows up as a problem in the debugging file. For example:

```
tail -f /tmp/myfile
```

Debugging the telnetd Daemon

If the **inetd** daemon could execute the **telnet** service but you still cannot connect via the **telnet** command, there may be something wrong with the **telnet** interface.

1. Verify that **telnet** is using the correct terminal type.

- a. Check the **\$TERM** variable on your machine:

```
echo $TERM
```

- b. Log into the machine to which you are trying to attach and check the **\$TERM** variable:

```
echo $TERM
```

2. Use the **telnet** interface's debugging capabilities by entering the **telnet** command without flags.

```
telnet
tn>
```

- a. Enter `open host` where *host* is the name of the machine.
 - b. Enter Ctrl-T to get to the `tn>` prompt.
 - c. At the `tn>` prompt, enter "debug" for debugging mode.
3. Try to connect to another machine using the **telnet** interface:

```
telnet bastet
Trying...
Connected to bastet
Escape character is '^T'.
```

Watch the display as the various commands scroll up the screen. For example:

```
SENT do ECHO
SENT do SUPPRESS GO AHEAD
SENT will TERMINAL TYPE (reply)
SENT do SUPPORT SAK
SENT will SUPPORT SAK (reply)
RCVD do TERMINAL TYPE (don't reply)
RCVD will ECHO (don't reply)
RCVD will SUPPRESS GO AHEAD (don't reply)
RCVD wont SUPPORT SAK (reply)
SENT dont SUPPORT SAK (reply)
RCVD do SUPPORT SAK (don't reply)
SENT suboption TELOPT_NAWS Width 80, Height 25
RCVD suboption TELOPT_TTYPE SEND
RCVD suboption TELOPT_TTYPE aixterm
...
```

4. Check `/etc/termcap` or `/usr/lib/terminfo` for the `aixterm` definition. For example:

```
ls -a /usr/lib/terminfo
```

5. If the `aixterm` definition is missing, add it by building the **ibm.ti** file. For example:

```
tic ibm.ti
```

The **tic** command is a terminal information compiler.

Resolve Network Hardware Problems

Resolve network hardware problems by looking for any impedance variations along the cable with a time domain reflectometer (TDR), including:

- An open cable with no terminator
 - A shorted cable or bad transceiver tap
 - A healthy transceiver tap
 - A healthy connector and barrel adapter
 - A sharp bend, crunch, or kink in the cable
1. Analyze the packets and data coming across the cable with a network analyzer.
 2. If you are using token ring, make sure that it is set to the right ring speed (4MB to 16MB). To do this, enter the **smit tcpip** command:

```
smit tcpip
```

You will access the TCP/IP submenu directly.

From the TCP/IP submenu, choose the **Minimum Configuration & Startup** option, choose the **Token Ring Network Interface** option (such as **tr0**), and look at the **RING Speed** field.

3. If you are using Ethernet, make sure it is connected correctly (bnc or bix). To do this, enter the **smit devices** command:

```
smit devices
```

You will access the Devices submenu directly.

From the Devices submenu, choose the **List Devices** option, choose the **Show Characteristics of a Supported Device** option, choose **adapter** in the **Device Class** list, choose an interface (such as **mca**) in the **Device Interface** list, choose **ethernet** in the **Device Type** list, and look at the **Adapter CONNECTOR** field.

Resolve Communication Adapter Problems

Determine if your communication adapter is the source of your network problems by doing the following:

- Checking for Software Problems on page 7-7
- Checking for Hardware Problems on page 7-8

Checking for Software Problems

1. Use the **netstat** command to make sure there is a complete route from your machine to the target machine. For example:

```
netstat -r
```

The **netstat** command displays the status and various statistics of the network.

The error `no route to remote host available` could indicate that there is not a complete route from your machine to the target or a machine on the route is down.

2. Check for input and output errors. For example:

```
netstat -i
```

Input and output errors can be caused by bad cables or by bad packets sent from other machines to your machine. Input errors can also indicate that a packet was sent to an unknown protocol.

3. Check if your machine needs more buffers allocated to networking. For example:

```
netstat -m
```

If a large amount of memory has been denied in the statistics listing, consider reconfiguring the number of memory buffers allocated to networking. You can find more information about tuning these types of parameters in *AIX Version 3.2 Performance Monitoring and Tuning Guide*.

4. Check for dropped connections. For example:

```
netstat -s
```

Look at the statistics on protocol layers. Dropped connections could indicate a problem with the network or with disconnected cables.

5. Use the **arp** command to make sure you have the complete IP address for the target machine. For example:

```
arp -a
```

The **arp** command looks for the physical adapter address. This command might show an incomplete address. For example:

```
? (192.100.61.210) at (incomplete)
```

This could be due to an unplugged machine, a stray address with no machine at that particular address, or a hardware problem (such as a machine that connects and receives packets but is not able to send packets back).

6. Look for errors on the adapter card. For example:

```
netstat -v
```

The **netstat -v** command shows statistics for the Ethernet, token ring, X.25 and 802.3 adapter device drivers. The command also shows network and error logging data for all device drivers active on an interface including: No Mbufs Errors, No Mbuf Extension Errors, and Packets Transmitted and Adapter Errors Detected.

Checking for Hardware Problems

Run diagnostics in either of two ways to verify that the adapter card is good:

- Use the **diag** command to perform hardware problem determination:

Note: You must have root user authority to run the **diag** command.

```
diag
```

- Using the **smit diag** command, choose the `Current Shell Diagnostics` option, and then select the adapter from the Diagnostic Selection menu using the Function Selection menu:

```
smit diag
```

Chapter 8. Printing Problems

Printing problems occur when the **/var** file system is full. This usually happens when print jobs sent to the print queue begin to back up for some reason, causing the spooling directory within the file system to grow too large. The spooling directories usually affected are **/var/spool/lpd** and **/var/spool/qdaemon**.

The print queue can back up if the queue daemon has stopped functioning, the printer has gone down or has been turned off, or a large print job sent to the printer has occupied all resources. The **/var** file system can also fill up if other directories in the file system besides the spooling directory grow too large.

When the **/var** file system is full, you must do one or more of the following:

- Reactivate the Queue Daemon on page 8-1
- Clear a Print Queue Backlog on page 8-2
- Reallocate Printer Resources on page 8-4
- Delete Unnecessary Directory Files on page 8-5

Reactivate the Queue Daemon

The queue daemon (or **qdaemon**) process tracks print job requests and the printers available to handle these requests. The **qdaemon** maintains queues of outstanding requests and, as devices become available, sends them to the proper device at the proper time. If the **qdaemon** stops functioning, you will experience printing problems and will then need to restart the **qdaemon** using the following procedure.

Note: Some commands may require root user or system group authority.

1. Determine if the **qdaemon** has stopped functioning by entering the following **ps** command:

```
ps -ef | grep qdaemon
```

If you do not see a process called **/var/sbin/qdaemon**, **qdaemon**, or **/etc/qdaemon** running, the **qdaemon** is not running.

2. Restart the **qdaemon** by entering the following **startsrc** command:

```
startsrc -s qdaemon
```

If you are not using the System Resource Controller (SRC), you can also restart the queue daemon with the **qdaemon** command.

Let the **qdaemon** print all the jobs in the print queue.

3. Make sure the **lpd** daemon is up and running by entering the following command:

```
startsrc -s lpd
```

The **lpd** daemon provides the remote print server on a network.

Clear a Print Queue Backlog

To clear the queuing system, you must stop **qdaemon** and check if the **/var** file system is full. If so, use the following procedure to clear the queue directories and restart the **qdaemon**.

1. Make sure you are logged in as root.
2. If possible, let all current print jobs finish printing or cancel them. To cancel a print job, issue the **lpstat** command to get the print job number. Then use the **enq** command to cancel each job:

```
enq -x jobnumber
```

The **lpstat** command displays information about the current status of the line printer. The **enq** command enqueues a file.

3. Issue the following command to stop **qdaemon**:

```
stopsrc -s qdaemon
```

4. Issue the following commands to verify that **qdaemon** did not fork other processes:

```
ps -ef | grep qdaemon
ps -ef | grep pio
```

The **ps** command shows the current status of processes. The **grep** command searches a file for a pattern.

If you get one line back from each of the above **grep** commands, skip step 5 and go to step 6. If you get more than one line, go to step 5.

5. If other **qdaemons** or **pios** were returned by the **ps -ef** command, kill these processes by issuing the following command with each process id:

```
kill -9 pid
```

The following example shows a **qdaemon** returned by **ps -ef**. The process id is 3357.

```
root 3357 2288
```

To kill this process id, enter `kill -9 3357` at the command line.

6. Perform this step only if it is necessary to save the current print jobs from being deleted. Otherwise, proceed to step 7.

If your print job is queued in one of the following directories, make a copy of it, and place it in **/tmp**; you can print it when the queuing system is running again.

Note: In these directories, the files will have unfamiliar system names.

```
/var/spool/qdaemon
/var/spool/lpd
```

7. If the **/var** file system gets too full, you may experience problems with **qdaemon** or the spooler. Large print jobs may fail, or **00root** files with zero lengths may appear in your **qdir** directory. Rebooting the system in this case may not clear out the files or restart **qdaemon**.

Enter the **df** command and look in the `%used` column for **/var** to see if the file system is too full. Free space in the file system as necessary.

The **df** command displays information about total space and available space on a file system.

8. Change the directory as follows:

```
cd /var/spool/lpd/qdir
```

9. Issue a **pwd** command to verify that you are in the proper directory. Then, remove all files in this directory using the **rm** command:

```
rm *
```

The **pwd** command writes to standard output the full path name of your current directory (from the root directory). The **rm** command removes the entries for the specified file or files from a directory.

10. Change the directory again:

```
cd /var/spool/lpd/stat
```

11. Issue a **pwd** command to verify that you are in the proper directory. Then, remove all files in this directory:

```
rm *
```

12. Change the directory again:

```
cd /var/spool/qdaemon
```

13. Issue a **pwd** command to verify that you are in the proper directory. Then, remove all files in this directory:

```
rm *
```

14. Follow this step if you are having trouble with the remote queue or **lpd**. Change the directory:

```
cd /var/spool/lpd
```

Issue a **pwd** to verify that you are in the proper directory. Then, remove all files in this directory using the **rm** command:

```
rm *
```

Note: The **rm** command will not remove the subdirectories.

15. Start **qdaemon**:

```
startsrc -s qdaemon
```

The queuing system should start normally. If some queues are still down, bring them up by entering:

```
enable queuename
```

Reallocate Printer Resources

Use the following procedures to avoid having one print job use all of the printer resources.

Note: Some commands may require root user or system group authority.

1. Determine if a print job is using all resources in one of two ways:

- Use the following **lpq** command:

```
lpq
```

The **lpq** command, when entered without flags, reports the status of the default queue.

- Use the following **enq** command:

```
enq -q
```

The **enq** command enqueues a file to a shared resource, typically a printer (that is, it puts files into a queue for a particular resource). The **-q** flag displays the status of the default queue.

2. Use one of the following commands to remove the job from the print queue (you must have root user authority to cancel jobs other than your own):

- Use the following **enq** command.

```
enq -x 21
```

In this example, the **enq** command uses the **-x** flag to cancel job number 21.

- Use the following **lprm** command:

```
lprm -P lp0 42
```

In this example, the **lprm** command removes job number 42 from the **lp0** printer queue, named with the **-P** flag. You can also remove jobs for a specific user by naming the user on the command line.

- Use the following **qadm** command:

```
qadm -X lp0
```

In this example, the **qadm** command uses the **-x** flag to cancel all jobs on the **lp0** printer.

- Use the following SMIT FastPath for the **qcan** command:

```
smit qcan
```

In this example, you can choose the **By Print Queue** option to cancel either all of a particular user's jobs or all jobs on a particular printer.

3. Tell the sender of the print job to first divide it into smaller pieces by using the following **split** command, and then send the file as a series of jobs:

```
split -50 bigfile
```

The **split** command reads the specified file and writes it into segments to a set of output files. In the previous example, **bigfile** is split into 50-line segments named **bigfileaa**, **bigfileab**, **bigfileac**, and so forth.

Delete Unnecessary Directory Files

Use the following procedures to clean out unnecessary files stored in the spooling directory.

Note: Some commands require root user or system group authority.

1. Determine if there are unnecessary files stored in the spooling directory by entering the following **du** command:

```
du -rs /var/spool
```

The **du** command summarizes disk usage. The **-s** flag instructs the **du** command to display only the total disk usage of the **/var/spool** directory and the files it contains. The **-r** flag tells the **du** command to display an error message if it cannot read a file or directory.

2. Delete or move files in a full directory by doing either of the following:

- Delete any extraneous files. For example:

```
rm extrafile
```

- Move files that are a few hours old to a safe temporary directory. For example:

```
mv extrafile /u/spoolhold
```

Note: You must have root user authority to remove or move files other than your own.

3. Prevent users from storing files in your spooling directories by doing the following:

- Set permissions on the spooling directory using the **chmod** command. Change the directory to exclude general users. For example:

```
chmod go-rw /var/spool/lp0
```

- Create a **cron** job to clean out the directory (you must have root user authority). Edit the **crontab** file. For example, you might add the following line to your **crontab** file:

```
find /spool -mtime +7 -a -exec rm -f
```

This line removes any file in the **/var/spool** directory one week after the last modification.

For more information about creating **cron** jobs and using the **crontab** command, see “How to Set Up an Accounting System” in *AIX Version 3.2 System Management Guide: Operating System and Devices*.

- Establish policy for the whole user group.

For example, use e-mail to make a general announcement or add to the message of the day (**/etc/motd**) asking users to clean up their files. To change the message of the day, see “How to Change the Message of the Day” in *AIX Version 3.2 System Management Guide: Operating System and Devices*.

Create a script to identify all users whose disk holdings are above a certain threshold and send them e-mail requesting that they clean up their files.

- Provide an alternate way to store files, such as a tape drive in a public area, so users can archive infrequently used files.

4. As a last resort, mount more space to the spool directory. There are two ways to do this:

- Use the **mount** command, which makes a file system available for use at a specified location. For example:

```
mount /var/spool morespool
```

- Use the **smit mount** command, choose the **Mount a File System** option, and specify the file system name and attributes.

Related Information

For more information about mounting file systems, see “How to Mount or Unmount a File System” in *AIX Version 3.2 System Management Guide: Operating System and Devices*.

For more information about printers and printing problems, see “Printer Overview for System Management” in *AIX Version 3.2 System Management Guide: Operating System and Devices*.

Chapter 9. Hardware Diagnostics

Use this diagnostic procedure to obtain a service request number (SRN). Your service representative uses your SRN to determine what field replaceable units (FRUs) the representative needs to restore your system to correct operation.

Diagnose your system by doing the following:

- Load a Diagnostics Program on page 9-2
- Choose Test Options on page 9-6

Refer to the following information for help with running diagnostics:

- Identify Your Hardware on page 9-9
- Interpret Values in the Three-Digit Display on page 9-10
- Gather Information about Your System Configuration on page 9-13
- Hardware Error Report Service Aid on page 9-14

Consider the following before running this procedure:

- The diagnostic programs can use either direct-attached displays or a TTY terminal attached to the S1 port.
 - Note:** See the operator guide for your type TTY terminal to find the key sequences you need when responding to the diagnostic programs.
- You can run the diagnostics program from either your system disk or other media. From your system disk, you can run diagnostics in either standalone or concurrent mode. If you cannot use your system disk, run the diagnostics from either diskettes or compact disc. See "Diagnostic Modes of Operation" in your system operator guide for more information about the modes.
- The `DIAGNOSTIC OPERATING INSTRUCTIONS` screen does not appear on a console display attached to a 5085 or 5086. It appears on the console display attached to the RISC System/6000 system.
- If the procedure instructs you to stop the operating system and you are operating a system that is attached to one or more other systems, consider how actions you take with one system can affect the attached systems. Consult with the operator of the attached system whenever you think your operations might affect another system.

The following actions can affect or be affected by the operation of an attached system: starting and stopping communication with the other system, running diagnostics on the system, using wrap plugs with a diagnostic program, and analyzing error log information.

Isolate a system unit from any attached systems before stopping the operating system or running diagnostic programs. Some system cabling changes (such as installing wrap plugs or removing a device from the configuration) may require action by the operator of the attached system before you make the cabling changes on your system.

- For more information on service request numbers (SRNs), refer to *POWERstation and POWERserver Common Diagnostics and Service Guide*, Order Number SA23-2687.

Load a Diagnostics Program

Load a diagnostics program by doing the following:

- Checking the Version Number of Your Operating System on page 9-2
- Checking Your Operating System on page 9-2
- Choosing Either Concurrent or Standalone Diagnostics on page 9-2
- Loading the Concurrent Diagnostic Program on page 9-3
- Loading the Standalone Diagnostic Program on page 9-3
- Loading Diagnostics from Either Diskette or Compact Disc on page 9-3
- Responding to Diagnostic Instructions or Messages on page 9-4

Checking the Version Number of Your Operating System

Version 3 of the operating system contains diagnostics programs. Earlier operating systems might not contain diagnostics programs.

Enter the **uname -v** command to check your version number. The version number appears on your screen as a whole number, below the command line.

Are you using Version 3 of the operating system?

Yes Go to the next step, "Checking Your Operating System" on page 9-2.

No If you want to quit this diagnostic procedure, record and report SRN 111–103 to your service representative.

Or, if you want to continue, go to "Loading Diagnostics from Either Diskette or Compact Disc" on page 9-3.

Checking Your Operating System

Confirm that your system can start the diagnostics programs.

Is your operating system accepting commands?

Yes Go to the next step, "Choosing Either Concurrent or Standalone Diagnostics" on page 9-2.

No Attempt to execute the **shutdown** command to stop the operating system. When complete or if your system is hung, switch off your system's power. Go to "Loading Diagnostics from Either Diskette or Compact Disc" on page 9-3.

Choosing Either Concurrent or Standalone Diagnostics

Concurrent diagnostics can test many resources while your operating system is running and other users are using the system. Standalone diagnostics, however, can isolate and test problems more thoroughly than the concurrent method, but only the diagnostics can be running during this testing.

Do you want to run the diagnostics in standalone mode?

Yes Use the **shutdown** command to stop your operating system, and then switch off your system's power. Go to "Loading the Standalone Diagnostic Program" on page 9-3.

No Go to the next step, "Loading the Concurrent Diagnostic Program" on page 9-3.

Loading the Concurrent Diagnostic Program

Load the concurrent diagnostic program by doing the following:

1. Enter the **diag** command to start the diagnostics program. Use the **diag** command when you want to diagnose a specific error message that your system has posted.

Note: You must have root user authority to use the **diag** command.

2. Wait about 3 minutes for the `DIAGNOSTIC OPERATING INSTRUCTIONS` screen to appear.
3. Does the `DIAGNOSTIC OPERATING INSTRUCTIONS` screen show correctly on your console display?

Yes Press the Enter key to continue with your diagnostics test. The `FUNCTION SELECTION` screen appears after you press the Enter key. Go to "Choose Test Options" on page 9-6 to continue.

Note: If the `FUNCTION SELECTION` screen does not appear after you press the Enter key, you might have a problem with your keyboard. (If you have a TTY, you may need to press a key other than your Enter key.) Go to "Identifying Your Keyboard" on page 9-9 to continue.

No Use the **shutdown** command to stop the operating system, and then switch off your system's power. Go to "Loading the Standalone Diagnostic Program" on page 9-3.

Loading the Standalone Diagnostic Program

Note: The standalone method, while more thorough than the concurrent method, may not allow you to test either your system disk or your SCSI adapter. If not, go to "Loading Diagnostics from Either Diskette or Compact Disc" on page 9-3 for a more comprehensive test.

Load the standalone diagnostics program using the following steps:

1. Stop your system with the **shutdown** command.
2. Switch off your system's power.
3. Set the Mode Switch to the Service position.
4. Switch on the power for all attached devices.
5. Switch on your system's power.
6. Watch for symptoms, messages, or instructions on your console display.
7. Go to "Respond to Diagnostic Instructions or Messages" on page 9-4. Find your symptom or message and follow the instructions.

Loading Diagnostics from Either Diskettes or Compact Disc

An English-only version of the diagnostics program is available on either diskette or compact disc. Use diskettes for the most thorough test. The compact disc method cannot test your SCSI adapter because the compact disc uses the adapter.

Note: You can use a TTY terminal to start diagnostics from diskette and compact disc. Check for the following conditions before loading the diagnostics program:

- The TTY terminal must be attached to the S1 port on your system.
- The attributes for the terminal must be set to match the defaults of the diagnostics programs.

To load the diagnostics with a TTY, see “Running the Diagnostic Programs from a TTY Terminal” in the “Using the Diagnostics” chapter of your system operator’s guide. Remember to set your terminal attributes to work with the diagnostics programs.

Return to this section when you finish checking the attributes. Record any settings that are changed.

Load the diagnostics programs from either diskettes or compact disc by doing the following:

1. Stop your system with the **shutdown** command.
2. Switch off your system’s power.
3. Set your system’s Mode Switch to the Service position.
4. Insert either the first diskette or the compact disc in the proper drive.
5. Switch on the power for all attached devices.
6. Switch on your system’s power.

Note: Step 7 is for diskette users only. Compact disc users should continue with Step 8.

7. Insert the next diskette when the `c07` code shows in the three-digit display. Continue inserting diskettes (wait for the `c07` code each time) until the first diagnostics screen shows on your console display.

Go to “Responding to Diagnostic Instructions or Messages” on page 9-4 if your system does not show the `c07` code. Find your symptom and follow the instructions.

8. Respond to screen messages, followed by the Enter key. The diagnostics program defines your system console and shows the `DIAGNOSTIC OPERATING INSTRUCTIONS` screen.
9. Press the Enter key to continue. The diagnostics program shows the `FUNCTION SELECTION` screen.
10. Select the `Initialize Terminal` option from the menu on the `FUNCTION SELECTION` screen.
11. Enter your terminal type. The diagnostics program initializes your system environment and shows the `FUNCTION SELECTION` screen again.
12. Go to “Choose Test Options” on page 9-6 for information about continuing with your diagnostic tests.

Responding to Diagnostic Instructions or Messages

Did your system stop with a blank three-digit display and did the `DIAGNOSTIC OPERATING INSTRUCTIONS` screen appear with no obvious problem on the screen (the text is not distorted and blurred)?

- | | |
|------------|--|
| Yes | Press the Enter key to continue with your diagnostic tests. The <code>FUNCTION SELECTION</code> screen appears after you press the Enter key. Go to “Choose Test Options” on page 9-6 to continue with your diagnostic tests. |
| No | If the appearance of the <code>DIAGNOSTIC OPERATING INSTRUCTIONS</code> screen is either bad (distorted or unreadable) or blank, you might have a problem with your display console. Go to “Identifying Your Console Display” on page 9-9 for directions on correcting your display problem. If identifying your console display does not correct the problem, record and report SRN 111-121 to your service representative. |

If the `FUNCTION SELECTION` screen does not appear after you press the Enter key, you might have a problem with your keyboard. Go to “Identifying Your Keyboard” on page 9-9 to find the SRN you use to report your keyboard problem.

If the power light either does not come on or comes on but does not stay on, check that your power cable is securely plugged into the outlet, check the circuit breakers, and check the power at the outlet. If you do not find a problem, record and report SRN 111–152 to your service representative.

If your system’s normal login screen shows and the three-digit display is blank, check whether your Mode Switch is set to the Service position. If the Mode Switch is not in the Service position, stop the operating system. Set the switch to the Service position, press the Reset button, and go to “Loading the Standalone Diagnostics Program” on page 9-3. If the Mode Switch is already in the Service position, record and report SRN 111–102 to your service representative.

If flashing, alternating, or steady values appear in the three-digit display, refer to “Interpret Values in the Three-Digit Display” on page 9-10.

Choose Test Options

Select the `Diagnostic Routines` option from the menu on the `FUNCTION SELECTION` screen. The `DIAGNOSTIC MODE SELECTION` screen appears.

Select the `Problem Determination` option from the menu on the `DIAGNOSTIC MODE SELECTION` screen.

Begin your diagnostic test by doing one of the following:

- Responding to Test Messages on page 9-6
- Choosing a Specific Diagnostic Test on page 9-7

Responding to Test Messages

Determine which test message applies to your system, and refer to the appropriate procedures:

- Diagnostic Selection Menu Appears on page 9-6
- Missing Resource Menu Appears on page 9-6
- New Resource Menu Appears on page 9-6

Diagnostic Selection Menu Appears

If the `DIAGNOSTIC SELECTION` screen appears when you select the `Problem Determination` option, go to “Choosing a Specific Diagnostic Test” on page 9-7.

Missing Resource Menu Appears

If the `MISSING RESOURCE` screen appears when you select the `Diagnostic Routines` option, follow the displayed instructions until either the `DIAGNOSTIC SELECTION` screen or an SRN is displayed.

If the `DIAGNOSTIC SELECTION` screen appears, go to “Choosing a Specific Diagnostic Test” on page 9-7.

If you get an SRN, record and report it to your service representative.

If you get a code in the three-digit display, go to “Interpret Values in the Three-Digit Display” on page 9-10.

New Resource Menu Appears

If the `NEW RESOURCE` screen appears when you select the `Diagnostic Routines` option, follow the instructions on your screen.

Note: Devices attached to the S1 and S2 serial ports do not appear on the `NEW RESOURCE` menu.

If the `DIAGNOSTIC SELECTION` screen appears, go to “Choosing a Specific Diagnostic Test” on page 9-7.

If you get an SRN, record and report it to your service representative.

If you do not get an SRN, the diagnostics program did not find a hardware problem. Check your configuration, and then contact your software support center if you still have a problem. If you are attached to another system, refer to the hardware diagnostic considerations on page 9-1.

Choosing a Specific Diagnostic Test

Select and run the diagnostic tests on the hardware you are having problems with.

Alternatively, you can run a full system checkout to check all of your configured hardware. The system checkout is available, however, only when you use standalone diagnostics. Select the `System Checkout` option from the menu on the `DIAGNOSTIC SELECTION` screen.

Your system can respond in one of several ways when you choose a specific test:

- An SRN Appears on page 9-7
- Your System Stops on page 9-7
- A Test Completion Notice Appears before You Have Finished Testing on page 9-7
- A Test Completion Notice Appears after You Have Finished Testing on page 9-7

An SRN Appears

If your console display shows an SRN when you run a specific test, record and report the SRN to your service representative.

Your System Stops

If your system stops with a code showing in the three-digit display, go to “Interpret Values in the Three-Digit Display” on page 9-10. Choose your code from the list, and read how to interpret and act on the code.

A Test Completion Notice Appears before You Have Finished Testing

If your console display shows the `TESTING COMPLETE` screen with the `No trouble was found` message and you have not tested all of your resources, select the `Diagnostics` option when the `NEW RESOURCE` screen appears, and follow the instructions on your screen.

Note: Devices attached to the S1 and S2 serial ports do not appear on the `NEW RESOURCE` screen.

If the `DIAGNOSTIC SELECTION` screen appears, go to “Choosing a Specific Diagnostic Test” on page 9-7.

If you get an SRN, record and report it to your service representative.

If you do not get an SRN, the diagnostics program did not find a hardware problem. Check your configuration, and then contact your software support center if you still have a problem. If you are attached to another system, refer to hardware diagnostics considerations on page 9-1.

A Test Completion Notice Appears after You Have Finished Testing

If your console display shows the `TESTING COMPLETE` screen with the `No trouble was found` message and you have tested all of your resources, then the diagnostics program did not find a hardware problem.

If you still have a problem, check your configuration, and then contact your software support center. If you are attached to another system, refer to “Multiple Systems Guidelines” in the chapter on using diagnostics of your system unit operator guide.

Note: If Dials and Lighted Programmable Function Keyboards (LPFKs) are attached to serial ports S1 or S2 and you are running diagnostics from disk or server, the Dials and LPFKs only appear on the selection screen if they have been configured by the

user. Use the Dials and LPFKs configuration service aid or SMIT to configure these devices.

If the Dials and LPFKs are attached to serial ports S1 or S2, you must configure them using the Dials and LPFKs configuration service aid before they can be tested from diskette.

Identify Your Hardware

Identify your hardware by doing the following:

- Identifying Your Console Display on page 9-9
- Identifying Your Keyboard on page 9-9

Identifying Your Console Display

Identify your console display in the following list. Follow the prescribed action if you think your console display is preventing you from completing your diagnostics test.

display device	See your display documentation for problem determination.
TTY terminal	See your TTY terminal documentation for problem determination.

Identifying Your Keyboard

Identify your keyboard in following list. Report the SRN if you think your keyboard is preventing you from completing your diagnostics test.

101-key	Identify by the type of Enter key used. The Enter key is within one horizontal row of keys. Report SRN 111-921.
102-key	Identify by the type of Enter key used. The Enter key extends into two horizontal rows of keys. Report SRN 111-922.
Kanji	Identify by the Japanese characters. Report SRN 111-923.
122-key	Identify by the double row of function keys. Report SRN 111-938.
TTY terminal	Go to your hardware documentation for problem determination. This instruction applies to all attached terminals.

Interpret Values in the Three-Digit Display

If the diagnostics program has trouble loading, a light-emitting diode (LED) code will illuminate your three-digit display. Some values are steady and unmoving, some values alternate, and one code flashes on and off.

Choose from the following list for information about interpreting and acting on your code:

- c07 (steady) on page 9-10
- c31 (steady) on page 9-10
- 200 (steady) on page 9-10
- 260 (steady) on page 9-11
- 261 (steady) on page 9-11
- 262 (steady) on page 9-11
- All Other Values (steady) on page 9-11
- Two or More Values (alternating) on page 9-11
- 888 (flashing) on page 9-12
- Responding to the 260, 261, and 262 Values on page 9-12

c07 (steady)

The c07 code appears when you load the diagnostics program from diskettes and the diagnostics program needs you to load the next diskette.

c31 (steady)

When the c31 code appears, your diagnostics program cannot detect a console display.

Follow the instructions on your screen to select a console display. If you do not have a console display, set the Mode Switch first to Normal and then back to Service to indicate to the diagnostics there is no console display.

Note: Trouble with either your display or your keyboard can prevent you from selecting a console display.

If your screen appearance is bad (distorted or unreadable), go to "Identifying Your Console Display" on page 9-9. Follow the instructions for correcting the screen problem.

If you cannot make a screen selection because your keyboard seems not to respond, you might have a problem with your keyboard. Go to "Identifying Your Keyboard" on page 9-9 to find the SRN you need to report your problem.

200 (steady)

When you see a 200 code in the three-digit display, check that the Mode Switch is set to the Service position.

If the Mode Switch is not in the Service position, set it to Service. Then see "Loading the Standalone Diagnostic Program" on page 9-3 for information about restarting your diagnostic tests.

If the Mode Switch is in the Service position, record and report SRN 111–102 to your service representative.

260 (steady)

Note: Record and report SRN 111–101 to your service representative if you are loading diagnostics from either diskette or compact disc on any machine other than a 7011 or 7008. If your machine is a 7011 or 7008, press the 1 key to continue the diagnostics program.

Continue with this section if you are loading diagnostics from your system disk.

When you get a 260 code in the three-digit display, check whether the console display is directly attached to the system unit by means of a graphics adapter. If so, go to “Responding to the 260, 261, and 262 Values” on page 9-12.

If the console display is not directly attached to the system, press the 1 key on your keyboard. Observe your system; then go to “Responding to the 260, 261, and 262 Values” on page 9-12.

261 (steady)

Note: Record and report SRN 111–101 to your service representative if you are loading diagnostics from either diskette or compact disc on any machine other than a 7011 or 7008. If your machine is a 7011 or 7008, press the 1 key to continue the diagnostic program.

Continue with this section if you are loading diagnostics from your system disk.

Press the 1 key on your keyboard. Observe your system; then go to “Responding to the 260, 261, and 262 Values” on page 9-12.

262 (steady)

Note: Record and report SRN 111–101 to your service representative if you are loading diagnostics from either diskette or compact disc on any machine other than a 7011 or 7008. If your machine is a 7011 or 7008, press the 1 key to continue the diagnostic program.

Continue with this section if you are loading diagnostics from your system disk.

Your diagnostic program did not detect a keyboard. If a keyboard is attached to the keyboard connector (K) on the system unit, record and report SRN 101–262 to your service representative.

Otherwise, press the 1 key on your keyboard; then go to “Responding to the 260, 261, and 262 Values” on page 9-12.

All Other Values (steady)

Record and report SRN 101–xxx to your service representative, where xxx is the code displayed in the three-digit display.

Two or More Values (alternating)

Note: Record and report SRN 111–101 to your service representative if you are loading diagnostics from either diskette or compact disc.

Continue with this section if you are loading diagnostics from your system disk.

Your system stopped with two or more values between 221 and 296 alternating in the three-digit display. This code indicates the diagnostics program could not load from your system disk. The loading program first looked for the diagnostics programs on your system disk and then tried to find the diagnostics on either diskettes or compact disc.

Load the diagnostics program from either diskettes or a compact disc. Go to “Loading Diagnostics from Either Diskettes or Compact Disc” on page 9-3 for instructions.

if you already tried to load the diagnostics programs from either diskettes or a compact disc, record and report SRN 111–101.

888 (flashing)

See the “Reading Flashing 888 Numbers” in your system unit operator guide. Follow the steps to display the full crash or diagnostic message. Record the message numbers on the Problem Summary Form, and report the SRN to your service representative.

Responding to the 260, 261, and 262 Values

When you get either a 260, a 261, or a 262 code, you can usually press the 1 key on your keyboard and observe your system. Watch for one of the following results, and perform the indicated procedures.

Note: See the descriptions of these three values on page 9-11, and perform any required steps before continuing with this section.

1. If information does not show correctly on the console display (the information is distorted, blurred, or not readable), then go to “Identifying Your Console Display” on page 9-9.
2. If your console display shows an SRN, record and report the SRN to your service representative.
3. If your console display shows the `MAIN MENU`, you can either stop this problem determination procedure or load diagnostic programs from other media.

If you want to stop, record and report SRN 111–103 to your service representative.

If you want to continue, go to “Loading Diagnostics from Either Diskette or Compact Disc” on page 9-3.

4. If your console display shows neither the `MAIN MENU` nor an SRN, you can either stop this problem determination procedure or load diagnostic programs from other media.

If you want to stop, record and report SRN 111–103 to your service representative.

If you want to continue, go to “Loading Diagnostics from Either Diskette or Compact Disc” on page 9-3.

Gather Information about Your System Configuration

You can gather information about your system configuration by doing either of the following:

- Using the `lscfg` Command on page 9-13
- Using the `snap` Command on page 9-13

Using the `lscfg` Command

Enter the following command to show your system configuration on your screen:

```
lscfg
```

The **lscfg** command shows the name, location, and description of all hardware in your system.

Using the `snap` Command

Note: You need root user authority to use the **snap** command.

Enter the following command to gather all configuration information in a **tar** file and copy it to diskette:

```
snap -a -o /dev/rfd0
```

The **snap** command in this example uses the **-a** flag to gather all information about your system configuration. The **-o** flag copies the compressed **tar** file to the device you name. The `/dev/rfd0` parameter names your disk drive.

Enter the following command to gather all configuration information in a **tar** file and copy it to tape:

```
snap -a -o /dev/rmt0
```

The `/dev/rmt0` parameter names your tape drive.

Hardware Error Report Service Aid

The Hardware Error Report Service Aid is a tool which automatically scans the error log for hardware errors and gives users error analysis detail. The error analysis results can be viewed through SMIT.

To access Hardware Error Report Service Aid through SMIT, enter:

```
smit problem
```

You will access the Problem Determination submenu directly.

From the Problem Determination submenu, select:

1. **Hardware Diagnostics**
2. **Current Shell Diagnostics**
3. **Service Aid**
4. **Hardware Error Report Service Aid**

After selecting **Hardware Error Report Service Aid**, you can select the following to review error log hardware entries and error reports:

- **Display Error Summary**
- **Display Error Detail**
- **Display Error Analysis Summary**
- **Display Error Analysis Detail**

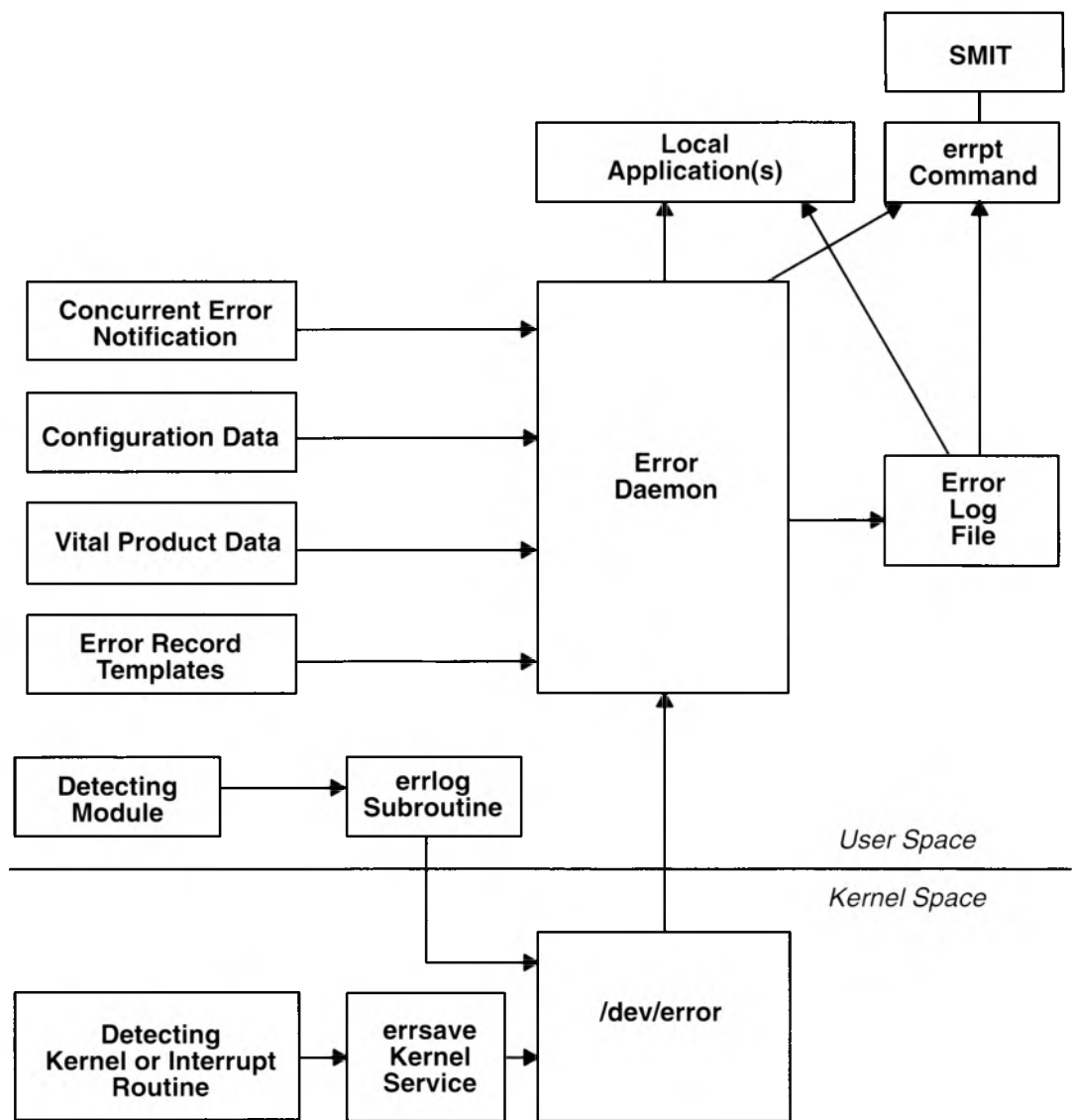
Chapter 10. Error Logging Facility

The error logging facility records hardware and software failures in the error log for information purposes or for fault detection and corrective action.

Refer to the following to use the error logging facility:

- Error Logging Overview on page 10-2
- Error Logging Controls on page 10-3
- Error Logging Tasks on page 10-5
- Error Logging and Alerts on page 10-15
- Automatic Error Log Analysis on page 10-16

The following diagram illustrates the error logging process:



Flow of the Error Logging Facility

Error Logging Overview

The error logging process begins when the error detecting module detects an error. The error-detecting segment of code then sends error information to either the **errsave** kernel service or the **errlog** application subroutine, where the information is in turn written to the **/dev/error** special file. This file then adds a time stamp to the collected data. The **errdemon** daemon constantly checks the **/dev/error** file for new entries, and when new data is written, the daemon conducts a series of operations.

Before any entry can be written to the error log, the **errdemon** daemon compares the label sent by the kernel or application code to the contents of the Error Record Template Repository. If the label matches an item in the repository, the daemon collects additional data from other parts of the system.

To write an entry to the error log, the **errdemon** daemon retrieves the appropriate template from the repository, the resource name of the unit that caused the error, detail data, as well as material from the message catalog. Also, if the error signifies a hardware-related problem and hardware vital product data (VPD) exists, the daemon retrieves the VPD from the Object Data Manager. When you access the error log either through SMIT or with the **errpt** command, the error log is formatted according to the error template in the error template repository and presented in either a summary or detailed report. Most entries in the error log are attributable to hardware and software problems, but informational messages can also be logged.

The **diag** command uses the error log in part to diagnose hardware problems. To correctly diagnose new system problems, the system deletes hardware-related entries older than 90 days from the error log. The system deletes software-related entries 30 days after they are logged.

Terms to help you use the error logging facility include the following:

error ID A 32-bit CRC hexadecimal code used to identify a particular failure. Each error record template has a unique error ID.

error identifier The mnemonic name for an error ID.

error log The file that stores instances of errors and failures encountered by the system.

error log entry A record in the system error log that describes a hardware failure, a software failure, or an operator message. An error log entry contains captured failure data.

error record template

A description of what will be displayed when the error log is formatted for a report, including information on the type and class of the error, probable causes, and recommended actions. Collectively, the templates comprise the Error Record Template Repository.

Error Logging Controls

You can control the error logging facility by using the following:

- Error Logging Commands on page 10-3
- Error Logging Subroutines and Kernel Services on page 10-3
- Error Logging Files on page 10-4

Error Logging Commands

errclear	The errclear command deletes entries from the error log. This command can erase the entire error log. This command can also remove entries with specified error ID numbers, classes, or types.
errdead	The errdead command extracts errors contained in the <code>/dev/error</code> buffer captured in the system dump. The system dump will contain error records if the errdemon daemon was not active prior to the dump.
errdemon	The errdemon daemon reads error records from the <code>/dev/error</code> file and writes error log entries to the system error log. The errdemon also performs error notification as specified in the error notification objects in the Object Data Manager (ODM). This daemon is started automatically during system initialization.
errinstall	The errinstall command is provided for use by software installation procedures. The errinstall command can be used to add or replace messages in the error message catalog. The system creates a backup file named <i>File.undo</i> . The undo file allows you to cancel the changes you made by issuing the errinstall command.
errlogger	The errlogger command writes an operator message entry to the error log.
errmsg	The errmsg command is provided for use in implementing error logging in your in-house applications. The errmsg command lists, adds, or deletes messages stored in the error message catalog. Using this command, text can be added to the <code>Error Description</code> , <code>Probable Cause</code> , <code>User Cause</code> , <code>Install Cause</code> , <code>Failure Cause</code> , <code>Recommended Action</code> , and <code>Detailed Data</code> message sets.
errpt	The errpt command generates an error report from entries in the system error log. The report can be formatted as a single line of data for each entry, or the report can be a detailed listing of data associated with each entry in the error log. Entries of varying classes and types can be omitted from or included in the report.
errstop	The errstop command stops the errdemon daemon, which is initiated during system initialization. Running the errstop command also disables some diagnostic and recovery functions of the system.
errupdate	The errupdate command is provided for use by software installation procedures and for modifying the Alert, Log, and Report attributes of an error template. The errupdate command adds or deletes templates in the Error Record Template Repository.

Error Logging Subroutines and Kernel Services

errlog	The errlog subroutine writes an error to the error log device driver.
---------------	--

errsave The **errsave** kernel service allows the kernel and kernel extensions to write to the error log.

Error Logging Files

/dev/error The **error** special file provides standard device driver interfaces required by the error log component.

/dev/errorctl The **errorctl** special file provides nonstandard device driver interfaces for controlling the error logging system.

/usr/include/sys/errids.h
The **errids.h** header file correlates error IDs with error labels.

/usr/include/sys/err_rec.h
The **err_rec.h** header file contains structures defined as arguments to the **errsave** kernel service and the **errlog** subroutine.

/var/adm/ras/errlog
This file stores instances of errors and failures encountered by the system.

/var/adm/ras/errnotify.add
This file contains stanza definitions for the **errnotify** class in the ODM for default notification objects.

/var/adm/ras/errnotify.cre
This file defines the error notification structure.

/var/adm/ras/errtmpl
This file contains the Error Record Template Repository.

Related Information

The “Error Notification Object Class” in *AIX Version 3.2 General Programming Concepts* allows applications to be notified when particular errors are recorded.

Error Logging Tasks

Error logging tasks and information to assist you in using the error logging facility include:

- Reading an Error Report on page 10-5
- Examples of Detailed Error Reports on page 10-8
- Example of a Summary Error Report on page 10-12
- Interpreting Device Sense Data on page 10-12
- Generating an Error Report on page 10-12
- Stopping an Error Log on page 10-13
- Cleaning an Error Log on page 10-13
- Copying an Error Log to Diskette or Tape on page 10-14

Reading an Error Report

To obtain a report of all errors logged in the 24 hours prior to the failure, enter:

```
errpt -a -s mmddhhmmyy | pg
```

where *mmddhhmmyy* represents the month, day, hour, minute, and year 24 hours prior to the failure.

An error log report contains the following information:

ERROR LABEL

The predefined name for the event.

ERROR ID

The numerical identifier for the event.

Date/Time

The date and time of the event.

Sequence Number

The unique number for the event.

Machine ID

The identification number of your system processor unit.

Node ID

The mnemonic name of your system.

Error Class

The general source of the error. The possible error classes are:

H Hardware. (When you receive a hardware error, refer to your system operator guide for information about performing diagnostics on the problem device or other piece of equipment. The diagnostics programs test the device and analyze the error log entries related to it to determine the state of the device.)

S Software.

O Informational messages.

Error Type	The severity of the error that has occurred. Five types of errors are possible:
PEND	The loss of availability of a device or component is imminent.
PERF	The performance of the device or component has degraded to below an acceptable level.
PERM	Condition that could not be recovered from. Error types with this value are usually the most severe errors and are more likely to mean that you have a defective hardware device or software module. Error types other than PERM usually do not indicate a defect, but they are recorded so that they can be analyzed by the diagnostics programs.
TEMP	Condition that was recovered from after a number of unsuccessful attempts. This error type is also used to record informational entries, such as data transfer statistics for DASD devices.
UNKN	It is not possible to determine the severity of the error.

Resource Name

The name of the failing resource (for example, a device name of `hdisk0`.)

Resource Class

The general class of the failing resource (for example, a device class of `disk`).

Resource Type The type of the failing resource (for example, a device type of `355mb`).

Location Code The path to the device. There may be up to four fields, which refer to drawer, slot, connector, and port, respectively.

VPD Vital product data. The contents of this field, if any, vary. Error log entries for devices typically return information concerning the device manufacturer, serial number, Engineering Change levels, and Read Only Storage levels.

Error Description

A summary of the error.

Probable Cause

A listing of some of the possible sources of the error.

User Causes

A list of possible reasons for errors due to user mistakes. An improperly inserted disk and external devices (such as modems and printers) that are not turned on are examples of user-caused errors.

Recommended Actions

A description of actions for correcting a user-caused error.

Install Causes

A list of possible reasons for errors due to incorrect installation or configuration procedures. Examples of this type of error include hardware and software mismatches, incorrect installation of cables or cable connections becoming loose, and improperly configured systems.

Recommended Actions

A description of actions for correcting an installation-caused error.

Failure Causes

A list of possible defects in hardware or software.

Note: A failure causes section in a software error log usually indicates a software defect. Logs that list user or install causes or both, but not failure causes, usually indicate that the problem is not a software defect.

If you suspect a software defect, or are unable to correct user or install causes, report the problem to your software service department.

Recommended Actions

A description of actions for correcting the failure. For hardware errors, `PERFORM PROBLEM DETERMINATION PROCEDURES` is one of the recommended actions listed. For hardware errors, this will lead to running the diagnostic programs.

Detailed Data Failure data that is unique for each error log entry, such as device sense data. See “Interpreting Device Sense Data” on page 10-12.

Reporting may be turned off for some errors. To show which errors have reporting turned off, enter:

```
errpt -t -F report=0 | pg
```

If reporting is turned off for any errors, enable reporting of all errors using the **errupdate** command.

Logging may also have been turned off for some errors. To show which errors have logging turned off, enter:

```
errpt -t -F log=0 | pg
```

If logging is turned off for any errors, enable logging for all errors using the **errupdate** command in the event that it becomes necessary to recreate the failure.

Examples of Detailed Error Reports

The following are sample error report entries that are generated by issuing the **errpt -a** command.

Note: "Error Identifiers for the Error Log" on page C-1 lists the possible error log entries by error label.

An error-class value of H and an error-type value of PERM indicate that the system encountered a problem with a piece of hardware (the SCSI adapter device driver) and could not recover from it.

```
ERROR LABEL:          SCSI_ERR1
ERROR ID:              0502F666

Date/Time:            Jun 19 22:29:51
Sequence Number:      95
Machine ID:           123456789012
Node ID:              host1
Class:                H
Type:                 PERM
Resource Name:        scsi0
Resource Class:       adapter
Resource Type:        hscsi
Location:             00-08
VPD:
    Device Driver Level.....00
    Diagnostic Level.....00
    Displayable Message.....SCSI
    EC Level.....C25928
    FRU Number.....30F8834
    Manufacturer.....IBM97F
    Part Number.....59F4566
    Serial Number.....00002849
    ROS Level and ID.....24
    Read/Write Register Ptr.....0120

Error Description
ADAPTER ERROR

Probable Causes
ADAPTER HARDWARE CABLE
CABLE TERMINATOR DEVICE

Failure Causes
ADAPTER
CABLE LOOSE OR DEFECTIVE

Recommended Actions
PERFORM PROBLEM DETERMINATION PROCEDURES
CHECK CABLE AND ITS CONNECTIONS

Detail Data
SENSE DATA
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000
```

An error-class value of H and an error-type value of PENDING indicate that a piece of hardware (the token ring) may become unavailable soon due to numerous errors detected by the system.

ERROR LABEL: TOK_ESERR
ERROR ID: AF1621E8

Date/Time: Jun 20 11:28:11
Sequence Number: 17262
Machine Id: 123456789012
Node Id: host1
Error Class: H
Error Type: PENDING
Resource Name: TokenRing
Resource Class: NONE
Resource Type: NONE
Location: NONE

Error Description
EXCESSIVE TOKEN-RING ERRORS

Probable Causes
TOKEN-RING FAULT DOMAIN

Failure Causes
TOKEN-RING FAULT DOMAIN

Recommended Actions
REVIEW LINK CONFIGURATION DETAIL DATA
CONTACT TOKEN-RING ADMINISTRATOR RESPONSIBLE FOR THIS LAN

Detail Data
SENSE DATA
0ACA 0032 A440 0001 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000
0000 2080 0000 0000 0010 0000 0000 0000 0000 0000 0000 0000 0000 0000
0000 0000 78CC 0000 0000 0005 C88F 0304 F4E0 0000 1000 5A4F 5685
1000 5A4F 5685 3030 3030 0000 0000 0000 0000 0000 0000 0000 0000 0000
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000
0000 0000 0000 0000 0000 0000

An error-class value of `S` and an error-type value of `PERM` indicate that the system encountered a problem with software and could not recover from it.

```
ERROR LABEL:    DSI_PROC
ERROR ID:       20FAED7F

Date/Time:     Jun 28 23:40:14
Sequence Number: 20136
Machine Id:    123456789012
Node Id:       123456789012
Error Class:   S
Error Type:    PERM
Resource Name: SYSVMM
```

Error Description
Data Storage Interrupt, Processor

Probable Causes
SOFTWARE PROGRAM

Failure Causes
SOFTWARE PROGRAM

Recommended Actions
IF PROBLEM PERSISTS THEN DO THE FOLLOWING
CONTACT APPROPRIATE SERVICE REPRESENTATIVE

Detail Data
Data Storage Interrupt Status Register
4000 0000
Data Storage Interrupt Address Register
0000 9112
Segment Register, SEGREG
D000 1018
EXVAL
0000 0005

An error-class value of `S` and an error-type value of `TEMP` indicate that the system encountered a problem with software. After several attempts, the system was able to recover from the problem.

```
ERROR LABEL:      SCSI_ERR6
ERROR ID:         52DB7218

Date/Time:       Jun 28 23:21:11
Sequence Number: 20114
Machine Id:      123456789012
Node Id:         host1
Error Class:     S
Error Type:      TEMP
Resource Name:   scsi0
```

```
Error Description
SOFTWARE PROGRAM ERROR
```

```
Probable Causes
SOFTWARE PROGRAM
```

```
Failure Causes
SOFTWARE PROGRAM
```

```
Recommended Actions
IF PROBLEM PERSISTS THEN DO THE FOLLOWING
CONTACT APPROPRIATE SERVICE REPRESENTATIVE
```

```
Detail Data
SENSE DATA
0000 0000 0000 0000 0000 0011 0000 0008 000E 0900 0000 0000 FFFF
FFFE 4000 1C1F 01A9 09C4 0000 000F 0000 0000 0000 0000 FFFF FFFF
0325 0018 0040 1500 0000 0000 0000 0000 0000 0000 0000 0000 0800
0000 0100 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000
0000 0000
```

An error class value of 0 indicates that an informational message has been logged.

```
ERROR LABEL:      OPMSG
ERROR ID:         AA8AB241

Date/Time:       Jul 16 03:02:02
Sequence Number: 26042
Machine Id:      123456789012
Node Id:         host1
Error Class:     0
Error Type:      TEMP
Resource Name:   OPERATOR

Error Description
OPERATOR NOTIFICATION

User Causes
errlogger COMMAND

Recommended Actions
REVIEW DETAILED DATA

Detail Data
MESSAGE FROM errlogger COMMAND
hdisk1 : Error log analysis indicates a hardware failure.
```

Example of a Summary Error Report

The following is an example of a summary error report generated using the **errpt** command. One line of information is returned for each error entry.

Note: “Error Identifiers for the Error Log” on page C-1 lists the possible error log entries by error label.

ERROR_ID	TIMESTAMP	T	CL	RESOURCE_NAME	ERROR_DESCRIPTION
192AC071	0101000070	T	0	errdemon	Error logging turned off
0E017ED1	0405131090	P	H	mem2	Memory failure
9DBCfDEE	0101000070	T	0	errdemon	Error logging turned on
038F2580	0405131090	U	H	scdisk0	UNDETERMINED ERROR
AA8AB241	0405130990	T	O	OPERATOR	OPERATOR NOTIFICATION

Interpreting Device Sense Data

To learn more about interpreting device sense data, refer to “Hardware Error Report Service Aid” on page 9-14. The hardware error report service aid prints a field-by-field description of the sense data for most error log entries.

Generating an Error Report

Use the following procedure to create an error report of software or hardware problems.

1. Determine if error logging is on or off. To do this, determine if the error log contains entries:

```
errpt -a
```

The **errpt** command generates an error report from entries in the system error log.

If the error log does not contain entries, error logging has been turned off. Activate the facility by entering:

```
/usr/lib/errdemon
```

Note: You must have root user access to run this command.

The **errdemon** daemon starts error logging and writes error log entries in the system error log. If the daemon is not running, errors are not logged.

2. Generate an error log report using the **errpt** command. For example, to see all the errors for the `hdisk1` disk drive, enter:

```
errpt -N hdisk1
```

3. Generate an error log report using SMIT. For example, use the **smit errpt** command:

```
smit errpt
```

Select `1` to send the error report to standard output or `2` to send the report to the printer.

Select `yes` to display or print error log entries as they occur; otherwise, select `no`.

Specify the appropriate device name in the `Select resource names` option (such as `hdisk1`).

Select `Do`.

Stopping an Error Log

This procedure describes how to stop the error logging facility. Ordinarily you would not want to turn off the error logging facility. Instead, you should clean the error log of old or unnecessary entries. For instructions about cleaning the error log, refer to “Cleaning an Error Log” on page 10-13.

You should turn off the error logging facility when installing or experimenting with new software or hardware. This way the error logging daemon does not use up CPU time to log problems you know you are causing.

Note: You must have root user authority to use the command in this procedure.

Enter the **errstop** command to turn off error logging:

```
errstop
```

The **errstop** command stops the error logging daemon from logging entries.

Cleaning an Error Log

This procedure describes how to strip old or unnecessary entries from your error log. Cleaning is normally done for you as part of the daily **cron** command.

If it is not done automatically, you should probably clean the error log yourself every couple of days after you have examined the contents to make sure there are no significant errors.

You can also clean up specific errors. For example, if you get a new disk and you do not want the old disk’s errors in the log to confuse you, you can clean just the disk errors.

Delete all entries in your error log by doing either of the following:

- Use the **errclear -d** command. For example, to delete all software errors enter:

```
errclear -d S 0
```

The **errclear** command deletes entries from the error log that are older than a certain number of days. The `0` in the previous example means that you want to delete entries for all days.

- Use the **smit errclear** command:

```
smit errclear
```

Copying an Error Log to Diskette or Tape

Copy an error log by doing either of the following:

- Use the **ls** and **backup** commands to copy the error log to diskette. Place a formatted diskette into the diskette drive and enter the following command:

```
ls /var/adm/ras/errlog | backup -ivrp
```

- To copy the error log to tape, place a tape in the drive and enter the following command:

```
ls /var/adm/ras/errlog | backup
```

OR

- Use the **snap** command to gather system configuration information in a **tar** file and copy it to diskette. Place a formatted diskette into the diskette drive and enter the following command:

Note: You need root user authority to use the **snap** command.

```
snap -a -o /dev/rfd0
```

The **snap** command in this example uses the **-a** flag to gather all information about your system configuration. The **-o** flag copies the compressed **tar** file to the device you name. The */dev/rfd0* parameter names your disk drive.

Enter the following command to gather all configuration information in a **tar** file and copy it to tape:

```
snap -a -o /dev/rmt0
```

The */dev/rmt0* parameter names your tape drive.

See the **snap** command in *AIX Version 3.2 Commands Reference* for more information.

Error Logging and Alerts

If the `Alert` field of an error record template is set to `True`, the Alert Manager program uses the following fields in the error log to build an alert:

- `Class`
- `Error Type`
- `Error Description`
- `Probable Cause`
- `User Cause`
- `Install Cause`
- `Failure Cause`
- `Recommended Action`
- `Detail Data`

These template fields must comply with the SNA Generic Alert Architecture described in *SNA Formats, GA27-3136*. Alerts that do not comply with the architecture cannot be processed properly by a receiving program, such as NetView.

Messages added to the error logging message sets must not conflict with the SNA Generic Alert Architecture. When the **errmsg** command is used to add messages, the command selects message numbers that do not conflict with the architecture.

If the `Alert` field of an error record template is set to `False`, you can use any of the messages in the error logging message catalog. For more information on error logging and alerts, see “How to Log Alertable Errors” in *AIX Version 3.2 System Management Guide: Communications and Networks*.

Automatic Error Log Analysis

Use the **diagela** and **run_ela** programs to automatically analyze your hardware error log.

Note: You must have root user authority to run these programs.

Considerations

Note: After a FRU is replaced, based on an error log analysis program, the error log entries for the problem device must be removed, or the program will continue to indicate a problem with the device.

- You should enable only one of the two analysis programs at a time.
- The **diagela** program performs the same function as the **run_ela** program but also analyzes other hardware errors.
- The **run_ela** program functions only once per day, but the **diagela** program performs whenever a hardware error is posted in the error log.
- Since the **diagela** program might execute many times each day, the program might slow down your system.
- If either the block multiplexer channel adapter or ESCON channel adapter is installed, additional error log information might be available from the System/370 or System/390 host system.

run_ela Program

The **crontab** file starts this preventative maintenance program once a day by default. The program searches the error log for disk drive entries classified as either permanent or temporary hardware errors. If such error log entries are found, a disk drive error problem entry is made in the error log, and a message is sent to the system console.

Edit your **crontab** file to disable the **run_ela** program. Either remove or comment out the following line:

```
/etc/lpp/diagnostics/bin/run_ela
```

diagela Program

This program invokes a diagnostic application, which in turn analyzes the error log of a problem device. If the diagnostic application detects a problem, it sends a message to your console and to all system group users.

Use the **enable** command to activate the **diagela** program. Log in as root and enter the following command:

```
/etc/lpp/diagnostics/bin/diagela ENABLE
```

Use the **disable** command to deactivate the **diagela** program. Log in as root and enter the following command:

```
/etc/lpp/diagnostics/bin/diagela DISABLE
```

Chapter 11. Trace Facility

The trace facility helps you isolate system problems by monitoring selected system events. Events that can be monitored include: entry and exit to selected subroutines, kernel routines, kernel extension routines, and interrupt handlers. The trace facility captures a sequential flow of system events, providing a fine level of detail on system activity. Events are shown in time sequence and in the context of other events. The trace facility is useful in expanding the trace event information to understand who, when, how, and even why the event happened.

When the trace facility is active, information about system events is recorded in a system **trace** log file. The trace facility includes commands for activating and controlling traces and generating trace reports. Applications and kernel extensions can use several subroutines to record additional events.

Use the following procedures to activate the trace facility:

- Start the Trace Facility on page 11-1
- Control the Trace Facility on page 11-6

Start the Trace Facility

Use the following procedures to configure and start a system trace:

- Configuring the trace Command on page 11-1
- Recording Trace Event Data on page 11-3
- Using Generic Trace Channels on page 11-3
- Starting a Trace on page 11-4
- Stopping a Trace on page 11-4
- Generating a Trace Report on page 11-5

Configuring the trace Command

The **trace** command starts the tracing of system events and controls the size of and manages the **trace** log file as well as the internal trace buffers that collect trace event data. The syntax of this command is:

```
trace [-fl] [-ad] [-s] [-h] [-jk events] [,events] [-m message]
      [-o outfile] [-g] [-T buf_sz] [-L log_sz]
```

The various options of the **trace** command are:

- f or -l** Control the capture of trace data in system memory. If you specify neither the **-f** nor **-l** option, the trace facility creates two buffer areas in system memory to capture the trace data. The **trace** log files and the internal **trace** buffers that collect trace event data can be managed, including their size, by this command. The **-f** or **-l** flag provides you with the ability to prevent data from being written to the file during data collection. The options are to collect data only until the memory buffer becomes full (**-f** for first), or to use the memory buffer as a circular buffer that captures only the last set of events that occurred before **trace** was terminated (**-l**). The **-f** and **-l** options are mutually exclusive. With either the **-f** or **-l** option, data is not

transferred from the memory collection buffers to file until **trace** is terminated.

-a Run the **trace** collection asynchronously (as a background task), returning a normal command line prompt. Without this option, the **trace** command runs in a subcommand mode (similar to the **crash** command) and returns a > prompt. You can issue subcommands and regular shell commands from the **trace** subcommand mode by preceding the shell commands with an ! (exclamation point).

-d Delay data collection. The trace facility is only configured. Data collection is delayed until one of the collection trigger events occurs. Various methods for triggering data collection on and off are provided. These include the following:

- **trace** subcommands
- **trace** commands
- **trace** subroutines.

-j events or -k events

Specify a set of events to include (**-j**) or exclude (**-k**) from the collection process. Specify a list of events to include or exclude by a series of three-digit-hexadecimal event IDs separated by a space.

-s Terminate trace data collection if the **trace** log file reaches its maximum specified size. The default without this option is to wrap and overwrite the data in the log file on a FIFO basis.

-h Do not write a **date/sysname/message** header to the **trace** log file.

-m message Specify a text string (message) to be included in the **trace** log header record. The message is included in reports generated by the **trcrpt** command.

-o outfile Specify a file to use as the log file. If you do not use the **-o** option, the default log file is **/var/adm/ras/trcfile**. To direct the trace data to standard output, code the **-o** option as **-o -**. Use this technique only to pipe the data stream to another process since the trace data contains raw binary events that are not displayable.

-g Duplicate the **trace** design for multiple channels. Channel 0 is the default channel and is always used for recording system events. The other channels are generic channels, and their use is not predefined. There are various uses of generic channels in the system. The generic channels are also available to user applications. Each created channel is a separate events data stream. Events recorded to channel 0 are mixed with the predefined system events data stream. The other channels have no predefined use and are assigned generically.

A program typically requests that a generic channel be opened by using the **trcstart** subroutine. A channel number is returned, similar to the way a file descriptor is returned when a file is opened (the channel ID). The program can record events to this channel and, thus, have a private data stream. Less frequently, the **trace** command allows a generic channel to be specifically configured by defining the channel number with this option.

-T size and -L size

Specify the size of the collection memory buffers and the maximum size of the log file in bytes.

Note: Because the trace facility pins the data collection buffers, making this amount of memory unavailable to the rest of the system, the trace facility can impact performance in a memory-constrained environment. If the application being monitored is not memory-constrained, or if the percentage of memory consumed by the **trace** routine is small compared to what is available in the system, the impact of **trace** “stolen” memory should be small.

If you do not specify a value, trace uses a default size.

Recording Trace Event Data

The data recorded for each traced event consist of a word containing the trace hook identifier and the hook type followed by a variable number of words of trace data optionally followed by a time stamp. The word containing the trace hook identifier and the hook type is called the hook word. The remaining two bytes of the hook word are called hook data and are available for recording event data.

Trace Hook Identifiers

A trace hook identifier is a three-digit hexadecimal number that identifies an event being traced. You specify the trace hook identifier in the first 12 bits of the hook word. The values 0x010 through 0x0FF are available for use by user applications. All other values are reserved for system use. The trace hook identifiers for the installed software can be listed using the **trcrpt -j** command.

The trace hook IDs, which are stored in the **/usr/include/sys/trchkid.h** file, and the trace formatting templates, which are stored in the **/etc/trcfmt** file, are shared by all the trace channels.

Hook Types

The hook type identifies the composition of the event data and is user-specified. Bits 12 through 16 of the hook word constitute the hook type. For more information on hook types, refer to the **trcgen**, **trcgenk**, and **trchhook** subroutines.

Using Generic Trace Channels

The trace facility supports up to eight active trace sessions at a time. Each trace session uses a channel of the multiplexed trace special file, **/dev/systrace**. Channel 0 is used by the trace facility to record system events. The tracing of system events is started and stopped by the **trace** and **trcstop** commands. Channels 1 through 7 are referred to as generic trace channels and may be used by subsystems for other types of tracing such as data link tracing.

To implement tracing using the generic trace channels of the trace facility, a subsystem calls the **trcstart** subroutine to activate a trace channel and to determine the channel number. The subsystem modules can then record trace events using the **trcgen**, **trcgent**, **trcgenk**, or **trcgenkt** subroutine. The channel number returned by the **trcstart** subroutine is one of the parameters that must be passed to these subroutines. The subsystem can suspend and resume trace data collection using the **trcoff** and **trcon** subroutines and can deactivate a trace channel using the **trcstop** subroutine. The trace events for each channel must be written to a separate **trace** log file, which must be specified in the call to the **trcstart** subroutine. The subsystem must provide the user interface for activating and deactivating subsystem tracing.

Starting a Trace

Use the one of the following procedures to start the trace facility.

- Start the trace facility by using the **trace** command.

Start the trace asynchronously. For example:

```
trace -a
mycmd
trcstop
```

When using the trace facility asynchronously, use the **trace** daemon to trace the selected system events (such as the **mycmd** command); then use the **trcstop** command to stop the trace.

OR

Start the trace interactively. For example:

```
trace
->!mycmd
->quit
```

When using the trace facility interactively, get into the interactive mode as denoted by the **->** prompt, and use the **trace** subcommands (such as **!**) to trace the selected system events. Use the **quit** subcommand to stop the trace.

- Use **smit trace**, and choose the **Start Trace** option.

```
smit trace
```

Stopping a Trace

Use one of the following procedures to stop the trace you started earlier.

- When using **trace** asynchronously at the command line, use the **trcstop** command:

```
trace -a
mycmd
trcstop
```

When using the trace facility asynchronously, use the **trace** daemon to trace the selected system events (such as the **mycmd** command); then use the **trcstop** command to stop the trace.

- When using **trace** interactively at the command line, use the **quit** subcommand:

```
trace
->!mycmd
->quit
```

The interactive mode is denoted by the **->** prompt. Use the **trace** subcommands (such as **!**) to trace the selected system events. Use the **quit** subcommand to stop the trace.

- Use **smit trace** and choose the **Stop Trace** option:

```
smit trace
```

Generating a Trace Report

Use either of the following procedures to generate a report of events that have been traced.

- Use the **trcrpt** command:

```
trcrpt >/tmp/newfile
```

The previous example formats the **trace** log file and sends the report to **/tmp/newfile**. The **trcrpt** command reads the **trace** log file, formats the trace entries, and writes a report.

- Use the **smit trcrpt** command:

```
smit trcrpt
```

Go to “Control the Trace Facility” on page 11-6 for information about **trace** commands, calls and subroutines, and files.

Control the Trace Facility

When the trace is configured, the trace facility controls trigger the collection of data on or off and stop the trace facility (stop deconfigures the **trace** command and unpins buffers). Trace facility controls include the following:

- Trace Facility Commands and Subcommands on page 11-6
- Trace Facility Calls and Subroutines on page 11-6
- Trace Facility Files on page 11-7

Trace Facility Commands and Subcommands

trace	The trace command starts the tracing of system events. The trace log file and the internal trace buffers that collect trace event data can be managed, including their size, by this command.
trcdead	The trcdead command extracts trace information from a system dump. If the system halts while the trace facilities are active, the contents of the internal trace buffers are captured. This command extracts the trace event data from the dump and writes it to the trace log file.
trcrpt	The trcrpt command formats reports of trace event data contained in the trace log file. You can specify the events to be included (or omitted) in the report, as well as determine the presentation of the output with this command. The trcrpt command uses the trace formatting templates stored in the /etc/trcfmt file to determine how to interpret the data recorded for each event.
trcstop	The trcstop command stops the tracing of system events.
trcupdate	The trcupdate command updates the trace formatting templates stored in the /etc/trcfmt file. When you add applications or kernel extensions that record trace events, templates for these events must be added to the /etc/trcfmt file. The trcrpt command uses the trace formatting templates to determine how to interpret the data recorded for each event. Software products that record events usually run the trcupdate command as part of the installation process.

Trace Facility Calls and Subroutines

trcgen, trcgent The **trcgen** and **trcgent** subroutines record trace events consisting of more than five words of data. The **trcgen** subroutine may be used to record an event as part of the system event trace (trace channel 0) or to record an event on a generic trace channel (channels 1 through 7). You specify the channel number in a subroutine parameter when you record the trace event. The **trcgent** subroutine appends a time stamp to the event data.

trcgenk, trcgenkt

Kernel extensions use the **trcgenk** subroutine to record trace events consisting of more than five words of data. The **trcgenk** subroutine may be used to record an event as part of the system event trace (trace channel 0) or to record an event on a generic trace channel (channels 1 through 7). You specify the channel number in a subroutine parameter when you record the trace event. The **trcgenkt** subroutine appends a time stamp to the event data.

trchook, utrchook

The **trchook** and **utrchook** subroutines record up to five words of data. These subroutines may be used to record an event as part of the system event trace (trace channel 0). The **utrchook** subroutine uses a special FAST-SVC path to improve performance and should be used by programs at the user (application) level.

trcoff

The **trcoff** subroutine suspends the collection of trace data on either the system event trace channel (channel 0) or a generic trace channel (1 through 7). The trace channel remains active and trace data collection can be resumed by using the **trcon** subroutine.

trcon

The **trcon** subroutine starts the collection of trace data on a trace channel. The channel may be either the system event trace channel (0) or a generic channel (1 through 7). The trace channel, however, must have been previously activated by using the **trace** command or the **trcstart** subroutine. You can suspend trace data collection by using the **trcoff** subroutine.

trcstart

The **trcstart** subroutine requests a generic trace channel. This subroutine activates a generic trace channel and returns the channel ID to the calling application to use in recording trace events using the **trcgen**, **trcgent**, **trcgenk**, and **trcgenkt** subroutines.

trcstop

The **trcstop** subroutine frees and deactivates a generic trace channel.

Trace Facility Files

/etc/trcfmt

The **/etc/trcfmt** file contains the trace formatting templates used by the **trcrpt** command to determine how to interpret the data recorded for each event.

/usr/include/sys/trcmacros.h

This file contains commonly used macros for recording trace events.

/var/adm/ras/trcfile

This file is the default trace log file. The **trace** command allows you to specify a different trace log file.

Chapter 12. System Dump Facility

Your system generates a system dump when a severe error occurs. System dumps can also be user-initiated by users with root user authority. A system dump creates a picture of your system's memory contents. System administrators and programmers can generate a dump and analyze its contents when debugging new applications.

If your system stops with an 888 number flashing in the three-digit display, the system has generated a dump and saved it to a dump device. Go to "Copy a System Dump" on page 12-6 for information about copying the contents of the dump to other media.

To generate a system dump refer to the following:

- Configure a Dump Device on page 12-1
- Start a System Dump on page 12-2
- Check the Status of a System Dump on page 12-4
- Copy a System Dump on page 12-6
- Return to Normal Operations on page 12-11

Configure a Dump Device

When an unexpected system halt occurs, the system dump facility automatically copies selected areas of kernel data to the primary dump device. These areas include kernel segment 0 as well as other areas registered in the Master Dump Table by kernel modules or kernel extensions.

A dump device can be configured either as a dedicated device that requires no operator intervention when a dump occurs or as a shared device that can be used for other purposes until a dump is requested.

A dedicated dump device is referred to as the primary dump device. A shared dump device is referred to as the secondary dump device. Operator intervention is required when a dump is to be written to the secondary dump device. When you install the operating system, the dump device is automatically configured for you. By default, the primary device is **/dev/hd7** and the secondary device is **/dev/sysdumpnull**.

Note: Diskless systems automatically configure a remote dump device.

The default dump device on a 320 with disks smaller than 300 M bytes is **/dev/hd6**, which is a paging logical volume. When the dump is written to the paging logical volume, you must retrieve the dump before paging is activated. Refer to "Copy a System Dump to Either Diskette or Tape" on page 12-6 for information about retrieving a system dump.

Start a System Dump

Warning: Do not start a system dump if the flashing 888 number shows in your three-digit display. This number indicates your system has already created a system dump and written the information to your primary dump device. If you start your own dump before copying the information in your dump device, your new dump will overwrite the existing information. Follow with the procedures in Chapter 2. “888 in the Three-Digit Display” of the *AIX Version 3.2 Messages Guide and Reference* to record the message encoded as a sequence of three-digit display values. Then refer to “Check the Status of a System Dump” on page 12-4.

A user-initiated dump is different from a dump initiated by an unexpected system halt because the user can designate which dump device to use. When the system halts unexpectedly, a system dump is initiated automatically to the primary dump device.

You can start a system dump by using one of the following methods:

- Using the Command Line on page 12-2
- Using SMIT on page 12-3
- Using the Reset Button on page 12-3
- Using Special Key Sequences on page 12-3

Using the Command Line

Use the following steps to choose a dump device, initiate the system dump, and determine the status of the system dump:

Note: You must have root user authority to start a dump by using the **sysdumpstart** command.

1. Check which dump device is appropriate for your system (the primary or secondary device) by using the following **sysdumpdev** command:

```
sysdumpdev -l
```

This command lists the current dump devices. You can use the **sysdumpdev** command to change device assignments. By default, the primary device is **/dev/hd7** and the secondary device is **/dev/sysdumpnull**.

2. Start the system dump by entering the following **sysdumpstart** command:

```
sysdumpstart -p
```

This command starts a system dump on the default primary dump device. You can use the **-s** flag to specify the secondary dump device.

3. If a code shows in the three-digit display, refer to “Check the Status of a System Dump” on page 12-4. If the three-digit display is blank, the dump was not started. Try again using the Reset button.

Using SMIT

Use the following SMIT commands to choose a dump device and start the system dump:

Note: You must have root user authority to start a dump using SMIT. SMIT uses the **sysdumpstart** command to start a system dump.

1. Check which dump device is appropriate for your system (the primary or secondary device) by using the following SMIT FastPath command:

```
smit dump
```

2. Choose the **Show Current Dump Devices** option and write the available devices on notepaper.

3. Enter the following SMIT FastPath command again:

```
smit dump
```

4. Choose either the primary (the first example option) or secondary (the second example option) dump device to hold your dump information:

Start a Dump to the Primary Dump Device

OR

Start a Dump to the Secondary Dump Device

Base your decision on the list of devices you made in step 2.

5. Refer to "Check the Status of a System Dump" on page 12-4 if a value shows in the three-digit display. If the three-digit display is blank, the dump was not started. Try again using the Reset button.

Using the Reset Button

Start a system dump with the Reset button by doing the following (this procedure works for all system configurations and will work in circumstances where other methods for starting a dump will not):

1. Turn your machine's Mode Switch to the Service position.
2. Press the Reset button.

Your system writes the dump information to the primary dump device.

Using Special Key Sequences

Type key sequences to start a dump by doing the following:

1. Turn your machine's Mode Switch to the Service position.
2. Press the Ctrl Alt Numpad1 key sequence.

Your system writes the dump information to the primary dump device. You can specify the secondary dump device by pressing the Numpad2 key instead of the Numpad1 key.

Check the Status of a System Dump

When a system dump is taking place, status and completion codes are displayed in the three-digit display on the operator panel. When the dump is complete, a `0cx` status code will be displayed if the dump was user initiated, a flashing `888` will be displayed if the dump was system initiated.

You can check whether the dump was successful, and if not, what caused the dump to fail. If a `0cx` is displayed, see Status Codes below. If a flashing `888` is displayed, refer to Chapter 2. "888 in the Three-Digit Display" of the *AIX Version 3.2 Messages Guide and Reference*.

Status Codes

Find your status code in the following list, and follow the instructions:

- | | |
|------------|---|
| 000 | The Kernel debugger is invoked. If there is an ASCII terminal attached to one of the native serial ports, enter <code>q dump</code> at the debugger prompt (<code>></code>) on that terminal and then wait for a flashing <code>888</code> to appear in the three-digit display. After the flashing <code>888</code> appears, go to "Check the Status of a System Dump" on page 12-4. |
| 0c0 | The dump completed successfully. Go to "Copy a System Dump" on page 12-6. |
| 0c2 | A dump started by the system did not complete. Wait 1 minute for the dump to complete and for the three-digit display value to change. If the three-digit display value changes, find the new value on this list. If the value does not change, then the dump did not complete due to an unexpected error. Complete the Problem Summary Form, and report the problem to your software service department. |
| 0c4 | The dump did not complete successfully. A partial dump was written to the dump device, but there is not enough space on the dump device to contain the entire dump. To prevent this problem from occurring again, you must increase the size of your dump media. Go to "Copy a System Dump" on page 12-6. |
| 0c5 | A dump started by the system did not complete. Wait 1 minute for the dump to complete and for the three-digit display value to change. If the three-digit display value changes, find the new value on this list. If the value does not change, then the dump did not complete due to an unexpected error. Complete the Problem Summary Form, and report the problem to your software service department. |
| 0c7 | A network dump is in progress, and the host is waiting for the server to respond. The value in the three-digit display should alternate between <code>0c2</code> and <code>0c7</code> . If the value does not change, then the dump did not complete due to an unexpected error. Complete the Problem Summary Form, and report the problem to your software service department. |
| 0c8 | The dump device is disabled. The current system configuration does not designate a device for the requested dump. Complete the Problem Summary Form, and report the problem to your software service department. |

0c9

A dump started by the system did not complete. Wait 1 minute for the dump to complete and for the three-digit display value to change. If the three-digit display value changes, find the new value on this list. If the value does not change, then the dump did not complete due to an unexpected error. Complete the Problem Summary Form, and report the problem to your software service department.

Copy a System Dump

Your dump device holds the information that a system dump, whether generated by the system or a user, creates. You can copy this information to either diskette or tape and deliver the material to your service department for analysis.

The procedure for copying a system dump depends on the type of hardware system you are using. One type of hardware is the dataless and diskless workstation. The other type is the server and client machine. Choose your system type from the following list and go to that section for instructions:

- Copying a System Dump on Dataless and Diskless Workstations on page 12-6
- Copying a System Dump on Server and Client Machines on page 12-8

If you are booting your system from maintenance diskettes, use the following procedure:

- Copying a System Dump When Booting from Maintenance Diskettes on page 12-9

Copying a System Dump on Dataless and Diskless Workstations

This general procedure includes steps to account for differences in dataless and diskless systems. For example, the “Restart Your Dataless Workstation” section applies only to dataless systems. Also, the “Copy the System Dump from Your Server” section applies only if your client host does not have suitable drive hardware.

Copy a system dump on dataless and diskless workstations using the appropriate steps:

- Restart Your Dataless Workstation on page 12-6
- Locate the System Dump on page 12-7
- Copy the System Dump from Your Client Host on page 12-7
- Copy the System Dump from Your Server on page 12-8

Restart Your Dataless Workstation

Note: You must restart your *dataless* workstation before you can copy the dump from the server. This step is not necessary for diskless workstations.

The procedures for copying a system dump on dataless and diskless workstations are very similar. On dataless workstations, however, the system writes dump information to the local disk. The system then transfers the information to a file on the server when you restart the system.

Restart your dataless workstation by doing the following:

1. Switch off the power on your machine.
2. Turn the Mode Switch to the Normal position.
3. Switch on the power on your machine.

Go to “Locate the System Dump” on page 12-7.

Diagnosing a failure to restart

Go to the Symptom Index if your dataless workstation does not restart. Use the Problem Determination Procedures to diagnose your problem. Refer to “Hardware Diagnostics” on page 9-1 for information about reporting a service request number (SRN) to your service department.

Locate the System Dump

Find the machine and path name where the dump is stored by doing the following:

1. Log in to your client host system.
2. Find where the dump is stored by entering the following **lsdclient** command:

```
lsdclient -L ClientHostName
```

Use the name of the client host where the dump occurred for the *ClientHostName* parameter.

The command shows the name of the server where your system wrote the dump information. The command also shows the path name for the dump. Write this information on notepaper.

Go to “Copy the System Dump from Your Client Host” on page 12-7 if your client host has either a diskette or tape drive.

Go to “Copy the System Dump from Your Server” on page 12-8 if your client host does not have either a diskette or tape drive.

Copy the System Dump from Your Client Host

Note: You must have root user authority to use the commands mentioned in this section.

Copy the system dump from your client host machine onto either diskettes or tape by doing the following:

1. Create a temporary local directory on which to mount the remote dump directory by entering the following **mkdir** command:

```
mkdir /tmp/dumpdir
```

2. Mount the remote dump directory over the local directory you just created by entering the following **mount** command:

```
mount -n ServerHostname DumpPathname /tmp/dumpdir
```

Note: Use the host name of the server and the dump path name you wrote on notepaper in the “Locate the System Dump” section on page 12-7.

3. Copy the system dump to either diskette (the first example) or tape (the second example) using the following **ls** and **backup** commands:

```
ls /tmp/dumpdir/dump | backup -iv
```

OR

```
ls /tmp/dumpdir/dump | backup -ivf TapeDeviceName
```

4. Unmount the dump directory after the dump has been copied by entering the following **umount** command:

```
umount /tmp/dumpdir
```

5. Remove your temporary directory by entering the following **rmdir** command:

```
rmdir /tmp/dumpdir
```

Go to “Hardware Diagnostics” on page 9-1 for troubleshooting information if your system failed to complete this copying procedure.

Copy the System Dump from Your Server

If your client host machine does not have a drive for the medium you want to use, copy the system dump from your server onto either diskettes or tape by doing the following:

Note: You must have root user authority to use the **backup** and **ls** commands.

1. Log in as a root user on the server that holds the system dump information.
2. Copy the system dump to either diskette (the first example) or tape (the second example) using the following **ls** and **backup** commands:

```
ls DumpPathName/dump | backup -iv
```

OR

```
ls DumpPathName/dump | backup -ivf TapeDeviceName
```

Note: Use the dump path name you wrote on notepaper in the “Locate the System Dump” section on page 12-7.

Go to “Return to Normal Operations” on page 12-11 when you finish copying the system dump.

Go to “Hardware Diagnostics” on page 9-1 for troubleshooting information if your system failed to complete this copying procedure.

Copying a System Dump on Server and Client Machines

Copy a system dump on server and client machines by doing the following:

- Reboot Your Machine on page 12-8
- Copy a System Dump after Rebooting in Normal Mode on page 12-8
- Copy a System Dump after Rebooting in Maintenance Mode on page 12-9

Reboot Your Machine

Reboot in normal mode using the following steps:

1. Switch off the power on your machine.
2. Turn the Mode Switch to the Normal position.
3. Switch on the power on your machine.

Go to “Copy a System Dump after Rebooting in Normal Mode” on page 12-8 if your system brings up the login prompt.

Rebooting with AIX Install/Maintenance

Reboot your machine using “AIX Install/Maintenance” on page A-1 if your system stops with a number in the three-digit display instead of bringing up the login prompt.

Go to “Copy a System Dump after Rebooting in Maintenance Mode” on page 12-9 after you reboot in Maintenance mode.

Copy a System Dump after Rebooting in Normal Mode

After rebooting in Normal mode, copy a system dump by doing the following:

1. Login to your system as a root user.
2. Copy the system dump to either diskette (the first example) or tape (the second example) using the following **snap** command:

```
/usr/sbin/snap -gfkD -o /dev/rfd0
```

OR

```
/usr/sbin/snap -gfkD -o /dev/rmt#
```

Substitute # (pound sign) in the previous example with the number of your available tape device (the most common is **/dev/rmt0**). To find the correct number, enter the following **lsdev** command, and look for the tape device listed as Available:

```
lsdev -C -c tape -H
```

Copy a System Dump after Rebooting in Maintenance Mode

Note: Use this procedure only if you cannot reboot your machine in normal mode.

After rebooting in Maintenance mode, copy a system dump to either diskette (the first example) or tape (the second example) using the following **snap** command:

```
/usr/sbin/snap -gfkD -o /dev/rfd0
```

OR

```
/usr/sbin/snap -gfkD -o /dev/rmt#
```

Go to “Return to Normal Operations” on page 12-11 when you finish copying the system dump.

Copying a System Dump When Booting from Maintenance Diskettes

Use the following procedures when your dump device is also the paging space device. Generally, the dump resides on **/dev/hd6** and the root volume group, **rootvg**, contains **/dev/hdisk0**.

Warning: Follow the steps for booting your system in “AIX Install/Maintenance” on page A-1 but do not use the **getrootfs** command. The **getrootfs** command activates paging which will destroy your dump. Execute the following steps instead of the **getrootfs** command.

1. Enter the **ln** command:

```
ln /dev/hdisk0 /dev/ipldevice
```

2. Enter the **importvg** command:

```
importvg -y rootvg hdisk0
```

3. Enter the **varyonvg** command:

```
varyonvg -f -n rootvg
```

After you enter the **varyonvg** command, a message may appear indicating that **syncvg** is not found. Ignore the message. The **varyonvg** command requires **syncvg** during normal boot, but **syncvg** is neither required nor available during maintenance mode. In this case, the **varyonvg** command works correctly.

4. Copy the system dump by using the appropriate **dd** commands for either diskettes (the first example), streaming tape (the second example), or 9-track tape (the third example).

Diskettes

Copy the dump to diskettes by first preparing six formatted 1.4MB diskettes, then entering the following commands on successive diskettes (one command per diskette):

```
dd if=/dev/rhd6 of=/dev/rfd0 bs=36b count=80
dd if=/dev/rhd6 of=/dev/rfd0 bs=36b count=80 skip=80
dd if=/dev/rhd6 of=/dev/rfd0 bs=36b count=80 skip=160
dd if=/dev/rhd6 of=/dev/rfd0 bs=36b count=80 skip=240
dd if=/dev/rhd6 of=/dev/rfd0 bs=36b count=80 skip=320
dd if=/dev/rhd6 of=/dev/rfd0 bs=36b count=80 skip=400
```

Note: You will need more than six diskettes if your dump is more than 8M byte (8M byte is typical). If you know the typical size of a dump for your system, you can calculate the number of diskettes needed by dividing the dump size by the diskette capacity (8M byte divided by 1.4M byte). For each additional diskette, use the same command and increment the skip parameter by 80.

Streaming Tape

Copy the dump to streaming tape by entering the following **dd** command:

```
dd if=/dev/rhd6 of=/dev/rmt0
```

9-Track Tape

Copy the dump to 9-track tape by entering the following **dd** command:

```
dd if=/dev/rhd6 of=/dev/rnt0
```

Go to “Return to Normal Operations” on page 12-11 when you finish copying the system dump.

Return to Normal Operations

After completing your work with the system dump, return your system to normal operations by doing the following:

1. Switch your machine's power off.
2. Turn the Mode Switch to the Normal position.
3. Switch your machine's power on.

Appendix A. AIX Install/Maintenance

Maintenance Mode allows you to access the information on the hard disk in cases where the machine will not start from the hard disk.

Warning: Familiarity with the commands in Maintenance Mode is necessary. It is possible to delete or damage critical files with these commands. If you delete or damage files, you may have to reinstall your operating system.

Enter maintenance mode from any of the following means:

- Maintenance Mode from Diskette on page A-1
- Maintenance Mode from 8-mm Tape on page A-3
- Maintenance Mode from Other Types of Tape on page A-3

Maintenance Mode from Diskette

Enter Maintenance Mode from diskette by doing the following:

1. Turn off the system.
2. Turn the Mode Switch to the Service position.
3. Insert the BOS boot diskette in the diskette drive.
4. Turn the system on again, and wait for the `c07` code to appear in the 3-digit display.
5. Remove the BOS boot diskette, and insert the BOS Display Extensions diskette.
6. Wait for the `c07` code to appear in the three-digit display.
7. When `c07` appears, remove the BOS Display Extensions diskette and insert the BOS Display diskette.

Note: If your system has a non-IBM display adapter, insert the diskette for the adapter immediately after the BOS Display Extensions diskette.

8. When `c31` appears, each terminal and direct-attach display shows a message similar to the following:

```
Type F1 at this terminal and press Enter if you want this display
to be the system console.
```

Press the key indicated only on the terminal or direct-attach display that you want to serve as the console.

9. When a message similar to the following appears on the console and the BOS Display diskette is in the diskette drive, remove the diskette, insert the BOS Install/Maintenance diskette, and press Enter:

```
Insert BOS Install/Maint Diskette and Press Enter
```

10. When the `AIX Installation and Maintenance` menu appears, enter the ID number that corresponds to `Start a limited function maintenance shell`. The wording may differ on your menu.

Warning: If your dump device is also the paging space device, do not use the `getrootfs` command. The `getrootfs` command activates paging which will destroy your dump. Refer to

“Copying a System Dump When Booting from Maintenance Diskettes” on page 12-9 for an alternate procedure.

11. Find the boot logical volume and run the **getrootfs** command. The AIX Installation/Maintenance diskettes might assign a different hdisk name to a physical volume (fixed disk) than the multi user mode assigns. You need to know which physical volume contains hd5 when you access the boot logical volume with the **getrootfs** command.

If you have only one physical volume, the volume (hdisk0) contains hd5. Use hdisk0 with the **getrootfs** command.

If you have more than one physical volume, enter the **getrootfs** command without parameters to get a listing of disks. If only *one* disk is specified as the boot disk, the disk contains hd5.

If the **getrootfs** command specifies more than one boot disk, create and run the following program to see which volume to use:

```
getlvodm -P | while read pvname pvnumber junk1
do
    lqueryvg -p $pvname -L | while read lvnumber lvname junk2
    do
        if [ "$lvname" = "hd5" ]
        then
            lquerypv -p $pvnumber -N $pvname -d | grep \
            $lvnumber > dev/null 2>&1
            if [ "$?" -eq 0 ]
            then
                disk="$pvname"
                echo $disk
                break 2
            fi
        fi
    done
done
```

If you want the **getrootfs** command to automatically look for the correct volume, put the previous program code in the **getrootfs** file. Edit the file, and insert the previous code in place of the following lines:

```
echo usage: $0 diskname - do not include /dev/ before "diskname"
exit 1
```

Once you have found the physical volume that contains the boot logical volume, run the following command:

```
getrootfs hdiskx
```

Note: Use the number of your physical volume in place of the *x* in the previous example. For example, enter `getrootfs hdisk0` if the number of your physical volume is 0.

If the **getrootfs** command completes successfully, you can use either commands or SMIT to perform maintenance. Before you run SMIT or use a text editor, you must set the `TERM` variable to the appropriate value for the display you are using. For example, if you are using an IBM 5081 display, enter the following command:

```
TERM=ibm5081; export TERM
```

An error message appears if the **getrootfs** command does not complete successfully. You will be able to use the built-in shell commands such as **cd**, **echo**, and **pwd**. A subset

of commands necessary to perform maintenance will also be available. To list the available commands, enter the following command:

```
echo bin/* etc/* usr/bin/* usr/sbin/*
```

12. Return to the Problem Determination Procedure that brought you to "AIX Install/Maintenance."

Maintenance Mode from 8-mm Tape

Enter Maintenance Mode from 8-mm tape by doing the following:

1. Turn off the system.
2. Turn the Mode Switch to the Secure position.
3. Turn on the system. Wait for the 200 code to show in the three-digit display.
4. Press the 8-mm tape drive eject button. The door will open in 1 or 2 minutes.
5. Insert the tape labeled "Version 3" into the tape drive device. If you have more than one tape, insert the tape labeled "Volume 1".
6. Turn the Mode Switch to the Service position.
7. Wait for the c31 code to show in the three-digit display.
8. When the c31 code appears, each terminal and direct-attach display shows a message similar to the following:

```
Type F1 at this terminal and press Enter if you want this display  
to be the system console.
```

Press the key indicated only on the terminal or direct-attach display that you want to serve as the console.

9. When the AIX Installation and Maintenance menu appears, enter the ID number that corresponds to Start a limited function maintenance shell. The wording may differ on your menu.
10. Continue this procedure by using Steps 10 and 11 under "Maintenance Mode from Diskette" on page A-1.

Maintenance Mode from Other Types of Tape

Enter Maintenance Mode from other types of tape by doing the following:

1. Turn off the system.
2. Turn the Mode Switch to the Service position.
3. Insert the tape labeled "Version 3" into the tape drive device. Insert the tape labeled "Volume 1" if you have more than one tape.
4. Turn on the system.
5. Wait for the c31 code to show in the three-digit display.
6. When the c31 code appears, each terminal and direct-attach display shows a message similar to the following:

```
Type F1 at this terminal and press Enter if you want this display  
to be the system console.
```

Press the key indicated only on the terminal or direct-attach display that you want to serve as the console.

7. When the `AIX Installation and Maintenance` menu appears, enter the ID number that corresponds to `Start a limited function maintenance shell`. The wording may differ on your menu.
8. Continue this procedure by using Steps 10 and 11 under “Maintenance Mode from Diskette” on page A-1.

Appendix B. Software Validation

Validate software when you want to make sure that the installed software product (or licensed product) has not been damaged or corrupted. The files of a product are checked to make sure they exist and then for total file size, checksum values, and symbolic links. They are then checked against the Software Vital Product Data (SWVPD) database. If the values do not match, the product has been altered or damaged, and you need to contact your software service center.

There are two ways to validate software:

- Use the **lppchk** command. To check for file existence, file length, and checksum value, enter:

```
lppchk -c
```

The **lppchk** command can also be used for a specific product, for example:

```
lppch -c bos.obj
```

To check the file links, enter:

```
lppchk -f
```

The **lppchk** command verifies the files of an installable software product.

- Use the **smit problem** command and choose the **Validate Software** option:

```
smit problem
```

Appendix C. Error Identifiers for the Error Log

Your system stores information about errors and failures in the error log. This information includes error identifiers, which the error logging facility uses to compile reports. Each unique error identifier is a 32-bit CRC hexadecimal code that determines which error record template the report uses.

For information about device sense data interpretation and error log analysis, see “Hardware Error Report Service Aid” on page 9-14 and “Automatic Error Log Analysis” on page 10-16.

The following categories of error identifiers are ordered alphabetically, reading left to right. Turn to your category, also ordered alphabetically in this Appendix, for a complete list of error labels.

370 Parallel Adapter	ATE	
BADISK	C327	CDROM
COM	DISK	DISKETTE
ENT	EPOW	ERRLOG
EU	Exceptions/Interrupts	FDDI
HCON	Integrated Ethernet	LION
LVM	MEM	MPQP
MSLA	NETBIOS	PSLA
RS	SCSI	SD
SLA	SNA	TAPE
TMSCSI	TOK	TTY
VCA	X25	Miscellaneous

System/370 Parallel Adapter Error Identifiers for the Error Log

CAT ERR1

Error Description: LICENSED INTERNAL CODE (LIC) PROGRAM ABNORMALLY TERMINATED

This error appears as a notification in the adapter's status queue when the LIC has stopped for any reason.

CAT ERR2

Error Description: LICENSED INTERNAL CODE (LIC) PROGRAM ERROR

This error occurs when the call to download LIC returns with an error code or times out.

CAT ERR3

Error Description: RESOURCE UNAVAILABLE

This error occurs when a call to the **m_get** or **m_clget** macro for the **mbuf** kernel service fails. It indicates that the driver could not get an **mbuf** during a receive of data from the System/370 host.

CAT ERR4

Error Description: RESOURCE UNAVAILABLE

This error occurs when a call to the **xmalloc** subroutine fails. The driver could not allocate pinned memory for an internal data structure.

CAT ERR5

Error Description: ADAPTER ERROR

This error can occur when setting the adapter's parameters or while downloading a control-unit table that either fails or times out.

CAT ERR6

Error Description: RESOURCE UNAVAILABLE

This error indicates that a call to the **d_init** or **i_init** kernel service failed. The driver cannot be configured.

CAT ERR7

Error Description: ADAPTER ERROR

This error is caused when the internal driver lacks direct access to memory or when the receiver indicates that data has been lost.

CAT ERR8

Error Description: ADAPTER ERROR

This error indicates that an unrecoverable program input/output error occurred when bus memory was accessed.

ATE Error Identifiers for the Error Log

ATE ERR1

Error Description: COMMUNICATION PROTOCOL ERROR

This error is logged by ATE (asynchronous terminal emulation) if no pacing character is received.

ATE ERR2

Error Description: COMMUNICATION PROTOCOL ERROR

This error is logged by ATE if excessive transmission errors occur.

ATE ERR3

Error Description: COMMUNICATION PROTOCOL ERROR

This error is logged by ATE if no acknowledgement is received from the receiving site.

ATE ERR4

Error Description: COMMUNICATION PROTOCOL ERROR

This error is logged by ATE if the receiving site is not ready.

ATE ERR5

Error Description: COMMUNICATION PROTOCOL ERROR

This error is logged by ATE if the sending site is not sending.

ATE ERR6

Error Description: SOFTWARE PROGRAM ERROR

This error is logged by ATE for no carrier signal.

ATE ERR7

Error Description: COMMUNICATION PROTOCOL ERROR

This error is logged by ATE if checksum error is detected.

ATE ERR8

Error Description: COMMUNICATION PROTOCOL ERROR

This error is logged by ATE if sector is received twice.

ATE ERR9

Error Description: COMMUNICATION PROTOCOL ERROR

This error is logged by ATE if incorrect sector is received.

ATE ERR10

Error Description: COMMUNICATION PROTOCOL ERROR

This error is logged by ATE if sector could not be verified.

BADISK Error Identifiers for the Error Log

BADISK ERR1

Error Description: DISK FAILURE

This error is recorded by the BUS ATTACHED DASD device driver in the event of a recovered soft read error.

DETAIL DATA

Sense Data The sense data consists of failure data which is analyzed by the Diagnostic Programs.

BADISK ERR2

Error Description: DISK OPERATION ERROR

This error is recorded by the BUS ATTACHED DASD device driver in the event of a hard read error.

Refer to the Detail Data under BADISK ERR 1.

BADISK ERR3

Error Description: DISK OPERATION FAILURE

This error is recorded by the BUS ATTACHED DASD device driver in the event of a soft equipment check.

Refer to the Detail Data under BADISK ERR 1.

BADISK ERR4

Error Description: DISK OPERATION ERROR

This error is recorded by the BUS ATTACHED DASD device driver in the event of a hard equipment check.

Refer to the Detail Data under BADISK ERR 1.

BADISK ERR5

Error Description: DISK FAILURE

This error is recorded by the BUS ATTACHED DASD device driver in the event of an attachment error.

Refer to the Detail Data under BADISK ERR 1.

BADISK ERR8

Error Description: DISK OPERATION ERROR

This error is recorded by the BUS ATTACHED DASD device driver in the event of a seek fault.

Refer to the Detail Data under BADISK ERR 1.

C327 Error Identifiers for the Error Log

C327 INTR

Error Description: C327 ERROR INTERRUPT

This error is logged by the 3270 Connection Adapter device driver when the control unit detects an error condition, the error is corrected, or the control unit is not responding because the co-axial (COAX) cable is disconnected.

DETAIL DATA

Reason Code This field indicates where the error occurred. Most of the errors are described in the publication *3270 Information Display System: 3274 Control Unit Description and Programmer's Guide*. The following errors could also occur:

603	Control unit is not responding (COAX disconnected).
670	Control unit is not responding (COAX disconnected).
671	Adapter card not functioning correctly.
774	Session is not available.

Line Address The number of the session which had the error (session numbers start with 1).

C327 START

Error Description: C327 START ERROR

This error is logged by the 3270 Connection Adapter device driver when a session with a host could not be started.

DETAIL DATA

Reason Code Reason the session could not be started. The following errors could also occur:

8200	Control unit is not responding (COAX disconnected).
8300	Adapter card is not functioning correctly.
8303	SNA control unit—not supported.
8306	Control unit does not support extended AEDV status.
8601	Session is not available.

Line Address The number of the session which had the error (session numbers start with 1).

CD-ROM Error Identifiers for the Error Log

CD-ROM ERR1

Error Description: OPTICAL DISK OPERATION ERROR

This error is logged by the CD-ROM device driver after retries to complete the original command have failed. This failure can result from a defective CD-ROM.

DETAIL DATA

Sense Data The sense data consists of failure data which is analyzed by the Diagnostic Programs.

CD-ROM ERR2

Error Description: OPTICAL DISK OPERATION ERROR

This error is logged by the CD-ROM device driver when a failure occurred and the operation succeeded after retries.

Refer to the Detail Data under CD-ROM ERR 2.

CD-ROM ERR3

Error Description: OPTICAL DISK DRIVE ERROR

This error is logged by the CD-ROM device driver after retries of the original command have failed. This error can result from disk drive failure.

Refer to the Detail Data under CD-ROM ERR 2.

CD-ROM ERR4

Error Description: OPTICAL DISK DRIVE ERROR

This error is logged by the CD-ROM device driver. A drive error occurred, but the command eventually completed after retries.

Refer to the Detail Data under CD-ROM ERR 2.

CD-ROM ERR5

Error Description: OPTICAL DISK DRIVE ERROR

This error is logged by the CD-ROM device driver. A command from the device driver issued to the adapter timed out and still failed to complete after retries.

Refer to the Detail Data under CD-ROM ERR 2.

CD-ROM ERR6

Error Description: OPTICAL DISK DRIVE ERROR

This error is logged by the CD-ROM device driver. A command issued from the device driver to the adapter timed out but eventually completed after retries.

Refer to the Detail Data under CD-ROM ERR 2.

CD-ROM ERR7

Error Description: IMPENDING STORAGE SUBSYSTEM FAILURE

This error is logged by the CD-ROM device driver after a failure occurred that was recovered automatically at the device level with no retries by the device driver.

Refer to the Detail Data under CD-ROM ERR 2.

CD-ROM ERR8

Error Description: UNDETERMINED ERROR

This error is logged by the CD-ROM device driver. An undefined error code was detected.

Refer to the Detail Data under CD-ROM ERR 2.

COM Error Identifiers for the Error Log

COM CFG ADPT

Error Description: CONFIGURATION FAILED: ADAPTER CONFIGURED

This error is logged by the TTY device driver during configuration if the adapter has already been configured.

DETAIL DATA

ERROR CODE System error code (see **sys/errno.h**).

COM CFG BUSI

Error Description: CONFIGURATION FAILED: BAD BUS ID

This error is logged by the TTY device driver if a bad bus ID is detected during configuration.

Refer to the Detail Data under COM CFG ADPT.

COM CFG BUSID

Error Description: CONFIGURATION FAILED: BUS ID OUT OF RANGE

This error is logged by the TTY device driver if a bad bus ID that is out of range is detected during configuration.

Refer to the Detail Data under COM CFG ADPT.

COM CFG BUST

Error Description: CONFIGURATION FAILED: BAD BUS TYPE

This error is logged by the TTY device driver if a bad bus type is detected during configuration.

Refer to the Detail Data under COM CFG ADPT.

COM CFG DEVA

Error Description: CONFIGURATION FAILED: DEVSWADD FAILED

This error is logged by the TTY device driver if call to **devswadd()** fails during configuration.

Refer to the Detail Data under COM CFG ADPT.

COM CFG DEV D

Error Description: CONFIGURATION FAILED: DEVSWDEL FAILED

This error is logged by the TTY device driver if call to **devswadd()** fails during configuration.

Refer to the Detail Data under COM CFG ADPT.

COM CFG DMA

Error Description: CONFIGURATION FAILED: DMA LEVEL CONFLICT

This error is logged by the TTY device driver if a DMA level conflict is detected during configuration.

Refer to the Detail Data under COM CFG ADPT.

COM CFG IFLG

Error Description: CONFIGURATION FAILED: BAD INTERRUPT FLAG

This error is logged by the TTY device driver if a bad interrupt flag is detected during configuration.

Refer to the Detail Data under COM CFG ADPT.

COM CFG ILVL

Error Description: CONFIGURATION FAILED: BAD INTERRUPT LEVEL

This error is logged by the TTY device driver if a bad interrupt level is detected during configuration.

Refer to the Detail Data under COM CFG ADPT.

COM CFG INTR

Error Description: CONFIGURATION FAILED: INTERRUPT PRIORITY

This error is logged by the TTY device driver if bad interrupt priority is detected during configuration.

Refer to the Detail Data under COM CFG ADPT.

COM CFG MNR

Error Description: CONFIGURATION FAILED: BAD MINOR NUMBER

This error is logged by the TTY device driver if a bad minor device number is detected during configuration.

Refer to the Detail Data under COM CFG ADPT.

COM CFG NADP

Error Description: CONFIGURATION FAILED: ADAPTER NOT PRESENT

This error is logged by the TTY device driver during configuration if adapter-not-present is detected.

Refer to the Detail Data under COM CFG ADPT.

COM CFG PIN

Error Description: CONFIGURATION FAILED: PINCODE FAILED

This error is logged by the TTY device driver if call to **pincode()** fails during configuration.

Refer to the Detail Data under COM CFG ADPT.

COM CFG PORT

Error Description: CONFIGURATION FAILED: PORT CONFIGURED

This error is logged by the TTY device driver during configuration if the port has already been configured.

Refer to the Detail Data under COM CFG ADPT.

COM CFG RESID

Error Description: CONFIGURATION FAILED: RESID NOT CORRECT

This error is logged by the TTY device driver if bad residual count is detected during configuration.

Refer to the Detail Data under COM CFG ADPT.

COM CFG SLIH

Error Description: CONFIGURATION FAILED: I_INIT OF SLIH FAILED

This error is logged by the TTY device driver if call to **i_init()** fails during configuration.

Refer to the Detail Data under COM CFG ADPT.

COM CFG UIO

Error Description: CONFIGURATION FAILED: RESID NOT CORRECT

This error is logged by the TTY device driver during configuration if **uiomove()** fails with incorrect residual.

Refer to the Detail Data under COM CFG ADPT.

COM CFG UNK

Error Description: CONFIGURATION FAILED: BAD ADAPTER TYPE

This error is logged by the TTY device driver if bad adapter type is detected during configuration.

Refer to the Detail Data under COM CFG ADPT.

COM CFG UNPIN

Error Description: CONFIGURATION FAILED: UNPINCODE FAILED

This error is logged by the TTY device driver if call to **unpincode()** fails during configuration.

Refer to the Detail Data under COM CFG ADPT.

COM MEM SLIH

Error Description: CAN NOT ALLOCATE MEMORY: SLIH STRUCTURE

This error is logged by the TTY device driver if **malloc()** for SLIH structure fails.

Refer to the Detail Data under COM CFG ADPT.

COM PERM PIO

Error Description: PIO EXCEPTION

This error is logged by the TTY device driver if a programming input or output exception has occurred, indicating possible adapter failure.

DETAIL DATA

PIO csr register

PIO channel status register.

PIO dsisr register

PIO data storage interrupt status register.

PIO srval register

PIO segment register contents.

PIO dar register

PIO data address register.

Adapter Check Status

Adapter check status.

COM PERM SLIH

Error Description: PIO EXCEPTION

This error is logged by the TTY device driver if permanent PIO error is detected.

DETAIL DATA**PIO csr register**

PIO channel status register.

PIO dsisr register

PIO data storage interrupt status register.

PIO srval register

PIO segment register contents.

PIO dar register

PIO data address register.

Adapter Check Status

Adapter check status.

Additional information

Additional failure data which should be made available to the service organization if this problem requires a service call.

COM PIN SLIH

Error Description: CAN NOT PIN MEMORY: SLIH STRUCTURE

This error is logged by the TTY device driver if **pin()** for slih structure fails.

Refer to the Detail Data under COM CFG ADPT.

COM TEMP PIO

Error Description: PIO EXCEPTION

This error is logged by the TTY device driver if a temporary PIO error is detected.

DETAIL DATA**PIO csr register**

PIO channel status register.

PIO dsisr register

PIO data storage interrupt status register.

PIO srval register

PIO segment register contents.

PIO dar register

PIO data address register.

Adapter Check Status

Adapter check status.

Additional information

Additional failure data which should be made available to the service organization if this problem requires a service call.

CD-ROM or DISK Error Identifiers for the Error Log

DISK ERR1

Error Description: CD-ROM or DISK DRIVE OPERATION ERROR

This error is recorded by the SCSI disk device driver in the event of a media error.

DETAIL DATA

Sense Data The sense data consists of failure data which is analyzed by the Diagnostic Programs.

DISK ERR2

Error Description: CD-ROM or DISK DRIVE FAILURE

This error is recorded by the SCSI disk device driver in the event of a physical hardware error.

DETAIL DATA

Sense Data The sense data consists of failure data which is analyzed by the Diagnostic Programs.

DISK ERR3

Error Description: CD-ROM or DISK DRIVE FAILURE

This error is recorded by the SCSI disk device driver in the event of an adapter detected failure.

DETAIL DATA

Sense Data Sense data is not applicable for this error. Zeros are recorded.

DISK ERR4

Error Description: IMPENDING STORAGE SUBSYSTEM FAILURE

This error is recorded by the SCSI disk device driver in the event of a recovered error. Either the device or the device driver recovered the data.

DETAIL DATA

Sense Data The sense data consists of failure data which is analyzed by the Diagnostic Programs.

DISK ERR5

Error Description: UNDETERMINED ERROR

This error is recorded by the SCSI disk device driver in the event of an unknown failure.

DETAIL DATA

Sense Data Sense data is not applicable for this error. Zeros are recorded.

DISKETTE Error Identifiers for the Error Log

DISKETTE ERR1

Error Description: DISKETTE OPERATION ERROR

This error is logged by the diskette device driver if a diskette permanent error occurs.

DETAIL DATA

Sense Data The sense data consists of failure data which is analyzed by the Diagnostic Programs.

DISKETTE ERR2

Error Description: DISKETTE DEVICE FAILURE

This error is logged by the diskette device driver if a diskette timeout error occurs.

Refer to Detail Data under DISKETTE ERR1.

DISKETTE ERR3

Error Description: DISKETTE MEDIA ERROR

This error is logged by the diskette device driver if a diskette media error occurs.

Refer to Detail Data under DISKETTE ERR1.

DISKETTE ERR4

Error Description: DISKETTE OPERATION ERROR

This error is logged by the diskette device driver if an undetermined diskette error occurs.

Refer to Detail Data under DISKETTE ERR1.

DISKETTE ERR5

Error Description: INPUT/OUTPUT DEVICE ERROR

This error is logged by the diskette device driver if a temporary diskette PIO error occurs.

Refer to Detail Data under DISKETTE ERR1.

DISKETTE ERR6

Error Description: INPUT/OUTPUT DEVICE ERROR

This error is logged by the diskette device driver if a permanent diskette PIO error occurs.

Refer to Detail Data under DISKETTE ERR1.

ENT Error Identifiers for the Error Log

ENT ERR1

Error Description: ADAPTER ERROR

This error is logged by the Ethernet device handler for the following permanent Ethernet adapter hardware errors:

- Mismatch between firmware version in microcode and ROS level from the vital product data (VPD).
- First start command to the adapter failed to complete in a specified amount of time.
- One or more of the fields in the VPD is invalid.
- Microchannel bus I/O access failure.

DETAIL DATA

Sense Data The sense data consists of failure data which is analyzed by the Diagnostic Programs.

ENT ERR2

Error Description: COMMUNICATION PROTOCOL ERROR

This error is logged by the Ethernet device handler for the following temporary Ethernet adapter hardware errors:

- Adapter detected a parity error and reported this error to the device handler.
- One of the following transmission errors occurred: Maximum Collisions, FIFO Underrun, Carrier Sense Lost, Clear To Send Lost, Transmit Timeout, Packet Too Short, or Packet Too Large.
- Microchannel bus I/O access failure.

Refer to Detail Data under ENT ERR1.

ENT ERR3

Error Description: ADAPTER ERROR

This error is logged by the Ethernet device handler in the event of one of the following permanent adapter firmware errors:

- Adapter **Execute** command returned with error bit set.
- Adapter **Execute** command "Report Configuration" returned invalid data.

Refer to Detail Data under ENT ERR1.

ENT ERR4

Error Description: ADAPTER ERROR

- Incorrect VPD data.

Refer to Detail Data under ENT ERR1.

ENT ERR5

Error Description: RESOURCE UNAVAILABLE

This error is logged by the Ethernet device handler when one of the following system errors is detected by the Ethernet device handler:

- DMA kernel facilities failed.
- DMA region facilities failed.
- Receive buffer facilities (**mbuf**) failed.

Refer to Detail Data under ENT ERR1.

ENT ERR6

Error Description: CSMA/CD LAN COMMUNICATIONS LOST

This error is logged by the Ethernet device handler when an alert for lost data is received.

Refer to Detail Data under ENT ERR1.

EPOW Error Identifiers for the Error Log

EPOW RES

Error Description: ELECTRICAL POWER RESUMED

This error is logged by the EPOW (Early Power Off Warning) interrupt indicating that power resumed.

DETAIL DATA

Power Status Register

Contents of the power status register.

EPOW SUS

Error Description: LOSS OF ELECTRICAL POWER

This error is logged by the EPOW (Early Power Off Warning) interrupt indicating that primary power is about to be lost.

DETAIL DATA

Power Status Register

Contents of the power status register.

ERRLOG Error Identifiers for the Error Log

ERRLOG OFF

Error Description: ERRDEMON TURNED OFF

This error is logged by the error daemon when the error logging is stopped. The system automatically turns off error logging during shutdown.

ERRLOG ON

Error Description: ERRDEMON TURNED ON

This error is logged by the error daemon when the error logging is started. The system automatically turns on error logging during initialization.

EU Error Identifiers for the Error Log

EU BAD ADPT

Error Description: EXPANSION UNIT ERROR

This error is logged by the Async Expansion Unit if a bad adapter is detected during configuration.

DETAIL DATA

Expansion Unit Slot Number

The expansion unit slot containing the bad adapter.

EU CFG BUSY

Error Description: CONFIGURATION FAILED: IN USE

This error is logged by the Async Expansion Unit if a configuration operation fails because the device is already in use.

EU CFG GONE

Error Description: CONFIGURATION FAILED: UNCONFIGURED

This error is logged by the Async Expansion Unit device driver if a configuration operation fails because the device is already unconfigured.

EU CFG HERE

Error Description: CONFIGURATION FAILED: ALREADY CONFIGURED

This error is logged by the Async Expansion Unit device driver if a configuration operation fails because the device is already configured.

EU CFG NADP

Error Description: CONFIGURATION FAILED: ADAPTER MISSING

This error is logged by the Async Expansion Unit device driver if a configuration operation fails because the adapter is not present.

EU CFG NPLN

Error Description: CONFIGURATION FAILED: ADAPTER MISSING

This error is logged by the Async Expansion Unit device driver if the adapter cannot be detected during configuration.

EU DIAG ACC

Error Description: CANNOT PERFORM DESTRUCTIVE DIAGNOSTICS

This error is logged by the Async Expansion Unit device driver if diagnostics are requested while the device is in use.

EU DIAG MEM

Error Description: CAN NOT ALLOCATE MEMORY: WRAP BUFFER

This error is logged by the Async Expansion Unit device driver if **malloc()** for the wrap buffer fails.

Exceptions/Interrupts Error Identifiers for the Error Log

CHECKSTOP

Error Description: CHECKSTOP

This error is logged when the **errdaemon** is started and when the checkstop count in nonvolatile random access memory (NVRAM) indicates that a checkstop has occurred. The **errdaemon** copies the checkstop data from NVRAM to a file and records the path name of the file and the checkstop count in the error log entry. The **errdaemon** resets the checkstop count to zero.

DETAIL DATA

Checkstop Count

The value of the checkstop count from NVRAM.

Checkstop File Pathname

Path name of file where checkstop data was saved.

CORE DUMP

Error Description: SOFTWARE PROGRAM ABNORMALLY TERMINATED

This error is logged when a software program abnormally terminates and causes a core dump.

DETAIL DATA

Signal Number The decimal value of the signal number received at program termination.

User's Process ID

The decimal value of the user ID on which the terminated program was running.

File System Serial Number

The decimal value of the file system serial number for the core file generated.

I-node Number The decimal value of the i-node number relating to the core file.

The file-system serial number is assigned to file systems at mount time and represents the order in which mounts occurred. This serial number identifies the file system in which the core dump occurred. The i-node number identifies the directory that contains the core dump file.

Mounted file systems are associated with a linked list of virtual file system (VFS) structures. You can locate the corresponding VFS serial number as follows:

- Write a program to list the mounted file systems and call the **stat** subroutine on each one of them. Then, compare the `st_vfs` field of each file system to the VFS serial number from the error log.

OR

- Execute the **crash** command with the **vfs** subcommand to list the mounted file systems. Then, compare the values in the NUMBER column of the VFS table with the VFS serial number from the error log.

Note: The file-system serial number is not guaranteed to be useful following a system restart since it depends on the mount sequence.

CORRECTED SCRUB

Error Description: MEMORY SCRUBBING CORRECTED ECC ERROR

DETAIL DATA

Single Bit Signature/Syndrome Register

Hardware register containing detailed information about the error.

Single Bit Status Register

Hardware register containing the error type.

Single Bit Address Register

Word address of where the error occurred.

DMA ERR

Error Description: UNDETERMINED ERROR

This error is logged for an undetermined DMA error. Check the error log for a device or adapter DMA error.

DETAIL DATA

Bus Number Virtual memory handle I/O channel control.

Error Code Channel Status Register.

DOUBLE PANIC

Error Description: SOFTWARE PROGRAM ABNORMALLY TERMINATED

This error is logged by the kernel panic routine when a second system panic occurs while processing the first one.

DETAIL DATA

Panic String This is a string corresponding to the last kernel print before the first panic. If the panic routine was called by the assert routine, this string will contain the file name and line number within the module where assert was called.

Panic String This is the panic string for the second panic.

DCR IOCC

Error Description: DATA STORAGE INTERRUPT, IOCC

This error is logged by the interrupt handler for the I/O channel controller (IOCC) type of Data Storage Interrupt.

DETAIL DATA

Data Storage Interrupt Status Register (DSISR)

Defines the cause of the Data Storage Interrupt.

Data Status Address Register (DSAR)

Address of the storage access that caused the Data Storage Interrupt.

Segment Register (SEGREG)

Segment register of unit causing exception.

Channel Status Register 15 (CSR15)

Indicates where the error occurred.

DSI PROC

Error Description: DATA STORAGE INTERRUPT, PROCESSOR

This error is logged by the interrupt handler for a processor type of Data Storage Interrupt.

DETAIL DATA

Data Storage Interrupt Status Register

Defines the cause of the Data Storage Interrupt.

Data Status Address Register

Address of the storage access that caused the Data Storage Interrupt.

Segment Register

Segment register of unit causing exception.

DSI SCU

Error Description: DATA STORAGE INTERRUPT, SCU

This error is recorded by the interrupt handler for the storage control unit type of Data Storage Interrupt.

DETAIL DATA

Data Storage Interrupt Status Register

Defines the cause of the Data Storage Interrupt.

Data Status Address Register

Address of the storage access that caused the Data Storage Interrupt.

Data Storage Interrupt Reason Register

Indicates reason for Data Storage Interrupt.

Segment Register

Segment register of unit causing exception.

DSI SLA

Error Description: DATA STORAGE INTERRUPT, SLA

This error is logged by the interrupt handler when a serial link adapter type of Data Storage Interrupt occurs.

DETAIL DATA

Data Storage Interrupt Status Register

Defines the cause of the Data Storage Interrupt.

Data Status Address Register

Address of the storage access that caused the Data Storage Interrupt.

Segment Register

Segment register of unit causing exception.

DUMP

Error Description: DUMP DEVICE ERROR

This error is logged by the dump pseudo-device driver when it is unable to open the dump device.

DETAIL DATA

Major/Minor Device Number

Major and minor device numbers of the dump device.

Error Code System error code (see **sys/errno.h**).

DUMP STATS

Error Description: SYSTEM DUMP

This error includes the information included in the **sysdumpdev -L** command.

DETAIL DATA

Major Device Number

Number of the major device.

Minor Device Number

Number of the minor device.

Dump Size Size of the dump in bytes.

Time Time at which the dump occurred.

Dump Type Primary or secondary (1 or 2).

Dump Status The last digit of the dump LED code.

EXCHECK DMA

Error Description: External check, DMA

This error is logged by the interrupt handler if a direct memory access (DMA) type of external check occurs. It can indicate that an unknown location in memory has gone bad.

DETAIL DATA

External Check Error Status Register

Indicates source and type of external check.

External Check Error Address Register

Address of non-error correction control (ECC) type of error indicated in EESR.

External Check ECC Address Register

Address of ECC type of error indicated in EESR.

Memory Configuration Registers

Configuration registers 0, 2, 6, 8, 10, 12, 14.

EXCHECK SCRUB

Error Description: OPERATOR NOTIFICATION

This error indicates that an unrecoverable double-bit memory error has occurred.

DETAIL DATA

External Check Error Status Register

Indicates source and type of external check.

External Check Error Address Register

Address of non-ECC type of error indicated in EESR.

External Check ECC Address Register

Address of ECC type of error indicated in EESR.

Memory Configuration Registers

Configuration registers 0, 2, 6, 8, 10, 12, 14.

FLPT UNAVAIL

Error Description: FLOATING POINT UNAVAILABLE

This error is logged by the interrupt handler when the Floating Point Unavailable Interrupt occurs while in kernel mode. This can be caused by an attempted use of the floating point processor while it is in an unavailable state.

DETAIL DATA

Segment Register

Segment register of the instruction that caused the exception.

Machine Status Save/Restore Register 0

SRR0 is used to save machine status on interrupts and to restore machine status when a Return From Interrupt instruction is executed. In general, SRR0 contains the instruction address which caused the interrupt or the instruction address to return to after an interrupt is serviced. For this interrupt, SRR0 contains the address of the instruction that caused the Floating Point Unavailable interrupt.

Machine State Register

The state of the processor.

INTR ERR

Error Description: UNDETERMINED ERROR

This error is logged for undetermined interrupt error.

DETAIL DATA

Bus Number Virtual memory handle (IOCC).

Bus Status Code

Interrupt Level.

Error Code EiS register.

ISI PROC

Error Description: INSTRUCTION STORAGE INTERRUPT

This error is logged by the interrupt handler when Instruction storage Interrupt occurs.

DETAIL DATA

Instruction Storage Interrupt Status Register

Defines the cause of the Instruction Storage Interrupt.

Instruction Storage Save/Restore Register 0

SRR0 is used to save machine status on interrupts and to restore machine status when a Return From Interrupt instruction is executed. In general, SRR0 contains the instruction address which caused the interrupt or the instruction address to return to after an interrupt is serviced. For this interrupt, SRR0 contains the address of the instruction that caused the Floating Point Unavailable interrupt.

Segment Register

Segment register of the instruction that caused the exception.

KERNEL PANIC

Error Description: SOFTWARE PROGRAM ABNORMALLY TERMINATED

This error is recorded by the kernel panic routine. Throughout the kernel there are direct calls to panic or indirect calls via the assert routine. These calls are initiated when the kernel gets into a corrupted state that it cannot recover from.

DETAIL DATA

Assert String If the panic routine was called by the assert routine, this string contains the file name and line number within the module where assert was called.

Panic String This is a string corresponding to the last kernel print before the panic.

MACHINECHECK

This error is logged by the machine check handler.

DETAIL DATA**Machine Check Error Status Register**

Contents of MESR.

Machine Check Error Address Register

Contents of MEAR.

MEMORY

Error Description: MEMORY FAILURE

This error is logged during system configuration if the IPL ROS memory test detected a memory problem.

DETAIL DATA

Failing Module Failing memory module.

MISC ERR

Error Description: MISCELLANEOUS INTERRUPT

This error is logged by the Miscellaneous Interrupt handler for I/O bus timeout or channel check.

DETAIL DATA**Bus Status Register**

Contents of Bus Status Register.

Miscellaneous Interrupt Register

Contents of Miscellaneous Interrupt Register.

PROGRAM INT

Error Description: PROGRAM INTERRUPT

This error is logged by the interrupt handler when Program Interrupt occurs while in kernel mode.

DETAIL DATA

Segment Register

Segment register of the instruction that caused the exception.

Machine Status Save/Restore Register 0

SRR0 is used to save machine status on interrupts and to restore machine status when a Return From Interrupt instruction is executed. In general, SRR0 contains the instruction address which caused the interrupt or the instruction address to return to after an interrupt is serviced. For this interrupt, SRR0 contains the address of the instruction that caused the Floating Point Unavailable interrupt.

Machine Status Save/Restore Register 1

SRR1 is used to save machine status on interrupts and to restore machine status when a Return From Interrupt instruction is executed. When an interrupt occurs, bits 0–15 of SRR1 are loaded with information specific to each interrupt. Bits 16–31 of the MSR are placed in bits 16–31 of SRR1.

Machine State Register

The state of the processor.

REBOOT ID

Error Description: System shut down by user.

This error is logged when the **shutdown** command is invoked.

DETAIL DATA

User ID User ID of session that invoked the **shutdown** command.

Reboot Type Soft, hard, or timed reboot.

Time to Reboot

Only used for type `timed reboot`; otherwise, the value is 0.

SYS RESET

Error Description: System Reset Interrupt received.

This error is logged by the interrupt handler when the Reset button on the control panel is used to reboot the system.

DETAIL DATA

Keymode Switch Position at Boottime

`service` or `normal`.

Keymode Switch Position Currently

`service` or `normal`.

FDDI Error Identifiers for the Error Log

FDDI ADAP CHECK

Error Description: ADAPTER ERROR

This error indicates that an adapter check has occurred. If the fiber distributed data interface (FDDI) device was connected to the network when this error occurred, the FDDI device driver will go into Network Recovery Mode in an attempt to recover from the error. The device will be temporarily unavailable during the recovery procedures. User intervention is not required to reactivate the device.

DETAIL DATA

Errhead	The name of the error being logged.
File	The line number and file name of the detecting module.
POS	The current POS register settings of the device at the time the error occurred.
SRC_Addr	The current source address in use by the FDDI device.
Attach_Class	The attachment class of the FDDI device. A value of 0x0000 indicates a single attachment station, while a value of 0x0001 indicates a dual attachment station.
MCERR	The last micro channel error detected by the FDDI device driver. Possible values are specified in the <code>/usr/include/sys/dma.h</code> file.
IOX	The last PIO exception code by the FDDI device driver. Possible values are specified in the <code>/usr/include/sys/m_except.h</code> file.
NRM	The last Network Recovery Mode entry status block.
LS	The link statistics of the adapter and self-test results.
SMT_Control	The SMT control word.
SMT_Event_Mask	The SMT event mask word.
SMT_Error_Mask	The SMT error mask word.
State	The device state at the time of the error.

FDDI BYPASS

Error Description: ADAPTER ERROR

This error indicates that the optical bypass switch is in a stuck condition. User intervention is not required for this error.

Refer to the Detail Data under FDDI ADAP CHECK.

FDDI DOWN

Error Description: ADAPTER ERROR

This error indicates that the FDDI device is no longer functional due to a fatal error, and the error which caused the device to shutdown appears before this error log entry. User

intervention is required to activate the device. See the description of the fatal error log entry for possible actions.

Refer to the Detail Data under FDDI ADAP CHECK.

FDDI DWNLD

Error Description: MICROCODE PROGRAM ABNORMALLY TERMINATED

This error indicates that the microcode download to the FDDI adapter has failed. If this error occurs during the configuration of the device, the configuration of the device fails. The device will be temporarily unavailable during the recovery procedures. User intervention is not required to reactivate the device.

Refer to the Detail Data under FDDI ADAP CHECK.

FDDI LLC DISABLE

Error Description: LAN ERROR

This error indicates that logical link control (LLC) services of the FDDI device have been disabled by a remote station. LLC services (the transmitting and receiving of LLC data) will be unavailable until LLC services are enabled remotely. The LAN administrator responsible for this LAN should be contacted.

Refer to the Detail Data under FDDI ADAP CHECK.

FDDI LLC ENABLE

Error Description: ERROR RESOLVED

This error indicates that LLC services for the FDDI device have been enabled remotely. LLC services are now available.

Refer to the Detail Data under FDDI ADAP CHECK.

FDDI MC ERR

Error Description: ADAPTER ERROR

This error indicates that the FDDI device driver has detected a Micro Channel error. The device driver will initiate recovery logic in an attempt to recover them from the error. User intervention is not required for this error.

Refer to the Detail Data under FDDI ADAP CHECK.

FDDI NOMBUFFS

Error Description: RESOURCE UNAVAILABLE

This error indicates that the FDDI device driver request for an **mbuf** structure was denied. A packet will be dropped when this error occurs. User intervention is not required for this error.

Refer to the Detail Data under FDDI ADAP CHECK.

FDDI PATH ERR

Error Description: ADAPTER ERROR

This error indicates that the FDDI adapter's path tests have failed. The FDDI device driver will initiate recovery logic in an attempt to recover from the error. The FDDI device will be temporarily unavailable during the recovery procedure. User intervention is not required to reactivate the device.

Refer to the Detail Data under FDDI ADAP CHECK.

FDDI PIO

Error Description: PIO EXCEPTION

This error indicates that the FDDI device driver has detected a program input/output error. The device driver will initiate recovery logic in an attempt to recover from the error. User intervention is not required for this error.

Refer to the Detail Data under FDDI ADAP CHECK.

FDDI PORT

Error Description: ADAPTER ERROR

This error indicates that a port on the FDDI device is in a stuck condition. The FDDI device will be temporarily unavailable during the recovery procedure. User intervention is not required to reactivate the device.

Refer to the Detail Data under FDDI ADAP CHECK.

FDDI RCV

Error Description: ADAPTER ERROR

This error indicates that an error occurred during the reception of a packet. The FDDI device driver will initiate recovery logic in an attempt to recover from the error. User intervention is not required for this error.

Refer to the Detail Data under FDDI ADAP CHECK.

FDDI RCVRY ENTER

Error Description: RECOVERY LOGIC INITIATED BY DEVICE

This error indicates that the FDDI device driver has entered Network Recovery Mode in an attempt to recover from an error. The error which caused the device to go into Network Recovery Mode also appears in the error log. The device will not be fully functional until the device driver has exited Network Recovery Mode. The FDDI device will be temporarily unavailable during the recovery procedure. User intervention is not required to reactivate the device.

Refer to the Detail Data under FDDI ADAP CHECK.

FDDI RCVRY EXIT

Error Description: PROBLEM RESOLVED

This error indicates that the FDDI device driver has successfully recovered from the error which caused the device to go into Network Recovery Mode. The device is now fully functional.

Refer to the Detail Data under FDDI ADAP CHECK.

FDDI RCVRY TERM

Error Description: ADAPTER ERROR

This error indicates that the FDDI device driver was unable to recover from the error which caused the device to go into Network Recovery Mode and has terminated the recovery logic. The termination of recovery logic may be due to a fatal error being detected or the last close to the device being received. If termination was due to a fatal error, that error appears in the

error log. The FDDI device will be temporarily unavailable during the recovery procedure. User intervention is not required to reactivate the device.

Refer to the Detail Data under FDDI ADAP CHECK.

FDDI RMV ADAP

Error Description: REMOVE ADAPTER COMMAND RECEIVED

This error indicates that the adapter received a disconnect command from a remote station. The FDDI device driver initiates shutdown of the device. The FDDI device will be temporarily unavailable during the recovery procedure. User intervention is not required to reactivate the device.

Refer to the Detail Data under FDDI ADAP CHECK.

FDDI SELF TEST

Error Description: LAN ERROR

This error indicates that the FDDI adapter has received a **run self-test** command from a remote station. The device is unavailable while the adapter self-tests. If the self-tests are successful, the FDDI device driver will initiate logic to reconnect to the network. Otherwise, the FDDI device driver will initiate shutdown of the device. The FDDI device will be temporarily unavailable during the recovery procedure. User intervention is not required to reactivate the device.

Refer to the Detail Data under FDDI ADAP CHECK.

FDDI SELFT ERR

Error Description: ADAPTER ERROR

This error indicates that the FDDI device self-tests have failed. The device is no longer functional due to the error. The FDDI device driver initiates shutdown of the device.

Refer to the Detail Data under FDDI ADAP CHECK.

FDDI TRACE

Error Description: ADAPTER ERROR

This error indicates that the FDDI adapter has detected a timeout of the trace operation on the ring. User intervention is not required for this error.

Refer to the Detail Data under FDDI ADAP CHECK.

FDDI TX ERR

Error Description: ADAPTER ERROR

This error indicates that the FDDI device driver has detected a transmission error. User intervention is not required for this error.

Refer to the Detail Data under FDDI ADAP CHECK.

FDDI USYS

Error Description: UNDETERMINED ERROR

This error indicates that an unknown system error was caught by an FDDI device driver. User intervention is not required for this error.

Refer to the Detail Data under FDDI ADAP CHECK.

FDDI XCARD

Error Description: ADAPTER ERROR

This error indicates that self-tests of the extender adapter have failed. Due to the failure, the device is no longer functional. User intervention is not required to reactivate the device.

Refer to the Detail Data under FDDI ADAP CHECK.

HCON Error Identifiers for the Error Log

WHP0001

Error Description: SOFTWARE PROGRAM ERROR
This error is logged by HCON if a memory allocation error occurs.

DETAIL DATA

File Name File name logged by HCON.
IPC Id IPC message queue ID.

WHP0002

Error Description: SOFTWARE PROGRAM ERROR
This error is logged by HCON if IPC message queue receive error occurs.
Refer to the Detail Data under WHP001.

WHP0003

Error Description: SOFTWARE PROGRAM ERROR
This error is logged by HCON if IPC message queue send error occurs.
Refer to the Detail Data under WHP001.

WHP0004

Error Description: SOFTWARE PROGRAM ERROR
This error is logged by HCON if IPC message queue create error occurs.
Refer to the Detail Data under WHP001.

WHP0005

Error Description: SOFTWARE PROGRAM ERROR
This error is logged by HCON if IPC message queue create error occurs.
Refer to the Detail Data under WHP001.

WHP0006

Error Description: SOFTWARE PROGRAM ERROR
This error is logged by HCON if IPC message queue stat error occurs.
Refer to the Detail Data under WHP001.

WHP0007

Error Description: SOFTWARE PROGRAM ERROR
This error is logged by HCON if IPC message queue set error occurs.
Refer to the Detail Data under WHP001.

WHP0008

Error Description: SOFTWARE PROGRAM ERROR

This error is logged by HCON if IPC message queue remove error occurs.
Refer to the Detail Data under WHP001.

WHP0009

Error Description: SOFTWARE PROGRAM ERROR

This error is logged by HCON if IPC shared segment attachment error occurs.
Refer to the Detail Data under WHP001.

WHP0010

Error Description: SOFTWARE PROGRAM ERROR

This error is logged by HCON if IPC shared segment detachment error occurs.
Refer to the Detail Data under WHP001.

WHP0011

Error Description: SOFTWARE PROGRAM ERROR

This error is logged by HCON if IPC shared segment allocation error occurs.
Refer to the Detail Data under WHP001.

WHP0012

Error Description: SOFTWARE PROGRAM ERROR

This error is logged by HCON if IPC shared segment start error occurs.
Refer to the Detail Data under WHP001.

WHP0013

Error Description: SOFTWARE PROGRAM ERROR

This error is logged by HCON if IPC shared segment set error occurs.
Refer to the Detail Data under WHP001.

WHP0014

Error Description: SOFTWARE PROGRAM ERROR

This error is logged by HCON if IPC shared segment remove error occurs.
Refer to the Detail Data under WHP001.

Integrated Ethernet Error Identifiers for the Error Log

IENT ERR1

Error Description: ADAPTER ERROR

This error indicates that the Ethernet controller is malfunctioning.

DETAIL DATA

Return Code The error return code as defined in the `/usr/include/sys/errno.h` file.

Status Code For internal use only.

Program Check Code
For internal use only.

IENT ERR2

Error Description: CONFIGURATION OR CUSTOMIZATION ERROR

This error indicates that the Ethernet device could not be activated because it could not obtain the necessary resources. The resources include DMA channels, interrupt level, bus memory space, and system memory space.

DETAIL DATA

Return Code The error return code as defined in the `/usr/include/sys/errno.h` file.

Status Code For internal use only.

IENT ERR3

Error Description: SOFTWARE DEVICE DRIVER

This error indicates that the Ethernet device experienced a microchannel error during normal operation. It is likely that data has been lost.

DETAIL DATA

Return Code For internal use only.

Status Code For internal use only.

Program Check Code
For internal use only.

IENT ERR4

Error Description:

This error indicates that the Ethernet driver is experiencing a shortage of system-wide mbuffers (clusters).

OR

The Ethernet driver recieved an invalid packet size.

OR

The Ethernet driver failed to free memory.

OR

The Ethernet driver failed an action command.

DETAIL DATA

Return Code

816 mbuffer/cluster shortage. Verify the mbuffer watermarks using the **no** command. A possible fix is to bump up the following watermarks until errors are no longer being reported (the tradeoff is pinned memory usage):

- **lowclust**
- **lowmbuf**
- **thewall**
- **mb_cl_hiwat**.

683 An invalid package size was received.

1407, 162 Memory could not be freed up.

1829 An action command failed.

Status Code The system control block command or status word.

Program Check Code

The return code.

For information concerning tuning system mbuffers, refer to the *AIX Version 3.2 Performance Monitoring and Tuning Guide*, SC23-2365.

IENT ERR5

Error Description: COMMUNICATIONS SUBSYSTEM FAILURE

This error indicates that a transmission problem has been encountered.

DETAIL DATA

Return Code The error return code, as defined in the `/usr/include/sys/entuser.h` file.

Status Code The transmit command block status word.

Program Check Code

The system control block status word.

LION Error Identifiers for the Error Log

LION BOX DIED

Error Description: LOST COMMUNICATION WITH 64-PORT CONCENTRATOR

This error is logged by the 64-port concentrator driver if communications with the concentrator are lost.

LION BUFFERO

Error Description: BUFFER OVERRUN: 64-PORT CONCENTRATOR

This error occurs when the hardware buffer in a 64-port concentrator is overrun.

LION CHUNKNUMC

Error Description: BAD CHUNK COUNT: 64-PORT CONTROLLER

This error occurs when the value for the number of characters in a chunk does not match the actual values in the buffer.

LION HRDWRE

Error Description: CANNOT ACCESS MEMORY ON 64-PORT CONTROLLER

This error is logged by the 64-port concentrator driver if it is unable to access memory on the 64-port controller.

LION MEM ADAP

Error Description: CANNOT ALLOCATE MEMORY: ADAP STRUCTURE

This error is logged by the 64-port concentrator driver if **malloc()** for the **adap** structure fails.

LION MEM LIST

Error Description: CANNOT ALLOCATE MEMORY: TTYP_T LIST

This error is logged by the 64-port concentrator driver if **malloc()** for the **ttyp_t list** structure fails.

LION PIN ADAP

Error Description: CANNOT PIN MEMORY: ADAP STRUCTURE

This error is logged by the 64-port concentrator driver if **pin()** for the **adap** structure fails.

LION UNKCHUNK

Error Description: UNKNOWN ERROR CODE FROM THE 64-PORT CONCENTRATOR.

DETAIL DATA

ERROR CODE Number of characters in the chunk received.

LVM Error Identifiers for the Error Log

CMDLVM

Error Description: DISK OPERATION ERROR

This error is logged by the logical volume manager (LVM).

DETAIL DATA

Physical Volume

ID of physical volume where error occurred.

LVM BBDIR90

Error Description: BAD BLOCK DIRECTORY OVER 90% FULL

This message is issued when the bad block directory is over 90% full during an operation to update it. When this directory is full, bad blocks cannot be relocated.

DETAIL DATA

Current Number Of Entries

Number of entries in the bad block directory.

LVM BBDIRBAD

Error Description: BAD BLOCK RELOCATION FAILURE—PV NO LONGER RELOCATING
NEW BAD BLOCKS

A bad block relocation attempt by the LVM has failed. The bad block directory on the physical volume has been corrupted.

DETAIL DATA

Block Number Number of the bad block.

LVM BBDIRERR

Error Description: BAD BLOCK RELOCATION FAILURE—PV NO LONGER RELOCATING
NEW BAD BLOCKS

An update operation on the bad block directory has failed due to the reason indicated by the error code. Any bad blocks on this DASD that have not already been relocated will not be relocated.

DETAIL DATA

Directory Operation

The directory operation, if any, the system was working on at the time of the error.

LVM BBDIRFUL

Error Description: BAD BLOCK RELOCATION FAILURE

A bad block relocation operation has failed because the bad block directory on this DASD is full. Any bad blocks on this DASD that have not already been relocated will not be relocated.

LVM BBEPPOOL

Error Description: BAD BLOCK RELOCATION FAILURE—PV NO LONGER RELOCATING
NEW BAD BLOCKS

The bad block relocation pool has no free blocks left. Therefore, any bad blocks on this DASD that have not already been relocated will not be relocated.

LVM BBFAIL

Error Description: BAD BLOCK RELOCATION FAILURE—PV NO LONGER RELOCATING NEW BAD BLOCKS

A bad block relocation attempt by the LVM failed due to a cause other than a media error. The cause is indicated by the error code.

DETAIL DATA

Block Number Number of the bad block.

LVM BBRELMAX

Error Description: BAD BLOCK RELOCATION FAILURE—PV NO LONGER RELOCATING NEW BAD BLOCKS

An attempt at hardware relocation followed by the maximum number of attempts at software relocation have all failed for the stated bad block. No more relocations will be attempted on this physical volume.

DETAIL DATA

Block Number Number of the bad block.

LVM HWFAIL

Error Description: HARDWARE DISK BLOCK RELOCATION FAILED

A hardware relocation operation initiated by LVM for a bad disk block has been unsuccessful. This could be due to hardware limitations.

DETAIL DATA

Block Number Number of the bad block.

LVM HWREL

Error Description: HARDWARE DISK BLOCK RELOCATION ACHIEVED

A hardware disk block relocation initiated by the LVM was successful.

DETAIL DATA

Block Number Number of the bad block.

LVM MISSPVADDED

Error Description: PHYSICAL VOLUME DEFINED AS MISSING

During the varyon procedure for a volume group, a physical volume was missing. The physical volume could be powered off or physically missing.

LVM MISSPVRET

Error Description: PHYSICAL VOLUME IS NOW ACTIVE

A previously missing or removed physical volume has become active.

LVM MWCWFAIL

Error Description: MIRROR CACHE WRITE FAILED

A write operation to update the mirror write consistency cache failed.

DETAIL DATA

Block Number Number of the bad block.

LVM SA FRESHPP

Error Description: PHYSICAL PARTITION MARKED ACTIVE

A formerly stale copy of a mirrored partition has been marked fresh. This could be due to its location on a formerly missing physical volume that became available and for which the **syncvg** command has been issued.

DETAIL DATA

Physical Volume Device Major/Minor

The device number of the major/minor physical volume.

Logical Volume Device Major/Minor

The device number of the major/minor logical volume.

LVM SA WRERR

Error Description: FAILED TO WRITE VOLUME GROUP STATUS AREA

A write operation to update the volume group status area did not complete successfully. The volume group status area contains the status of mirrored partitions and of the physical volumes.

LVM SA PVMISS

Error Description: PHYSICAL VOLUME DECLARED MISSING

A physical volume is missing while the system is writing a volume group status area (VGSA). The VGSA contains the status of mirrored partitions and of physical volumes.

LVM SA STALEPP

Error Description: PHYSICAL PARTITION MARKED STALE

A copy of a mirrored partition has been marked stale. This could be due to its location on a missing physical volume at the time the partition is updated.

DETAIL DATA

Physical Volume Device Major/Minor

The device number of the major/minor physical volume.

Logical Volume Device Major/Minor

The device number of the major/minor logical volume.

LVM SA QUORCLOSE

Error Description: QUORUM LOST, VOLUME GROUP CLOSING

If a plurality of volume group status areas are not active, then the volume group is shut down. The check of the quorum count is done whenever a physical volume is missing during a volume group status area update.

DETAIL DATA

Quorum Count The number of the status areas that reside in the volume group.

Active Count The number of active status areas in the volume group.

LVM SWREL

Error Description: SOFTWARE DISK BLOCK RELOCATION ACHIEVED

A software disk block relocation initiated by the LVM was successful.

DETAIL DATA

Block Number Number of the bad block.

MEM Error Identifiers for the Error Log

MEM1

Error Description: MEMORY FAILURE

This error indicates the absence of a memory card out of a memory card pair.

DETAIL DATA

Card Slot The card slots of the affected memory cards.

MEM2

Error Description: MEMORY FAILURE

This error indicates the failure of up to two SIMMs on a memory card.

DETAIL DATA

Card Slot The card slot of the affected memory card.

Memory SIMM Number
The identification number of the failing SIMM or SIMMs.

MEM3

Error Description: MEMORY FAILURE

This error indicates the failure of a memory card out of a memory card pair.

DETAIL DATA

Card Slot The card slot of the affected memory card.

MPQP Error Identifiers for the Error Log

MPQP ADPERR

Error Description: MPQP ADAPTER ERROR

This error is logged by the MPQP device driver when invalid conditions are returned by the adapter code or the adapter is not functioning.

DETAIL DATA

File Name Module and line number where the error occurred.

Port Number Port number generating the condition.

Command Command generating the condition.

Receive Error Indicates the type of error that caused the receive error threshold to be exceeded. Refer to **sys/mpqp.h** for the codes that correspond to each error type.

MPQP ASWCHK

Error Description: MPQP ADAPTER SOFTWARE CHECKSUM ERROR.

This error is logged by the MPQP device driver when checksum on adapter software did not compare.

Refer to Detail Data under MPQP ADPERR.

MPQP BFR

Error Description: MPQP BUFFER ALLOCATION

This error is logged by the MPQP device driver when the system is unable to allocate a needed memory resource to the driver.

Refer to Detail Data under MPQP ADPERR.

MPQP CTSDRP

Error Description: MPQP CTS DROPPED DURING TRANSMIT

This error is logged by the MPQP device driver when CTS (clear to send) is dropped while a transmission is in progress.

Refer to Detail Data under MPQP ADPERR.

MPQP CTSTO

Error Description: COMMUNICATION PROTOCOL ERROR

This error is logged by the MPQP device driver when CTS (clear to send) fails to come on during transmission.

Refer to Detail Data under MPQP ADPERR.

MPQP DSRDRP

Error Description: MPQP DSR DROPPED

This error is logged by the MPQP device driver when DSR (data set ready) is dropped while DTR (data terminal ready) is still on.

Refer to Detail Data under MPQP ADPERR.

MPQP DSROFFTO

Error Description: MPQP DSR OFF TIMEOUT

This error is caused by starting a call while the DSR (data set ready) is on. If the DSR is on before the adapter drives DTR, the adapter assumes the previous call is still in progress. This is a security measure to ensure the previous session was terminated before the next call starts.

Refer to Detail Data under MPQP ADPERR.

MPQP DSRTO

Error Description: MPQP DSR TIMEOUT

This error is logged by the MPQP device driver when DSR (data set ready) fails to come on. It is a result of the modem failing to signal a ready condition.

Refer to Detail Data under MPQP ADPERR.

MPQP IPLTO

Error Description: MPQP INITIAL PROGRAM LOAD TIMEOUT

This error is logged by the MPQP device driver.

Refer to Detail Data under MPQP ADPERR.

MPQP QUE

Error Description: MPQP UNABLE TO ACCESS QUEUE

This error is logged by the MPQP device driver when it has been unable to access one of the command or response queues maintained by the adapter or driver code.

Refer to Detail Data under MPQP ADPERR.

MPQP RCVERR

Error Description: MPQP RECEIVE ERROR THRESHOLD EXCEEDED

If data is not received correctly, the driver logs an error. The application may recover by retransmitting. A certain amount of receive errors may be normal and is not cause for concern unless the errors become excessive and significantly degrade throughput.

Refer to Detail Data under MPQP ADPERR.

MPQP RCVOVR

Error Description: MPQP RECEIVE OVERRUN

This error is logged by the MPQP device driver when the driver is unable to provide adapter code with transfer buffers fast enough to keep up with incoming data, possibly resulting in data loss

Refer to Detail Data under MPQP ADPERR.

MPQP X21CECLR

Error Description: MPQP X21 CALL ESTABLISHMENT CLEAR

This error is logged by the MPQP device driver if the network has cleared a call, usually due to an error. If CPS data is returned, consult the CPS number to find out the reason for the clear.

Refer to Detail Data under MPQP ADPERR.

MPQP X21CPS

Error Description: MPQP X21 CALL PROGRESS SIGNAL

This error is logged by the MPQP device driver when an X.21 call progress signal is received.

Refer to Detail Data under MPQP ADPERR.

MPQP X21DTCLR

Error Description: MPQP X21 DATA TRANSFER CLEAR

This error is logged by the MPQP device driver when an unexpected X.21 clear is received during data transfer state.

Refer to Detail Data under MPQP ADPERR.

MPQP X21TO

Error Description: MPQP X21 TIMEOUT

This error is logged by the MPQP device driver if the X.21 subroutine does not complete because the timer expired. The timer is indicated in the detail data.

Refer to Detail Data under MPQP ADPERR.

MPQP XFTO

Error Description: MPQP TRANSMIT FAILSAFE TIMEOUT

This error is logged by the MPQP device driver if transmission does not complete, usually due to the following reasons: CTS not returned by modem, or Clocks not detected by port.

Refer to Detail Data under MPQP ADPERR.

MPQP XMTUND

Error Description: MPQP TRANSMIT UNDERRUN

This error is logged by the MPQP device driver when the driver or adapter code is unable to provide communications hardware with data fast enough to maintain protocol timing. SYN characters will be inserted to maintain timing.

Refer to Detail Data under MPQP ADPERR.

MSLA Error Identifiers for the Error Log

MSLA ADAPTER

Error Description: ADAPTER ERROR

An error has occurred that represents an error condition interrupt from the multisubchannel line access (MSLA) adapter.

DETAIL DATA

File Name File name associated with the location of the error.

Return Code The return code from the failing module (see **/sys/errno.h**).

Line Address Memory address associated with the data transmission.

MSLA CLOSE

Error Description: SOFTWARE PROGRAM ABNORMALLY TERMINATED

An error has occurred during the processing of a device driver **close** command or a driver **halt** command.

Refer to the Detail Data under MSLA ADAPTER.

MSLA INTR

Error Description: COMMUNICATION PROTOCOL ERROR

An error has occurred during the processing of interrupts from the MSLA.

Refer to the Detail Data under MSLA ADAPTER.

MSLA PROTOCOL

Error Description: COMMUNICATION PROTOCOL ERROR

The system has detected a handshaking error between the adapter and either the device driver or the internal device driver communications.

Refer to the Detail Data under MSLA ADAPTER.

MSLA START

Error Description: OUT OF RESOURCES

An error has occurred that prevents the start of a session. This error may signify a permanent program input/output error.

Refer to the Detail Data under MSLA ADAPTER.

MSLA WRITE

Error Description: ADAPTER ERROR

A write error has occurred during processing on the device driver.

Refer to the Detail Data under MSLA ADAPTER.

NETBIOS Error Identifiers for the Error Log

NB1

Error Description: SOFTWARE PROGRAM ERROR

This error indicates local area network (LAN) basic input/output (I/O) system (NETBIOS) is out of program status block (PSB) in the interrupt handler.

NB2

Error Description: SOFTWARE PROGRAM ERROR

This error indicates that NETBIOS has encountered an unknown **router** command option.

DETAIL DATA

Router Command Options

The **router** command options containing the unknown option.

NB3

Error Description: SOFTWARE PROGRAM ERROR

This error indicates that NETBIOS is out of input/output buffer.

NB4

Error Description: SOFTWARE PROGRAM ERROR

This error is logged by NETBIOS if the DISABLE SAP input/output control (IOctl) fails.

DETAIL DATA

Return Code System error code (see `/sys/errno.h`).

NB5

Error Description: SOFTWARE PROGRAM ERROR

This error is logged by NETBIOS if the Service Access Point (SAP) is already closed.

NB6

Error Description: SOFTWARE PROGRAM ERROR

This error is logged by NETBIOS if a buffer overflow occurs.

NB7

Error Description: SOFTWARE PROGRAM ERROR

This error is logged by NETBIOS in the event of inactivity without termination.

NB8

Error Description: SOFTWARE PROGRAM ERROR

This error is logged by NETBIOS when activity resumes.

NB9

Error Description: SOFTWARE PROGRAM ERROR

This error is logged by NETBIOS in the event of an undefined result indicator.

DETAIL DATA

Result Code The undefined result.

NB10

Error Description: SOFTWARE PROGRAM ERROR

This error is logged by NETBIOS when it is out of input/output buffer in an OPEN LINK STATION.

NB11

Error Description: SOFTWARE PROGRAM ERROR

This error is logged by NETBIOS in the event of an out of input/output buffer in OPEN LINK STATION completion.

NB12

Error Description: SOFTWARE PROGRAM ERROR

This error is logged by NETBIOS when the OPEN LINK STATION IOCTL failed.

DETAIL DATA

Result Code System error code (see */sys/errno.h*).

NB13

Error Description: SOFTWARE PROGRAM ERROR

This error is logged by NETBIOS when it is out of input/output buffer in CONNECT LINK STATION.

NB14

Error Description: SOFTWARE PROGRAM ERROR

This error is logged by NETBIOS if CONTACT IOCTL failed.

DETAIL DATA

Return Code System error code (*/sys/errno.h*).

NB15

Error Description: SOFTWARE PROGRAM ERROR

This error is logged by NETBIOS if CONNECT LINK STATION is out of retries.

NB16

Error Description: SOFTWARE PROGRAM ERROR

This error is logged by NETBIOS if CONNECT LINK STATION failed.

NB17

Error Description: SOFTWARE PROGRAM ERROR

This error is logged by NETBIOS if HALT LINK STATION IOCTL failed.

DETAIL DATA

Return Code System error code (*/sys/errno.h*).

NB18

Error Description: SOFTWARE PROGRAM ERROR

This error is logged by NETBIOS if out of input/output buffer in an ENABLE SAP IOCTL.

NB19

Error Description: SOFTWARE PROGRAM ERROR

This error is logged by NETBIOS if ENABLE SAP IOCTL failed.

DETAIL DATA

Return Code System error code (*/sys/errno.h*).

NB20

Error Description: SOFTWARE PROGRAM ERROR

This error is logged by NETBIOS if WRITE IOCTL failed.

DETAIL DATA

Return Code System error code (*/sys/errno.h*).

NB21

Error Description: SOFTWARE PROGRAM ERROR

This error is logged by NETBIOS in the event of an Error Operation Result from logical link control.

DETAIL DATA

Result Code Result.

NB22

Error Description: SOFTWARE PROGRAM ERROR

This error is logged by NETBIOS if an unknown user-SAP correlator is received in the interrupt handler.

DETAIL DATA

SAP CorrelatorThe unknown SAP correlator.

NB23

Error Description: SOFTWARE PROGRAM ERROR

This error is logged by NETBIOS if an unknown user-SAP correlator is received.

DETAIL DATA

SAP CorrelatorThe unknown SAP Correlator.

NB24

Error Description: SOFTWARE PROGRAM ERROR

This error is logged by NETBIOS in the event of an invalid correlator from open SAP/LS (Service Access Point/Local Service) response.

NB25

Error Description: SOFTWARE PROGRAM ERROR

This error is logged by NETBIOS if a call to **devswadd** subroutine fails.

DETAIL DATA

Return Code System error code (*/sys/errno.h*).

NB26

Error Description: SOFTWARE PROGRAM ERROR

This error is logged by NETBIOS if call to **devswdel** subroutine fails.

DETAIL DATA

Return Code System error code (*/sys/errno.h*).

NB27

Error Description: SOFTWARE PROGRAM ERROR

This error is logged by NETBIOS if open still pending at the time of termination.

NB28

Error Description: SOFTWARE PROGRAM ERROR

This error is logged by NETBIOS if unknown configuration options are detected.

DETAIL DATA

Configuration Option

The unknown configuration option.

NB29

Error Description: SOFTWARE PROGRAM ERROR

This error is logged by NETBIOS if a call to **malloc** subroutine fails.

NB30

Error Description: SOFTWARE PROGRAM ERROR

This error is logged by NETBIOS if a call to **palloc** subroutine fails.

PSLA Error Identifiers for the Error Log

PSLA001

Error Description: DEVICE ERROR

This error is logged by the primary system/serial link adapter (PSLA) device driver for hardware failures such as a PSLA graphic unit error or a cable error.

DETAIL DATA

DETECTING MODULE

The name of the module detecting the error.

FAILING MODULE

The name of the failing module.

MAJOR/MINOR DEVICE NUMBER

Major and minor device numbers.

ERROR CODE System error code (see **sys/errno.h**).

REASON CODE

Describes type of error.

LOCATION Unique error location information for PSLA.

SENSE DATA The sense data consists of failure data which is analyzed by the Diagnostic Programs.

PSLA002

Error Description: DEVICE ERROR

This error is logged by the PSLA device driver if a device driver or microcode error occurs.

Refer to the Detail Data under PSLA001.

PSLA003

Error Description: LINK ERROR

This error is logged by the PSLA device driver when a host link error occurs.

Refer to the Detail Data under PSLA001.

RS Error Identifiers for the Error Log

RS 8 16 ARB

Error Description: INVALID 8/16 PORT ARBITRATION REGISTER

This error is logged by the TTY driver when invalid 8/16 port arbitration register is detected.

DETAIL DATA

Adapter Return Code

Adapter return code.

RS BAD INTER

Error Description: INTERRUPT FROM NON-EXISTENT PORT

This error is logged by the TTY driver when an interrupt from an unknown port is received.

DETAIL DATA

Port Number Port number of unknown port.

RS MEM EDGE

Error Description: CANNOT ALLOCATE MEMORY: EDGE STRUCTURE

This error is logged by the TTY driver when **malloc()** for TTY edge structure fails.

RS MEM EDGEV

Error Description: CANNOT ALLOCATE MEMORY: EDGE VECTOR

This error is logged by the TTY driver when **malloc()** for edge vector fails.

RS MEM IOCC

Error Description: CANNOT ALLOCATE MEMORY: IOCC STRUCTURE

This error is logged by the TTY driver when **malloc()** for TTY IOCC structure fails.

RS MEM PVT

Error Description: CANNOT ALLOCATE MEMORY: PRIV. STRUCTURE

This error is logged by the TTY driver when **malloc()** for TTY private structure fails.

RS PIN EDGE

Error Description: CANNOT PIN MEMORY: EDGE STRUCTURE

This error is logged by the TTY driver when **pin()** for TTY edge structure fails.

RS PIN EDGEV

Error Description: CANNOT PIN MEMORY: EDGE VECTOR

This error is logged by the TTY driver when **pin()** for TTY edge vector fails.

RS PIN IOCC

Error Description: CANNOT PIN MEMORY: IOCC STRUCTURE

This error is logged by the TTY driver when **pin()** for TTY IOCC structure fails.

RS PROG IOCC

Error Description: SOFTWARE ERROR: IOCC NOT CONFIGURED

This error is logged by the TTY driver during configuration when it detects that the IOCC is not in a configured state.

RS PROG SLIH

Error Description: SOFTWARE ERROR: CANNOT FIND SLIH

This error is logged by the TTY driver during configuration when it cannot find its **slih** structure.

SCSI Error Identifiers for the Error Log

SCSI ERR1

Error Description: ADAPTER ERROR

This error is logged by the SCSI adapter device driver in the event of a permanent hardware error involving the SCSI adapter, the system I/O bus and related hardware, or both. Either these errors cannot be retried, or all allowed retries have been exhausted. It is unlikely that any operations to the SCSI adapter can continue after one of these errors.

DETAIL DATA

Adapter Return Code

The sense data consists of failure data, which is analyzed by the Diagnostic Programs.

SCSI ERR2

Error Description: ADAPTER ERROR

This error is logged by the SCSI adapter device driver in the event of a potentially catastrophic hardware error involving the SCSI adapter, the system input/output bus and its related hardware, or both. Either these errors cannot be retried, or all allowed retries have been exhausted. Since these errors are not necessarily catastrophic, operations may or may not continue successfully after the error.

Refer to the Detail Data under SCSI ERR1.

SCSI ERR3

Error Description: MICROCODE PROGRAM ERROR

This error is logged by the SCSI adapter device driver in the event of a permanent unknown adapter microcode error. Either these errors cannot be retried, or all allowed retries have been exhausted. It is unlikely that any operations to the SCSI adapter can continue after one of these errors.

Refer to the Detail Data under SCSI ERR1.

SCSI ERR4

Error Description: MICROCODE PROGRAM ERROR

This error is logged by the SCSI adapter device driver in the event of a potentially catastrophic unknown adapter microcode error. Either these errors cannot be retried, or all allowed retries have been exhausted. Since these errors are not necessarily catastrophic, operations may or may not continue successfully after the error.

Refer to the Detail Data under SCSI ERR1.

SCSI ERR5

Error Description: SOFTWARE PROGRAM ERROR

This error is logged by the SCSI adapter device driver in the event of a permanent catastrophic device driver logic error. Either these errors cannot be retried, or all allowed retries have been exhausted. It is unlikely that any operations to the SCSI driver can continue after one of these errors.

Refer to the Detail Data under SCSI ERR1.

SCSI ERR6

Error Description: SOFTWARE PROGRAM ERROR

This error is logged by the SCSI adapter device driver in the event of a potentially catastrophic device driver logic error. Either these errors cannot be retried, or all allowed retries have been exhausted. Since these errors are not necessarily catastrophic, operations may or may not continue successfully after the error.

Refer to the Detail Data under SCSI ERR1.

SCSI ERR7

Error Description: UNDETERMINED ERROR

This error is logged by the SCSI adapter device driver in the event of a potentially permanent kernel service routine failure. Either these errors cannot be retried, or all allowed retries have been exhausted. It is unlikely that any operations to the SCSI adapter device driver can continue after one of these errors.

Refer to the Detail Data under SCSI ERR1.

SCSI ERR8

Error Description: UNDETERMINED ERROR

This error is logged by the SCSI adapter device driver in the event of a potentially permanent kernel service routine failure. Either these errors cannot be retried, or all allowed retries have been exhausted. Since these errors are not necessarily catastrophic, operations may or may not continue successfully after the error.

Refer to the Detail Data under SCSI ERR1.

SCSI ERR9

Error Description: POTENTIAL DATA LOSS CONDITION

This error indicates that there may be downlevel SCSI equipment installed. A potential data loss condition is possible.

SD Error Identifiers for the Error Log

SDA ERR1

Error Description: STORAGE SUBSYSTEM FAILURE

This entry indicates that an unrecoverable adapter hardware error has occurred.

DETAIL DATA

SENSE DATA The sense data consists of failure data which is analyzed by the Diagnostic Programs.

SDA ERR2

Error Description: STORAGE SUBSYSTEM FAILURE

This entry indicates that the system has encountered an unrecoverable adapter hardware error.

Refer to Detail Data under SDA ERR1.

SDA ERR3

Error Description: UNDETERMINED ERROR

This entry indicates that an unrecoverable system-detected error has occurred.

Refer to Detail Data under SDA ERR1.

SDA ERR4

Error Description: UNDETERMINED ERROR

This entry indicates that the system has encountered a recoverable system-detected error.

Refer to Detail Data under SDA ERR1.

SDC ERR1

Error Description: LINK ERROR

This entry indicates that a serial link between the controllers and DASD failed.

Refer to Detail Data under SDA ERR1.

SDC ERR2

Error Description: STORAGE SUBSYSTEM FAILURE

This entry indicates that an unrecoverable controller hardware error has occurred.

Refer to Detail Data under SDA ERR1.

SDC ERR3

Error Description: STORAGE SUBSYSTEM FAILURE

This entry indicates that the system has encountered an unrecoverable controller hardware error.

Refer to Detail Data under SDA ERR1.

SDM ERR1

Error Description: MICROCODE PROGRAM ERROR

This entry indicates that a microcode error has been detected.

Refer to Detail Data under SDA ERR1.

SLA Error Identifiers for the Error Log

SLA CRC ERR

Error Description: SLA LINK CHECK CRC ERROR

This error indicates that the CRC checksum for a frame is not correct.

DETAIL DATA

Sense Data The sense data consists of failure data that is analyzed by the Diagnostic Programs. The `Status 1` and `Status 2` fields are valid.

SLA DRIVER ERR

Error Description: SLA LINK CHECK FAULT IN LASER DRIVE

This error indicates that the optics card has detected a fault in the transmit driver.

DETAIL DATA

Sense Data The sense data consists of failure data that is analyzed by the Diagnostic Programs. The `Status 1` and `Status 2` fields are valid.

SLA EXCEPT ERR

Error Description: INTERNAL SERIAL LINK ADAPTER EXCEPTION

This error indicates that a PIO exception has been detected.

DETAIL DATA

Sense Data The sense data consists of failure data that is analyzed by the Diagnostic Programs. Neither the `Status 1` nor the `Status 2` field is valid.

SLA FRAME ERR

Error Description: SLA LINK CHECK POSSIBLE LOST FRAME

This error is logged whenever a frame is lost. The detected error can be either a response time out or a send count error.

DETAIL DATA

Sense Data The sense data consists of failure data that is analyzed by the Diagnostic Programs. If the `Status 1` field is `0xFFFFFFFF` and the `Status 2` field is `0`, then a response time out occurred. If the `Status 1` field is `0` and the `Status 2` field is `0xFFFFFFFF`, the a send count error was detected.

SLA PARITY ERR

Error Description: SLA BUFFER PARITY ERROR

This error is logged when the SLA detects either a parity error in the TAG register or a parity error in the data buffer.

DETAIL DATA

Sense Data The sense data consists of failure data that is analyzed by the Diagnostic Programs. The `Status 1` field and the `Status 2` field are valid.

SLA PROG ERR

Error Description: SLA PROGRAMMING CHECK

This error is logged when the SLA detects a program check. This error can be caused if the receiver did not map enough space for the message or if there is an incorrect tag as the first TOD clock work area.

DETAIL DATA

Sense Data The sense data consists of failure data which is analyzed by the Diagnostic Programs. The `Status 1` and `Status 2` fields are valid.

SLA SIG ERR

Error Description: SLA LINK CHECK SIGNAL FAILURE

This error is logged when the SLA detects a signal error in excess of 1 second.

DETAIL DATA

Sense Data The sense data consists of failure data which is analyzed by the Diagnostic Programs. The `Status 1` and `Status 2` fields are valid.

For more information on the `Status 1` and `Status 2` fields, refer to "Sense Data for the Serial Optical Link Device Driver" in *AIX Version 3.2 Kernel Extensions and Device Support Programming Concepts*.

SNA Error Identifiers for the Error Log

SNA CLDF

Error Description: CHILD PROCESS FAILURE

This error is logged by SNA when one of its child processes terminates unexpectedly or will not start.

DETAIL DATA

Component ID SNA component name.

Detecting Module

Module that detected the error.

Module line number

Line in the detecting module.

Error Code System error number (see `/sys/errno.h`).

Failing Module Name of the process that terminated.

SNA CSA1

Error Description: INVALID XID RECEIVED

This error is logged by SNA when a module detects that the received XID is invalid.

DETAIL DATA

Sense Data The sense data consists of failure data captured for the error.

Detecting Module

Module that detected the error.

Additional Subvector

Alert subvector.

SNA CSA2

Error Description: XID PROTOCOL ERROR

This error is logged by SNA when a module detects that the received XID generates a protocol error.

Refer to the Detail Data under SNA CSA1.

SNA DDCF

Error Description: UNABLE TO CONFIGURE DEVICE DRIVER

This error is logged by SNA when a SNA device driver encounters a problem during device configuration.

Refer to the Detail Data under SNA CLDF.

SNA IPCF

Error Description: SNA IPC FAILURE

This error is logged by SNA when a module encounters an error with IPC processing.

Refer to the Detail Data under SNA CLDF.

SNA OMDDF

Error Description: OPEN TO SNA MDD FAILED

This error is logged by SNA when a process is unsuccessful in its attempt to open the SNA manager device driver (MDD).

Refer to the Detail Data under SNA CLDF.

SNA PRF

Error Description: SNA PROFILE ERROR

This error is logged by SNA when a module encounters an error with the SNA profile database.

Refer to the Detail Data under SNA CLDF.

SNA SECF

Error Description: SNA SECURITY FAILURE

This error is logged by SNA when a module encounters an error with SNA security processing.

Refer to the Detail Data under SNA CLDF.

SNA SEMF

Error Description: SNA SEMAPHORE FAILURE

This error is logged by SNA when a module encounters an error with semaphore processing.

Refer to the Detail Data under SNA CLDF.

SNA SHMF

Error Description: SNA SHARED SEGMENT FAILURE

This error is logged by SNA when a problem is encountered with the SNA shared segment.

Refer to the Detail Data under SNA CLDF.

SNA SRCF

Error Description: CALL TO SRC FAILED

This error is logged by SNA when a module encounters an error with a call to the system resource controller (SRC).

Refer to the Detail Data under SNA CLDF.

SNA SRF

Error Description: SNA SYSTEM RESOURCE FAILURE

This error is logged by SNA when a module encounters a system resource failure.

Refer to the Detail Data under SNA CLDF.

TAPE Error Identifiers for the Error Log

TAPE ERR1

Error Description: TAPE OPERATION ERROR

This error is logged by the tape device driver in the event of a tape media error. Either these errors cannot be retried, or all allowed retries have been exhausted. This is normally an indication of defective media or dirty read and write heads on the tape device. It is unlikely that I/O operations to the tape device can continue after one of these errors.

DETAIL DATA

Sense Data The sense data consists of failure data that is analyzed by the Diagnostic Programs.

TAPE ERR2

Error Description: TAPE DRIVE FAILURE

This error is logged by the tape device driver in the event of a permanent hardware error involving the tape device. Either these errors cannot be retried, or all allowed retries have been exhausted. It is unlikely that I/O operations to the tape device can continue after one of these errors.

Refer to the Detail Data under TAPE ERR1.

TAPE ERR3

Error Description: TAPE DRIVE FAILURE

This error is logged by the tape device driver in the event of a recoverable error involving either the tape device or media. Since these errors are recoverable, operations to the device can continue.

Refer to the Detail Data under TAPE ERR1.

TAPE ERR4

Error Description: TAPE DRIVE FAILURE

This error is logged by the tape device driver in the event of an adapter detected error possibly involving the tape device, the SCSI adapter, and the system I/O bus and related hardware. Either these errors cannot be retried, or all allowed retries have been exhausted. It is unlikely that I/O operations to the tape device can continue after one of these errors.

Refer to the Detail Data under TAPE ERR1.

TAPE ERR5

Error Description: UNDETERMINED ERROR

This error is logged by the tape device driver in the event of an unknown error. This error may be caused by one or more of the following: the tape device, the SCSI adapter, or the system I/O bus and related hardware and/or kernel services. Either these errors cannot be retried, or all allowed retries have been exhausted. It is unlikely that I/O operations to the tape device can continue after one of these errors.

Refer to the Detail Data under TAPE ERR1.

TAPE ERR6

Error Description: TAPE OPERATION ERROR

This error is logged by the tape device driver when the tape drive has had 30 hours of use without being cleaned. The drive continues to operate normally, but a cleaning tape should be inserted at the first opportunity. If the drive is not cleaned, it will experience more soft errors, eventually resulting in failure of device commands.

DETAIL DATA

Sense Data The sense data consists of failure data that should be made available to the service organization is if this problem requires a service call.

TMSCSI Error Identifiers for the Error Log

TMSCSI CMD ERR

Error Description: ATTACHED SCSI TARGET DEVICE ERROR

This error indicates a hardware error that cannot be retried has occurred while the system was sending a command.

DETAIL DATA

SENSE DATA The sense data consists of failure data that is analyzed by the Diagnostic Programs.

TMSCSI READ ERR

Error Description: ATTACHED SCSI INITIATOR DEVICE

This error indicates a hardware error that cannot be retried has occurred while the system was receiving data.

Refer to the Detail Data under TMSCSI CMD ERR.

TMSCSI RECVRD ERR

Error Description: ATTACHED SCSI TARGET DEVICE ERROR

This error indicates that a recovered error has occurred while the system was sending a command.

Refer to the Detail Data under TMSCSI CMD ERR.

TMSCSI UNKN SFW ERR

Error Description: SOFTWARE PROGRAM ERROR

This error indicates that a device driver has detected a software error.

Refer to the Detail Data under TMSCSI CMD ERR.

TMSCSI UNRECVRD ERR

Error Description: ATTACHED SCSI TARGET DEVICE ERROR

This error indicates that an unrecovered error has occurred while the system was sending a command.

Refer to the Detail Data under TMSCSI CMD ERR.

TOK Error Identifiers for the Error Log

TOK ADAP CHK

Error Description: ADAPTER ERROR

This error indicates that a Token Ring adapter check has occurred.

DETAIL DATA

Sense Data The sense data consists of failure data which is analyzed by the Diagnostic Programs.

Additional Subvectors
Additional Alert subvectors.

TOK ADAP ERR

Error Description: POTENTIAL DATA LOSS CONDITION

This error is logged when there may be downlevel Token Ring equipment installed. A potential data loss condition is possible.

Refer to the Detail Data under TOK ADAP CHK.

TOK AUTO RMV

Error Description: AUTO REMOVAL

This error indicates that the adapter was a member of the beacon fault domain and removed itself to perform a self-test, which was unsuccessful.

Refer to the Detail Data under TOK ADAP CHK.

TOK BAD ASW

Error Description: MICROCODE PROGRAM ERROR

This error indicates an incompatible microcode and adapter.

Refer to the Detail Data under TOK ADAP CHK.

TOK BEACON1

Error Description: OPEN FAILURE

This error indicates that the adapter detected a beaconing condition on the ring during the insertion process.

Refer to the Detail Data under TOK ADAP CHK.

TOK BEACON2

Error Description: TOKEN-RING INOPERATIVE

This error indicates that the ring was in a beaconing condition for longer than the time allowed by the hard-error detection timer.

Refer to the Detail Data under TOK ADAP CHK.

TOK BEACON3

Error Description: TOKEN-RING TEMPORARY ERROR

This error indicates that ring was in a beaconing condition for less than 52 seconds and was then recovered.

Refer to the Detail Data under TOK ADAP CHK.

TOK CONGEST

Error Description: COMMUNICATIONS OVERRUN

This error indicates that the Ring Error Monitor (REM) detected an adapter on the ring that is experiencing excessive congestion and is discarding a significant number of frames.

Refer to the Detail Data under TOK ADAP CHK.

TOK DOWNLOAD

Error Description: MICROCODE PROGRAM ABNORMALLY TERMINATED

This error indicates that the microcode download failed.

Refer to the Detail Data under TOK ADAP CHK.

TOK DUP ADDR

Error Description: OPEN FAILURE

This error indicates that the adapter detected the presence of a station with its individual address on the ring during the insertion process.

Refer to the Detail Data under TOK ADAP CHK.

TOK ERR5

Error Description: OPEN FAILURE

This error indicates that an unknown adapter hardware error occurred during the insertion process.

Refer to the Detail Data under TOK ADAP CHK.

TOK ERR10

Error Description: AUTO REMOVAL

This error indicates that the ring was in a beaconing condition for shorter than the time allowed by the hard-error detection timer.

Refer to the Detail Data under TOK ADAP CHK.

TOK ERR15

Error Description: ADAPTER ERROR

This error indicates that the Token Ring device handler caught an unknown system error.

Refer to the Detail Data under TOK ADAP CHK.

TOK ESERR

Error Description: EXCESSIVE TOKEN-RING ERRORS

This error indicates that the ring error monitor (REM) detected excessive soft errors for the ring.

Refer to the Detail Data under TOK ADAP CHK.

TOK MC ERR

Error Description: ADAPTER ERROR

This error indicates that the Token Ring device handler has detected a microchannel error.

Refer to the Detail Data under TOK ADAP CHK.

TOK NOMBUFS

Error Description: RESOURCE UNAVAILABLE

This error indicates that a Token Ring device handler request for an **mbuf** structure was denied.

Refer to the Detail Data under TOK ADAP CHK.

TOK PIO ERR

Error Description: ADAPTER ERROR

This error indicates that the Token Ring device handler has detected a programmable input/output error.

Refer to the Detail Data under TOK ADAP CHK.

TOK RCVRY ENTER

Error Description: ADAPTER ERROR

This error indicates that the Token Ring device handler has entered Network Recovery Mode.

Refer to the Detail Data under TOK ADAP CHK.

TOK RCVRY EXIT

Error Description:

This error indicates that the Token Ring device handler has exited Network Recovery mode successfully.

Refer to the Detail Data under TOK ADAP CHK.

TOK RCVRY TERM

Error Description: ADAPTER ERROR

This error indicates that the Token Ring device handler has terminated Network Recovery mode.

Refer to the Detail Data under TOK ADAP CHK.

TOK RMV ADAP1

Error Description: OPEN FAILURE

This error indicates that the adapter received a Remove Ring Station MAC frame during the insertion process.

Refer to the Detail Data under TOK ADAP CHK.

TOK RMV ADAP2

Error Description: REMOVE ADAPTER COMMAND RECEIVED

This error indicates that the adapter received a Remove Adapter command from a LAN manager and left the LAN.

Refer to the Detail Data under TOK ADAP CHK.

TOK TX ERR

Error Description: ADAPTER ERROR

This error indicates that the Token Ring device handler has detected a transmission error.

Refer to the Detail Data under TOK ADAP CHK.

TOK WIRE FAULT

Error Description: WIRE FAULT

This error indicates a wire-fault condition on the ring.

Refer to the Detail Data under TOK ADAP CHK.

TOK WRAP TST

Error Description: OPEN FAILURE

This error indicates that the adapter detected a problem on its lobe during the wrap-test portion of the insertion process.

Refer to the Detail Data under TOK ADAP CHK.

TTY Error Identifiers for the Error Log

TTY BADINPUT

Error Description: BAD TTYINPUT RETURN

This error is logged by the TTY driver if the **tty input** routine returns an error.

DETAIL DATA

Error Code System error code (see **sys/errno.h**).

TTY OVERRUN

Error Description: RECEIVER OVERRUN ON INPUT

The sending device is ignoring flow control and overloading the hardware buffer on the adapter. This occurs prior to the driver accessing the hardware FIFO.

Refer to Detail Data under TTY BADINPUT.

TTY PARERR

Error Description: PARITY/FRAMING ERROR ON INPUT

Parity errors are occurring incoming data to asynchronous ports on a character-by-character basis.

Refer to Detail Data under TTY BADINPUT.

TTY PROG PTR

Error Description: SOFTWARE ERROR: T_HPTR FIELD INVALID

This error is logged by the TTY driver if `t_hptr` pointer is null.

Refer to Detail Data under TTY BADINPUT.

TTY TTYHOG

Error Description: TTYHOG OVERRUN

The sending device is ignoring flow control. This error occurs after the hardware FIFO has been accessed and has written to the software buffer.

Refer to Detail Data under TTY BADINPUT.

VCA Error Identifiers for the Error Log

VCA INITZ

Error Description: HOST INDEPENDENT INITIALIZATION FAILED

This error indicates that a hardware problem was detected during the voice control adapter (VCA) card's configuration.

DETAIL DATA

Line Number The line number in the source code where the error was logged.

Detecting Module

The name of the source code function that logged the error.

Failing Module The name of the source code function where the error occurred.

Return Code The return code sent to the user from the **perror** subroutine. The error definition may be found in the **/usr/include/sys/perror.h** file.

VCA INTR1

Error Description: INTERRUPT HANDLER REGISTRATION CODE FAILED

This error is caused by a failure in the **intr_enable** and **i_init** kernel services. This failure prevents the interrupt handler from being properly installed, but the voice control adapter device driver still functions.

Refer to Detail Data under VCA INITZ.

VCA INTR2

Error Description: UNEXPECTED INTERRUPT

This error is caused by a hardware failure. The card is creating unexpected interrupts.

Refer to Detail Data under VCA INITZ.

VCA INTR3

Error Description: INVALID INTERRUPT

This error is caused by hardware sending interrupts to the wrong track.

Refer to Detail Data under VCA INITZ.

VCA INTR4

Error Description: INTERRUPT TIMED OUT

This error is caused by hardware not sending an interrupt when an interrupt was expected.

Refer to Detail Data under VCA INITZ.

VCA IOCTL1

Error Description: INVALID IOCTL REQUEST

This error indicates that the user tried to issue an IOCTL request that is not supported by the device driver.

Refer to Detail Data under VCA INITZ.

VCA IOCTL2

Error Description: INVALID IOCTL RESPONSE

This error indicates that the user tried to issue an IOCTL request that did not have the required permissions.

Refer to Detail Data under VCA INITZ.

VCA MEM

Error Description: FAILED PINNING MEMORY

This error indicates that the voice control adapter device driver could not pin either the **current_vca** structure or the bottom half of the driver during installation.

Refer to Detail Data under VCA INITZ.

X25 Error Identifiers for the Error Log

X25 ADAPT

Error Description: ADAPTER ERROR

This error is logged by the X.25 device driver if the adapter card could not be found on the bus.

DETAIL DATA

Sense Data The sense data consists of failure data which is analyzed by the Diagnostic Programs.

X25 ALERT5

Error Description: X-5, MODEM FAILURE: DCD, DSR, CABLE

This error is logged by the X.25 device driver if the physical layer cannot be established to the modem. The signal lines DCD and DSR are not active.

Refer to Detail Data under X25 ADAPT.

X25 ALERT7

Error Description: X-7, MODEM FAILURE: ACU NOT RESPONDING

This error is logged by the X.25 device driver if the attached auto-call unit failed to establish a call.

Refer to Detail Data under X25 ADAPT.

X25 ALERT8

Error Description: X-8, X.21 NOT CONNECTED

This error is logged by the X.25 device driver when it fails to connect to an X.21 network.

Refer to Detail Data under X25 ADAPT.

X25 ALERT9

Error Description: X-9, FRAME TYPE W RECEIVED

This error is logged by the X.25 device driver if a W type FRMR frame is received.

Refer to Detail Data under X25 ADAPT.

X25 ALERT10

Error Description: X-10, FRAME TYPE X RECEIVED

This error is logged by the X.25 device driver if an X type FRMR frame is received.

Refer to Detail Data under X25 ADAPT.

X25 ALERT11

Error Description: X-11, FRAME TYPE Y RECEIVED

This error is logged by the X.25 device driver when a Y type FRMR frame is received.

Refer to Detail Data under X25 ADAPT.

X25 ALERT12

Error Description: X-12, FRAME TYPE Z RECEIVED

This error is logged by the X.25 device driver when a Z type FRMR frame is received.

Refer to Detail Data under X25 ADAPT.

X25 ALERT13

Error Description: X-13, FRAME TYPE W TRANSMITTED

This error is logged by the X.25 device driver when a W type FRMR frame is transmitted.

Refer to Detail Data under X25 ADAPT.

X25 ALERT14

Error Description: X-14, FRAME TYPE X TRANSMITTED

This error is logged by the X.25 device driver when an X type FRMR frame is transmitted.

Refer to Detail Data under X25 ADAPT.

X25 ALERT15

Error Description: X-15, FRAME TYPE Y TRANSMITTED

This error is logged by the X.25 device driver when a Y type FRMR frame is transmitted.

Refer to Detail Data under X25 ADAPT.

X25 ALERT16

Error Description: X-16, FRAME TYPE Z TRANSMITTED

This error is logged by the X.25 device driver when a Z type FRMR frame is transmitted.

Refer to Detail Data under X25 ADAPT.

X25 ALERT17

Error Description: X-17, FRAME RETRY N2 REACHED

This error is logged by the X.25 device driver when the frame level retry count (N2) is reached.

Refer to Detail Data under X25 ADAPT.

X25 ALERT18

Error Description: X-18, UNEXPECTED DISC RECEIVED

This error is logged by the X.25 device driver if a disconnect frame is received unexpectedly.

Refer to Detail Data under X25 ADAPT.

X25 ALERT19

Error Description: X-19, DM RXD DURING LINK ACTIVATION

This error is logged by the X.25 device driver when a DM frame was received after sending a SABM.

Refer to Detail Data under X25 ADAPT.

X25 ALERT21

Error Description: X-21, CLEAR INDICATION RECEIVED

This error is logged by the X.25 device driver if a clear indication packet with DCE-originated cause and diagnostics is received.

Refer to Detail Data under X25 ADAPT.

X25 ALERT22

Error Description: X-22, RESTART INDICATION RECEIVED

This error is logged by the X.25 device driver after a restart indication packet containing a DCE-originated cause and diagnostics was received by the DCE.

Refer to Detail Data under X25 ADAPT.

X25 ALERT23

Error Description: X-23, RESET REQUEST BY X.25 ADAPTER

This error is logged by the X.25 device driver if a reset request packet is sent automatically by the adapter.

Refer to Detail Data under X25 ADAPT.

X25 ALERT24

Error Description: X-24, CLEAR REQUEST BY X.25 ADAPTER

This error is logged by the X.25 device driver when the adapter code sent out a clear request with DCE-originated cause and diagnostics. The clear was not one requested by a higher layer.

Refer to Detail Data under X25 ADAPT.

X25 ALERT25

Error Description: X-25, RESTART REQUEST BY X.25 ADAPTER

This error is logged by the X.25 device driver when a restart request containing DCE-originated cause and diagnostics is transmitted.

Refer to Detail Data under X25 ADAPT.

X25 ALERT26

Error Description: X-26, TIMEOUT ON RESTART REQUEST, T20

This error is logged by the X.25 device driver if timer T20 expires before receipt of a restart confirmation packet.

Refer to Detail Data under X25 ADAPT.

X25 ALERT27

Error Description: X-27, TIMEOUT ON RESET REQUEST, T22

This error is logged by the X.25 device driver if timer T22 expires before receipt of a reset confirmation packet.

Refer to Detail Data under X25 ADAPT.

X25 ALERT28

Error Description: X-28, TIMEOUT ON CALL REQUEST, T21

This error is logged by the X.25 device driver if timer T21 expired before receipt of either a call connected or clear indication packet.

Refer to Detail Data under X25 ADAPT.

X25 ALERT29

Error Description: X-29, TIMEOUT ON CLEAR REQUEST, T23

This error is logged by the X.25 device driver if timer T23 expires before receipt of a clear confirmation packet.

Refer to Detail Data under X25 ADAPT.

X25 ALERT30

Error Description: X-30, DIAGNOSTIC PACKET RECEIVED

This error is logged by the X.25 device driver if a diagnostic packet is received.

Refer to Detail Data under X25 ADAPT.

X25 ALERT31

Error Description: X-31, RESET INDICATION PACKET RECEIVED

This error is logged by the X.25 device driver when a reset indication packet with DCE-originated cause and diagnostics is received.

Refer to Detail Data under X25 ADAPT.

X25 ALERT32

Error Description: X-32, (DCE) CLEAR INDICATION BY X.25 ADAPTER

This error is logged by the X.25 device driver when a clear indication containing DCE-generated cause and diagnostics is received.

Refer to Detail Data under X25 ADAPT.

X25 ALERT33

Error Description: X-33, (DCE) RESET INDICATION BY X.25 ADAPTER

This error is logged by the X.25 device driver if a reset indication packet containing a DCE-originated cause and diagnostics is received.

Refer to Detail Data under X25 ADAPT.

X25 ALERT34

Error Description: X-34, (DCE) RESTART INDICATION BY X.25 ADAPTER

This error is logged by the X.25 device driver after a restart indication packet containing a DCE-originated cause and diagnostics is received.

Refer to Detail Data under X25 ADAPT.

X25 ALERT35

Error Description: X-35, (DCE) RESTART REQUEST RECEIVED

This error is logged by the X.25 device driver when a restart request indication packet with DCE-originated cause and diagnostic codes is received.

Refer to Detail Data under X25 ADAPT.

X25 ALERT36

Error Description: X-36, (DCE) TIMEOUT ON RESTART INDICATION, T10

This error is logged by the X.25 device driver when timer T10 expired at the DCE before receipt of a restart confirmation packet.

Refer to Detail Data under X25 ADAPT.

X25 ALERT37

Error Description: X-37, (DCE) TIMEOUT ON RESET INDICATION, T12

This error is logged by the X.25 device driver if timer T12 expired before receipt of a reset confirmation packet.

Refer to Detail Data under X25 ADAPT.

X25 ALERT38

Error Description: X-38, (DCE) TIMEOUT ON CALL INDICATION, T11

This error is logged by the X.25 device driver if timer T11 expired before receipt of a call accept or clear request packet.

Refer to Detail Data under X25 ADAPT.

X25 ALERT39

Error Description: X-39, (DCE) TIMEOUT ON CLEAR INDICATION, T13

This error is logged by the X.25 device driver if timer T13 expired before receipt of a clear confirmation packet.

Refer to Detail Data under X25 ADAPT.

X25 CONFIG

Error Description: X.25 CONFIGURATION ERROR

This error is logged by the X.25 device driver when the adapter fails its internal configuration.

Refer to Detail Data under X25 ADAPT.

X25 IPL

Error Description: ADAPTER ERROR

This error is logged by the X.25 device driver if an adapter timed out during the reboot sequence. This is an installation-related problem and may indicate that the communication equipment was not installed correctly or that the hardware and microcode are incompatible.

Refer to Detail Data under X25 ADAPT.

X25 UCODE

Error Description: X.25 MICROCODE ERROR

This error is logged by the X.25 device driver if the adapter microcode terminates abnormally.

Refer to Detail Data under X25 ADAPT.

Miscellaneous Error Identifiers for the Error Log

CONSOLE

Error Description: SOFTWARE PROGRAM ERROR

This error is logged by the console device driver if an unexpected error occurs when calling another module.

DETAIL DATA

Detecting Module

Name of the detecting module.

Failing Module Name of the failing module.

Return Code Return code from the failing module (see **sys/errno.h**).

Reason Code Unique error indication for the console device driver.

HFTERR

Error Description: SOFTWARE PROGRAM ERROR

This error is logged by HFT (High Function Terminal), KTSM (Keyboard-Tablet-Sound-Mouse), HFPRF3D (High Performance 3D Color Graphics Processor), HISPD3D (High Speed 3D Graphics Accelerator), GRAYDA (Grayscale Graphics Display Adapter), and COLORDA (Color Graphics Display Adapter) device drivers when software errors are encountered.

DETAIL DATA

Detecting Module

Name of the detecting module.

Failing Module Name of the failing module.

Return Code Return code from the failing module (see **sys/errno.h**).

Reason Code Unique error indication for the console device driver.

NLS BADMAP

Error Description: SOFTWARE ERROR: NLS MAP CORRUPTER

This error occurs when the required National Language Support map is resident but does not match data from the input stream.

DETAIL DATA

Error Code System error code.

Rule Index Number of the rule in the NLS rule map that failed.

Number Of Rules

Number of NLS rules that were not followed.

Map Name NLS map name associated with a particular character set.

NLS MAP

Error Description: SOFTWARE PROGRAM ERROR

This error occurs when the required National Language Support map is not resident.

DETAIL DATA

Error Code System error code.

OPMSG

Error Description: OPERATOR NOTIFICATION

This error is logged when the **errlogger** command is run.

DETAIL DATA

Message From errlogger Command

The text entered using the **errlogger** command.

PGSP KILL

Error Description: SOFTWARE PROGRAM ABNORMALLY TERMINATED

DETAIL DATA

Program's Paging Space

The program's paging space in 1K-byte blocks.

PPRINTER ERR1

Error Description: PRINTER ERROR

This error is logged by the printer device driver. The failures recorded by this error log entry are not usually fatal and should occur very infrequently.

DETAIL DATA

Sense Data The sense data consists of failure data that is analyzed by the Diagnostic Programs.

Adapter At Address

Printer control register address.

Additional Information

Information about the data being transferred and the operation being performed.

Device Address

Device address

Generation Parameter

Pointer to internal printer structure.

RCMERR

Error Description: SOFTWARE PROGRAM ERROR

This error is logged by the rendering context manager when an unrecoverable error is detected. These errors are not necessarily catastrophic, and operations may continue; however, the response occurring immediately after the failure may be unpredictable.

DETAIL DATA

Detecting Module

Name of the detecting module.

Failing Module Name of the failing module.

Return Code Return code from the failing module (see the **sys/errno.h** file).

Reason Code Unique error indication for the console device driver.

REPLACED FRU

Error Description: REPAIR ACTION

This error is an informational message logged by the diagnostic programs that indicates that a piece of hardware has been replaced.

SRC

Error Description: SOFTWARE PROGRAM ERROR

This error is logged by the System Resource Controller daemon in the event of some abnormal condition. Abnormal conditions are divided in three areas: failing subsystems, communication failures, and other failures.

DETAIL DATA

Symptom Code

The status returned by the failed subsystem.

Software Error Code

The System Resource Controller error number (see **srcerrno.h**).

Error Code System error number (errno).

Detecting Module

Name of the module detecting the error.

Failing Module Name of the failed subsystem.

SYSLOG

Error Description: MESSAGE REDIRECTED FROM syslog

This error may be logged in the system error log by specifying *errlog* as a destination in **/etc/syslog.conf**. The **syslog** daemon redirects the specified messages to the error log.

DETAIL DATA

Syslog Message

Text of the syslog message.

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