IBM TotalStorage NAS Gateway 500

Service Guide

GY27-0418-00

IBM TotalStorage NAS Gateway 500

Service Guide

GY27-0418-00

First Edition (February 2004)

Before using this information and the product it supports, read the information in “Safety notices” on page xv, Appendix E, “Environmental notices”, on page 427, and Appendix F, “Notices”, on page 429.

A reader’s comment form is provided at the back of this publication. If the form has been removed, address comments to:

International Business Machines Corporation
Design & Information Development
Department CGF
P.O. Box 12195
Research Triangle Park, MC
U.S.A. 27709-9990

You can also submit comments by selecting **Feedback** at www.ibm.com/storage/support.

When you send information to IBM, you grant IBM a nonexclusive right to use or distribute the information in any way it believes appropriate without incurring any obligation to you.

Contents

About this manual

This manual describes the service procedures for the IBM® TotalStorage® NAS Gateway 500, hereafter referred to as the NAS Gateway 500.

Who should read this manual

This manual is written for trained service personnel. It can also be used by NAS Gateway 500 customers with root access to replace customer replaceable units (CRUs) (for example, adapters).

Note: Only trained service personnel should replace field replaceable units (FRUs) (for example, the operator panel).

How to use this manual

To use this manual, you should be familiar with:

- NAS Gateway 500 System Software (based on AIX®, IBM's version of UNIX)
- NAS Gateway 500 hardware and software (Chapter 1, "Reference information", on page 1)
- NAS Gateway 500 error codes, checkpoints, and service request numbers (SRNs) (Chapter 2, "Problem determination overview", on page 33)
- NAS Gateway 500 Maintenance Analysis Procedures (MAPs) (Chapter 3, "Maintenance Analysis Procedures (MAPs)", on page 39)
- NAS Gateway 500 service processor functions and menus (Chapter 9, "Using the service processor", on page 255)

There should also be a service console connected to serial port 1, to allow a connection to the NAS Gateway 500 service processor menus and POST messages. It can also be used to access the NAS Gateway 500 SMIT panels.

To start solving serviceable events on the NAS Gateway 500, service analysis should begin with Chapter 3, "Maintenance Analysis Procedures (MAPs)", on page 39.

Publications

The following sections contain information on the publications in the NAS Gateway 500 library. The first section illustrates what manuals you can use to perform specific tasks, followed by lists of hardcopy and softcopy publications, then how to find translated publications, and the last section provides a list of related publications that might be helpful.

NAS Gateway 500 publications by task

Table 1 on page x shows the manuals in the NAS Gateway 500 library that contain information related to this product and that support the listed common user tasks. That is, when you are performing a specific task, you have a reference to the manual or manuals that contain the information that you need to perform that task:

Table 1. IBM TotalStorage NAS Gateway 500 information library as it supports common user tasks

Title	User tasks					
	Planning	**Hardware installation**	**Software installation**	**Configuration**	**Operation and administration**	**Diagnosis, problem determination, and service**
IBM TotalStorage NAS Gateway 500 Planning Guide, GA27-4335	✓	✓		✓		
IBM TotalStorage NAS Gateway 500 Hardware Installation Guide, GA27-4336	✓	✓				
IBM TotalStorage NAS Gateway 500 Quick Start Instructions, GX27-4026-00		✓				
IBM TotalStorage NAS Gateway 500 Administrator's Guide, SC30-4072			✓	✓	✓	
IBM TotalStorage NAS Gateway 500 Command Reference, SC30-4074			✓	✓	✓	✓
IBM TotalStorage NAS Gateway 500 CIFS File Serving Guide, SC30-4075			✓	✓	✓	
IBM TotalStorage NAS Gateway 500 Service Guide, GY27-0418		✓			✓	✓
IBM TotalStorage NAS Gateway 500 Advanced Configuration and Problem Determination Guide, SC30-4073			✓	✓	✓	✓
IBM TotalStorage Translated Safety Notices, GA27-4338		✓				✓

Hardcopy publications shipped with the NAS Gateway 500

The following technical publications are shipped in hardcopy with the NAS Gateway 500. These manuals can also be found in PDF format on the NAS Gateway 500 documentation CD-ROM and at www.ibm.com/servers/storage/support/:

- *IBM TotalStorage NAS Gateway 500 Hardware Installation Guide*, GA27-4336

  This publication provides procedures for setting up, cabling, and replacing component options of the NAS Gateway 500.
- *IBM TotalStorage NAS Gateway 500 Quick Start Instructions*, GX27-4026

  This publication describes how to install the NAS Gateway 500.
- *IBM TotalStorage NAS Gateway 500 Administrator's Guide*, SC30-4072

  This publication describes how to configure the system for the NAS Gateway 500.
- *IBM TotalStorage Translated Safety Notices*, GA27-4338

  This publication contains translations of safety notices specific to IBM TotalStorage NAS products.
- Web site location for the IBM TotalStorage NAS Gateway 500 Release Notes

  This publication identifies the Web site location (www.ibm.com/servers/storage/support/) for the NAS Gateway 500 Release Notes
- *IBM TotalStorage NAS Gateway 500 Statement of Limited Warranty*, GX27-4024

  This publication lists the warranty and translations of the warranty for the IBM TotalStorage NAS Gateway 500.

Softcopy publications

Additional technical publications are provided in PDF format on the NAS Gateway 500 documentation CD-ROM and at www.ibm.com/servers/storage/support/.

The following publications contain additional information about the NAS Gateway 500:

- *IBM TotalStorage NAS Gateway 500 Planning Guide*, GA27-4335.

  This manual describes the requirements to consider when planning the installation of the IBM TotalStorage NAS Gateway 500.
- *IBM TotalStorage NAS Gateway 500 Advanced Configuration and Problem Determination Guide*, SC30-4073

  This manual provides information on advanced configuration of the software and problem determination for the NAS Gateway 500.
- *IBM TotalStorage NAS Gateway 500 Service Guide*, GY27-0418

  This manual provides procedures intended for service personnel to troubleshoot and repair the NAS Gateway 500.
- *IBM TotalStorage NAS Gateway 500 Command Reference*, SC30-4074

  This manual contains reference information for commands that you can use on the IBM TotalStorage NAS Gateway 500 System Software. It describes the tasks each command performs, how commands can be modified, how they handle input and output, and who can run them.
- *IBM TotalStorage NAS Gateway 500 CIFS File Serving Guide*, SC30-4075

  This manual provides information about concepts, tools, and techniques for networking NAS Gateway 500 to personal computer clients running Windows operating systems.
- *IBM TotalStorage NAS Gateway 500 Release Notes*, GX27-4027

  These release notes provide product information about issues that were unresolved when the information deliverables went to production.
- *RS/6000® eServer™ pSeries® Adapters, Devices and Cable Information for Multiple Bus Systems*, SA23-2778

  This manual contains information about adapters, devices, and cables for your system.

- *RS/6000 eServer pSeries Diagnostic Information for Multiple Bus Systems*, SA38-0509

  This manual contains diagnostic information, service request numbers (SRNs), and failing function codes (FFCs). It is intended to supplement the service information found in the *IBM TotalStorage NAS Gateway 500 Service Guide*.

Translated publications

Translated publications can be found on the following Web site:

www.ibm.com/servers/storage/support/

Related publications

The following manuals provide additional information about or related to the system:

- *7014 Model T00 and T42 Rack Installation and Service Guide*
- *AIX 5L Version 5.2 Commands Reference, Volume 1*
- *AIX 5L Version 5.2 Commands Reference, Volume 2*
- *AIX 5L Version 5.2 Commands Reference, Volume 3*
- *AIX 5L Version 5.2 Commands Reference, Volume 4*
- *AIX 5L Version 5.2 Commands Reference, Volume 5*
- *AIX 5L Version 5.2 Commands Reference, Volume 6*
- *AIX 5L Version 5.2 Files Reference*
- *AIX 5L Version 5.2 Glossary*
- *AIX 5L Version 5.2 Installation Guide and Reference*
- *AIX 5L Version 5.2 Network Information Services (NIS and NIS+) Guide*
- *AIX 5L Version 5.2 Operating System Installation: Getting Started*
- *AIX 5L Version 5.2 Performance Management Guide*
- *AIX 5L Version 5.2 Performance Tools Guide and Reference*
- *AIX 5L Version 5.2 Security Guide*
- *AIX 5L Version 5.2 System Management Concepts: Operating System and Devices*
- *AIX 5L Version 5.2 System Management Guide: Communications and Networks*
- *AIX 5L Version 5.2 System Management Guide: Operating System and Devices*
- *AIX 5L Version 5.2 System User's Guide: Communications and Networks*
- *AIX 5L Version 5.2 System User's Guide: Operating System and Devices*
- *AIX 5L Version 5.2 Technical Reference: Base Operating System and Extensions Volume 1*
- *AIX 5L Version 5.2 Technical Reference: Base Operating System and Extensions Volume 2*
- *AIX 5L Version 5.2 Web-based System Manager Administration Guide*

Additional information

The following sections describe the notices and highlighting conventions used in the NAS Gateway 500 library, and also an explanation of the importance of capitalization when entering commands.

Notices and highlighting

The publications in the NAS Gateway 500 library contain certain notices that relate to a specific topic. The caution and danger notices also appear in the multilingual Safety Information on the documentation CD-ROM that came with the product. Each notice is numbered for easy reference to the corresponding notices in the Safety Information.

The following list also includes highlighting conventions used throughout the library.

Term	Definition in this document
Notes	These notices provide important tips, guidance, or advice.
Attention	These notices indicate possible damage to programs, devices, or data. An attention notice is placed just before the instruction or situation in which damage could occur.
Caution	These notices indicate situations that can be potentially hazardous to you. A caution notice is placed just before descriptions of potentially hazardous procedure steps or situations.
Danger	These notices indicate situations that can be potentially lethal or extremely hazardous to you. A danger notice is placed just before descriptions of potentially lethal or extremely hazardous procedure steps or situations.
Bold	Identifies commands, subroutines, keywords, files, structures, directories, and other items whose names are predefined by the system. Also identifies graphical objects such as buttons, labels, and icons that the user selects.
Italics	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 that you actually type.

Accessibility

The softcopy version of this manual and the other publications in the NAS Gateway 500 library are accessibility-enabled for the IBM Home Page Reader.

Web sites

This section lists the Web sites where additional technical information is found. Be sure to visit the support page that is specific to your hardware. The Web sites include FAQs, parts information, technical hints and tips, technical publications, and downloadable files, if applicable.

Site	Description
www.ibm.com	Main IBM home page
www.storage.ibm.com/	IBM Storage home page
www.ibm.com/servers/storage/support/	IBM Support home page for Storage products

Safety notices

A *danger* notice indicates the presence of a hazard that has the potential of causing death or serious personal injury. Danger notices appear on the following pages:

- xvi
- 58
- 59
- 307
- 351

A *caution* notice indicates the presence of a hazard that has the potential of causing moderate or minor personal injury. Caution notices appear on the following pages:

- xvi
- 58
- 307
- 348
- 317
- 316

Note: For a translation of these notices, see *Translated Safety Notices*, GA27-4338. This document is included on the NAS Gateway 500 documentation CD-ROM.

Rack safety instructions

- This unit weighs a maximum of 39 kg (87.5 lb). Three persons are required to move it safely. Using fewer than three persons to move it can result in injury.
- Do not install this unit in a rack where the internal rack ambient temperatures will exceed 35°C (95°F).
- Do not install this unit in a rack where the air flow is compromised. Any side, front, or back of the unit used for air flow through the unit must not be in direct contact with the rack.
- Ensure that a hazardous condition is not created due to uneven mechanical loading when installing this unit in a rack. If the rack has a stabilizer it must be firmly attached before installing or removing this unit.
- Consider and inspect the connection of the equipment to the supply circuit to ensure that overloading of circuits does not compromise the supply wiring or overcurrent protection. To provide the correct power connection to the rack, refer to the rating labels located on the equipment in the rack to determine the total power requirement for the supply circuit.
- An electrical outlet that is not correctly wired could place hazardous voltage on the metal parts of the system or the devices that attach to the system. It is the responsibility of the customer to ensure that the outlet is correctly wired and grounded to prevent an electrical shock.

Electrical safety

Observe the following safety instructions any time you are connecting or disconnecting devices attached to the workstation.

In the system that you are about to setup or service:

- The ac power interface connector is considered the main power disconnect device.
- This system has redundant power supply capabilities, meaning that it has two power supplies running simultaneously in the same system unit. When instructed to disconnect the power source, ensure that all power cables have been unplugged.

DANGER

To prevent electrical shock hazard, disconnect all power cables from the electrical outlet before relocating the system. (D07)

CAUTION:
This product is equipped with a 3-wire power cable and plug for the user's safety. Use this power cable in conjunction with a correctly grounded electrical outlet to avoid an electrical shock. (C10)

Laser safety information

CAUTION:
This product may contain a CD-ROM, DVD-ROM, or laser module on a PCI card, which are class 1 laser products. (C14)

Laser compliance

All lasers are certified in the U.S. to conform to the requirements of DHHS 21 CFR Subchapter J for class 1 laser products. Outside the U.S., they are certified to be in compliance with the IEC 825 (first edition 1984) as a class 1 laser product. Consult the label on each part for laser certification numbers and approval information.

CAUTION:
All IBM laser modules are designed so that there is never any human access to laser radiation above a class 1 level during normal operation, user maintenance, or prescribed service conditions. Data processing environments can contain equipment transmitting on system links with laser modules that operate at greater than class 1 power levels. For this reason, never look into the end of an optical fiber cable or open receptacle. Only trained service personnel should perform the inspection or repair of optical fiber cable assemblies and receptacles. (C13)

Data integrity and verification

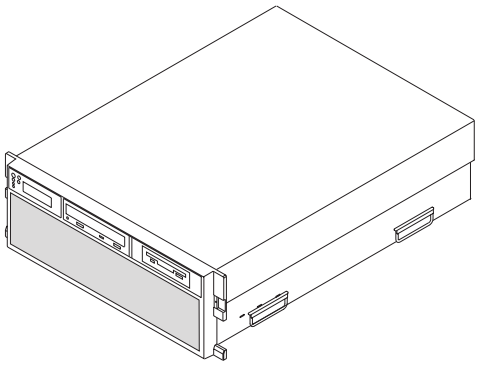
IBM computer systems contain mechanisms designed to reduce the possibility of undetected data corruption or loss. This risk, however, cannot be eliminated. Users who experience unplanned outages, system failures, power fluctuations or outages, or component failures must verify the accuracy of operations performed and data saved or transmitted by the system at or near the time of the outage or failure. In addition, users must establish procedures to ensure that there is independent data verification before relying on such data in sensitive or critical operations. Users should periodically check the IBM support Web sites for updated information and fixes applicable to the system and related software.

Chapter 1. Reference information

This chapter provides an overview of the system, including a logical description and a physical overview. The following additional details pertaining to the system are also provided:

- System features
- Powering the system on and off
- Console strategy
- Power-on self-test
- POST indicators
- POST keys
- System unit locations
- System logic flow
- Location codes
- Mapping AIX and physical location codes
- System cables
- Specifications
- External AC power cables
- Service inspection guide

Overview



The NAS Gateway 500 is a four Electronic Industries Association (EIA) unit drawer designed to be housed in a 19-inch rack. It can be configured as a two-way or four-way symmetric multiprocessing (SMP) system; it can have up to two hot-plug disk drives and six hot-plug PCI-X adapters. It has redundant hot-plug power supplies and redundant cooling fans. Power is provided through two AC power cords. It operates at either 100 - 127 V AC or 200 - 240 V AC power. The two media bays are used to accommodate the following drives:

- IDE CD-ROM drive
- Diskette drive

System features

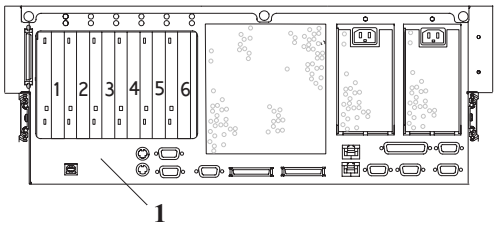
This section describes the features of the NAS Gateway 500.

Bus architecture

The NAS Gateway 500 has six PCI-X slots available. The slots are 64-bit capable at 133 MHz, 3.3 volts. All slots are capable of using the full-length PCI-X adapters. The PCI-X slots are numbered on the back of the chassis, from left to right.

The NAS Gateway 500 includes dual integrated Ultra3 SCSI controllers, dual 10/100 Mbps integrated Ethernet controllers, and four front-accessible disk bays supporting up to two hot-swappable disks. Only one drive is used if mirroring feature code is not installed. Otherwise, two hard disk drive bays are used. Hard disk drives are used **only** for the operating system. Two hard disk drive bays remain unused. The hard disk drives are 36.4 GB, 10 000 rpm Ultra 3 SCSI drives. The two media bays are used for a CD-ROM and a diskette drive. The Converged Service Processor 2 (CSP), including system power control, is also integrated, along with the native I/O functions such as serial ports.

The following figure shows the PCI-X adapter slot locations when viewing from the back of the system.



1 PCI-X adapter slot locations

Processor books

- Each NAS Gateway 500 has one or two processor books. The processor books are mechanical assemblies that contain a two-way processor card. Each of the two processors on this card has a dedicated 8-MB L2 cache, and these processors share a common 64-MB L3 cache.
- L3 cache capacity per processor configuration:
  - Two-way configuration = One L3 chip with a 64-MB cache capacity
  - Four-way configuration = One L3 chip per processor book and two processor books, yielding a total of 128-MB cache capacity

Note: A two-way processor node is made up of a single processor book, and a four-way processor node is made up of two processor books.

Memory

- 4-GB to 32-GB error correction code (ECC) double data rate (DDR) 100 MHz synchronous dynamic random-access memory (SDRAM).
- Dual in-line memory modules (DIMMs) plug into the processor cards (eight DIMM slots per card).
- DIMMs can be populated singly or in quads (four DIMMs). A memory feature consists of a quad. See 4 and Table 5 on page 12 for valid memory configurations.
- A system with a single processor book (a two-way processor node) can have a maximum of 16 GB of memory, and a system with a dual processor book (a four-way processor node) can have a maximum of 32 GB of memory.

Media drives

Typical system configuration consists of two media bays.

- Media bay 1 has an IDE CD-ROM.
- Media bay 2 has a diskette drive.

Hot-pluggable disk drives

Four hot-plug disk-drive bays with a maximum of two bays used for the operating system and operating system mirroring feature, using only 36.4 GB Ultra3 10K RPM 1-inch drives. Disk-drive bays 3 and 4 are always empty.

PCI-X slots and integrated adapter ports

Six hot-plug PCI-X slots (64 bit, 133 MHz, 3.3 volts) are included in the NAS Gateway 500.

The following integrated ports are included in the NAS Gateway 500:

- Two 10/100 Ethernet (IEEE 802.3 compliant).

  Table 2 shows the location and current usage for the dual 10/100 Ethernet ports:

Table 2. Usage for integrated 10/100 Ethernet ports

Description	Location	Applicable usage
Port 2 dual integrated 10/100 Ethernet controller	Back of the system	Reserved for clustering heartbeat, when FC 1001 (cluster interconnect kit) is installed
Port 1 dual integrated 10/100 Ethernet controller	Back of the system	Reserved for connection to the Service/Management LAN

- One external Ultra3 SCSI (one external Ultra3 SCSI with VHDCI 4 mini 68-pin port
- Three serial ports.
  - Serial port 1 (S1) has two physical connectors, one RJ-48 connector located in front on the operator panel and a 9-pin D-shell connector located on the back of the chassis. The use of the front connector disables the back S1 connector.
  - Serial port 2 (S2) has a 9-pin D-shell connector on the back of the system chassis.
  - Serial port 3 (S3) has a 9-pin D-shell connector on the back of the system chassis.

  Table 3 shows the current usage for the serial port connectors:

Table 3. Usage for serial port connectors

Serial port number	Location	Examples of applicable usage
Serial port 1 (S1 front)	Operator panel	Reserved for a service console, whether it is used or not
Serial port 1 (S1 back)	Back of the system	Reserved for a service console, whether it is used or not
Serial port 2 (S2)	Back of the system	Reserved for the call-home modem, whether it is used or not
Serial port 3 (S3)	Back of the system	Reserved for the clustering (null modem cable) or an uninterruptible power supply

Notes:

1. Serial port S1 and serial port 2 are never used for clustering or to attach an uninterruptible power supply. *Do not* run an uninterruptible power supply connected to serial port S2.

If you decide to disconnect clustering, you *must* reset the service processor using the pinhole reset switch before running another application. The service processor pinhole reset switch is located on the operator panel.

2. If you are using both serial port S2 (for example, to support the call home function) and serial port S3 (for clustering) and you require an uninterruptible power supply as well, you must order the uninterruptible power supply with an Ethernet adapter and connect it to the Service/Management LAN.

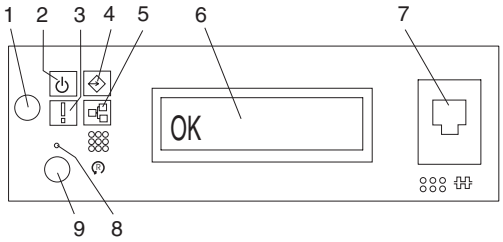
Power supply

There are two power supplies per system; the second power supply is used for redundant power.

- Input type:
  - 120 - 127 V AC 12 A
  - 200 - 240 V AC 6 A
- Single phase
- Frequency = 47 Hz - 63 Hz
- Total output power of each power supply is 670 watts.

Operator panel

The following figure shows the operator panel.



1 Power-on button

2 Power-on LED (blinks when in standby)

3 Attention LED

4 SCSI port activity LED

5 Ethernet port activity LED

6 32-character operator panel diagnostics display

7 (FS1) Front serial connector (RJ-48 connector)

8 Service processor reset switch (pinhole)

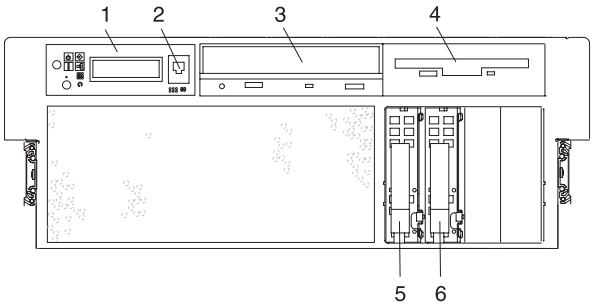
9 System reset button (amber)

Hardware security features

On the NAS Gateway 500, you can set the following types of service processor passwords to limit access to these systems:

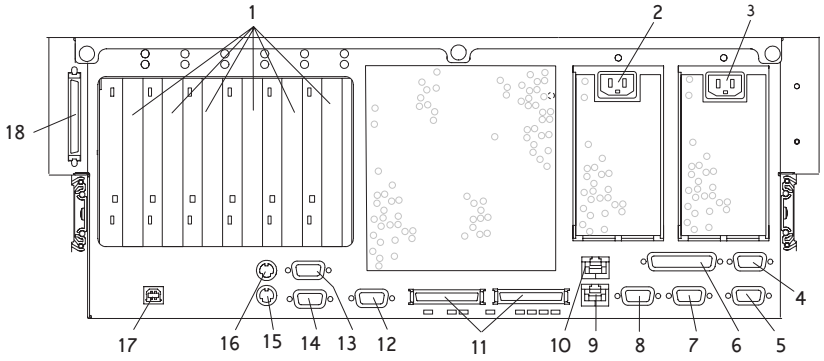
- General-access password - set only from the service processor menus. It provides limited access to the service processor menus and is usually available to all users who are allowed to power on the system.
- Privileged-access password - Set from the service processor menus or from System Management Services (SMS) menus. Used by the system administrator or root user and allows access to all service processor functions.

Front view of the NAS Gateway 500 (with bezel off)



1 Operator panel
2 Front serial connector
3 IDE CD-ROM drive
4 Diskette drive
5 Hot-plug disk drive for operating system
6 Hot-plug disk drive for optional OS mirroring feature

Back view of the NAS Gateway 500



1 PCI-X slots (64-bit) 133 MHz
2 Power supply 2 cable receptacle
3 Power supply 1 cable receptacle
4 System power control network connector SPCN1 (not supported)
5 System power control network connector SPCN2 (not supported)
6 Parallel connector (not supported)
7 Hardware Management Console connector HMC2 (not supported)
8 Hardware Management Console connector HMC1 (not supported)
9 Ethernet connector 1
10 Ethernet connector 2
11 RIO 0 and RIO 1 connectors (not supported)
12 Serial connector 2
13 Serial connector 3
14 Serial connector 1
15 Mouse connector (not supported)
16 Keyboard connector (not supported)
17 Rack indicator (not supported)
18 External SCSI connector

Powering the system on and off

For procedures to power off and power on the system for various system configurations and operating systems, see “Stopping the system” on page 310 and “Starting the system” on page 311.

Console strategy

The NAS Gateway 500 is a headless system (that is, without a display interface permanently attached or part of the normal NAS Gateway 500 configuration). Serial port 1 is reserved for the system console. A console attached to serial port 1 allows access to the service processor, POST messages and other service aids, such as running diagnostics from the CD-ROM drive.

You can also use a personal computer (PC) as a console using a null-modem cable. The PC would require a terminal emulation program (for example, HyperTerminal on Windows and vt100 emulation mode) to act as the console interface. Specific communication settings depend on the system; however, these are typical settings:

- 9600 baud
- 8 data bits
- 1 stop bit
- No parity
- Xon/Xoff or hardware

The firmware starts a console-selection sequence at system boot time if any of the following is true:

- A console has not yet been selected.
- A previous console-selection sequence timed out.
- A change in the system configuration affects the console.

The console-selection sequence allows you to select (from the appropriate input device) any one of the available console devices. If no console is selected within approximately 60 seconds, serial port 1 (S1) is selected as the console and the selection sequence times out.

Attention: If an ASCII terminal is attached to serial port 1 (S1), and there is any interaction with this terminal:

- After `0K` is displayed in the operator panel

  AND
- Before the power-on sequence is initiated

the firmware will use this terminal as the console, regardless of the previous console selection.

After a console has been selected, the console-selection sequence is started at boot time only if there is a change in the system configuration (as previously described), or the contents of the system’s nonvolatile memory (NVRAM) are lost.

You can also initiate a system console-selection sequence from the SMS menus.

Power-on self-test

After power is turned on and before the operating system is booted, the system does a power-on self-test (POST). This test performs checks to ensure that the hardware is functioning correctly before the operating system is installed. During the POST, a POST screen is displayed, and POST indicators appear on the firmware console (if one is connected). The next section describes the POST indicators and functions that can be accessed during the POST.

POST indicators

POST indicators indicate tests that are being performed as the system is preparing to boot the operating system. The POST indicators are words displayed on the system console. Each time that the system starts a different step in the POST, a POST indicator word appears on the console. Each word is an indicator of the tests that are being performed.

The POST screen displays the following words:

Memory Memory test.

Keyboard The time period for pressing a key to access the System Management Services, or to initiate a service mode boot is now open. See “POST keys” for more information.

Network Self-test on network adapters.

SCSI Adapters are being initialized.

Speaker Sounds an audible tone at the end of POST.

POST keys

The POST keys, if pressed *after* the **keyboard** POST indicator is displayed and *before* the last POST indicator **speaker** is displayed, cause the system to start services or to initiate service mode boots used for configuring the system and diagnosing problems. The keys are described below:

1 key

The numeric 1 key, when pressed during POST, starts the System Management Services (SMS) interface.

5 key

The numeric 5 key, when pressed during POST, initiates a system boot in service mode using the default service mode boot list.

This mode attempts to boot from the first device of each type found in the list. It does not search for other bootable devices of that type if the first device is not bootable. Instead, it continues to the next device type in the list. The firmware supports up to five entries in the boot list.

Note: This is the preferred method of loading standalone diagnostics from CD-ROM.

The default service mode boot sequence is:
1. Diskette
2. CD-ROM
3. Hard file
4. Tape drive (not applicable)
5. Network (not applicable)
   a. Token ring (not applicable)
   b. Ethernet (not applicable)

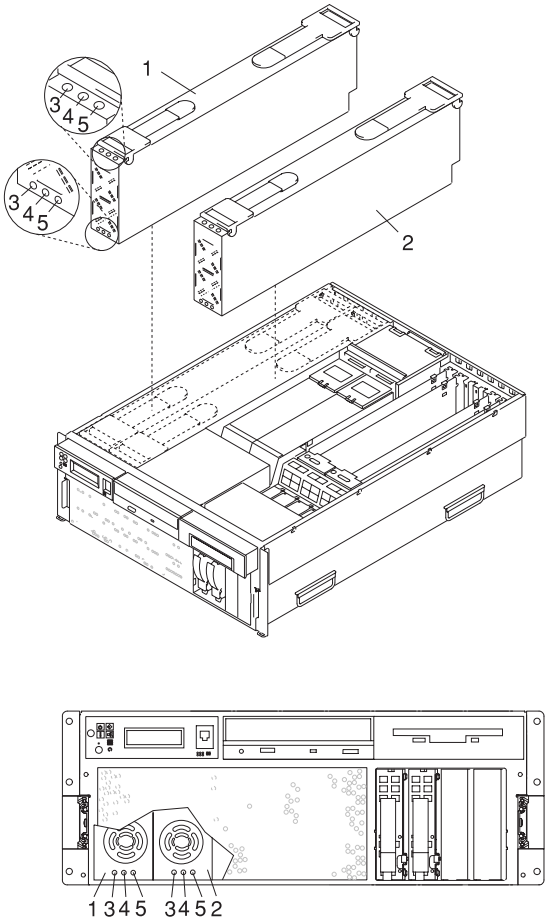
6 key

The numeric 6 key works like the numeric 5 key, except that firmware uses the customized service mode bootlist that was set up in the NAS Gateway 500 service aids or the service processor menus.

Note: This is the preferred method of loading online diagnostics from the boot hard disk.

System unit locations

Power supply locations

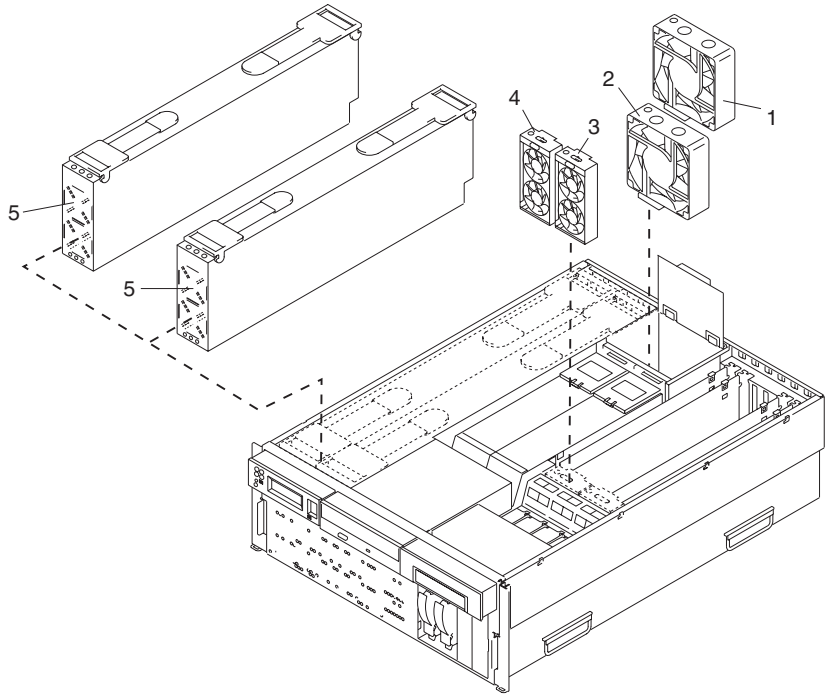


1 Power supply #1
2 Power supply #2
3 AC good LED (green)
4 DC good LED (green)
5 Fault LED (amber)

Fan locations

The following illustration identifies the system cooling fans. The fans have an amber LED located on top of the housing. A lit amber LED indicates that the fan is not operating correctly.

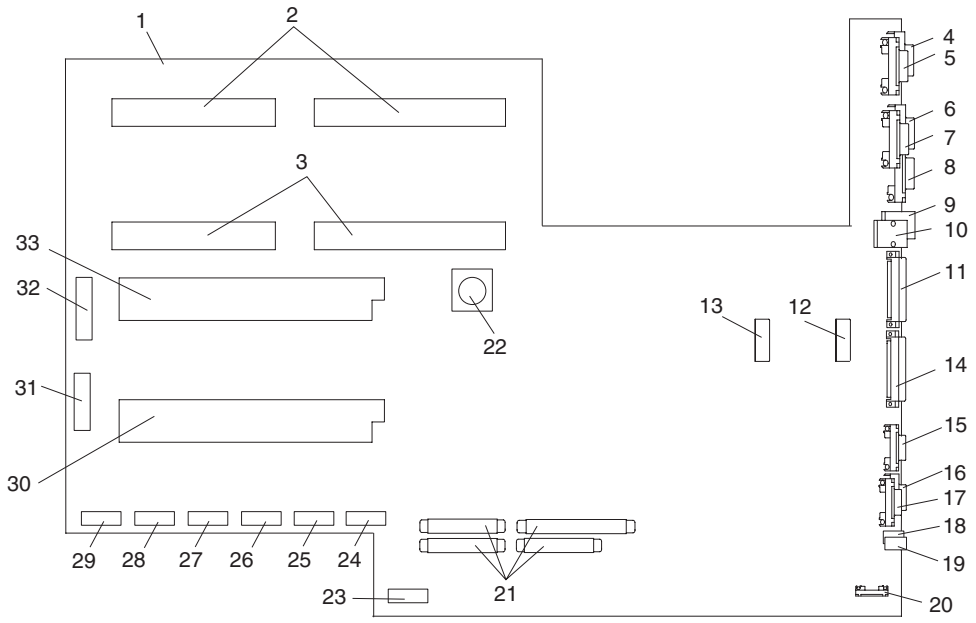
The power supplies have two groups of three LEDs located on the front and top. The amber LED on the power supply indicates a problem with the power supply. If a power supply is diagnosed with a cooling problem, the entire power supply must be replaced.



1 Processor-card cooling fan #1
2 Processor-card cooling fan #2
3 PCI-X-adapter cooling fan #4
4 PCI-X-adapter cooling fan #3
5 Stacked-power-supply cooling fans

CEC backplane locations

The following illustration of the CEC backplane identifies the primary connectors used in your system.



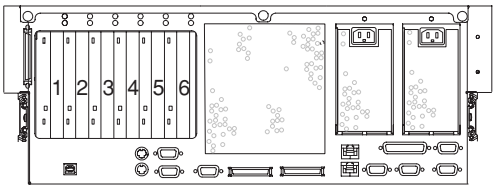
1 CEC backplane
2 Power supply #1 connectors
3 Power supply #2 connectors
4 SPCN1 connector (not supported)
5 SPCN2 connector (not supported)
6 HMC2 connector (not supported)
7 Parallel port connector (not supported)
8 HMC1 connector (not supported)
9 Ethernet #1 connector
10 Ethernet #2 connector
11 Connector RIO-G1 connector (not supported)
12 Processor-cooling-fan #1 connector
13 Processor-cooling-fan #2 connector
14 Connector RIO-G0 connector (not supported)
15 Serial port #2 connector
16 Serial port #1 connector
17 Serial port #3 connector
18 Mouse (not supported)
19 Keyboard (not supported)
20 Rack-indicator connector (not supported)
21 PCI-riser-card connectors
22 Battery connector
23 For manufacturing use only
24 PCI-X cooling fan #3 and #4 connector
25 IDE CD-ROM signal connector
26 Diskette-drive-signal connector
27 Diskette-drive-power connector
28 Media power connector
29 Disk-drive-backplane-power connector
30 Processor card #2 connector
31 For manufacturing use only
32 Operator-panel connector
33 Processor card #1 connector

PCI riser card locations

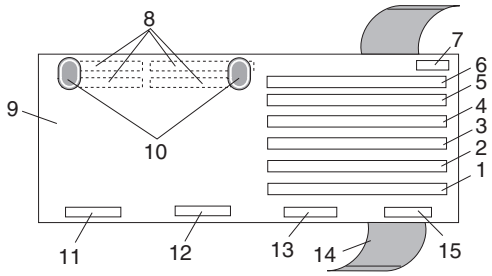
The slots are 64-bit capable at 133 MHz, 3.3 volts. The PCI-X slots are numbered on the back of the chassis, from left to right.

The PCI-X riser card has two integrated SCSI controllers. One SCSI controller (PCI, 64-bit) is a SYM53C1010 that operates at 66 MHz and has dual low voltage differential (LVD) ports. The other is a 53C875, SE-SCSI controller. The internal port from SCSI controller SYM53C1010 connects to the DASD board through a 68-pin SCSI cable. The port from the SE-SCSI controller is unused.

The following illustration shows the PCI-X adapter slot locations when viewing from the back of the system.



The following illustration shows the connector and slot locations on the PCI riser card.



1 PCI-X slot 1

2 PCI-X slot 2

3 PCI-X slot 3

4 PCI-X slot 4

5 PCI-X slot 5

6 PCI-X slot 6

7 Manufacturing use only

8 Riser card to CEC backplane standoff connectors (quantity 4) located on the underside of the PCI riser card

9 Riser card

10 “Push” labels

11 Internal disk drive SCSI connector (for internal disk drive use only)

12 Single-ended SCSI to media connector

13 External SCSI connector

14 Removal sling

15 Riser-card-to-disk-drive-backplane signal connector

DIMM locations

The dual in-line memory modules (DIMMs) used in the NAS Gateway 500 are located on the processor card. Your system contains either one or two processor cards, each card with eight DIMM slots. Associated with each DIMM slot is an LED, which is located on the edge of the processor card and is visible from the top of the processor book. A lit LED indicates a problem with a specific DIMM. If a DIMM slot LED is lit, swap that DIMM out first, following these rules:

- DIMMs can be installed singly or in quads. However, you do not need to install four new DIMMs in a quad when you have a memory problem. Swap out each DIMM, starting the system after each change, until the faulty DIMM has been replaced.

  Note: A quad is a group of four DIMMs. Each DIMM in a quad must be the same type and size. However, both quads on the same processor card are not required to be the same.
- The system must have at least four DIMMs installed (one quad).
- The quad slot combinations are M1, M3, M6, and M8 (or M2, M4, M5, and M7).

  Note: M1, M3, M6, and M8 (or M2, M4, M5, and M7) combinations are the only possible slot combinations recognized by the system.

Table 4 shows valid memory configurations when only one FC 5127 (processor book) is installed. You can have only one of the memory configurations identified by each row of Table 4.

Table 4. Valid configurations when one FC 5127 is installed

Number of FC 4452 (4 x 512 MB)	Number of FC 4453 (4 x 1 GB DIMMs)	Number of FC 4454 (4 x 2 GB (DIMMs)	Total memory
2	0	0	4 GB
1	1	0	6 GB
1	0	1	10 GB
0	1	0	4 GB
0	1	1	12 GB
0	2	0	8 GB
0	0	1	8 GB
0	0	2	16 GB

Table 5 shows valid memory configuration when two FC 5127s (processor books) are installed. You can have only one of the memory configurations identified by each row of Table 5.

Table 5. Valid configurations when two FC 5127s are installed

Number of FC 4452	Number of FC 4453	Number of FC 4454	Total memory
4	0	0	8 GB
2	2	0	12 GB
2	0	2	20 GB
0	2	0	8 GB
0	2	2	24 GB
0	4	0	16 GB
0	0	2	16 GB
0	0	4	32 GB

The following processor card illustration shows the DIMM slot locations, as well as the LED location associated with each DIMM slot.

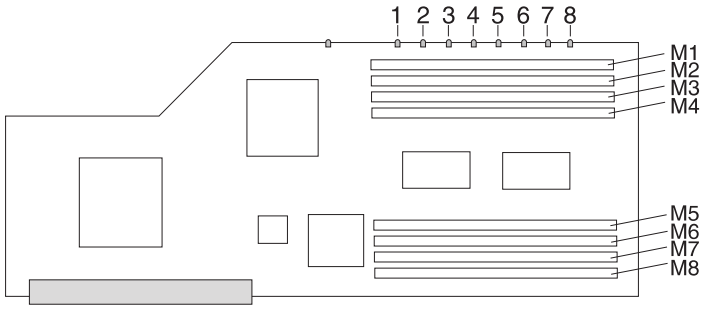


Table 6. Fault LEDs for processor book and memory module slots (1-8)

Number	Description	Location code
M1	Memory slot 1 (J2A)	U0.1-P1-C1-M1
M2	Memory slot 2 (J2B)	U0.1-P1-C1-M2
M3	Memory slot 3 (J3A)	U0.1-P1-C1-M3
M4	Memory slot 4 (J3B)	U0.1-P1-C1-M4
M5	Memory slot 5 (J1B)	U0.1-P1-C1-M5
M6	Memory slot 6 (J1A)	U0.1-P1-C1-M6
M7	Memory slot 7 (J0B)	U0.1-P1-C1-M7
M8	Memory slot 8 (J0A)	U0.1-P1-C1-M8
Note: The location code column indicates the location codes for processor card 1. If your system is configured for processor card 2, substitute C2 in place of C1.		

Memory rules

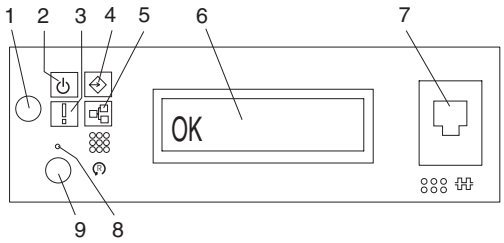
For optimal performance, memory should be balanced between the two processor boards. If you do not balance the memory correctly, the NAS Gateway 500 will function with reduced performance.

Memory placement rules:

- All memory FCs contain four DIMMs of equal size (one quad).
- Memory is plugged in one quad at a time.
- Placement order is from the lowest to the highest MB-size quads (FC 4452, 4453, 4454)
- Populate the quad consisting of J0A, J1A, J2A, and J3A first, then populate the second quad (J0B, J1B, J2B, and J4B).
- If you have two processors, populate both first quads, and then populate both second quads.

Reading the operator panel and system LEDs

The following illustration shows the component location on the operator panel.

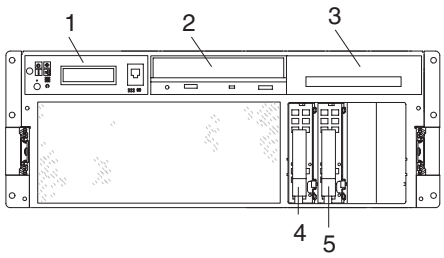


1 Power-on button
2 Power LED
3 Attention LED
4 SCSI port activity
5 Ethernet port activity
6 Operator-panel display
7 (FS1) front serial connector (RJ-48 connector)
8 Service processor reset switch (pinhole)
9 System reset button

Index	Component name	Component description
1	Power-on button	Turns the system power on and off.
2	Power LED	Blinking - When connected to the power source (system is in standby mode). Solid - When power button has been pressed. **Note:** There is approximately a 40-second transition period from the time the power button is pressed to when the power LED goes from blinking to solid. During the transition period, you might observe the blinking intervals speed up.
3	Attention LED	Normal state - LED is off.
4	SCSI port activity	Normal State - LED is on when there is SCSI activity.
5	Ethernet port activity	Normal state - LED is on when there is Ethernet activity.
6	Operator-panel display	Displays current status of system startup, or diagnostic information in the event of a hardware problem.
7	Front serial connector (FS1)	Serial port uses RJ-48 connector. Use to plug in external devices at the front of the system unit.
8	Service processor reset switch (pinhole)	Service personnel use only.
9	System reset button	Resets the system.

For more information about other system LEDs, see “Component LEDs” on page 384.

SCSI IDs and bay locations



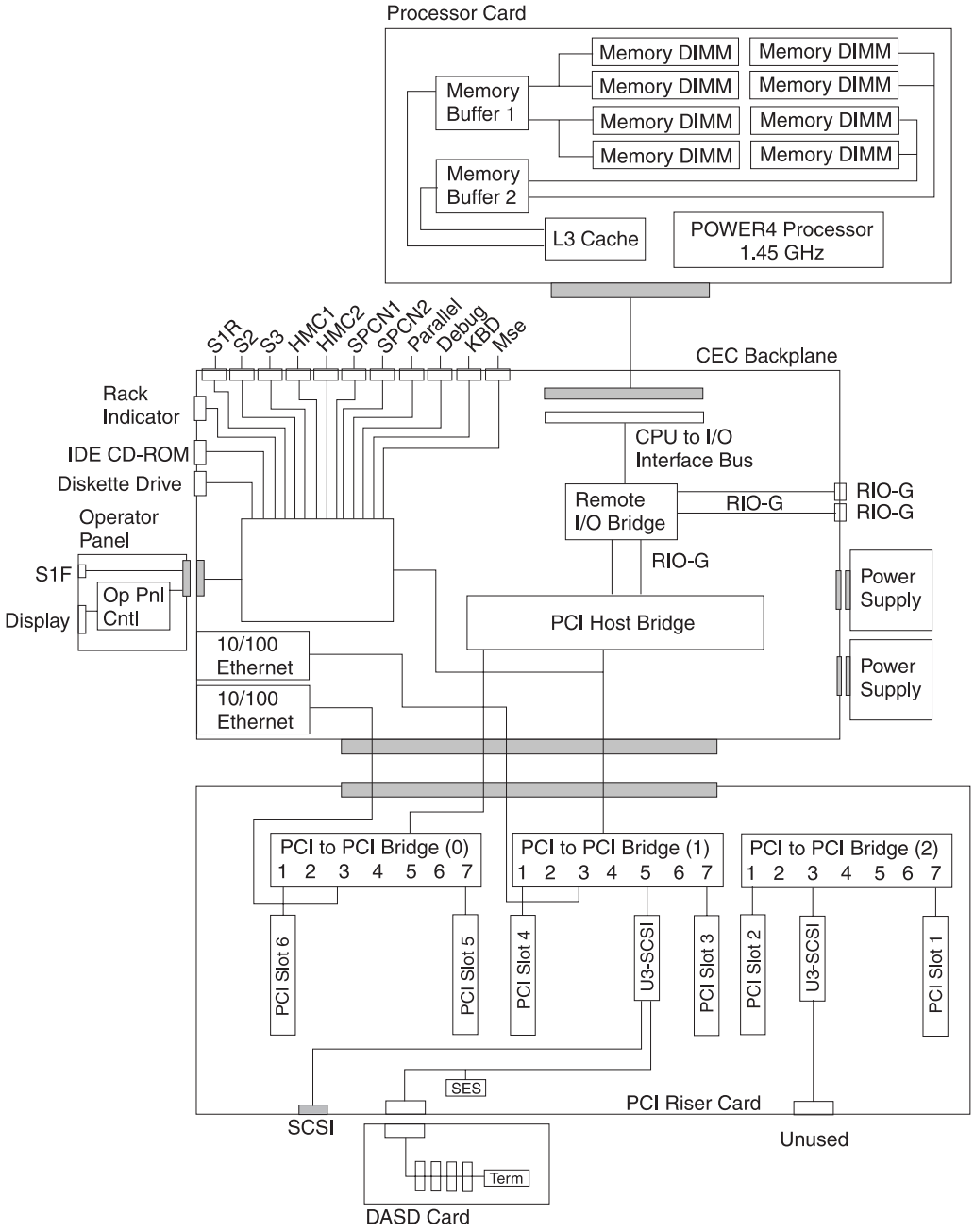
Note: To show the disk drive and disk drive bay locations, the NAS Gateway 500 is shown with its bezel removed.

Index	Bay location	Drive name	SCSI ID
1		Operator panel	
2	D01	IDE CD-ROM	IDE (Non-SCSI)
3	D02	Diskette drive	SCSI ID 0
4	D10 (base OS)	Disk drive	SCSI ID 8
5	D11 (OS mirroring)	Disk drive (optional)	SCSI ID 9

Note: The SCSI bus IDs are the recommended values and indicate how the IDs are set when the system is shipped from the factory. Field installations might not comply with these recommendations.

System logic flow

Note: Not all components are supported.



Location codes

This system unit uses physical location codes in conjunction with AIX location codes to provide mapping of the failing field replaceable units. The location codes are produced by the system unit's firmware and AIX.

Physical location codes

Physical location codes provide a mapping of logical functions in a platform (or expansion sites for logical functions, such as connectors or ports) to their specific locations within the physical structure of the platform.

Location code format

The location code is an alphanumeric string of variable length, consisting of a series of location identifiers, separated by a dash (-), or slash (/), or a pound sign (#) character. The series is hierarchical; that is, each location identifier in the string is a physical or logical child of the one preceding it.

- The - (dash) separator character represents a normal structural relationship where the child is a separate physical package and it plugs into (or is connected to) the parent. For example, P1-C1 is a processor card (C1) plugged into a planar (P1), or P1-M1 is a DIMM plugged into a planar (P1).
- The / (slash) separator character separates the base location code of a function from any extended location information. A group of logical devices can have the same base location code because they are all on the same physical package, but might require extended location information to describe the connectors that they support. For example, P2/S1 describes the location of the serial port 1 controller and its connector (S1), which is located on planar P2 (its base location code), but the / indicates that further devices can be connected to it at the external S1 serial connector. The location code P2/Z1 indicates an integrated SCSI controller that drives connector Z1, although location codes of P2-Z1-... point to the actual SCSI bus and devices.
- The # (pound sign) separator character indicates a cable connection between a connector and parent.

The following are examples:

- U0.1-P1-C1 identifies processor card C1 plugged into the CEC backplane P1.
- U0.1-P1-C2-M1 identifies DIMM M1 plugged into slot 1 on processor card C2 connected to the CEC backplane P1.
- U0.1-P1/S1 identifies serial port 1 controller on the CEC backplane P1 or the connector for serial port 1.
- U0.1-P2/Z1 identifies an integrated SCSI port controller on PCI riser card P2 that drives internal SCSI drive connector Z1.
- U0.1-P2-Z1-A8... points to the actual SCSI bus and devices attached to Z1; in this case, a hot-plug disk drive in bay location D10 with a SCSI ID of 8.

AIX location codes

The basic formats of the AIX location codes are as follows:

- For non-SCSI devices and drives:
  - AB-CD-EF-GH
- For SCSI devices and drives:
  - AB-CD-EF-G,H

Non-SCSI devices and drives

For planars, cards, and non-SCSI devices, the location code is defined as follows:

```
AB-CD-EF-GH
 |  |  |  |device/FRU/port ID
 |  |  connector ID
 |  devfunc number, adapter number or physical location
 bus type or PCI parent bus
```

- The AB value identifies a bus type or PCI parent bus as assigned by the firmware.

- The CD value identifies adapter number, the adapter's devfunc number, or physical location. The devfunc number is defined as the PCI device number multiplied by 8, plus the function number.
- The EF value identifies a connector.
- The GH value identifies a port, address, device, or FRU.

Adapters and cards are identified only with AB-CD.

The possible values for AB are:

00	Processor bus
01	ISA bus
02	EISA bus
03	MCA bus
04	PCI bus used if the PCI bus cannot be identified
05	PCMCIA buses
xy	For PCI adapters where x is equal to or greater than 1. The x and y are characters in the range of 0-9, A-H, J-N, P-Z (O, I, and lowercase are omitted) and are equal to the parent bus's 'ibm, aix-location' open firmware property.

The value of CD is the device's devfunc number (PCI device number multiplied by 8, plus the function number). The C and D are characters in the range of 0-9, and A-F (hex numbers). Location codes therefore uniquely identify multiple adapters on individual PCI cards.

EF is the connector ID. It is used to identify the adapter's connector to which a resource is attached.

GH is used to identify a port, device, or FRU. For example:
- For a diskette drive, H identifies either diskette drive 1 or 2. G is always 0.
- For all other devices, GH is equal to 00.

For an integrated adapter, EF-GH is the same as the definition for a pluggable adapter. For example, the location code for a diskette drive is 01-D1-00-00. A second diskette drive is 01-D1-00-01.

SCSI devices/drives

For SCSI devices, the location code is defined as follows:

```
AB-CD-EF-G,H
 |  |  | | |
 |  |  | | logical unit address of the SCSI device
 |  |  | Control unit address of the SCSI device
 |  |  Connector ID
 |bBus type or PCI parent bus
```

Where AB-CD-EF are the same as non-SCSI devices.

G defines the control unit address of the device. Values of 0 to 15 are valid.

H defines the logical unit address of the device. Values of 0 to 255 are valid.

A bus location code is also generated as '00-XXXXXXXX' where XXXXXXXX is equivalent to the node's unit address.

Examples of physical location codes displayed by AIX are as follows:
- Processor card C1 plugged into CEC backplane P1:

  U0.1-P1-C1

- Processor card C2 attached to CEC backplane P1:

  U0.1-P1-C2

- DIMM in slot 2 of processor card C1 attached to CEC backplane P1:

  U0.1-P1-C1-M2

Examples of AIX location codes displayed are as follows:

- Integrated PCI-X adapter:

10-80	Ethernet
10-60	Integrated SCSI port 1 (internal)
10-88	Integrated SCSI port 2 (external)

- PCI-X adapters:

20-58 to 20-5F	Any PCI-X card in slot 1
20-60 to 20-67	Any PCI-X card in slot 2
10-68 to 10-6F	Any PCI-X card in slot 3
10-70 to 10-77	Any PCI-X card in slot 4
10-78 to 10-7F	Any PCI-X card in slot 5
10-80 to 10-87	Any PCI-X card in slot 6

- Device attached to SCSI controller:

10-60-00-4,0	Device attached to integrated SCSI port 1

Multiple FRU callout instructions

If an eight-digit error code appears in the operator panel display or is found in Chapter 5, “Error code to FRU index”, on page 125, a location code for a failing part might also be specified. If the location code includes a blank space followed by a lowercase *x* followed by a number, this is an error code with multiple FRU callouts. This error can typically happen with DIMMs or processors, and might involve mixed types of parts. In this case, check the system’s configuration for FRU part numbers to determine the appropriate set of FRUs.

To determine the FRU part numbers of the electronic assemblies in the entire system, use the service processor menus. From the General User menu, select Read VPD Image from Last System Boot, then enter 90 to display detailed vital product data (VPD).

FRU identify LEDs

This system is configured with an arrangement of LEDs that help identify various components of the system. These include, but are not limited to the following:

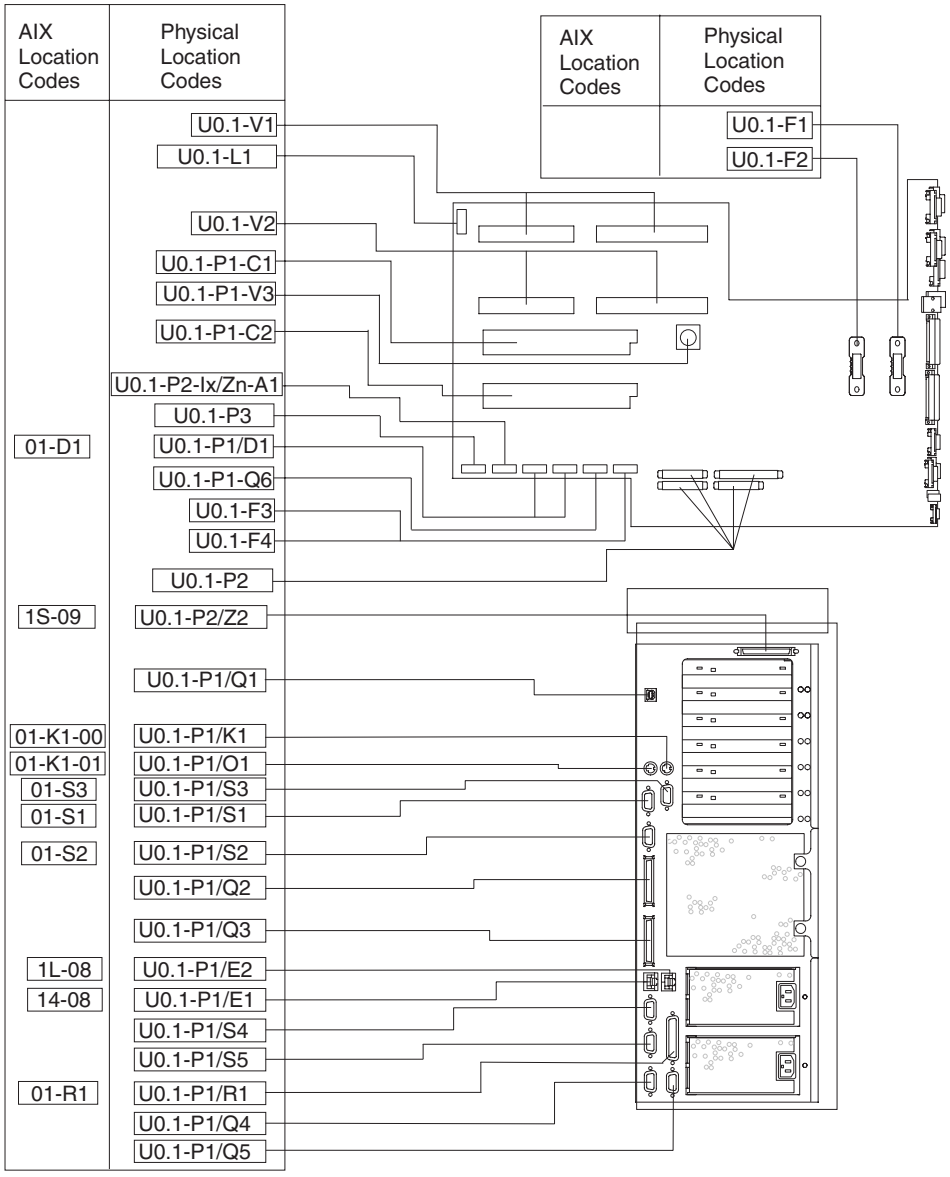
- Various FRU identify LEDs
  - Power subsystem FRUs
  - CEC subsystem FRUs
  - I/O subsystem FRUs
  - PCI-X adapter identify LED
  - DASD identify LED

Any identify LED in the system can be flashed when the system is in the failed state with power on by using the service processor LED Control Menu contained in the “System information menu” on page 268.

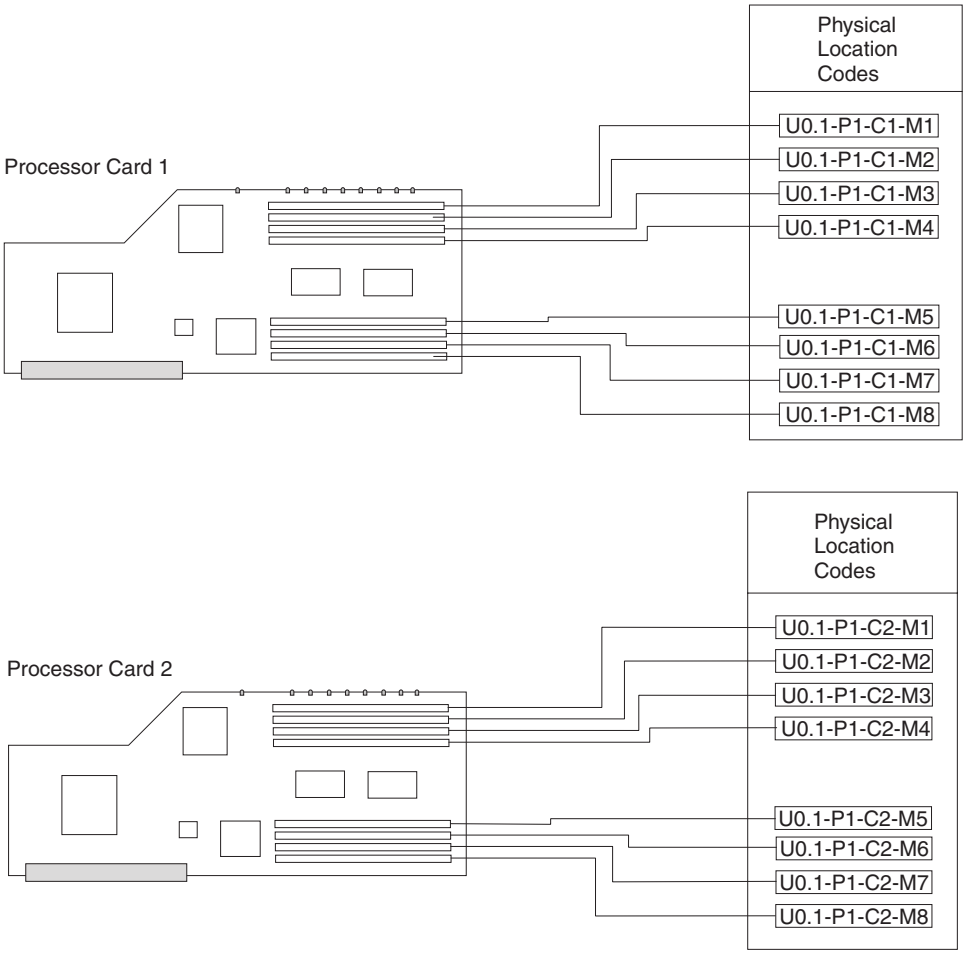
Any identify LED in the system can also be flashed by using the ″Identify and Attention Indicators″ task through diagnostics. The procedure to operate the ″Identify and Attention Indicators″ task in diagnostics is outlined in the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*.

Mapping AIX and physical location codes

Use the following illustration to aid you in the mapping of a location code to its connector on the system backplane.

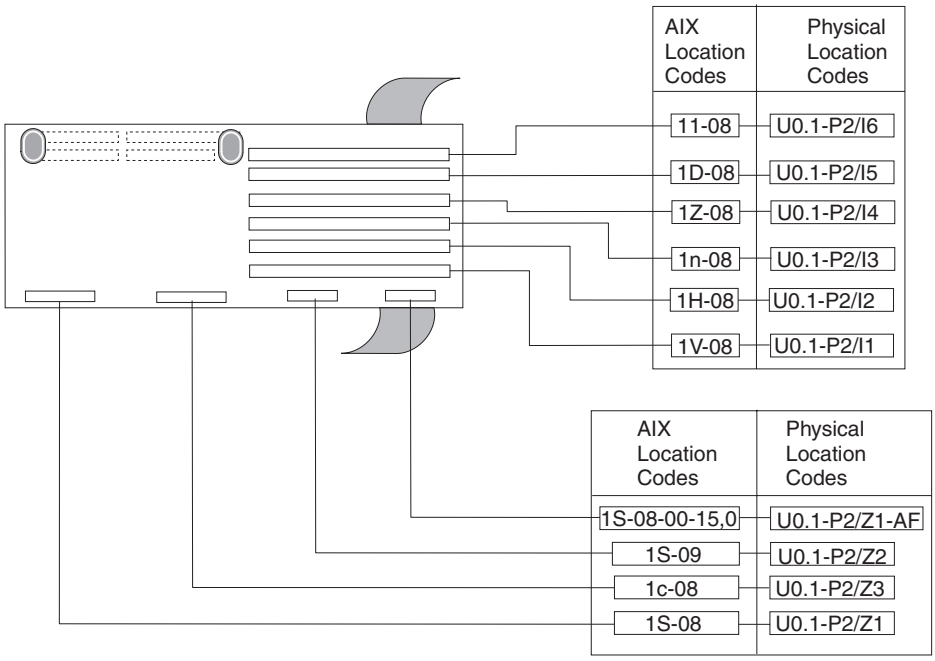


Use the following illustration to aid you in the mapping of a location code to its DIMM slot on the processor cards.



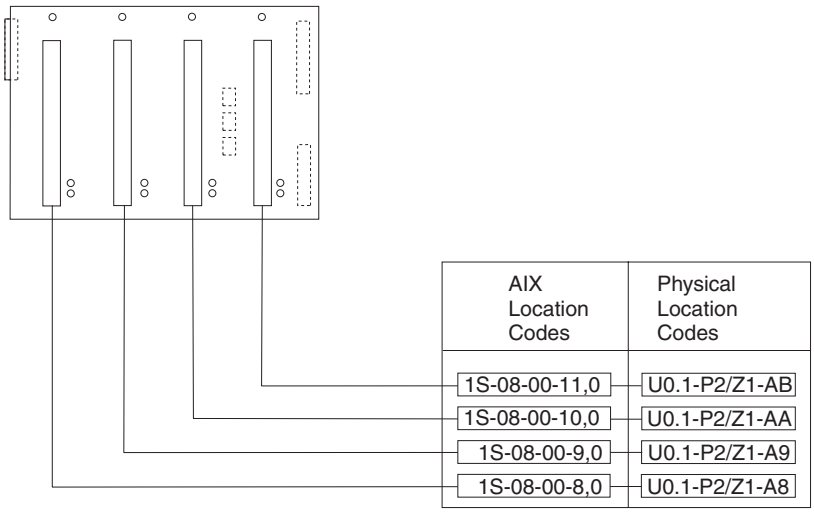
Use the following illustration to aid you in the mapping of a location code to its slot on the PCI riser card.

PCI riser card location codes



Disk drive backplane location codes

Use the following illustration to aid you in the mapping of a location code to its slot on the disk drive backplane.



AIX and physical location code table

Note:

The NAS Gateway 500 does not support all listed components.

Component name	Physical location code	AIX location code
Central electronics complex (CEC)		
Rack frame	U0	
CEC drawer	U0.1	
CEC backplane	U0.1-P1	
PCI riser card	U0.1-P2	
Disk drive backplane	U0.1-P3	
Processor cards		
Processor card 1	U0.1-P1-C1	
Processor card 2	U0.1-P1-C2	
DIMMs on processor card 1		
DIMM 1	U0.1-P1-C1-M1	
DIMM 2	U0.1-P1-C1-M2	
DIMM 3	U0.1-P1-C1-M3	
DIMM 4	U0.1-P1-C1-M4	
DIMM 5	U0.1-P1-C1-M5	
DIMM 6	U0.1-P1-C1-M6	
DIMM 7	U0.1-P1-C1-M7	
DIMM 8	U0.1-P1-C1-M8	
DIMMs on processor card 2		
DIMM 1	U0.1-P1-C2-M1	
DIMM 2	U0.1-P1-C2-M2	
DIMM 3	U0.1-P1-C2-M3	
DIMM 4	U0.1-P1-C2-M4	
DIMM 5	U0.1-P1-C2-M5	
DIMM 6	U0.1-P1-C2-M6	
DIMM 7	U0.1-P1-C2-M7	
DIMM 8	U0.1-P1-C2-M8	
Integrated devices		
Debug connector (manufacturing use only)		Labeled debug connector
Parallel port	U0.1-P1/R1	01-R1
ISA bus	U0.1-P1	1G-18
HMC2 connector	U0.1-P1/S5	
HMC1 connector	U0.1-P1/S4	
SPCN2 connector	U0.1-P1/Q5	
SPCN1 connector	U0.1-P1/Q4	
Keyboard connector	U0.1-P1/K1	01-K1-00

Component name	Physical location code	AIX location code
Keyboard	U0.1-P1/K1-K1	01-K1-00-00
Mouse connector	U0.1-P1/O1	01-K1-01
Mouse	U0.1-P1/O1-O1	01-K1-01-00
Ethernet connector 1	U0.1-P1/E1	14-08
Ethernet connector 2	U0.1-P1/E2	1L-08
RIO-G1 connector	U0.1-P1/Q3	
RIO-G0 connector	U0.1-P1/Q2	
Rack indicator USB connector	U0.1-P1/Q1	
Serial connector 1	U0.1-P1/S1	01-S1
Serial connector S1F (located on operator panel)	U0.1-P1/S1	01-S1
Serial connector 2	U0.1-P1/S2	01-S2
Serial connector 3	U0.1-P1/S3	01-S3
Diskette port	U0.1-P1/D1	01-D1
Diskette	U0.1-P1-D1	01-D1-00-00
CD-ROM (IDE)	U0.1-P1/Q6-A0	1G-19-00
Base CD-ROM (IDE) controller	U0.1-P1/Q6	1G-19
Pluggable adapters		
PCI host bridge 0	U0.1-P2	
PCI host bridge 1	U0.1-P2	
PCI-X slot 1	U0.1-P2/I1	
PCI-X slot 1 card	U0.1-P2-I1	1V-08
PCI-X slot 2	U0.1-P2/I2	
PCI-X slot 2 card	U0.1-P2-I2	1H-08
PCI host bridge 2	U0.1-P2	
PCI-X slot 3	U0.1-P2/I3	
PCI-X slot 3 card	U0.1-P2-I3	1n-08
PCI-X slot 4	U0.1-P2/I4	
PCI-X slot 4 card	U0.1-P2-I4	1Z-08
PCI-X slot 5	U0.1-P2/I5	
PCI-X slot 5 card	U0.1-P2-I5	1D-08
PCI-X slot 6	U0.1-P2/I6	
PCI-X slot 6 card	U0.1-P2-I6	11-08
SCSI devices		
Internal SCSI port (for internal disk drive)	U0.1-P2/Z1	1S-08
External SCSI port	U0.1-P2/Z2	1S-09
Single-ended SCSI	U0.1-P2/Z3	1c-08
Media device #1 (a CD-ROM drive)	U0.1-P2-Ix/Zn-A0	Dependent on *Ix*
Media device #2 (a diskette drive)	U0.1-P2-Ix/Zn-A1	Dependent on *Ix*

Component name	Physical location code	AIX location code
Hot-swap disk drive bay 1	U0.1-P2/Z1-A8	1S-08-00-8,0
Hot-swap disk drive bay 2	U0.1-P2/Z1-A9	1S-08-00-9,0
Hot-swap disk drive bay 3	U0.1-P2/Z1-AA	1S-08-00-10,0
Hot-swap disk drive bay 4	U0.1-P2/Z1-AB	1S-08-00-11,0
Fans		
Fan 1 (processor fan)	U0.1-F1	
Fan 2 (processor fan)	U0.1-F2	
Fan 3 (PCI-X fan)	U0.1-F3	
Fan 4 (PCI-X fan)	U0.1-F4	
Operator panel		
Operator panel	U0.1-L1	
Power supply		
Power supply 1	U0.1-V1	
Power supply 2	U0.1-V2	
Battery		
Battery	U0.1-P1-V3	
Platform firmware		
Platform firmware	U0.1-P1/Y1	
System VPD module		
System VPD module	U0.1-L1-N1	

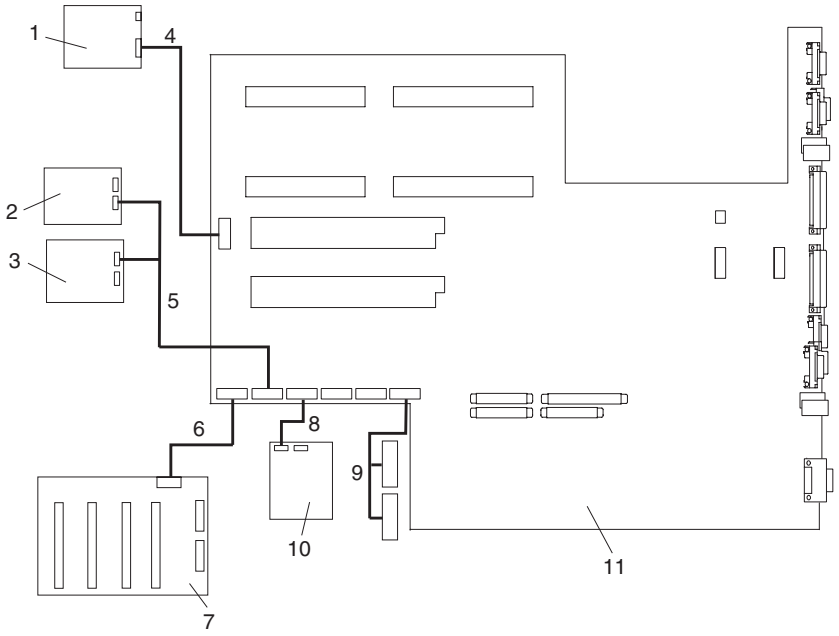
Notes:

1. The physical location code for the PCI-X slots, when empty, uses the P1/Ix notation, where the '/' identifies an integrated device (in this case the empty slot). A PCI-X device plugged into the slot uses the P1-Ix notation, where the '-' identifies a plugged device.
2. SCSI bus IDs are the recommended values. SCSI IDs shown for media devices indicate how the devices are set if shipped from the factory. Field installations might not comply with these recommendations.

System cables

The following diagrams show the system cable connections. The following diagram illustrates the routing of the internal power cables.

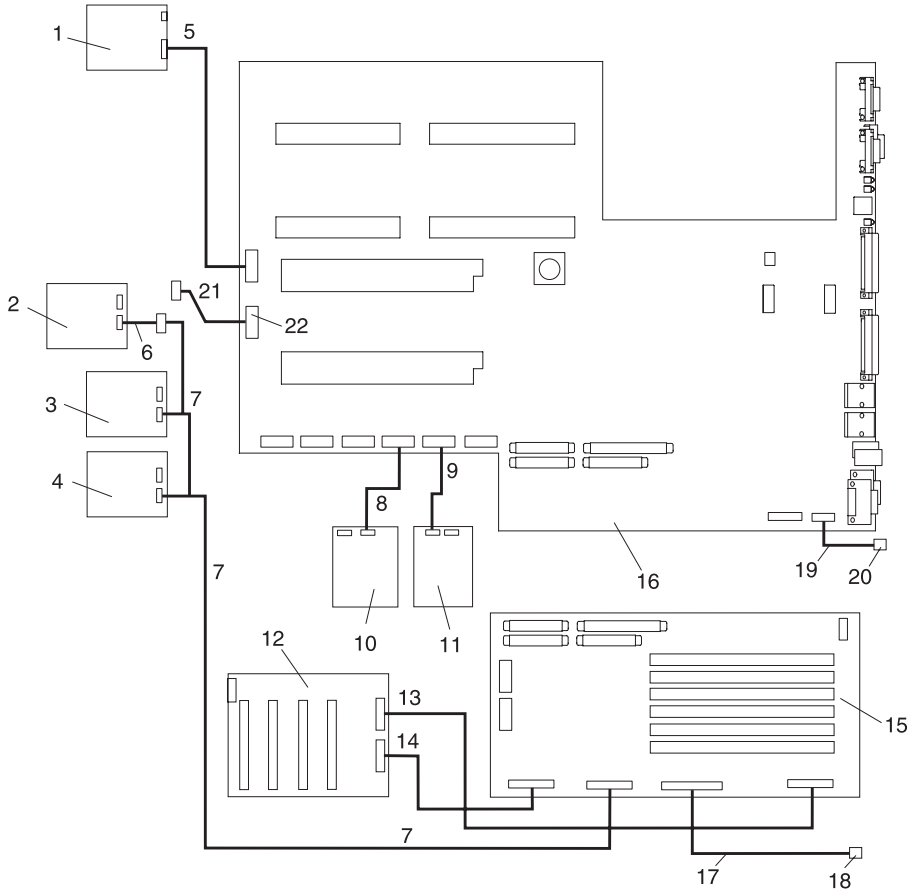
Internal power cable routing diagram



1	Operator panel
2	IDE CD-ROM
3	SCSI media device (not supported)
4	CEC backplane to operator panel signal/power cable
5	Two-drop power cable from CEC backplane to IDE CD-ROM and other SCSI media devices (second connector unused)
6	CEC backplane to disk drive backplane power cable
7	Disk drive backplane
8	Diskette drive to CEC backplane power cable
9	PCI-X cooling fans #3 and #4 power cable
10	Diskette drive
11	CEC backplane

Internal signal cable routing diagram

The following diagram illustrates the routing of the signal cables.



1	Operator panel
2	SCSI media device (50-pin, not supported)
3	SCSI media device (68-pin, not supported)
4	SCSI media device (68-pin, not supported)
5	CEC backplane to operator panel signal cable
6	SCSI media (68-pin) to 50-pin converter cable (not supported)
7	SCSI media device signal cable to integrated single-ended SCSI connector on the PCI riser card (not supported)
8	CEC backplane connector to diskette drive signal cable
9	CEC backplane to IDE CD-ROM signal cable
10	Diskette drive
11	IDE CD-ROM
12	Disk drive backplane
13	PCI riser card to disk drive backplane signal cable
14	PCI riser card to disk drive backplane signal cable
15	PCI riser card
16	CEC backplane
17	PCI riser card to external SCSI signal cable
18	External SCSI port
19	CEC backplane to rack indicator signal cable
20	Rack indicator port (not supported)
21	CEC backplane to debug port signal cable
22	Debug parallel port

Specifications

This section contains system specifications for the NAS Gateway 500.

Note: Refer to the *7014 Series Model T00 and T42 Rack Installation and Service Guide*, for information on cabling power from the rack to the I/O subsystem.

Table 7. Specifications for the NAS Gateway 500

Dimensions	
Height	178 mm (7.0 in., 4 EIA units)
Width	482.6 mm (19.0 in.)
Depth	641.4 mm (25.25 in.)
Weight	
Minimum configuration	34.92 kg (78.70 lbs)
Maximum configuration	39.03 kg (87.49 lbs)
Electrical	
Power source loading (typical in kVA)	2-way processor: 0.348, 4-way processor: 0.522
Power source loading (max. in kVA)	2-way processor: 0.522, 4-way processor: 0.783
Voltage range (V AC)	100 to 127 or 200 to 240 (autoranging)
Frequency (hertz)	50 / 60
Voltage range (V dc)	Not supported
Thermal output (typical)	2-way processor: 1129 Btu/hr, 4-way processor: 1693 Btu/hr
Thermal output (max.)	2-way processor: 1693 Btu/hr, 4-way processor: 2540 Btu/hr
Power input requirements (typical)	2-way processor: 330 watts, 4-way processor: 500 watts
Power input requirements (max.)	2-way processor: 500 watts, 4-way processor: 750 watts
Power factor - U.S., World Trade, Japan	0.96
Inrush current[2]	50 amps
Maximum altitude[3],[4]	2135 m (7000 ft)
Temperature requirements[3]	**Operating** 5 to 35°C (41 to 95°F)
Humidity requirements[4]	**Operating**
(Noncondensing)	8 to 80%
Wet bulb	27°C (80°F)
Noise emissions[1, 5, 6]	**Operating**
L_{WAd}	6.1 bels
$<L_{pA}>_m$	44 dBA
Installation and air flow	Maintenance of service clearance will allow proper air flow.

1. Noise emission notes:
   a. L_{WAd} is the declared sound power emission level for a production series of machines.
   b. L_{pAm} is the mean value of the sound pressure emission levels at the operator position (if any) for a production series of machines.
   c. $<L_{pA}>_m$ is the mean value of the space-averaged sound pressure emission levels at the one-meter positions for a production series of machines.
   d. N/A = Not Applicable (no operator position).
   e. All measurements are made in accordance with ISO DIS 779 and reported in conformance with ISO DIS 7574/4.
2. Inrush currents occur only at initial application of power; no inrush occurs during normal power off-on cycle.
3. The upper limit of the dry bulb temperature must be derated 1°C per 137 m (450 ft) above 915 m (3000 ft).
4. The upper limit of the wet bulb temperature must be derated 1°C per 274 m (900 ft) above 305 m (1000 ft).
5. Levels are for a single system installed in a T00 or T42 32-EIA rack with the center of the unit approximately 1500 mm (59 in.) off the floor.
6. Levels apply to the following hardware configuration: 2-way 1 gigahertz processor, 3 hard files, 2048 gigabytes of RAM, redundant system (two 645-watt power supplies, 2 processor fans).
7. All measurements made in accordance with ISO 7779 and declared in conformance with ISO 9296.

External AC power cables

To avoid electrical shock, power cables with grounded attachment plugs are provided. Use only properly grounded outlets.

Power cables used in the United States and Canada are listed by Underwriter's Laboratories (UL) and certified by the Canadian Standards Association (CSA). These power cords consist of the following:

- Electrical cables, Type SVT or SJT.
- Attachment plugs complying with National Electrical Manufacturers Association (NEMA) 5-15P, that is:

″For 115 V operation, use a UL listed cable set consisting of a minimum 14 AWG, Type SVT or SJT three-conductor cord a maximum of 15 feet in length and a parallel blade, grounding type attachment plug rated at 15 A, 125 V.″

″For 230 V operation in the United States use a UL listed cable set consisting of a minimum 18 AWG, Type SVT or SJT three-conductor cable a maximum of 15 feet in length, and a tandem blade, grounding type attachment plug rated at 15 A, 250 V.″

- Appliance couplers complying with International Electrotechnical Commission (IEC) Standard 320, Sheet C13.

Power cables used in other countries consist of the following:

- Electrical cables, Type HD21.
- Attachment plugs approved by the appropriate testing organization for the specific countries where they are used.

″For units set at 230 V (outside of U.S.): use a cable set consisting of a minimum 18 AWG (1.0 mm^2 nominal cross sectional area). Outside of North America , a more common cordage reference is in mm^2 and for a HAR (harmonized) cord, you might not find a AWG equivalent.″

To find the power cables that are available, refer to Chapter 12, “Parts information”, on page 373.

Service inspection guide

Service personnel should perform an inspection on the system when:

- The system is inspected for a maintenance agreement.
- Service is requested and service has not recently been performed.
- An alterations and attachments review is performed.
- Changes have been made to the equipment that might affect the safe operation of the equipment.
- External devices with their own power cables have those cables attached.

If the inspection indicates an unacceptable safety condition, the condition must be corrected before anyone can service the machine.

Note: The owner of the system is responsible to correct any unsafe conditions.

Perform the following checks:

1. Make sure that the system is powered off.
2. Check the covers for sharp edges and for damage or alterations that expose the internal parts of the system.
3. Check the covers for proper fit to the system. They should be in place and secure.
4. Remove the covers.
5. Check for alterations or attachments. If there are any, check for obvious safety hazards, such as broken wires, sharp edges, or broken insulation.
6. Check the internal cables for damage.
7. Check for dirt, water, and any other contamination within the system.
8. Check the voltage label on the back of the system to ensure that it matches the voltage at the outlet.
9. Check the external power cables for damage.
10. With the external power cables connected to the system, check for 0.1 ohm or less resistance between the ground lug on the external power cable plugs and the metal frame.
11. Perform the following checks on each device that has its own power cables:
    a. Check for damage to the power cable.
    b. Check for the correctly grounded power cable.
    c. With the external power cables connected to the device, check for 0.1 ohm or less resistance between the ground lug on the external power cable plugs and the metal frame of the device.
12. Install the covers.

Chapter 2. Problem determination overview

The system uses an integrated set of software diagnostic procedures to help isolate failing components and system maintenance. This book, along with the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*, which is included on the NAS Gateway 500 documentation CD-ROM, is the basis of the diagnostic procedures for the system. In particular, Chapter 4, “Checkpoints”, on page 93, Chapter 5, “Error code to FRU index”, on page 125, Chapter 6, “Using the online and standalone diagnostics”, on page 239, and Chapter 12, “Parts information”, on page 373, in this book are important for the trained service representative to understand and use when isolating a failure on the system.

Maintenance Analysis Procedures (MAPs)

Maintenance Analysis Procedures (MAPs) guide the trained service representative through the system. These MAPs are the entry point for all isolation and error recovery procedures. The MAPs are consistent with existing procedures and methods. The system uses a set of integrated procedures, mentioned earlier, to which the MAPs are the primary entry point.

The MAPS are as follows:

- Entry MAP
- Quick Entry MAP
- Map 0410: Repair Checkout
- MAP 1020: Problem Determination
- MAP 1240: Memory Problem Resolution
- MAP 1520: Power
- MAP 1521: The Base System Drawer Will Not Power On and No Error Codes Are Available
- MAP 1523: The SPCN Error Codes Table Directed You Here and the Error Code is 1011 1B0x
- MAP 1540: Problem Isolation Procedures
- MAP 1541: JTAG Problem Isolation
- MAP 1542: I/O Problem Isolation
- MAP 1548: Processor Subsystem Problem Isolation

The Entry MAP is the starting point for problem determination. The purpose of this MAP is to quickly point to the appropriate MAP or service reference information either in this book, or in the common book set, which includes the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*.

The Quick Entry MAP is a subset of the Entry MAP and helps to save time for some types of problems.

The Problem Determination MAP provides a structured analysis method to get an error code if one is not provided by the customer, or if diagnostics cannot be loaded.

The Power MAP deals with isolation of components to diagnose a power problem. Power problems can be related to powering on and powering off the system, or power failures that occur after power is turned on.

The Processor Subsystem Problem Isolation MAP is used to locate defective components not found by normal diagnostics or error-isolation methods. This MAP provides a systematic method of isolation to the failing item.

Checkpoints, error codes, and SRNs

The system uses various types of checkpoints, error codes, and SRNs, which are referred to throughout this book (primarily in Chapter 4, “Checkpoints”, on page 93, Chapter 5, “Error code to FRU index”, on page 125, Chapter 6, “Using the online and standalone diagnostics”, on page 239, and Chapter 12, “Parts information”, on page 373). These codes can appear in the service processor boot progress log, the operating system error log, and the operator panel. Understanding the definition and relationships of these codes is important to the service personnel who are installing or maintaining the system.

Codes that can appear in the service processor boot progress log, the operating system error log, the virtual terminal, and the operator panel are as follows:

Checkpoints Checkpoints are displayed in the operator panel from the time AC power is connected to the system until the operating system login prompt is displayed after a successful operating system boot. These checkpoints have the following forms:

- **8xxx** 8xxx checkpoints are displayed from the time AC power is connected to the system until the `0K` prompt is displayed by the service processor on the operator panel. (Several 9xxx checkpoints are displayed just before the `0K` prompt is displayed.)
- **9xxx** 9xxx checkpoints are displayed by the service processor after the power-on sequence is initiated. A system processor takes control when `91FF` is displayed on the operator panel.

  Note: Certain checkpoints might remain in the operator panel for long periods of time. A spinning cursor is visible in the upper-right corner of the operator panel during these periods to indicate that system activity is continuing.
- **Exxx** Exxx checkpoints indicate that a system processor is in control and is initializing the system resources. Control is being passed to the operating system when `E105` is displayed on the operator panel. Location code information might also be displayed on the operator panel during this time.
- **0xxx and 2xxx** 0xxx and 2xxx codes are operating system progress codes and configuration codes. Location codes might also be shown on the operator panel during this time.

Error Codes If a fault is detected, an 8-digit error code is displayed in the operator panel. A location code might be displayed at the same time on the second line.

SRNs Service request numbers, in the form xxx-xxx, xxx-xxxx, xxxx-xxx, or xxxx-xxxx might also be displayed on the operator panel and be noted in the AIX error log.

Use the following table to assist you in the identifying the types of error data that you might encounter:

Number of digits in error code	Error code	Interpretation
Any	Contains - (hyphen)	SRN
4	Does not contain -	Checkpoint
5	Does not contain -	SRN
6	Does not contain -	Error code
8	Does not contain -	Error code

Checkpoints can become error codes if the system fails to advance past the point at which the code is presented. For a list of the checkpoints, see Chapter 4, “Checkpoints”, on page 93. Each entry provides a description of the event and the recommended action if the system fails to advance.

SRNs are listed in the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*.

FRU isolation

For a list of error codes and recommended actions for each code, see Chapter 5, “Error code to FRU index”, on page 125. These actions can refer to Chapter 12, “Parts information”, on page 373, Chapter 3, “Maintenance Analysis Procedures (MAPs)”, on page 39, or provide informational message and directions. If a replacement part is indicated, direct reference is made to the part name. The respective AIX and physical location codes are listed for each occurrence as required. For a list of locations codes, see “Location codes” on page 17.

To look up part numbers and view component diagrams, see Chapter 12, “Parts information”, on page 373. The beginning of that chapter provides a parts index with the customer replacement units (CRUs) and the predominant field replaceable units (FRUs) listed by name. The remainder of the chapter provides illustrations of the various assemblies and components that make up the system.

FRU identify LEDs

This system is configured with an arrangement of LEDs that help identify various components of the system. These include, but are not limited to the following:

- RIO port identify LED (not supported)
- Various FRU identify LEDs
  - Power subsystem FRUs
  - CEC subsystem FRUs
  - I/O subsystem FRUs
  - PCI-X adapter identify LED
  - DASD identify LED

See “Component LEDs” on page 384.

Any identify LED in the system can be flashed when the system is in the failed state with power on by using the service processor LED Control Menu contained in the “System information menu” on page 268.

Any identify LED in the system can also be flashed by using the ″Identify and Attention Indicators″ task through diagnostics. The procedure to operate the ″Identify and Attention Indicators″ task in diagnostics is outlined in the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*.

Remote error notification (call home)

The NAS Gateway 500 is a high-reliability device that includes advanced monitoring of critical components. When certain error events occur, notifications can be sent to monitoring facilities (for example, IBM Service). The NAS Gateway 500 supports two methods for doing this.

The first method is the Electronic Service Agent (ESA), which is a pre-loaded application on the NAS Gateway 500. The second method is through the service processor. The service processor, as a self-contained independent processor, does not depend on the functioning of the operation system and can be used to report some errors that the ESA cannot.

Electronic Service Agent for the NAS Gateway 500

ESA allows the NAS Gateway 500 to report events to IBM service that require service involvement, such as system failures or when problem-definable thresholds have been reached. If a call is placed, it is analyzed and verified to ensure that this call is covered under the customer's warranty and maintenance agreement. If covered, a PMH is opened and service is performed (for example, a service call, or a CE called to the site). For information on configuring ESA, refer to the *NAS Gateway 500 Administrator's Guide*.

Service processor

The service processor provides a second method of reporting error information. Unlike ESA, which requires that the main processors are functioning well enough to report errors, the service processor is controlled by firmware and does not require the operating system to be operational to perform its tasks. In the event that the main processor is not able to report a system change, the service processor is able to advise support personnel of any unexpected changes in the system environment. For more information on configuring the service processor to perform call home, refer to the *NAS Gateway 500 Administrator's Guide*.

System LEDs

LEDs provide a means to identify components in your system.

System attention LED

The system attention LED on the operator panel turns on when an entry is made in the service processor error log. When the LED is on, it indicates that user intervention or service is needed. The error entry is transmitted and recorded in the following logs:

- The service processor error log
- The operating system error log

If the system attention LED is turned on, you can access the system logs to determine the reason. The method used to access your system logs depends on how your system is set up. For more information about how to access the system logs, see "Accessing system error logs".

Accessing system error logs

Note: The system attention LED can be reset by following the procedures described in "Resetting the system attention LED" on page 37.

When an error is detected by the system, information about the error is stored in error logs. The error logs are accessed from the console that is used to manage the system.

If the system attention LED comes on, do the following to access the error logs:

1. If the system is operational, examine the system error log to see if user intervention is required by typing **errpt** on the command line. Refer to the *NAS Gateway 500 Advanced Configuration and Problem Determination Guide* for more details.
2. If the system is powered off, examine the service processor error log for entries. From the service processor main menu, perform the following steps:
   a. Select the System Information Menu.
   b. Select Read Service Processor Error Logs. See "Service processor error logs" on page 289 for more information.
   c. The service processor error log can be cleared by typing **C** on the command prompt.

Note: This will not reset the system attention LED.

3. If the system error log indicates service support is required, or there are entries in the service processor error log, see “Entry MAP” on page 39 with the information noted from the error log.

Resetting the system attention LED

As a user with root authority, type `diag` on the command line, and do the following:

1. Select **Task Selection**.
2. On the Task Selection Menu, select **Identify and Attention Indicators**.
3. When the list of LEDs is displayed, use the cursor to highlight **Set System Attention Indicator to Normal**.
4. Press Enter, and then press F7 to commit. This action turns off the LED.

If the system is powered off, access the service processor menus. From the service processor main menu, do the following:

1. Select **System Information Menu**.
2. Select **LED Control Menu**.
3. Select **Clear System Attention Indicator**. This action turns off the LED.

Chapter 3. Maintenance Analysis Procedures (MAPs)

This chapter contains Maintenance Analysis Procedures (MAPs) for the NAS Gateway 500.

Entry MAP

When possible, run online diagnostics in service mode. Online diagnostics perform additional functions compared to standalone diagnostics. This ensures that the error state of the system that was captured in NVRAM is available for your use in fixing the problem. The system error log and SMIT are available only when diagnostics are run from the hard drive.

Use the following table to help determine your next step.

Notes:

1. Licensed programs frequently rely on system information stored on the VPD module on the operator panel assembly. If the MAPs indicate that the operator panel assembly should be replaced, refer to “Operator panel replacement” on page 363. If the old VPD module has to be replaced, call technical support for recovery instructions. If recovery is not possible, notify the system owner that new keys for licensed programs might be required.
2. If a network adapter is replaced, the network administrator must be notified so that the client MAC addresses of the new adapter card can be propagated to any required locations in the Ethernet. In addition, the operating system configuration of the network adapter might need to be updated based on the information used on the previous network adapter. Also, check to ensure that any client or server access is maintained.
3. If a fibre-channel HBA is replaced, the SAN administrator must be notified so that the adapter definitions on the back-end storage, and the fibre-channel zones on the SAN switches can be updated with the World Wide Name (WWN) of the new adapter.
4. If more than eight digits are displayed in the operator panel, use only the first eight digits to find the error in the tables. The digits that display beyond the first eight digits are location codes that can assist you in diagnosing the problem. See “Location codes” on page 17.
5. If you are not able to isolate the problem, try loading standalone diagnostics from the CD-ROM.

Use the following table to help determine your next step.

Symptom	Starting point
You have a problem that does not prevent the system from booting and the operator panel is functional.	Go to the Fast Path MAP in the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*.
You do not have a symptom.	Go to MAP 0020 in the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*.
You have a service request number (SRN) displayed on the operator panel or in an error log.	Go to the Fast Path MAP in the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*.
The system stops and a 3-digit number is displayed in the operator panel.	Record SRN 101-xxx, where xxx is the 3-digit number displayed in the operator panel, then go to the Fast Path MAP in the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*.
The system stops and a 4-digit number beginning with 0 or 2 is displayed in the operator panel.	Go to the Fast Path MAP in the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*.
All other symptoms and error codes.	Go to “Quick Entry MAP” on page 40.

Quick Entry MAP

The following is a Quick Entry MAP table of contents.

Table 8. Quick Entry MAP

Attention: If you replace FRUs or perform an action and the problem is still not corrected, go to "MAP 1540: Problem Isolation Procedures" on page 69 unless you were directed to MAP 1540 by the error code. Otherwise, call service support if the actions for an error code do not resolve the problem.

If you replace FRUs or perform an action, and the problem is corrected, go to "MAP 0410: Repair Checkout" on page 45.

Symptom	Action
Service actions	
You have parts to exchange or a corrective action to perform.	1. Go to Chapter 11, “Removal and replacement procedures”, on page 307. 2. Go to “MAP 0410: Repair Checkout” on page 45.
You need to verify that a part exchange or corrective action corrected the problem.	Go to “MAP 0410: Repair Checkout” on page 45.
You need to verify correct system operation.	Go to “MAP 0410: Repair Checkout” on page 45.
The system attention LED on the operator panel is on.	
The system attention LED on the operator panel is on.	Go to “System attention LED” on page 36 and perform the listed actions.
OK does not appear in the operator panel before pressing the power-on button. Other symptoms appear in the operator panel or LEDs before the power-on button is pressed.	
Symptom: A bouncing or scrolling ball remains on the operator panel, or the operator panel is filled with dashes or blocks. **Action:** Verify that the operator panel cable from the operator panel to the CEC backplane is connected and properly seated at both ends. If an ASCII terminal is available, connect it to the system through serial port 1. 1. If the service processor menu is displayed: a. Replace the operator panel assembly, location U0.1-L1. Refer to “Operator panel” on page 362. b. Replace the CEC backplane, location U0.1-P1. (See “Central electronics complex (CEC) backplane” on page 366.) 2. If the service processor menu is not displayed, replace the CEC backplane. (See “Central electronics complex (CEC) backplane” on page 366.) If an ASCII terminal is not available, replace the following one at a time. 1. Operator panel assembly, location U0.1-L1. Refer to “Operator panel” on page 362. 2. CEC backplane, location U0.1-P1. (See “Central electronics complex (CEC) backplane” on page 366.)	
You have a blank display on the operator panel. Other LEDs on the operator panel appear to behave normally.	1. Replace the operator panel assembly, Location: U0.1-L1. Refer to “Operator panel” on page 362. 2. Replace the CEC backplane, Location: U0.1-P1. (See “Central electronics complex (CEC) backplane” on page 366.)
You have a blank display on the operator panel. Other LEDs on the operator panel are off.	Go to “MAP 1520: Power” on page 58.
8-digit error codes	
You have an 8-digit error code displayed.	Look up the error code in the table in “Checkpoint and error code index” on page 127.
System stops with an 8-digit number displayed	
The system stops with an 8-digit error code displayed when booting.	Look up the error code in the table in “Checkpoint and error code index” on page 127.
System stops with a 4-digit number displayed	
The system stops with a 4-digit number displayed that does not begin with 0 or 2.	Go to “Checkpoint and error code index” on page 127. If you do not find a match there, go to the Fast Path MAP in the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*.
System stops with a 3-digit number displayed (see below for 888 sequence)	

Symptom	Action
The system stops with a 3-digit error code.	Add 101- to the left of the three digits to create an SRN. Go to the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*. If there is a location code displayed under the 3-digit error code, then look at the location to see if it matches the failing component that the SRN pointed to. If they do not match, perform the action from *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems* first. If the problem still exists, then replace the failing component from that location code.
Power and cooling problems	
The system will not power on and no error codes are available.	Go to "MAP 1520: Power" on page 58.
The power LEDs on the operator panel and the power supply do not come on or stay on.	1. Check the service processor error log. 2. Go to "MAP 1520: Power" on page 58.
The power LEDs on the operator panel and the power supply come on and stay on, but the system does not power on.	1. Check the service processor error log. 2. Go to "MAP 1520: Power" on page 58.
A rack or a rack-mounted unit will not power on.	1. Check the service processor error log. 2. Go to "MAP 1520: Power" on page 58.
The cooling fans do not come on, or come on but do not stay on.	1. Check the service processor error log. 2. Go to "MAP 1520: Power" on page 58.
The system attention LED on the operator panel is on and there is no error code displayed.	1. Check the service processor error log. 2. Go to "MAP 1520: Power" on page 58.
888 sequence in operator panel	
An 888 sequence is displayed in the operator panel.	Go to the Fast Path MAP in the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*.
Other symptoms or problems	
The operator panels `OK` and the fans are off.	The service processor is ready. The system is waiting for power-on. Boot the system. If the boot is unsuccessful, and the system returns to the OK, go to "MAP 1020: Problem Determination" on page 49.
The operator panel displays STBY.	The service processor is ready. The system was shut down by the operating system and is still powered on. This condition can be requested by a privileged system user with no faults. See the service processor error log for possible operating system fault indications.
All of the system POST indicators are displayed on the system console; the system pauses and then restarts. The term *POST indicators* refers to the device mnemonics (the words **memory**, **keyboard**, **network**, **scsi**, and **speaker**) that appear on the system console during the power-on self-test (POST).	Go to "Boot problems or concerns" on page 122.
The system stops and all of the POST indicators are displayed on the system console. The term *POST indicators* refers to the device mnemonics (the words **memory**, **keyboard**, **network**, **scsi**, and **speaker**) that appear on the system console during the power-on self-test (POST).	Go to "Boot problems or concerns" on page 122.

Symptom	Action
The system stops and the message STARTING SOFTWARE PLEASE WAIT... is displayed on the firmware console.	Go to Chapter 4, “Checkpoints”, on page 93.

Symptom: The system does not respond to the password being entered, or the system login prompt is displayed when booting in service mode.

Action:

Use the problem determination procedures for the ASCII terminal. Make sure the ASCII terminal is connected to S1.

If the problem persists, replace the CEC backplane, location U0.1-P1. (See “Central electronics complex (CEC) backplane” on page 366.)

If the problem is fixed, go to “MAP 0410: Repair Checkout” on page 45.

If the problem is still not corrected, go to “MAP 1548: Processor Subsystem Problem Isolation” on page 77.

Symptom: No codes are displayed on the operator panel within a few seconds of turning on the system. The operator panel is blank before the system is powered on.

Action: Reseat the operator panel cable. If the problem is not resolved, replace in the following order:

1. Operator panel assembly, location U0.1-L1. Swap the VPD module from the old operator panel to the new operator panel. See “Operator panel” on page 362.
2. CEC backplane, location U0.1-P1. (See “Central electronics complex (CEC) backplane” on page 366.)

If the problem is fixed, go to “MAP 0410: Repair Checkout” on page 45.

If the problem is still not corrected, go to “MAP 1548: Processor Subsystem Problem Isolation” on page 77.

Symptom: The SMS configuration list or boot sequence selection menu shows more SCSI devices attached to a controller/adapter than are actually attached.

Action: A device might be set to use the same SCSI bus ID as the control adapter. Note the ID being used by the controller/adapter (this can be checked and changed through an SMS utility), and verify that no device attached to the controller is set to use that ID.

If settings do not appear to be in conflict:

1. Go to “MAP 1542: I/O Problem Isolation” on page 72.
2. Replace the SCSI cable.
3. Replace the device.
4. Replace the SCSI adapter.

Note: In a ″twin-tailed″ configuration where there is more than one initiator device (normally another system) attached to the SCSI bus, it might be necessary to use SMS utilities to change the ID of the SCSI controller or adapter.

Symptom	Action
Symptom: The System Management Services menu is displayed. **Action:** If you are loading diagnostics from the CD-ROM, you might not have pressed the correct key when you were trying to indicate a service mode IPL of the diagnostic programs. If this is the case, start again at the beginning of this step. If you are sure that you pressed the correct key, the device or media that you are attempting to boot from might be faulty. 1. Select **View Error Log**. 2. If an error is logged, check the time stamp. 3. If the error was logged during the current boot attempt, record it. 4. Look up the error in Chapter 5, “Error code to FRU index”, on page 125 and do the listed action. 5. If no recent error is logged in the error log, try to boot from an alternate boot device connected to the same controller as the original boot device. If the boot succeeds, replace the original boot device (for removable media devices, try the media first). 6. Go to “MAP 1548: Processor Subsystem Problem Isolation” on page 77.	
You suspect a cable problem.	Go to *RS/6000 @server pSeries Adapters, Devices, and Cable Information for Multiple Bus Systems*.
All other problems.	Go to “MAP 1020: Problem Determination” on page 49.

MAP 0410: Repair Checkout

Purpose of this MAP

This MAP is used to check out the system after a repair is completed..

Note: Use Standalone Diagnostics for repair checkout only when no other diagnostics are available on the system. Standalone Diagnostics do not log repair actions.

Step 0410-1

Did you use a hot-swap operation to change the FRU?

NO Go to “Step 0410-2”.

YES Go to “Step 0410-5”.

Step 0410-2

Note: If the system planar or battery has been replaced, it might be necessary for the customer to set the boot sequence for this system before diagnostics can be loaded. The system time and date information should also be set when the repair is completed.

Do you have cards, adapters, cables, devices, or any other FRUs that were removed during problem analysis that you want to put back into the system?

NO Go to “Step 0410-4”.

YES Go to “Step 0410-3”.

Step 0410-3

1. After performing a system shutdown, turn off the system power and unplug all power cords (cables) from electrical outlets.
2. Install all of the cards, adapters, cables, devices, and any other FRUs that were removed during problem analysis.
3. Go to step “Step 0410-4”.

Step 0410-4

1. Set slow boot using the service processor Enable/Disable Fast System Boot menu. See “System power control menu” on page 265.
2. Power on the system.
3. Wait until the system login prompt displays or until apparent system activity on the operator panel or console has stopped.

Did the login prompt display?

NO Go to “MAP 1020: Problem Determination” on page 49.

YES Go to “Step 0410-7” on page 46.

Step 0410-5

Is the system containing the FRU running service mode diagnostics?

NO Go to “Step 0410-7” on page 46.

YES Go to “Step 0410-6” on page 46.

Step 0410-6

Exit service mode diagnostics, and reboot the system. Wait for the login prompt or until the activity on the operator panel or display stops.

Did the login prompt display?

NO Go to “MAP 1020: Problem Determination” on page 49.

YES Go to “Step 0410-7”.

Step 0410-7

If the Resource Repair Action menu is already displayed, go to “Step 0410-9”. Otherwise, do the following:

1. Log in with root authority.
2. Enter the *diag -a* command and check for missing resources. Follow any instructions that display. If an SRN displays, suspect a loose card or connection. If no instructions display, no resources were detected as missing.
3. Enter the *diag* command.
4. Press **Enter**.
5. Select the **Advanced Diagnostics** option.
6. When the Diagnostic Mode Selection menu displays, select **System Verification**.
7. When the Advanced Diagnostic Selection menu displays, select the **All Resources** option or test the FRUs you exchanged, and any devices that are attached to the FRUs you exchanged, by selecting the diagnostics for the individual FRUs.

Did the Resource Repair Action menu (801015) display?

NO Go to “Step 0410-8”.

YES Go to “Step 0410-9”.

Step 0410-8

Did the Testing Complete, no trouble was found menu (801010) display?

NO There is still a problem. Go to “MAP 1020: Problem Determination” on page 49.

YES Use the **Log Repair Action** option, if not previously logged, in the Task Selection menu to update the system error log. If the repair action was reseating a cable or adapter, select the resource associated with that repair action.

If the resource associated with your action is not displayed on the Resource List, select **sysplanar0**.

Note: On systems with a Fault Indicator LED, this changes the Fault Indicator LED from the *Fault* state to the *Normal* state.

Go to “Step 0410-11” on page 47.

Step 0410-9

When a test is run on a resource in System Verification mode, and that resource has an entry in the system error log, if the test on the resource was successful, the Resource Repair Action menu displays.

After replacing a FRU, you must select the resource for that FRU from the Resource Repair Action menu. This updates the system error log to indicate that a system-detectable FRU has been replaced.

Note: On systems with a Fault Indicator LED, this changes the Fault Indicator LED from the Fault state to the Normal state.

Do the following:

1. Select the resource that has been replaced from the Resource Repair Action menu. If the repair action was reseating a cable or adapter, select the resource associated with that repair action.

   If the resource associated with your action is not displayed on the Resource List, select **sysplanar0**.
2. Press **Commit** after you make your selections.

Did another Resource Repair Action (801015) display?

NO If the No Trouble Found menu displays, go to “Step 0410-11”.

YES Go to “Step 0410-10”.

Step 0410-10

The parent or child of the resource you just replaced might also require that you run the Resource Repair Action service aid on it.

When a test is run on a resource in System Verification mode, and that resource has an entry in the system error log, if the test on the resource was successful, the Resource Repair Action menu displays.

After replacing that FRU, you must select the resource for that FRU from the Resource Repair Action menu. This updates the system error log to indicate that a system-detectable FRU has been replaced.

Note: On systems with a Fault Indicator LED, this changes the Fault Indicator LED from the FAULT state to the NORMAL state.

Do the following:

1. From the Resource Repair Action menu, select the parent or child of the resource that has been replaced . If the repair action was reseating a cable or adapter, select the resource associated with that repair action. If the resource associated with your action is not displayed on the Resource List, select **sysplanar0**.
2. Press **Commit** after you make your selections.
3. If the No Trouble Found menu displays, go to “Step 0410-11”.

Step 0410-11

If you changed the service processor or network settings, as instructed in previous MAPs, restore the settings to the value they had prior to servicing the system. If you ran standalone diagnostics from CD-ROM media, remove the standalone diagnostics CD-ROM media from the system.

Was this system part of a clustered node?

NO Go to “Step 0410-13” on page 48.

YES Go to “Step 0410-12”.

Step 0410-12

Bring this node back into the cluster pair to resume file serving using the hostname and group name recorded at shutdown.

1. Rejoin the cluster by typing on the command line: `/opt/nas/bin/clnasrennode -n <hostname>`.
2. Poll status until the node has finished stabilizing: `/opt/nas/bin/clnasnodestate -n <hostname>`.
3. Once the status changes to “stable,” relocate the volumes back to this node for file serving: `/opt/nas/bin/clnasrelocate -g <groupname> -n <hostname>`.
4. Go to“Step 0410-13” on page 48.

Step 0410-13

This completes the repair, return the system to the user.

MAP 1020: Problem Determination

Purpose of this MAP

Use this MAP to get an error code if you were not provided one by the customer or you are unable to load diagnostics. If you can load the diagnostics, go to MAP 0020 in the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*.

The service processor might have recorded one or more symptoms in its error log. Examine this error log before proceeding. (See “Accessing system error logs” on page 36.)

The service processor might have been set by the user to monitor system operations and to attempt recoveries. You can disable these actions while you diagnose and service the system. If the system was set up according to the recommendations of the *NAS Gateway 500 Administrator's Guide*, all the settings of the service processor (except language) were saved by using the SAVE/RESTORE HARDWARE MAINTENANCE POLICIES service aid. You can use the same service aid to restore the settings at the conclusion of your service action.

In case the service processor settings were not saved by the user, if you disable them, make notes of their current settings for restoration before you leave.

In addition to the parameters in the following table, you can disconnect the modem to prevent incoming signals that could cause the system to power on.

Following are the service processor settings. The service processor menus are described in the *NAS Gateway 500 Administrator's Guide*.

Surveillance	From the service processor Setup Menu, go to the Surveillance Setup Menu and disable surveillance.
Unattended start	From the service processor System Power Control Menu, disable unattended start mode.
Reboot policy	From the System Power Control Menu, go to the Reboot/Restart Policy Setup Menu and set: 1. Number of reboot attempts to **0** (zero) 2. Use OS-defined restart policy to **No** 3. Enable supplemental restart policy to **No**
Call out	From the Call-In/Call-Out Setup Menu, go to the Serial Port Selection Menu and disable call-out on serial port S2.

Another feature that could disrupt a service action by powering on the system is a function called *Timed Power-On*. For more information about timed power-on, see “System power-on methods” on page 281.

Be prepared to record code numbers and use those numbers in the course of analyzing a problem. Go to “Step 1020-1”.

Step 1020-1

The following step analyzes a failure to load the diagnostic programs. It can be performed by means of a locally attached ASCII terminal.

Note: Be prepared to answer questions regarding the operator panel and to perform certain actions based on displayed POST indicators. Be observant of these conditions.

1. Power off the system. Refer to “Stopping the system” on page 310.

2. Select slow boot mode (select disable fast boot) on the system power control menu from the service processor main menu.
3. Power on the system. Refer to “Starting the system” on page 311.
4. Insert the diagnostic CD-ROM into the CD-ROM drive.
5. When the keyboard indicator is displayed (the word keyboard), press 5 on the system console.
6. Enter a password, if requested.
7. Wait until the diagnostics are loaded or the system appears to stop. If you receive an error code or if the system stops before diagnostics are loaded, find your symptom in the following table, and then follow the instructions given in the Action column.

   If no fault is identified, continue to the next step.
8. Run the standalone diagnostics on the entire system. Find your symptom in the following table, and then follow the instructions given in the Action column.

   If no fault is identified, call service support for assistance.

Symptom	Action
The system stopped and a code is displayed on the operator panel.	Go to the “Quick Entry MAP” on page 40.
The system stops with a prompt to enter a password.	Enter the password. You cannot continue until a correct password has been entered. When you have entered a valid password, go to the beginning of this table and wait for one of the other conditions to occur.
The diagnostic operating instructions are displayed.	Go to ″MAP 0020: Problem Determination Procedure″ in the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*.
Symptom: The system login prompt is displayed. **Action:** If you are loading the diagnostics from a CD-ROM, you might not have pressed the correct key or you might not have pressed the key soon enough when you were trying to indicate a service mode IPL of the diagnostic programs. If this is the case, start again at the beginning of this step. **Note:** Perform the system shutdown procedure before turning off the system.	
Symptom: The system stopped. A POST indicator is displayed on the system console and an eight-digit error code is not displayed. **Action:** If the POST indicator represents: 1. Memory, go to “MAP 1240: Memory Problem Resolution” on page 52. 2. Network, go to “MAP 1548: Processor Subsystem Problem Isolation” on page 77. 3. SCSI, go to “MAP 1548: Processor Subsystem Problem Isolation” on page 77. 4. Speaker a. Replace the operator panel, location U0.1-L1. Refer to “Operator panel” on page 362. b. Replace the CEC backplane, location: U0.1-P1. (See “Central electronics complex (CEC) backplane” on page 366.) c. Go to “MAP 1548: Processor Subsystem Problem Isolation” on page 77.	

Symptom	Action
Symptom: The System Management Services menu is displayed. **Action:** If you are loading diagnostics from the CD-ROM, you might not have pressed the correct key when you were trying to indicate a service mode IPL of the diagnostic programs. If this is the case, start again at the beginning of this step. If you are sure that you pressed the correct key, the device or media you are attempting to boot from might be faulty. 1. Select **View Error Log**. 2. If an error is logged, check the time stamp. 3. If the error was logged during the current boot attempt, record it. 4. Look up the error in Chapter 5, “Error code to FRU index”, on page 125 and do the listed action. 5. If no recent error is logged in the error log, try to boot from an alternate boot device connected to the same controller as the original boot device. If the boot succeeds, replace the original boot device (for removable media devices, try the media first). 6. Go to “MAP 1548: Processor Subsystem Problem Isolation” on page 77.	
All other symptoms.	If you were directed here from the Entry MAP, go to “MAP 1548: Processor Subsystem Problem Isolation” on page 77. Otherwise, find the symptom in the “Quick Entry MAP” on page 40.

MAP 1240: Memory Problem Resolution

Note: The firmware or error code that sent you here could be one of the following:

- Service Processor Checkpoints 910B, 910C, 910E, or 95xx
- Firmware Checkpoints E134 or E701
- System Power Control Network Error Code 1011840C
- Firmware Error Codes 25Cyy001, 25Cyy002, 25B00001, or 25B00004
- Service Processor Error Codes 406x001x, 406x010x, 406x013x, 406x0CA6, or 450x30xx
- Common Firmware Error Codes B1xx466x
- Problem Determination Error Code M0MEM002

These checkpoints and error codes are referred to as *a memory code* in this MAP.

Purpose of this MAP

This MAP is used to troubleshoot a problem when the system stops with a memory checkpoint or memory error code on the operator panel or console.

Notes:

1. If the symptom changes while you are using this MAP, check for loose cards, cables, and obvious problems. If you do not find a problem, go to "MAP 1548: Processor Subsystem Problem Isolation" on page 77.
2. The service processor might have recorded one or more symptoms in its error log. It is a good idea to examine that error log before proceeding. (See "Accessing system error logs" on page 36.)
3. The service processor might have been set by the user to monitor service operations and to attempt recoveries. You might want to disable these actions while you diagnose and service the system. If you disable them, make note of their current settings so that you can restore them before you leave. The following settings might be of interest to you.

Surveillance	From the Service Processor Setup Menu, go to the Surveillance Setup menu and disable surveillance.
Unattended start	From the Service Processor System Power Control Menu, disable unattended start mode.
Reboot policy	From the System Power Control Menu, go to the Reboot/Restart Policy Setup Menu and set: 1. Number of reboot attempts to **0** (zero) 2. Use OS-Defined restart policy to **No** 3. Enable supplemental restart policy to **No**
Call out	From the Call-In/Call-Out Setup Menu, go to the Serial Port Selection Menu and disable call-out on serial port S2.

General memory information

Be sure to unplug the power cables before removing or installing the processor cards or DIMMs to avoid damage to them.

It is acceptable for the DIMMs to partially populate each processor card in a multiprocessor card system. For example, four DIMMs can be placed onto processor card 1, and another four DIMMs can be placed onto processor card 2. The system uses both sets of DIMMs indiscriminately.

See "DIMMs" on page 346 for more information on valid memory configurations.

Attention: Go to the service processor menus. In the System Information Menu, select **Memory Configuration/ Deconfiguration**. Verify on the first panel that memory repeat gard is disabled. If it is enabled, disable it for the duration of this MAP. When exiting this MAP to go to MAP 0410 in the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*; also return the setting to enabled if necessary.

Step 1240-1

1. Record the error code that sent you to this map.
2. Go to the service processor menus and disable memory repeat gard if it is not already disabled.
3. Turn off the power. Remove the power cords.
4. Remove and reinstall the processor cards.
5. Reattach the power cords. Wait for `OK` to display in the operator panel.
6. Turn on the power. Attempt to boot to the SMS menus. (The system might stop with an 8-digit error code before it reaches the SMS menus.)
7. Power off the system using the white power button. After `OK` is displayed in the operator panel, look at the memory configuration/deconfiguration menu.

Are any DIMMs deconfigured or does the error code recorded earlier in this step still appear?

No Reseating the processor cards has corrected the problem.

Enable memory repeat gard if necessary.

Go to "MAP 0410: Repair Checkout" on page 45.

Yes If there is only 1 processor card installed, tag it as "suspect bad" and go to "Step 1240-6" on page 54. If there are 2 processor cards installed, go to "Step 1240-2".

Step 1240-2

1. Turn off the power. Remove the power cords.
2. Remove processor card 2.
3. Reattach the power cords. Wait for `OK` to display in the operator panel.
4. Turn on the power. Attempt to boot to the SMS menus. (The system might stop with an 8-digit error code before it reaches the SMS menus.)
5. Power off the system using the white power button. After `OK` is displayed in the operator panel, look at the memory configuration/deconfiguration menu.

Are any DIMMs deconfigured or does the error code recorded in "Step 1240-1" still appear?

No Go to "Step 1240-3".

Yes Go to "Step 1240-6" on page 54.

Step 1240-3

1. Turn off the power. Remove the power cords.
2. Remove processor card 1.
3. Reinstall processor card 2 in slot 1.
4. Reattach the power cords. Wait for `OK` to display in the operator panel.
5. Turn on the power. Attempt to boot to the SMS menus. (The system might stop with an 8-digit error code before it reaches the SMS menus.)
6. Power off the system using the white power button. After `OK` is displayed in the operator panel, look at the memory configuration/deconfiguration menu.

Are any DIMMs deconfigured or does the error code recorded in "Step 1240-1" on page 53 still appear?

No Go to "Step 1240-4".

Yes Go to "Step 1240-6".

Step 1240-4

1. Turn off the power. Remove the power cords.
2. Install processor card 1 in slot 2.
3. Reattach the power cords. Wait for 0K to display in the operator panel.
4. Turn on the power. Attempt to boot to the SMS menus. (The system might stop with an 8-digit error code before it reaches the SMS menus.)
5. Power off the system using the white power button. After 0K is displayed in the operator panel, look at the memory configuration/deconfiguration menu.

Have any DIMMs been deconfigured or does the error code recorded in "Step 1240-1" on page 53 still appear?

No Reseating the processor cards has corrected the problem.

Enable memory repeat gard if necessary.

Go to "MAP 0410: Repair Checkout" on page 45.

Yes Go to "Step 1240-5".

Step 1240-5

One of the FRUs remaining in the system unit is defective.

1. Turn off the power. Remove the power cords.
2. Exchange the following FRUs one at a time in the order listed:
   - CEC backplane
   - Processor cards
3. Reattach the power cords. Wait for 0K to display in the operator panel.
4. Turn on the power. Attempt to boot to the SMS menus. (The system might stop with an 8-digit error code before it reaches the SMS menus.)
5. Power off the system using the white power button. After 0K is displayed in the operator panel, look at the memory configuration/deconfiguration menu.

Are any DIMMs deconfigured or does the error code recorded in "Step 1240-1" on page 53 still appear?

No Enable memory repeat gard if necessary.

Go to "MAP 0410: Repair Checkout" on page 45.

Yes Reinstall the original FRU.

Repeat this step until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all FRUs have been exchanged, go to "MAP 1548: Processor Subsystem Problem Isolation" on page 77.

Step 1240-6

1. Turn off the power. Remove the power cords.
2. Reseat the DIMMs. Reinstall the processor card.
3. Reattach the power cords. Wait for 0K to display in the operator panel.

4. Turn on the power. Attempt to boot to the SMS menus. (The system might stop with an 8-digit error code before it reaches the SMS menus.)
5. Power off the system using the white power button. After 0K is displayed in the operator panel, look at the memory configuration/deconfiguration menu.

Are any DIMMs deconfigured or does the error code recorded in "Step 1240-1" on page 53 still appear?

NO Reseating the DIMMs has corrected the problem.

Enable memory repeat gard if necessary.

Go to "MAP 0410: Repair Checkout" on page 45.

YES If there is only one quad of DIMMs on the card, go to "Step 1240-10" on page 56.

If there are two quads of DIMMs on the card, go to "Step 1240-7".

Step 1240-7

1. Turn off the power. Remove the power cords.
2. Remove one quad of DIMMs. Record the positions of the DIMMs as they are removed. When instructed to reinstall the DIMMs, install them back into the same slots from which they were removed.
3. Reattach the power cords. Wait for 0K to display in the operator panel.
4. Turn on the power. Attempt to boot to the SMS menus. (The system might stop with an 8-digit error code before it reaches the SMS menus.)
5. Power off the system using the white power button. After 0K is displayed in the operator panel, look at the memory configuration/deconfiguration menu.

Are any DIMMs deconfigured or does the error code recorded in "Step 1240-1" on page 53 still appear?

NO Go to "Step 1240-8".

YES Go to "Step 1240-10" on page 56.

Step 1240-8

1. Turn off the power. Remove the power cords.
2. Move the quad of DIMMs located on the card to the other quad's slots.
3. Reattach the power cords. Wait for 0K to display in the operator panel.
4. Turn on the power. Attempt to boot to the SMS menus. (The system might stop with an 8-digit error code before it reaches the SMS menus.)
5. Power off the system using the white power button. After 0K is displayed in the operator panel, look at the memory configuration/deconfiguration menu.

Are any DIMMs deconfigured or does the error code recorded in "Step 1240-1" on page 53 still appear?

NO Go to "Step 1240-9" on page 56.

YES Replace the processor card.

Enable memory repeat gard if necessary.

Go to "MAP 0410: Repair Checkout" on page 45.

Step 1240-9

The failing DIMMs is in the quad of DIMMs that was removed in “Step 1240-7” on page 55. Do the following:

1. Turn off the power. Remove the power cords.
2. Remove the quad of DIMMs that is on the processor card and reinstall the quad of DIMMs that had been removed. The DIMMs can be reinstalled in either quad.

Go to “Step 1240-11”.

Step 1240-10

1. Turn off the power. Remove the power cords.
2. Move the quad of DIMMs that is on the processor card to the other quad’s location.
3. Reattach the power cords. Wait for 0K to display in the operator panel.
4. Turn on the power. Attempt to boot to the SMS menus. (The system might stop with an 8-digit error code before it reaches the SMS menus.)
5. Power off the system using the white power button. After 0K is displayed in the operator panel, look at the memory configuration/deconfiguration menu.

Are any DIMMs deconfigured or does the error code recorded in “Step 1240-1” on page 53 still appear?

NO Replace the processor card.

Enable memory repeat gard if necessary.

Go to “MAP 0410: Repair Checkout” on page 45.

YES One or more of the DIMMs on the card is defective. Go to “Step 1240-11”.

Step 1240-11

Attention: If only one quad of DIMMs is on the processor card, you must have at least one replacement DIMM of the same size and speed as the DIMMs that are on the card.

If there were two quad of DIMMs on the processor card, but they are not the same size, your must have at least one replacement DIMM of the same size and speed as the DIMMs in the quad that is failing.

If there were two quad of DIMMs on the processor card, and they are the same size and speed, DIMMs from the good quad can be used when isolating the failing DIMM in the suspect quad.

1. Turn off the power. Remove the power cords.
2. Remove one of the DIMMs on the processor card and install the replacement DIMM or another known good DIMM.
3. Reattach the power cords. Wait for 0K to display in the operator panel.
4. Turn on the power. Attempt to boot to the SMS menus. (The system might stop with an 8-digit error code before it reaches the SMS menus.)
5. Power off the system using the white power button. After 0K is displayed in the operator panel, look at the memory configuration/deconfiguration menu.

Are any DIMMs deconfigured or does the error code recorded in “Step 1240-1” on page 53 still appear?

NO The DIMM that was just removed was the failing DIMM; replace it.

Enable memory repeat gard if necessary.

Go to “MAP 0410: Repair Checkout” on page 45.

YES Go to “Step 1240-12”.

Step 1240-12

Have all the DIMMs in the quad located on the processor card been replaced?

NO Go to “Step 1240-11” on page 56 to test the next DIMM of the quad on the processor card.

YES Go to “Step 1240-13”.

Step 1240-13

Did the processor originally have only one quad of DIMMs at the start of this map?

NO Call service support.

YES Replace the processor card. This ends the procedure. Enable memory repeat gard if necessary. Go to “MAP 0410: Repair Checkout” on page 45.

MAP 1520: Power

Notes:

1. This is not a start-of-call MAP. Use this Power MAP only if you have been directed here from another MAP, an SRN in the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*, or an error code.
2. This procedure is used to locate power problems in system units. If a problem is detected, this procedure helps you isolate the problem to a failing unit.
3. The NAS Gateway 500 always has two power supplies installed with separate power receptacles on the back of the power supply. There are three LEDs located on the front and top of the power supply:
   - AC good LED (green)
   - DC good LED (green)
   - Power supply fault indicator LED (amber)

   The LEDs indicate the condition of the power supply. Refer to “Component LEDs” on page 384 for additional information.
4. The condition of two power supplies being present, but only one working, can be determined by the service processor and a warning level EPOW.
5. Observe the following safety notices during service procedures.

DANGER

An electrical outlet that is not correctly wired could place hazardous voltage on metal parts of the system or the devices that attach to the system. It is the responsibility of the customer to ensure that the outlet is correctly wired and grounded to prevent an electrical shock. (D09)

Before installing or removing signal cables, ensure that the power cables for the system unit and all attached devices are unplugged.

When adding or removing any additional devices to or from the system, ensure that the power cables for those devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.

Use one hand, when possible, to connect or disconnect signal cables to prevent a possible shock from touching two surfaces with different electrical potentials.

CAUTION:
This product is equipped with a 3-wire power cable and plug for the user’s safety. Use this power cable in conjunction with a correctly grounded electrical outlet to avoid an electrical shock. (C10)

DANGER

To prevent electrical shock hazard, disconnect all power cables from the electrical outlet before relocating the system. (D07)

FRU identify LEDs

This system is configured with an arrangement of LEDs that help identify various components of the system. These include, but are not limited to the following:

- Various FRU identify LEDs
  - Power subsystem FRUs
  - CEC subsystem FRUs
  - I/O subsystem FRUs
  - PCI-X adapter identify LED
  - DASD identify LED

Any identify LED in the system can be flashed when the system is in the failed state with power on by using the service processor LED Control Menu contained in the “System information menu” on page 268.

Any identify LED in the system can also be flashed by using the ″Identify and Attention Indicators″ task through diagnostics. The procedure to operate the ″Identify and Attention Indicators″ task in diagnostics is outlined in the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*.

Symptom	Action
The system will not power on and no error codes are available.	Go to “MAP 1521: System with Power Failure and No Error Codes” on page 60.
Error code 1011 1B0x in the SPCN error codes table directed you here.	Go to “Map 1523: The SPCN Error Codes Table Directed You Here and the Error Code is 1011 1B0x” on page 66.

MAP 1521: System with Power Failure and No Error Codes

Step 1521-1

For NAS Gateway 500, do the following:

1. Place the system into the service position as described in “Placing the NAS Gateway 500 into the service position” on page 312.
2. Remove the service access cover as described in “Service access cover removal” on page 314.

You might have been directed to this MAP for one or more of the following reasons:

- The AC power supply power LEDs are not on. The power LEDs on the operator panel and the power LEDs on the back of the system unit are not blinking. The operator panel is blank.

  Go to “Step 1521-2”.
- The AC power supply power LEDs are on. Power LEDs, for AC power supplies, on the operator panel and the back of the system unit are not blinking, and the operator panel is blank. Go to “Step 1521-7” on page 62.
- The AC power supply power LEDs are on. Power LEDs located on the operator panel and the back of the system unit are blinking, and OK is displayed on the operator panel.

  When the power button, located on the operator panel, is pressed:
  - The power LED, located on the operator panel, does not come on.
  - None of the cooling fans start to turn.

  Go to “Step 1521-7” on page 62.
- The AC power supply power LEDs are on. The power LED, located on the operator panel, is blinking and OK is displayed on the operator panel.

  When the power button on the operator panel is pressed, the power LED, on the operator panel, comes on and all the fans start to turn.

  Go to “Step 1521-7” on page 62.
- An SRN referenced in the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems* is listed in MAP 1521 in the ″Actions/Descriptions″ column. Go to “Step 1521-11” on page 63.

Step 1521-2

Is the green power light on the power distribution panel on?

NO Go to “Step 1521-3”.

YES Go to “Step 1521-5” on page 61.

Step 1521-3

Do the following:

1. Unplug the main power cables from the wall outlet.
2. Because you are servicing a drawer unit that is mounted in a rack, unplug the main power cables from the power distribution panel.
3. Check that the power cables have continuity.
4. Check that the wall outlet has been wired correctly with the correct voltage.

Did you find a problem?

NO

Go to “Step 1521-4” on page 61.

YES Correct the problem. Go to “MAP 0410: Repair Checkout” on page 45.

Step 1521-4

Because you are servicing a drawer unit that is mounted in a rack, do the following:

1. Unplug the the system unit power cables from the power distribution panel.
2. Plug in the main power cables into the power distribution panel.
3. Plug in the main power cables from the wall outlet.

Is the green power light on the power distribution panel on?

NO Replace the rack-mounted power distribution panel.

YES Go to “Step 1521-5”.

Step 1521-5

Turn off the power and do the following:

For NAS Gateway 500:

1. Unplug the the system unit power cables from the power distribution panel.
2. Unplug the power cables from the system unit.
3. Check that the power cables have continuity.
4. Check that the power distribution panel outlets have the correct voltage.

Did you find a problem?

NO Go to “Step 1521-6”.

YES Correct the problem. Go to “MAP 0410: Repair Checkout” on page 45.

Step 1521-6

1. One of the following might be defective:
   - Power supplies
   - CEC backplane
   - DIMMs
   - Processor books
2. To test each FRU, exchange the FRUs that have not already been exchanged in the following order.
   - Power supply #1
   - Power supply #2
   - CEC backplane
   - DIMMs
   - Processor books
3. Turn off the power.
4. Unplug the power cables from the system unit.
5. Exchange one of the FRUs in the list.
6. Connect the power cables to the system unit.

Do the AC power LEDs on the power supplies come on within 40 seconds after applying AC power?

NO Reinstall the original FRU.

Repeat this step until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

YES Go to “MAP 0410: Repair Checkout” on page 45.

Step 1521-7

1. Unplug the power cables from the system unit.
2. Exchange the operator panel assembly.
3. Plug the power cables into the system unit and wait for the OK prompt located on the operator panel.
4. Turn on the power.

Does the power LED on the operator panel come on and stay on?

NO Reinstall the original operator panel assembly, go to “Step 1521-8”.

YES Go to “MAP 0410: Repair Checkout” on page 45.

Step 1521-8

1. Turn off the power.
2. Unplug the power cables from the system unit.
3. Record the slot numbers of all the adapters. Label and record the location of any cables attached to the adapters. Disconnect any cables attached to the adapters and remove all the adapters
4. Remove all but one quad of DIMMs from the first processor card.
5. Remove processor book #2 (if installed).
6. Unplug the signal and power cables from the DASD backplane.
7. Unplug the disk drives from the DASD backplane.
8. Unplug the signal and power cables from any devices in the media bays.
9. Remove all the fans.
10. Plug the power cables into the system unit.
11. Turn on the power.

Does the power LED on the operator panel come on and stay on?

NO Go to “Step 1521-9”.

YES Go to “Step 1521-10” on page 63.

Step 1521-9

Note: Either the processor card, PCI riser card, CEC backplane, or the power supplies might be defective.

To test each FRU, exchange the FRUs that have not already been exchanged in the following order:

1. Power supply #1
2. Power supply #2
3. CEC backplane
4. Processor book
5. Memory
6. PCI riser card

Do the following as you exchange each of the above FRUs in the order listed:

1. Turn off the power.
2. Unplug the power cables from the system unit.
3. Exchange one of the FRUs in the list.
4. Connect the power cables to the system unit.
5. Turn on the power.

Does the power LED on the operator panel come on and stay on?

NO Reinstall the original FRU.

Repeat this step until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

YES Go to “MAP 0410: Repair Checkout” on page 45.

Step 1521-10

One of the parts that was removed or unplugged is causing the problem. Install or connect the parts in the following order:

1. DIMMs on processor card #1
2. Processor book #2 (if removed)
3. DASD backplane
4. Disk drives
5. Media bay devices
6. PCI adapters, lowest slot to highest slot
7. Fans

Turn on the power after each part is installed or connected. If the system does not power on or the power LED located on the operator panel does not stay on, the most recently installed or connected part is causing the failure.

Do the following as you exchange each of the above FRUs in the order listed.

1. Turn off the power.
2. Unplug the power cables from the system unit.
3. Install or connect one of the parts in the list.
4. Plug the power cables into the system unit.
5. Turn on the power.

Does the power LED on the operator panel come on and stay on?

NO Replace the last part installed.

- If DIMMs on the first processor card were the last parts installed, exchange the DIMMs one at a time to isolate the failing module. If all DIMMs have been exchanged and the problem is not resolved, replace the processor card.
- If the second processor card was just installed, exchange the DIMMs one at a time to isolate a possible failing module. If all modules have been exchanged and the problem is not resolved, replace the processor card.

Repeat these steps until all the parts have been installed. Go to “Step 1521-11”.

YES Go to “MAP 0410: Repair Checkout” on page 45.

Step 1521-11

Does the system contain two power supplies?

NO Go to “Step 1521-12”.

YES Go to “Step 1521-14” on page 64.

Step 1521-12

Shut down the system and remove all power cables from the back of the system unit.

Exchange the following FRUs in the order listed:

1. Power supply
2. CEC backplane
3. PCI riser card

Restart the system and perform error log analysis.

Do you get an SRN indicating that a voltage sensor is out of range?

NO The last FRU exchanged is defective. Go to “MAP 0410: Repair Checkout” on page 45.

YES Reinstall the original FRU.

Repeat the FRU replacement steps until a defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all FRUs have been exchanged, go to “Step 1521-13”.

If the symptom changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to the “Quick Entry MAP” on page 40 and follow the instructions for the new symptom.

Step 1521-13

Check that the wall outlet is properly wired and is providing the correct voltage.

Did you find a problem?

NO Go to “MAP 1548: Processor Subsystem Problem Isolation” on page 77.

YES Correct the problem. Go to “MAP 0410: Repair Checkout” on page 45.

Step 1521-14

Because the NAS Gateway 500 has redundant power supplies, it is not necessary to power off the system when replacing a power supply.

The power supplies are symmetrical, so replacement starts with the unit closest to the system wall of the system (power supply 1). For instructions on replacing a power supply, refer to “Power supplies” on page 351.

Notes:
1. Always service first the power supply whose green LED, located on the front of the power supplies, is out.
2. Before removing a power supply, be sure the redundant power supply is operational by observing the green LED. The green LED must be on solid.

Replace the following FRUs in order:
1. Power supply #1
2. Power supply #2

Perform error log analysis.

Do you receive an SRN indicating that a voltage sensor is out of range?

NO The last FRU exchanged is defective. Go to “MAP 0410: Repair Checkout” on page 45.

YES Reinstall the original FRU.

Repeat the FRU replacement steps until a defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all FRUs have been exchanged, go to “Step 1521-15” on page 65.

If the symptom changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to the “Quick Entry MAP” on page 40 and follow the instructions for the new symptom.

Step 1521-15

The problem is within the system unit hardware or with the line voltage or wiring.

Shut down the system and remove the power cables from the system unit. Exchange the following FRUs in the order listed.

1. PCI riser card
2. CEC backplane

Restart the system and perform error log analysis.

Do you get an SRN indicating that a voltage sensor is out of range?

NO The last FRU exchanged is defective. Go to “MAP 0410: Repair Checkout” on page 45.

YES Reinstall the original FRU.

Repeat the FRU replacement steps until a defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all FRUs have been exchanged, go to “Step 1521-13” on page 64.

If the symptom changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to the “Quick Entry MAP” on page 40 and follow the instructions for the new symptom.

Map 1523: The SPCN Error Codes Table Directed You Here and the Error Code is 1011 1B0x

A system power supply is reporting a load fault.

Note: Read the danger and caution notices under “Safety notices” on page xv before continuing with this procedure.

Perform the following steps to isolate the problem.

Step 1523-1

1. Turn off the power.
2. Disconnect the AC power cables from the system.
3. Remove the following assemblies, in the sequence listed:
   a. Processor books
   b. PCI adapter cards
   c. DASD device
   d. Media bay devices
4. Reconnect the AC power cables to the system.
5. Turn on the power.

Is the error code 1011 1B0x displayed?

NO Go to “Step 1523-7” on page 67.

YES Go to “Step 1523-2”.

Step 1523-2

1. Turn off the power.
2. Disconnect the AC power cables from the system.
3. Remove system power supply 2.
4. Reconnect the AC power cable to the system power supply 1.
5. Turn on the power.

Is the error code 1011 1B0x displayed?

NO Go to “Step 1523-3”.

YES Go to “Step 1523-4” on page 67

Step 1523-3

1. Turn off the power.
2. Reinstall system power supply 2 that was removed in “Step 1523-2”.
3. Reconnect the AC power cable to the system power supply 2.
4. Turn on the power.

Is the error code 1011 1B0x displayed?

NO The symptom has changed.

This ends the procedure.

YES Replace system power supply 2, location: U0.1-V2.

This ends the procedure. Go to “MAP 0410: Repair Checkout” on page 45.

Step 1523-4

1. Turn off the power.
2. Reinstall system power supply 2 that was removed in “Step 1523-2” on page 66.
3. Reconnect the AC power cable to the system power supply 2.
4. Disconnect the AC cable to system power supply 1.
5. Remove system power supply 1.
6. Turn on the power.

Is the error code 1011 1B0x displayed?

NO Replace system power supply 1, location: U0.1-V1.

This ends the procedure. Go to “MAP 0410: Repair Checkout” on page 45.

YES Go to “Step 1523-5”.

Step 1523-5

1. Turn off the power.
2. Reinstall system power supply 2 that was removed in “Step 1523-4”.
3. Reconnect the AC power cable to the system power supply 2.
4. Remove system fan 3. Disregard a system fan error code if it occurs during this step.
5. Turn on the power.

Is the error code 1011 1B0x displayed?

NO Replace system fan 3, location: U0.1-F3. **This ends the procedure.** Go to “MAP 0410: Repair Checkout” on page 45.

YES Go to “Step 1523-6”.

Step 1523-6

1. Turn off the power.
2. Reinstall system fan 3 that was removed in “Step 1523-5”.
3. Remove system fan 4. Disregard a system fan error code if it occurs during this step.
4. Turn on the power.

Is the error code 1011 1B0x displayed?

NO Replace system fan 4, location: U0.1-F4. **This ends the procedure.** Go to “MAP 0410: Repair Checkout” on page 45.

YES Replace the system backplane, location: U0.1-P1. **This ends the procedure.** Go to “MAP 0410: Repair Checkout” on page 45.

Step 1523-7

1. Turn off the power.
2. Disconnect the AC power cables from the system.
3. Reinstall one of the assemblies that was removed in “Step 1523-1” on page 66, in the sequence listed:
   a. Processor cards
   b. PCI adapter books
   c. DASD devices

d. Media bay devices

4. Reconnect the AC power cables to the system.
5. Turn on the power.

Is the error code 1011 1B0x displayed?

NO Go to “Step 1523-8”.

YES The last assembly that you installed is defective. Replace the last card that you installed. **This ends the procedure.** Go to “MAP 0410: Repair Checkout” on page 45.

Step 1523-8

Have all the cards that were removed in “Step 1523-7” on page 67 been reinstalled?

NO Go to “Step 1523-7” on page 67 and reinstall the next assembly in the list.

YES Replace the system backplane, location: U0.1-P1.

This ends the procedure. Go to “MAP 0410: Repair Checkout” on page 45.

MAP 1540: Problem Isolation Procedures

These procedures are used to locate problems in the processor subsystem, I/O subsystems, or rack. If a problem is detected, these procedures help you isolate the problem to a failing unit. Find the symptom in the following table; then follow the instructions given in the Action column.

FRU identify LEDs

This system is configured with an arrangement of LEDs that help identify various components of the system. These include, but are not limited to, the following:

- Various FRU identify LEDs
  - Power subsystem FRUs
  - CEC subsystem FRUs
  - I/O subsystem FRUs
  - PCI-X adapter identify LED
  - DASD identify LED

Any identify LED in the system can be flashed when the system is in the failed state with power on by using the service processor LED Control Menu contained in the “System information menu” on page 268.

Any identify LED in the system can also be flashed by using the ″Identify and Attention Indicators″ task through diagnostics. The procedure to operate the ″Identify and Attention Indicators″ task in diagnostics is outlined in the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*.

This system is configured with an arrangement of LEDs that help identify various components of the system. These include, but are not limited to, the following LEDs:

Problem isolation procedures	
Symptom/reference code/checkpoint	**Action**
You were sent here by the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems* book.	Go to "MAP 1542: I/O Problem Isolation" on page 72.
406x 00B7	Go to "MAP 1548: Processor Subsystem Problem Isolation" on page 77.
406x 0EB1, 406x 0EB2, 406x 0EB3, 406x 0EB4, 406x 0EB5, 406x 0EB6, 406x 0EB7, 406x 0EB8, 406x 0EB9, 406x 0EBA, 406x 0EBB, 406x 0EBC	Go to "MAP 1549: Attention Problem Isolation" on page 90.
406x 0EB0	Go to "MAP 1541: JTAG Problem Isolation" on page 71.
1011 8400, 1011 8401, 1011 8409, 1011 840A, 1011 840B, 406x 0CA5, B1xx 4643, B1xx 4644, B1xx 4645, B1xx 4646, B1xx 4648	Go to "MAP 1548: Processor Subsystem Problem Isolation" on page 77.
E101, E102, E10A, E10B, E111, E120, E121, E122, E130, E131, E132, E133, E134, E135, E138, E139, E13A, E149, E14C, E191, E19A, E19B, E19D, E1A0, E1A1, E1A2, E1A3, E1A4, E1A5, E1A6, E1A7, E1A8, E1A9, E1AA, E1AB, E1AC, E1AD, E1AE, E1AF, E1B1, E1C4, E1C5, E1C6, E1D0, E1D3, E1D4, E1DB, E1F0, E1F1, E1F4, E1F5, E1F6, E1F8, E1F9, E1FA, E1FB, E1FD, E1FE, E5E0, E5E2, E5E3, E5E4, E5E5, E5E6, E5E7, E5E8, E5E9, E5EE, E5EF, B1xx 4601, B1xx 4602, B1xx 4650, B1xx 469E, B1xx 469F B1xx 4660, B1xx 4661, B1xx 4662	Go to "MAP 1548: Processor Subsystem Problem Isolation" on page 77.
E500, E501, E502, E503, E504, E505, E506, E507, E508, E509, E50A, E50B, E50C, E50D, E50E, E50F, E51F, E520, E521, E522, E523, E524, E525, E526, E527, E52F, E530, E531, E532, E533, E534, E535, E536, E537, E538, E539, E53A, E53B, E53C, E540, E541, E560, E56F, E57F, E580, E581, E582, E583, E584, E585, E586, E587, E588, E589, E58A, E58B, E58C, E58D, E58E, E58F E590, E591, E592, E593, E594, E595, E59E, E708, E70C, E70F, E7FF, E852, E861, E871	Go to "MAP 1542: I/O Problem Isolation" on page 72.
B1xx 4634	Call for service.

MAP 1541: JTAG Problem Isolation

Step 1541-1

Record the error code and location codes that sent you to this MAP.

Step 1541-2

Turn off the power.

Step 1541-3

Replace the following, if present, one at a time and in the order listed:

- First location code item recorded, if any, “Step 1541-1”.
- Second location code item recorded, if any, in “Step 1541-1”.
- Third location code item recorded, if any, in “Step 1541-1”.
- Fourth location code item recorded, if any, in “Step 1541-1”.
- Replace the CEC backplane at U0.1-P1.
- Processor card at location U0.1-P1-C1 if not recorded in “Step 1541-1”.
- All DIMMs on processor card 1 at location U0.1-P1-C1-M*n* (*n* equals 1 to 8), if not recorded in “Step 1541-1”.
- Processor card at location U0.1-P1-C2, if not recorded in “Step 1541-1”.
- All DIMMs on processor card 2 at location U0.1-P1-C2-M*n* (*n* equals 1 to 8), if not recorded in “Step 1541-1”.
- PCI riser card at U0.1-P2.

Step 1541-4

Turn on the power.

Step 1541-5

Did the system stop with the same error code as recorded in “Step 1541-1”?

Yes Go to “Step 1541-6”.

No The part just replaced was defective. **This ends the procedure.**

Return the system to its original configuration.

Go to “MAP 0410: Repair Checkout” on page 45.

Step 1541-6

Have all the cards listed in “Step 1541-3” been replaced?

Yes Go to “Step 1541-7”.

No Go to “Step 1541-2”.

Step 1541-7

Turn off the power. Call service support.

MAP 1542: I/O Problem Isolation

This MAP is used to locate defective FRUs not found by normal diagnostics. For this procedure, diagnostics are run on a minimally configured system. If a failure is detected on the minimally configured system, the remaining FRUs are exchanged one at a time until the failing FRU is identified. If a failure is not detected, FRUs are added back until the failure occurs. The failure is then isolated to the failing FRU.

This I/O problem-determination MAP isolates I/O card and I/O subsystem failures. When I/O problem isolation is complete, all cables and cards exhibiting a failure will have been replaced or reseated.

Notes:

1. This MAP assumes that a Diagnostics CD-ROM is available.
2. If a general-access password or privileged-access password is installed, you are prompted to enter the password before the diagnostic CD-ROM can load.
3. The term *POST indicators* refers to the device mnemonics (words **memory**, **keyboard**, **network**, **SCSI**, and **speaker**) that appear on the system console during the power-on self-test (POST).
4. The service processor might have recorded one or more symptoms in its error log. It is a good idea to examine that error log before proceeding. (See “Accessing system error logs” on page 36.)
5. The service processor might have been set by the user to monitor system operations and to attempt recoveries. You can disable these actions while you diagnose and service the system. If you disable them, make notes of their current settings so that you can restore them easily. The following table lists the settings:

Surveillance	From the service processor Setup Menu, go to the Surveillance Setup Menu and disable surveillance.
Unattended start	From the service processor System Power Control Menu, disable unattended start mode.
Reboot policy	From the System Power Control Menu, go to the Reboot/Restart Policy Setup Menu and set: a. Number of reboot attempts to **0** (zero). b. Use OS-Defined restart policy to **No.** c. Enable supplemental restart policy to **No**.
Call out	From the Call-In/Call-Out Setup Menu, go to the Serial Port Selection Menu and disable call-out on serial port S2.

The steps in this procedure will attempt to slow boot the system into service mode diagnostics. The following procedure describes booting a system with an attached console.The following procedure requires booting standalone diagnostics (5 key between the **keyboard** and **speaker** indicators).

Step 1542-1

1. Ensure that the diagnostics and the operating system are shut down.
2. Turn off the power.
3. Select slow boot mode (select **Disable Fast Boot**) on the System Power Control menu from the service processor main menu.
4. Turn on the power.
5. Insert the diagnostic CD-ROM into the CD-ROM drive.

Does the CD-ROM appear to operate correctly?

NO Go to “Boot problems or concerns” on page 122.

YES Go to “Step 1542-2”.

Step 1542-2

1. When the keyboard indicator is displayed (the word **keyboard**), press 5 on the firmware console.
2. Enter the appropriate password when you are prompted to do so.

Is the Please define system console panel displayed?

NO Go to “Step 1542-3”.

YES Go to “Step 1542-4”.

Step 1542-3

The system is unable to boot standalone diagnostics.

Check the service processor error log and the operator panel for additional error codes resulting from the slow boot in “Step 1542-1”. Did the slow boot generate a different error code from the one that originally sent you to MAP 1542?

NO It appears that you have a processor subsystem problem. Call service support. **This ends the procedure**.

YES Restore fast-boot mode (select **Enable Fast Boot**) on the System Power Control menu from the service processor main menu. Go to “Checkpoint and error code index” on page 127 and follow the actions for the new error code.

Step 1542-4

The system stopped with the ″Please define system console″ prompt appearing on the system console.

Standalone diagnostics can be booted. Perform the following:

1. Follow the instructions on the panel to select the system console.
2. When the Diagnostic Operating Instructions panel is displayed, press Enter.
3. If the terminal type has not been defined, you will get a message saying “The terminal is not properly initialized. Please enter a terminal type and press Enter.” Select a terminal type from the on screen list which is supported by your console. This is a separate and different operation from selecting the firmware console.
4. Select **Advanced Diagnostic Routines**.
5. When the Diagnostic Mode Selection menu is displayed, select **System Verification** to run diagnostics on all resources.

   Did running diagnostics produce a different symptom?

   NO Go to substep 6 on page 74.

YES Go to “Entry MAP” on page 39. Use the new symptom.

6. Record any devices missing from the list of all adapters and devices. Continue with this MAP. When you have fixed the problem, use this record to verify that all devices appear when you run System Verification.

Are there any devices missing from the list of all adapters and devices?

NO Reinstall all remaining adapters, if any, and reconnect all devices. Return the system to its original configuration. Be sure to select fast-boot mode (select **Enable Fast Boot**) on the System Power Control menu from the service processor main menu. Go to “MAP 0410: Repair Checkout” on page 45.

YES The boot attempts that follow will attempt to isolate any remaining I/O drawer problems with missing devices. Ignore any codes that are displayed on the operator panel unless stated otherwise. Go to “Step 1542-5”.

Step 1542-5

The system is running from the integrated I/O or from I/O attached to an adapter installed into one of the integrated PCI slots.

1. Turn on the power to boot standalone diagnostics from CD-ROM.
2. If the Please Define the System Console prompt is displayed, follow directions to select the system console.
3. Use the Display Configuration and Resource List to list all attached devices and adapters (refer to the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*, if necessary).
4. Check that all attached devices and adapters are listed.

If the Please Define the System Console prompt did not display or all attached devices and adapters are not listed, the problem is in the system.

Is the Please Define the System Console prompt displayed and are all attached devices and adapters listed?

NO Go to “Step 1542-7”.

YES Go to “Step 1542-6”.

Step 1542-6

1. Turn off the power.
2. The item just replaced fixed the problem.
3. Reconnect the diskette drive cable to the diskette drive connector on the system.
4. Plug in all adapters that were previously removed but not reinstalled.

Reconfigure the system to its original condition. Go to “MAP 0410: Repair Checkout” on page 45.

Step 1542-7

Are there any adapters in slots 1, 2, 3, 4, 5, or 6 (location codes U0.1-P1-I1 through I6) in the system?

NO Go to “Step 1542-8”.

YES Go to “Step 1542-10” on page 75.

Step 1542-8

Replace the CEC backplane, location U0.1-P1.

Step 1542-9

1. Boot standalone diagnostics from CD-ROM.
2. If the Please Define the System Console prompt is displayed, follow directions to select the system console.
3. Use the Display Configuration and Resource List to list all attached devices and adapters (refer to the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*, if necessary).
4. Check that all attached devices and adapters are listed.

Is the Please Define the System Console prompt displayed and are all attached devices and adapters listed?

NO Go to “Step 1542-13” on page 76.

YES Go to “Step 1542-6” on page 74.

Step 1542-10

1. If it is not already off, turn off the power.
2. Remove all adapters from slots 1, 2, 3, 4, 5, and 6 (location codes U0.1-P1-I1 through I6) in the system that are not attached to the boot device.
3. Label and record the location of any cables attached to the adapters.
4. Record the slot number of the adapters.
5. Turn on the power to boot standalone diagnostics from the CD-ROM.
6. If the ASCII terminal panel displays Enter 0 to select this console, press 0 on the ASCII terminal keyboard.
7. If the Please Define the System Console prompt is displayed, follow directions to select the system console.
8. Use the Display Configuration and Resource List to list all attached devices and adapters (refer to the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*, if necessary).
9. Check that all attached devices and adapters are listed.

Is the Please Define the System Console prompt displayed and are all attached devices and adapters listed?

NO Go to “Step 1542-8” on page 74.

YES Go to “Step 1542-11”.

Step 1542-11

If the Please Define the System Console prompt is displayed and all attached devices and adapters are listed, the problem is with one of the adapter cards or devices that was removed or disconnected from the I/O subsystem.

1. Turn off the power.
2. Reinstall the adapter or device that was removed. Use the original adapter cards in their original slots when reinstalling adapters.
3. Turn on the power to boot standalone diagnostics from CD-ROM.
4. If the Please Define the System Console prompt is displayed, follow directions to select the system console.
5. Use the Display Configuration and Resource List to list all attached devices and adapters (refer to the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*, if necessary).
6. Check that all attached devices and adapters are listed.

Is the Please Define the System Console prompt displayed and are all attached devices and adapters listed?

NO Go to “Step 1542-12”.

YES Reinstall the next adapter or device and return to the beginning of this step. Continue repeating this process until an adapter or device causes the Please Define the System Console prompt to not be displayed or all attached devices and adapters to not be listed.

After installing all of the adapters, if the Please Define the System Console prompt is displayed and all attached devices and adapters are listed, go to “Step 1542-6” on page 74.

Step 1542-12

Replace the adapter that you just installed with a new adapter and retry the boot to standalone diagnostics from CD-ROM.

1. If the Please Define the System Console prompt is displayed, follow directions to select the system console.
2. Use the Display Configuration and Resource List to list all attached devices and adapters (refer to the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*, if necessary).
3. Check that all attached devices and adapters are listed.

Is the Please Define the System Console prompt displayed and are all attached devices and adapters listed?

NO Go to “Step 1542-8” on page 74.

YES Go to “Step 1542-6” on page 74.

Step 1542-13

1. Turn off the power.
2. Disconnect the system power cables.
3. Replace the following parts, one at a time, in the sequence listed:
   a. Internal SCSI cable
   b. DASD backplane
   c. Media backplane
4. Reconnect the system power cables.
5. Turn on the power.
6. Boot standalone diagnostics from CD-ROM.
7. If the Please Define the System Console prompt is displayed, follow directions to select the system console.
8. Use the Display Configuration and Resource List to list all attached devices and adapters (refer to the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*, o if necessary).
9. Check that all attached devices and adapters are listed.

Is the Please Define the System Console prompt displayed and are all attached devices and adapters listed?

NO Replace the next part in the list and return to the beginning of this step. Repeat this process until a part causes the Please Define the System Console prompt to be displayed and all attached devices and adapters to be listed. If you have replaced all the items listed above and the Please Define the System Console prompt is not displayed or all attached devices and adapters are not listed, check any external devices and cabling. If you do not find a problem, call service support for assistance.

YES Go to “Step 1542-6” on page 74.

MAP 1548: Processor Subsystem Problem Isolation

Notes:

1. Be sure to unplug the power cords before removing or installing processor cards, the PCI riser card, or the CEC backplane to avoid damage to it.
2. This MAP assumes that a diagnostic CD-ROM is available.
3. If a power-on password or privileged-access password is installed, you are prompted to enter the password before the diagnostic CD-ROM can load.
4. The term *POST indicators* refers to the device mnemonics that appear during the power-on self-test (POST).
5. The support leg located on the bottom of the media support shelf is used to deactivate a microswitch. The microswitch is located on the CEC backplane and when deactivated cuts off power to some of the components and connectors located on the CEC backplane. This support shelf must be correctly seated and secured in position after any new FRU is added to the system and you perform a system boot.
6. The service processor might have recorded one or more symptoms in its error log.
   - If you arrived here after performing a slow boot, look for a possible new error that occurred during the slow boot. If there is a new error, and its actions call for a FRU replacement, perform those actions. If this does not resolve the problem, go to “Step 1548-1” on page 78.
   - If an additional slow boot has not been performed, or if the slow boot did not yield a new error code, look at the error that occurred just before the original error. Perform the actions associated with that error. If the problem is not resolved, go to “Step 1548-1” on page 78.
   - If a slow boot results in the same error code, and there are no error codes before the original error code, go to “Step 1548-1” on page 78.

   Before proceeding, it is a good idea to examine that error log. (See “Accessing system error logs” on page 36.
7. The service processor might have been set by the user to monitor system operations and to attempt recoveries. You might want to disable these actions while you diagnose and service the system. If you disable them, make notes of their current settings so that you can restore them before you leave. The following settings might be of interest to you.

Surveillance	From the Service Processor Setup Menu, go to the Surveillance Setup Menu and disable surveillance.
Unattended start mode	From the Service Processor System Power Control Menu, disable unattended start mode.
Reboot policy	From the System Power Control Menu, go to the Reboot/Restart Policy Setup Menu and set: a. Number of reboot attempts to **0** (zero) b. Use OS-Defined restart policy to **No** c. Enable supplemental restart policy to **No**.
Call out	From the Call-In/Call-Out Setup Menu, go to the Serial Port Selection Menu and disable call-out on serial port S2.

8. Verify that the system has not been set to boot to the SMS menus or to the open firmware prompt. From the System Power Control Menu, select **Boot Mode Menu**. Verify that all four options are set to disabled.

Purpose of this MAP

This MAP is used to locate defective FRUs not found by normal diagnostics. For this procedure, diagnostics are run on a minimally configured system. If a failure is detected on the minimally configured system, the remaining FRUs are exchanged one at a time until the failing FRU is identified. If a failure is not detected, FRUs are added back until the failure occurs. The failure is then isolated to the failing FRU.

Step 1548-1

1. Ensure that the diagnostics and the operating system are shut down.
2. Turn on the power.
3. Insert the diagnostic CD-ROM into the CD-ROM drive.

   Note: If you cannot insert the diagnostic CD-ROM, go to “Step 1548-2”.
4. When the keyboard indicator is displayed:
   - On an ASCII terminal, the word **keyboard**, press 5.
5. If you are prompted to do so, enter the appropriate password.

Is the Please Define the System Console prompt displayed?

NO Go to “Step 1548-2”.

YES Go to “Step 1548-17” on page 86.

Step 1548-2

1. Turn off the power.
2. If you have not already done so, configure the service processor with the instructions in note 7 on page 77. Then return here and continue.
3. Exit the service processor menus and remove the power cords.
4. Disconnect all external cables (serial port 1, serial port 2, Ethernet, and so on).
5. Place the drawer of the NAS Gateway 500 into the service position and remove the service access cover.
6. Record the slot numbers of the PCI adapters. Label and record the locations of any cables attached to the adapters. Disconnect any cables attached to the adapters and remove all the adapters.
7. Disconnect all power and signal cables from the media drives, located in media bay 1 and media bay 2.
8. Remove the media drives as described in “Media drive removal” on page 337.
9. Remove the media support shelf by loosening the thumbscrew and grasping the back edge of the shelf, sliding it back, then lifting it up and out of the system chassis.

   Note: The support leg located on the bottom of the media support shelf is used to deactivate a microswitch. The microswitch is located on the CEC backplane and, when deactivated, cuts off all power to the CEC backplane. This support shelf must be correctly seated and secured in position after any new FRU is added to the system.

10. Remove processor card #2 (if installed). If processor card #2 is removed, ensure that processor card #1 is installed and contains at least one quad of DIMMs.

    The processor card that is left in the system must contain at least one quad of DIMMs. For example, with a system configuration having two processor cards, processor card #2 contains all of the DIMMs, processor card #1 contains no DIMMs. Remove processor card #1 that contains no DIMMs, and then remove all but one quad of DIMMs from processor card #2. Place processor card #2 into processor slot #1.
11. Record the slot numbers of the DIMMs on processor card #1. Remove all DIMMs except for one quad from processor card #1.

    Notes:

    a. Place the DIMM locking tabs in the locked (upright) position to prevent damage to the tabs.

    b. DIMMs must be installed in quads and in the correct connectors. Refer to “DIMM locations” on page 12 for complete information on DIMMs.
12. Disconnect the cables attached to the PCI riser card.
13. Disconnect the IDE cable from the IDE connector on the CEC backplane.
14. If your system is equipped with a diskette drive, disconnect the diskette drive cable from the diskette drive connector on the CEC backplane.
15. Disconnect the signal and power connectors from the disk drive backplane.
16. Disconnect the disk drives from the disk drive backplane connectors.
17. Reinstall the media tray.
18. Plug in the power cords and wait for the operator panel to display `0K`.
19. Turn on the power.

Does the system stop with code E1F2, E1F3, STBY or 20EE000B, 4BA00830 displayed on the operator panel?

NO Go to “Step 1548-6” on page 80.

YES Go to “Step 1548-3”.

Step 1548-3

Were any more DIMMs removed from processor card #1?

NO Go to “Step 1548-5” on page 80.

YES Go to “Step 1548-4”.

Step 1548-4

1. Turn off the power, and remove the power cords.
2. Replug the DIMMs that were removed from processor #1 in “Step 1548-2” on page 78 in their original locations.

   Notes:

   a. Place the DIMM locking tabs into the locked (upright) position to prevent damage to the tabs.

   b. DIMMs must be installed in quads in the correct connectors. Refer to “DIMM locations” on page 12 for complete information on DIMMs.
3. Plug in the power cords and wait for the operator panel to display `0K`.
4. Turn on the power.

Does the system stop with code E1F2, E1F3, STBY, 20EE000B or 4BA00840 displayed in the operator panel?

NO A DIMM in the quad that you just replaced in the system is defective. Turn off the power, remove the power cords, and exchange the DIMMs in that quad, one at a time with new or previously removed DIMMs.

Repeat this step until the defective DIMM is identified, or all DIMMs have been exchanged.

If your symptom did not change and all the DIMMs have been exchanged, call your service support person for assistance.

If the symptom changed, check for loose cards and obvious problems. If you do not find a problem, go to the “Quick Entry MAP” on page 40 and follow instructions for the new symptom.

YES Go to “Step 1548-5”.

Step 1548-5

Was processor card #2 removed from the system?

NO Go to “Step 1548-8” on page 81.

YES Go to “Step 1548-7” on page 81.

Step 1548-6

One of the FRUs remaining in the system unit is defective.

Note: If a DIMM is exchanged, ensure that the new DIMM is the same size and speed as the original DIMM.

1. Turn off the power, remove the power cords, and exchange the following FRUs in the order listed:
   a. DIMMs. Exchange one at a time with new or previously removed DIMMs.
   b. Processor card #1.
   c. CEC backplane.
   d. PCI riser card.
   e. Power supplies.
2. Plug in the power cords and wait for the operator panel to display `0K`.
3. Turn on the power.

Does the system stop with code E1F2, E1F3, STBY or 20EE000B, 4BA00830 displayed on the operator panel?

NO Reinstall the original FRU.

Repeat the FRU replacement steps until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to the “Quick Entry MAP” on page 40 and follow the instructions for the new symptom.

YES Go to “MAP 0410: Repair Checkout” on page 45.

Step 1548-7

No failure was detected with this configuration.

1. Turn off the power and remove the power cords.
2. Reinstall processor card #2.
3. Plug in the power cords and wait for the operator panel to display `0K`.
4. Turn on the power.

Does the system stop with code E1F2, E1F3, STBY or 20EE000B, 4BA00830 displayed on the operator panel?

NO One of the FRUs remaining in the system unit is defective.

Exchange the FRUs that have not been exchanged, in the following order:

1. DIMMs, if present on processor card #2, exchange one at a time with new or previously removed DIMMs.
2. Processor card #2 (last one installed).
3. CEC backplane.

Repeat this step until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged, call your service support person for assistance.

If the symptom changed, check for loose cards and obvious problems. If you do not find a problem, go to the “Quick Entry MAP” on page 40 and follow the instructions for the new symptom.

YES Go to “Step 1548-8”.

Step 1548-8

1. Turn off the power.
2. Reconnect the system console.

   Note: If an ASCII terminal has been defined as the system console, attach the ASCII terminal cable to the S1 connector on the back of the system unit.
3. Turn on the power.
4. If the ASCII terminal is connected differently than it was before, the Console Selection panel appears and requires that a new console be selected.
5. When the word **keyboard** is displayed, press 1 on the ASCII terminal. This activates the System Management Services (SMS).
6. If you are prompted to do so, enter the appropriate password.

Is the SMS panel displayed?

NO One of the FRUs remaining in the system unit is defective.

Exchange the FRUs that have not been exchanged.

Repeat this step until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to the “Quick Entry MAP” on page 40 and follow the instructions for the new symptom.

YES Go to “Step 1548-9” on page 82.

Step 1548-9

1. Turn off the power and remove the power cords.
2. Plug the IDE cable into the IDE connector on the CEC backplane.
3. Connect the signal and power connectors to the IDE CD-ROM drive.
4. Plug in the power cords and wait for the operator panel to display 0K.
5. Turn on the power.
6. Insert the diagnostic CD-ROM into the CD-ROM drive.
7. After the word **keyboard** is displayed, press 5 on the ASCII terminal keyboard.
8. If you are prompted to do so, enter the appropriate password.

Is the Please Define the System Console prompt displayed?

NO One of the FRUs remaining in the system unit is defective.

Exchange the FRUs that have not been exchanged, in the following order:

1. IDE cable
2. CD-ROM drive
3. CEC backplane
4. Processor card

Repeat this step until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to the “Quick Entry MAP” on page 40 and follow the instructions for the new symptom.

YES Go to “Step 1548-10”.

Step 1548-10

The system is working correctly with this configuration. One of the SCSI devices that you disconnected might be defective.

1. Make sure the diagnostic CD-ROM is inserted into the CD-ROM drive.
2. Turn off the power and remove the power cords.
3. Plug the SCSI cable into the SCSI connector on the CEC backplane.
4. Connect the signal and power connectors to one of the SCSI devices. Do not connect the signal and power connectors to the disk drive backplane at this time.
5. Plug in the power cords and wait for the operator panel to display 0K.
6. Turn on the power.
7. After the word **keyboard** is displayed, press 5 on the ASCII terminal keyboard.
8. If you are prompted to do so, enter the appropriate password.

Is the Please Define the System Console prompt displayed?

NO One of the FRUs remaining in the system unit is defective.

Exchange the FRUs that have not been exchanged, in the following order:

1. SCSI cable
2. Last SCSI device connected (for example: disk drive)
3. CEC backplane
4. Processor card

Repeat this step until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to the return to “Quick Entry MAP” on page 40 and follow the instructions for the new symptom.

YES Repeat this step, adding one SCSI device at a time, until all the SCSI devices that were attached to the integrated SCSI adapter, except the disk drive backplane, are connected and tested.

Go to “Step 1548-11”.

Step 1548-11

The system is working correctly with this configuration. The disk drive backplane might be defective.

1. Make sure the diagnostic CD-ROM is inserted into the CD-ROM drive.
2. Turn off the power and remove the power cords.
3. Connect the signal and power connectors to the disk drive backplane.
4. Plug in the power cords and wait for the operator panel to display `0K`.
5. Turn on the power.
6. If the Console Selection panel is displayed, choose the system console.
7. After the word **keyboard** is displayed, press 5 on the ASCII terminal keyboard.
8. If you are prompted to do so, enter the appropriate password.

Is the Please Define the System Console prompt displayed?

NO One of the FRUs remaining in the system unit is defective.

Exchange the FRUs that have not been exchanged, in the following order:

1. SCSI cable
2. Disk drive backplane

Repeat this step until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to the “Quick Entry MAP” on page 40 and follow the instructions for the new symptom.

YES Go to “Step 1548-12”.

Step 1548-12

The system is working correctly with this configuration. One of the disk drives that you removed from the disk drive might be defective.

1. Make sure the diagnostic CD-ROM is inserted into the CD-ROM drive.
2. Turn off the power and remove the power cords.
3. Install a disk drive in the disk drive backplane.
4. Plug in the power cords and wait for the operator panel to display `0K`.
5. Turn on the power.
6. After the word **keyboard** is displayed, press 5 on the ASCII terminal keyboard.
7. If you are prompted to do so, enter the appropriate password.

Is the Please Define the System Console prompt displayed?

No Exchange the FRUs that have not been exchanged, in the following order:

1. Last disk drive installed
2. Disk drive backplane

Repeat this step until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to the “Quick Entry MAP” on page 40 and follow the instructions for the new symptom.

Yes Repeat this step with the second disk drive (if it was installed).

If the system has a diskette drive, go to “Step 1548-13”.

Go to “Step 1548-14”.

Step 1548-13

The system is working correctly with this configuration. The diskette drive might be defective.

1. Make sure the diagnostic CD-ROM is inserted into the CD-ROM drive.
2. Turn off the power and remove the power cords.
3. Plug the diskette drive cable into the diskette drive connector on the CEC backplane.
4. Connect the signal and power connectors to the diskette drive.
5. Plug in the power cords and wait for the operator panel to display 0K.
6. Turn on the power.
7. After the word **keyboard** is displayed, press 5 on the ASCII terminal keyboard.
8. If you are prompted to do so, enter the appropriate password.

Is the Please Define the System Console prompt displayed?

NO One of the FRUs remaining in the system is defective.

Exchange the FRUs that have not been exchanged, in the following order:

1. Diskette drive
2. Diskette drive cable
3. CEC backplane

Repeat this step until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to the “Quick Entry MAP” on page 40 and follow the instructions for the new symptom.

YES Go to “Step 1548-14”.

Step 1548-14

The system is working correctly with this configuration. One of the devices that you disconnected from the CEC backplane might be defective.

1. Turn off the power and remove the power cords.
2. Attach a CEC backplane device (for example: parallel, serial port 1, serial port 2, Ethernet, Ultra-2 SCSI) that had been removed.
3. Plug in the power cords and wait for the operator panel to display 0K.

4. Turn on the power.
5. If the Console Selection panel is displayed, choose the system console.
6. After the word **keyboard** is displayed, press 5 on the ASCII terminal keyboard.
7. If you are prompted to do so, enter the appropriate password.

Is the Please Define the System Console prompt displayed?

NO The last device or cable that you attached is defective.

To test each FRU, exchange the FRUs in the following order:

1. Device and cable (last one attached)
2. CEC backplane (see notes on page 39)

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to the "Quick Entry MAP" on page 40 and follow the instructions for the new symptom.

Go to "MAP 0410: Repair Checkout" on page 45.

YES Repeat this step until all of the devices are attached.

Go to "Step 1548-15".

Step 1548-15

The system is working correctly with this configuration. One of the adapters that you removed might be defective.

1. Turn off the power and remove the power cords.
2. Install an adapter and connect any cables and devices that were attached to the FRU.
3. Plug in the power cords and wait for the operator panel to display `0K`.
4. Turn on the power.
5. If the Console Selection panel is displayed, choose the system console.
6. After the word **keyboard** is displayed, press 5 on the ASCII terminal keyboard.
7. If you are prompted to do so, enter the appropriate password.

Is the Please Define the System Console prompt displayed?

NO Go to "Step 1548-16".

YES Repeat this step until all of the adapters are installed.

Go to "MAP 0410: Repair Checkout" on page 45.

Step 1548-16

The last adapter installed or one of its attached devices is probably defective.

1. Make sure the diagnostic CD-ROM is inserted into the CD-ROM drive.
2. Turn off the power and remove the power cords.
3. Starting with the last installed adapter, disconnect one attached device and cable.
4. Plug in the power cords and wait for the `0K` prompt to display on the operator panel.
5. Turn on the power.
6. If the Console Selection panel is displayed, choose the system console.
7. After the word keyboard is displayed, press the number 5 key on the ASCII terminal keyboard.
8. Enter the appropriate password if you are prompted to do so.

Is the Please Define the System Console prompt displayed?

NO Repeat this step until the defective device or cable is identified or all devices and cables have been disconnected.

If all the devices and cables have been removed, then one of the FRUs remaining in the system unit is defective.

To test each FRU, exchange the FRUs in the following order:
1. Adapter (last one installed)
2. PCI riser card
3. CEC backplane

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to the “Quick Entry MAP” on page 40 and follow the instructions for the new symptom.

YES The last device or cable that you disconnected is defective.

Exchange the defective device or cable.

Go to “MAP 0410: Repair Checkout” on page 45.

Step 1548-17

1. Follow the instructions on the panel to select the system console.
2. When the Diagnostic Operating Instructions panel is displayed, press Enter.
3. Select **Advanced Diagnostics Routines**.
4. If the terminal type has not been defined, you must use the Initialize Terminal option on the Function Selection menu to initialize the AIX diagnostic environment before you can continue with the diagnostics. This is a separate operation from selecting the console display.
5. If the New Resource panel is displayed, select an option from the bottom of the panel.

   Note: Adapters or devices that require supplemental media are not shown in the new resource list. If the system has adapters or devices that require supplemental media, select option 1.
6. When the Diagnostic Mode Selection panel is displayed, press Enter.
7. Select **All Resources** (if you were sent here from “Step 1548-21” on page 87, select the adapter/device that you loaded from the supplemental media).

Did you get an SRN?

NO Go to “Step 1548-19” on page 87.

YES Go to “Step 1548-18”.

Step 1548-18

Look at the FRU part numbers associated with the SRN.

Have you exchanged all the FRUs that correspond to the failing function codes (FFCs)?

NO Exchange the FRU with the highest failure percentage that has not been changed.

Repeat this step until all the FRUs associated with the SRN have been exchanged or diagnostics run with no trouble found. Run diagnostics after each FRU is exchanged.

If the operator panel or an adapter is removed, see notes on page 39.

Go to “MAP 0410: Repair Checkout” on page 45.

YES If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

Step 1548-19

Does the system have adapters or devices that require supplemental media?

NO Go to “Step 1548-20”.

YES Go to “Step 1548-21”.

Step 1548-20

Consult the PCI adapter configuration documentation for your operating system to verify that all installed adapters are configured correctly.

Go to “MAP 0410: Repair Checkout” on page 45.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

Step 1548-21

1. Select **Task Selection**.
2. Select **Process Supplemental Media** and follow the onscreen instructions to process the media.

Supplemental media must be loaded and processed one at a time.

Did the system return to the Tasks Selection panel after the supplemental media was processed?

NO Go to “Step 1548-22”.

YES Press F3 to return to the Function Selection panel.

Go to “Step 1548-17” on page 86, substep 4.

Step 1548-22

The adapter or device is probably defective.

If the supplemental media is for an adapter, replace the FRUs in the following order:

1. Adapter
2. CEC backplane

If the supplemental media is for a device, replace the FRUs in the following order:

1. Device and any associated cables
2. The adapter to which the device is attached

Repeat this step until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to the “Quick Entry MAP” on page 40 and follow the instructions for the new symptom.

Go to “MAP 0410: Repair Checkout” on page 45.

Step 1548-23

1. Ensure that the diagnostics and the operating system are shut down.
2. Turn off the power.
3. If you have not already done so, configure the service processor with the instructions in note 7 on page 77 and then return here and continue.
4. Exit the service processor menus and remove the power cords.
5. Place the drawer into the service position and remove the service access cover.
6. Record the slot numbers of the PCI adapters. Label and record the locations of any cables attached to the adapters. Disconnect any cables attached to the adapters and remove all the adapters.
7. Plug in the power cords and wait for the operator panel to display 0K.
8. Turn on the power.

Does the system stop with the same error code displayed on the operator panel that directed you to this MAP step?

NO Go to "Step 1548-25".

YES Go to "Step 1548-24".

Step 1548-24

One of the FRUs remaining in the system unit is defective.

1. Turn off the power, remove the power cords and exchange the CEC backplane. See the notes on page 39.
2. Plug in the power cable and wait for the operator panel to display 0K.
3. Turn on the power.

Does the system stop with the same error code displayed on the operator panel that directed you to this MAP step?

NO Go to "MAP 0410: Repair Checkout" on page 45.

YES Reinstall the original FRU.
If the symptom did not change and all the FRUs have been exchanged, return to "Step 1548-2" on page 78.

Step 1548-25

The system is working correctly with this configuration. One of the FRUs (adapters) that you removed is probably defective.

1. Turn off the power and remove the power cable from the power outlet.
2. Install a FRU (adapter) and connect any cables and devices that were attached to it.
3. Plug in the power cable and wait for the operator panel to display 0K.
4. Turn on the power.
5. If the Console Selection panel is displayed, choose the firmware console.
6. Enter the appropriate password if you are prompted to do so.

Does the system stop with the same error code displayed on the operator panel that directed you to this MAP step?

NO Repeat this step until all of the FRUs (adapters) are installed, and then go to "MAP 0410: Repair Checkout" on page 45.

YES Go to "Step 1548-26".

Step 1548-26

The last FRU installed or one of its attached devices is probably defective.

1. Turn off the power and remove the power cables from the power outlet.

2. Starting with the last installed adapter, disconnect one attached device and cable.
3. Plug in the power cords and wait for the operator panel to display 0K.
4. Turn on the power.
5. If the Console Selection panel is displayed, choose the firmware console.
6. Enter the appropriate password if you are prompted to do so.

Does the system stop with the same error code displayed on the operator panel that directed you to this MAP step?

NO The last device or cable that you disconnected is defective.
Exchange the defective device or cable.
Go to “MAP 0410: Repair Checkout” on page 45.

YES Repeat this step until the defective device or cable is identified or all of the devices and cables have been disconnected. If all of the devices and cables have been removed, then one of the FRUs remaining in the system unit is defective.
To test each FRU, exchange the FRUs in the following order:
1. Adapter (last one installed)
2. CEC backplane (see notes on page 39)

Go to “MAP 0410: Repair Checkout” on page 45v.
If the symptom did not change and all the FRUs have been exchanged, return to “Step 1548-2” on page 78.

MAP 1549: Attention Problem Isolation

Step 1549-1

Record the error code and the location codes that sent you to this MAP.

Step 1549-2

Turn off the power.

Step 1549-3

Examine the following table and locate the error code that sent you to this MAP to determine your next step.

Error Code	Action
406x 0EB1	Go to “Step 1549-4”.
406x 0EB2	Go to “Step 1549-4”.
406x 0EB3	Go to “Step 1549-4”.
406x 0EB4	Go to “Step 1549-7” on page 91.
406x 0EB5	Go to “Step 1549-7” on page 91.
406x 0EB6	Go to “Step 1549-7” on page 91.
406x 0EB7	Go to “Step 1549-7” on page 91.
406x 0EB8	Go to “Step 1549-7” on page 91.
406x 0EB9	Go to “Step 1549-7” on page 91.
406x 0EBA	Go to “Step 1549-7” on page 91.
406x 0EBB	Go to “Step 1549-7” on page 91.
406x 0EBC	Go to “Step 1549-7” on page 91.

Step 1549-4

Replace the following cards if present, one at a time:

- First location code item recorded, if any, in “Step 1549-1”.
- Second location code item recorded, if any, in “Step 1549-1”.
- Third location code item recorded, if any, in “Step 1549-1”.
- Processor card 1 at U0.1-P1-C1, if not recorded in “Step 1549-1”.
- Processor card 2 at U0.1-P1-C2, if not recorded in “Step 1549-1”.

  Attention: Before replacing the system backplane, call support.
- CEC backplane at U0.1-P1, if not recorded in “Step 1549-1”.

Step 1549-5

Turn on the power.

Step 1549-6

Did the system stop with the same error code as recorded in "Step 1549-1" on page 90?

No The card that you just replaced was defective. This ends the procedure. Return the system to its original configuration. Go to "MAP 0410: Repair Checkout" on page 45.

Yes If all of the cards listed in "Step 1549-4" on page 90 have been replaced, go to "Step 1549-10"; otherwise, continue with "Step 1549-4" on page 90 and replace the next card on the list.

Step 1549-7

Replace the following cards if present, one at a time:

- First location code item recorded, if any, in "Step 1549-1" on page 90.
- Second location code item recorded, if any, in "Step 1549-1" on page 90.
- Third location code item recorded, if any, in "Step 1549-1" on page 90.

  Attention: Before replacing the system backplane, call support.
- CEC backplane at U0.1-P1, if not recorded in "Step 1549-1" on page 90.

Step 1549-8

Turn on the power.

Step 1549-9

Did the system stop with the same error code as recorded in "Step 1549-1" on page 90?

No The card that you just replaced was defective. This ends the procedure. Return the system to its original configuration. Go to "MAP 0410: Repair Checkout" on page 45.

Yes If all of the cards listed in "Step 1549-7" have been replaced, go to "Step 1549-10"; otherwise continue with "Step 1549-7" and replace the next card on the list.

Step 1549-10

Call support.

Chapter 4. Checkpoints

Checkpoints are displayed on the media subsystem operator panel and the virtual terminal while the system is powering on and going through the initial program load (IPL). This chapter explains the IPL flow of the system and provides a table that lists checkpoints that you might see in the operator panel on the ASCII terminal.

IPL flow

The IPL process starts when AC power is connected to the system. The IPL process has the following phases:

- **Phase 1: Service processor initialization**

  Phase 1 starts when AC power is connected to the system and ends when OK is displayed in the media subsystem operator panel. 8xxx checkpoints are displayed during this phase. Several 9xxx codes might also be displayed.
- **Phase 2: Hardware initialization by the service processor**

  Phase 2 starts when system power-on is initiated by pressing the power on button on the processor subsystem operator panel. 9xxx checkpoints are displayed during this time. 91FF, the last checkpoint in this phase, indicates that the transition to phase 3 is taking place.
- **Phase 3: System firmware initialization**

  At phase 3, a system processor takes over control. During this phase, checkpoints in the form Exxx are displayed. E105, the last checkpoint in this phase, indicates that control is being passed to the operating system boot program.
- **Phase 4: Operating system boot**

  When the operating system starts to boot, checkpoints in the form 0xxx and 2xxx are displayed. This phase ends when the operating system login prompt is displayed on the operating system console.

The following table outlines the IPL phases from power-on to the operating system login prompt, matching the phases to corresponding operator-panel checkpoints. Also listed are the approximate boot times for each phase, along with their dependencies for each phase.

Note: The following table lists the major checkpoints only.

Phase #	Checkpoints on operator panel	Time in phase (minutes)	Major contributors to time in phase
Phase 1	8xxx => OK	Approx. 1	
Phase 2	9xxx => 91FF	3	
Phase 3	Exxx => E105	1	Number of bootable adapters
Phase 4	0xxx or 2xxx => blank	2 to 30+	Number of SCSI drives Number of Async sessions Number of processors Number of adapters Amount of memory

Checkpoints enable users and service personnel to know what the server is doing, with some detail, as it initializes. These checkpoints are not intended to be error indicators, but in some cases a server could

hang at one of the checkpoints without displaying an 8-character error code. It is for these hang conditions, only, that any action should be taken with respect to checkpoints. The most appropriate action is included with each checkpoint.

Before taking actions listed with a checkpoint, check for additional symptoms in the service processor error log. See “Accessing system error logs” on page 36 for information on how to access the service processor error log.

Notes:

1. Go to “MAP 1548: Processor Subsystem Problem Isolation” on page 77 for any of the following checkpoint hang conditions:
   - A four-digit code in the range of 8xxx-E4FF, E5Ex, or E700-EFFF that is not listed in the checkpoint tables.
   - A four-digit code in the range of 8xxx-E4FF, E5Ex, or E700-EFFF that is listed in the checkpoint tables but does not contain a repair action or FRU listing.
   - A four-digit code in the range of 8xxx-E4FF, E5Ex, or E700-EFFF, in which all of the FRUs listed have been replaced or service actions have been performed and the problem has not been corrected.
2. Go to “MAP 1542: I/O Problem Isolation” on page 72 for any of the following checkpoint hang conditions:
   - A four-digit code in the range of E500 through E6FF (except E5Ex - see note 1 above) that is not listed in the checkpoint tables.
   - A four-digit code in the range of E500 through E6FF (except E5Ex - see note 1 above) that is listed in the checkpoint tables but does not contain a repair action or FRU listing.
   - A four-digit code in the range of E500 through E6FF (except E5Ex - see note 1 above), in which all of the FRUs listed have been replaced or service actions have been performed and the problem has not been corrected.

Checkpoints listed in the following tables are in the format 8xxx, 9xxx, Axxx, Bxxx, or Exxx, where x is any hexadecimal digit from 1-9 or A-F. If your system hangs with a checkpoint displayed that begins with anything other than 8, 9, A, B, or E, go to the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*.

Use the following table to determine where to find the checkpoint.

Symptom	Action
You have a code that is of the form 8xxx, 9xxx, Axxx, or Bxxx.	Go to “Service processor checkpoints”.
You have a code of the form Exxx.	Go to “Firmware checkpoints” on page 101.
You have a four-character code that is *not* of the form 8xxx, 9xxx, Axxx, Bxxx, or Exxx.	Refer to the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems* manual.

Service processor checkpoints

Service processor checkpoints are in the range 8xxx to Bxxx. The message **OK** indicates successful service processor testing and initialization. Firmware checkpoints are listed in “Firmware checkpoints” on page 101.

Notes:

1. A spinning (or twirling) slash is displayed in the upper-right corner of the operator panel while some checkpoints are being displayed. If the slash stops spinning, this indicates a hang condition.
2. Not all service processor checkpoints are supported.

Table 9. Service processor checkpoints

Checkpoint	Description	Action or possible failing FRU
8000	Test of the service processor DRAM	See note 1 on page 100.
8004	Verify base code checksum	See note 1 on page 100.
8008	Verify base code mirror checksum	See note 1 on page 100.
8009	Set NVRAM configuration in TITAN	See note 1 on page 100.
800F	Start base code	See note 1 on page 100.
8010	Start supervisor in base code	See note 1 on page 100.
8012	Initialize hardware interrupts	See note 1 on page 100.
8014	Allocate and initialize area in DRAM	See note 1 on page 100.
8016	Initialize debugger and build VPD	See note 1 on page 100.
8018	Initialize service processor interfaces	See note 1 on page 100.
801A	Initialize external FLASH load	See note 1 on page 100.
801B	Initialize and test ISA hub chip	See note 1 on page 100.
801C	Initialize and test SUPER I/O chip	See note 1 on page 100.
801F	Initialize diskette, verify VDASD and start operational loader	See note 1 on page 100.
809x	Related to recovery mode system firmware update from diskette	See note 3 on page 100.
8092	Diskette initialization during recovery mode system firmware update	See note 3 on page 100.
8098	Firmware image being read during recovery mode system firmware update	See note 3 on page 100.
809C	Firmware image being written during recovery mode system firmware update	See note 3 on page 100.
809F	Diskette error during recovery mode system firmware update	See note 3 on page 100.
8100	Start operational loader	See note 1 on page 100.
81xx	Load code into DRAM from VDASD (where xx = number of loads)	See note 1 on page 100.
81FE	Load service processor operating system	See note 1 on page 100.
81FF	Start service processor operating system	See note 1 on page 100.
9000	Primary service processor task initializing	See note 1 on page 100.
9009	System processor IPL has started	See note 1 on page 100.
9010	Primary service processor thread waiting for response	See note 1 on page 100.
9020	Service processor state set to pre-standby	See note 1 on page 100.
9021	Service processor state set to standby	See note 1 on page 100.
9022	Service processor state set to IPL	See note 1 on page 100.
9023	Service processor state set to runtime	See note 1 on page 100.
9024	Service processor state set to terminate	See note 1 on page 100.
9025	Service processor state set to DPO	See note 1 on page 100.
9030	Waiting for secondary thread acknowledgement	See note 1 on page 100.

Table 9. Service processor checkpoints (continued)

Checkpoint	Description	Action or possible failing FRU
9033	I/O base initialization	See note 1 on page 100.
9034	I2C initialization	See note 1 on page 100.
9035	ISA initialization	See note 1 on page 100.
9036	Mailbox initialization	See note1 on page 100.
9037	SLLA initialization (VPD)	See note 1 on page 100.
9038	NVRAM initialization	See note 1 on page 100.
9039	Serial port initialization	See note 1 on page 100.
903A	Serial I/O initialization	See note 1 on page 100.
903B	SPCN initialization	See note 1 on page 100.
9051	End of reset and reload operation: service processor dump has completed	See note 1 on page 100.
9055	Start menus thread	See note 1 on page 100.
9060	Checking and configuring modem on serial port 1	See note 4 on page 100.
9061	Checking and configuring modem on serial port 2	See note 4 on page 100.
906A	Create mailbox processing thread	See note 1 on page 100.
906B	Create menu interface thread	See note 1 on page 100.
906C	Create general thread	See note 1 on page 100.
906D	Create SPCN thread	See note 1 on page 100.
9070	Create thread to control LEDs on I/O subsystems	See note 1 on page 100.
9071	Initialize thread to control LEDs on I/O subsystems	See note 1 on page 100.
9080	Start VPD collection program	See note 1 on page 100.
9081	Start SC VPD data collection	See note 1 on page 100.
9082	I2C/SPCN VPD data collection	See note 1 on page 100.
9083	End SC VPD data collection	See note 1 on page 100.
9084	End I2C/SPCN VPD data collection	See note 1 on page 100.
90FD	Waiting for IBIST to complete	See note 1 on page 100.
9101	Setup load source	See note 1 on page 100.
9102	Open load source	See note 1 on page 100.
9103	Verify open status of load source	See note 1 on page 100.
9104	Waiting for SPCN VPD collection to be completed	See note 1 on page 100.
9105	Load IPL LIDs	See note 1 on page 100.
9106	Initialize MOPs	See note 1 on page 100.
9107	System flush	See note 1 on page 100.
9108	Processor scan interface BATs and LBIST	See note 1 on page 100.
9109	ABIST	See note 1 on page 100.

Table 9. Service processor checkpoints (continued)

Checkpoint	Description	Action or possible failing FRU
910A	Non-processor scan interface BATs and LBIST	See note 1 on page 100.
910B	Wire test	See note 1 on page 100.
910C	Initialize main storage (system memory)	See note 1 on page 100.
910D	Configure processors	See note 1 on page 100.
910E	Configure and initialize I/O	See note 1 on page 100.
910F	Test and initialize main storage (system memory)	See note 1 on page 100.
9110	Free IPL LIDs	See note 1 on page 100.
9111	Load run-time LIDS	See note 1 on page 100.
9112	Load dump LIDs	See note 1 on page 100.
9113	Enable attention	See note 1 on page 100.
9114	Enable function 22	See note 1 on page 100.
9115	Load system IPL program	See note 1 on page 100.
9116	Load system data areas (NACA/PACA)	See note 1 on page 100.
9117	Start system IPL program	See note 1 on page 100.
9119	Waiting for VPD collection to complete	See note 1 on page 100.
9184	Firmware image being loaded into service processor's control storage during firmware update.	1. Remove, then reapply power to the system. If the service processor enters recovery mode, (indicated by A1FD 0000 in the display), attempt to update the firmware again in recovery mode. If the service processor comes up to the OK prompt, try again to update the firmware using the service processor menus. 2. Call service support.
91C4	Flash update pending, either a firmware update or hypervisor dump.	**Note:** This checkpoint might be displayed during the firmware update process. The checkpoint might be displayed for a long period of time during the process. If process does not complete, the system might be hung. See note 1 on page 100.
91FF	Control being handed to system processor from service processor	See note 1 on page 100.
9200	Scan interface BATs	See note 1 on page 100.
9300	Logic BIST	See note 1 on page 100.
9301	Scanned ABIST	See note 1 on page 100.
9302	Dedicated ABIST	See note 1 on page 100.
9303	Dedicated ABIST array fuse repair calculation	See note 1 on page 100.
9380	Built-in-self-test (BIST)	See note 2 on page 100.
9400	Service processor is requesting system flush	See note 1 on page 100.

Table 9. Service processor checkpoints (continued)

Checkpoint	Description	Action or possible failing FRU
9410	Service processor is issuing request to start instruction execution	See note 1 on page 100.
9411	Service processor is issuing request to stop instruction execution	See note 1 on page 100.
9420	Service processor is issuing request to start system clocks	See note 1 on page 100.
9421	Service processor is issuing request to stop system clocks	See note 1 on page 100.
94B0	Wire test faulty driver status refcode	See note 2 on page 100.
94B1	Wire test shorted net status refcode	See note 2 on page 100.
94B2	Wire test elastic interface test	See note 2 on page 100.
94BB	Wire test starting	See note 2 on page 100.
9501	IPL diagnostic initialization	See note 2 on page 100.
9502	IPL diagnostic L3 cache march test	See note 2 on page 100.
9503	IPL diagnostic L3 connections test	See note 2 on page 100.
9504	IPL diagnostic L2 cache march test	See note 2 on page 100.
9505	IPL diagnostic RIO wrap test	See note 2 on page 100.
9506	IPL diagnostic cleanup	See note 2 on page 100.
9507	IPL diagnostic test	See note 2 on page 100.
9508	IPL diagnostic main storage march test	See note 2 on page 100.
9509	IPL diagnostic main storage connections test	See note 2 on page 100.
950A	IPL diagnostic elastic interface slack test	See note 2 on page 100.
950B	IPL diagnostic fast initialization to zeros	See note 2 on page 100.
96C2	IPL MOPs processor configuration	See note 2 on page 100.
96C3	IPL MOPs main storage size	See note 2 on page 100.
96C4	IPL MOPs main storage configuration	See note 2 on page 100.
96C6	IPL MOPs I/O configuration	See note 2 on page 100.
96C7	IPL MOPs: enable chip machine checks	See note 2 on page 100.
96E1	Initialize run-time PRD objects and memory	See note 2 on page 100.
96E2	Run-time initialization: enable attention handling	See note 2 on page 100.

Table 9. Service processor checkpoints (continued)

Checkpoint	Description	Action or possible failing FRU
99FD	Service processor receiving firmware update module	See note 2 on page 100. **Attention:** This checkpoint might stay in the operator panel for some period of time during a firmware update or hypervisor dump with no indication of activity. Do not assume that the service processor is hung unless this checkpoint has been in the operator panel for at least 15 minutes. with no indication of activity. **Attention:** Do not remove power from the system, or reset the service processor, during a firmware update or hypervisor dump.
99FF	Service processor writing firmware update module	See note 2 on page 100. **Attention:** This checkpoint might stay in the operator panel for some period of time during a firmware update or hypervisor dump with no indication of activity. Do not assume that the service processor is hung unless this checkpoint has been in the operator panel for at least 15 minutes. with no indication of activity. **Attention:** Do not remove power from the system, or reset the service processor, during a firmware update or hypervisor dump.
A800	Start service processor dump process	See note 1 on page 100.
A801	Start dump to NVRAM	See note 1 on page 100.
A802	Start dump to debug port	See note 1 on page 100.
A803	NVRAM not usable	See note 1 on page 100.
A804	NVRAM dump done	See note 1 on page 100.
A805	Start dump to flash	See note 1 on page 100.
A806	Flash dump area done	See note 1 on page 100.
A807	Flash area not usable	See note 1 on page 100.
A808	Flash error log to debug port	See note 1 on page 100.
A809	Flash erase start	See note 1 on page 100.
A80A	Flash erase end	See note 1 on page 100.
A80B	Reserved; not used	See note 1 on page 100.
A80C	Reserved; not used	See note 1 on page 100.
A80D	Reserved; not used	See note 1 on page 100.
A80E	Reserved; not used	See note 1 on page 100.
A80F	Service processor dump done	See note 1 on page 100.

Table 9. Service processor checkpoints (continued)

Checkpoint	Description	Action or possible failing FRU
A810-A8FF	**Description:** Scan log dump in progress **Action/Possible Failing FRU** Informational message. (See "Scan Log Dump Policy" on page 262.) The last two characters of the checkpoints will change as the scan log dump progresses. If the last two characters do not change after 5 minutes, the service processor is hung and must be reset. Follow the procedure outlined in Note 1 following this table. When the scan log dump is complete, depending on how the reboot policy is set, the system will respond in one of these ways: • Go to the standby state (and the service processor menus will be available), indicated by OK or STBY in the operator panel. OR • Attempt to reboot.	
B0F5	Delayed power-off sequence has begun	See note 1.
B0FA	Delayed power-off acknowledged	See note 1.
B0FF	Power-off requested program executing	See note 1.

Notes:

1. If the system fails to progress after this checkpoint is displayed, do the following:
   a. Activate the service processor pinhole reset switch on the system's operator panel.
   b. If the hang repeats, check with service support to see if there is a firmware update that fixes the problem.
   c. If not, or if the update does not fix the problem, replace the CEC backplane, location: U0.1-P1.
   d. If this procedure does not fix the problem, call service support.
2. If the system fails to progress after this checkpoint is displayed, do the following:
   a. Activate the service processor pinhole reset switch on the system operator panel.
   b. Reboot the system in slow mode. (Slow/fast IPL is set using a service processor menu.) If the hang repeats, check with service support to see if there is a system firmware update that fixes this problem.
   c. If not, or if the update does not fix the problem, call service support.
3. Recovery mode flash update has failed. Do the following:
   a. Activate the service processor pinhole reset switch on the system operator panel and try the recovery mode flash update again.
   b. If the system hangs again, make a new set of firmware update diskettes, using new, blank diskettes. Retry the flash update with the new diskettes.
   c. If the same hang occurs with the new diskettes, replace the following FRUs one at a time in this order:
      1) Diskette drive
      2) CEC backplane, location: U0.1-P1.
   d. If this procedure does not fix the problem, call service support.
4. The service processor was unable to configure the modems directly attached to the serial port on the CEC backplane. Do the following:
   a. Check the modem, modem cable, and serial port for loose or unconnected cables. Reset the service processor using the pinhole reset switch on the system operator panel.
   b. If the hang repeats, check with service support to see if there is a firmware update that fixes the problem.
   c. If there is not, or the update does not fix the problem, replace the following FRUs, one at a time, in the following order:
      1) Modem cable
      2) Modem

d. If this procedure does not fix the problem, call service support.

Firmware checkpoints

Firmware uses checkpoints (progress codes) in the range of Exxx to EFFF. These checkpoints occur during system startup and can be useful in diagnosing certain problems. Service processor checkpoints are listed in “Service processor checkpoints” on page 94.

If you have a checkpoint with no location code associated with it, see “Determining location code” on page 126. If a checkpoint has a location code associated with a FRU replacement, see “Mapping AIX and physical location codes” on page 21 for physical location information.

If you replace FRUs and the problem is still not corrected, go to “MAP 1548: Processor Subsystem Problem Isolation” on page 77 unless otherwise indicated in the tables.

Notes:

1. If you receive a four-digit code in the range of E1xx to EFFF that is not listed in the following table, go to “MAP 1548: Processor Subsystem Problem Isolation” on page 77.
2. Not all firmware checkpoints are supported.

Table 10. Firmware checkpoints

Checkpoint	Description	Action or possible failing FRU
E101	Create RTAS node	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E102	Load/Init RTAS	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E105	Transfer control to operating system (normal boot).	See “Boot problems or concerns” on page 122.
E10A	Load RTAS device tree	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E10B	Set RTAS device properties	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E111	GOOD CRC - jump to composite image	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E120	Initialize I/O and early memory block	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E121	Initialize service processor	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E122	RTAS sensor setup complete	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E130	Build device tree	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E131	Build device tree	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E132	Build device tree	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E133	Build device tree	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E134	Create memory node	Go to “MAP 1540: Problem Isolation Procedures” on page 69.

Table 10. Firmware checkpoints (continued)

Checkpoint	Description	Action or possible failing FRU
E138	Create options node	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E139	Create node aliases and system aliases	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E13A	Create packages node	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E140	Operating system load	See “Boot problems or concerns” on page 122.
E149	Create boot mgr node	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E14C	Create terminal-emulator node	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E14D	Loading boot image	See “Boot problems or concerns” on page 122.
E150	Create host (primary) PCI controller node	If a location code is specified, replace the adapter at that location code. If no location code is specified, go to “MAP 1540: Problem Isolation Procedures” on page 69.
E151	Probing primary PCI bus	If a location code is specified, replace the adapter at that location code. If no location code is specified, go to “MAP 1540: Problem Isolation Procedures” on page 69.
E152	Probing for adapter FCODE, evaluate if present	Follow the repair action listed for checkpoint E151.
E153	End adapter FCODE, probe/evaluate	Follow the repair action listed for checkpoint E151.
E154	Create PCI bridge node	Follow the repair action listed for checkpoint E151.
E155	Probing PCI bridge secondary bus	Follow the repair action listed for checkpoint E151.
E156	Create PCI Ethernet node	If a location code is specified, replace the adapter at that location code. If no location code is specified, go to “MAP 1540: Problem Isolation Procedures” on page 69.
E158	System firmware waiting for a virtual terminal to be opened on an HMC for SMS menus to be displayed.	Call service support.
E15B	Transferring control to operating system (service mode boot)	See “Boot problems or concerns” on page 122.
E15F	Adapter VPD probe	Follow the repair action listed for checkpoint E151.
E170	Start of PCI Bus Probe	Follow the repair action listed for checkpoint E151.
E172	First pass of PCI device probe	Follow the repair action listed for checkpoint E151.

Table 10. Firmware checkpoints (continued)

Checkpoint	Description	Action or possible failing FRU
E174	**Description:** Establishing host connection **Action or possible failing FRU:** If the system is not connected to an active network, or if the target server is inaccessible (which can result from incorrect IP parameters being specified), the system still attempts to boot and because time-out durations are necessarily long to accommodate retries, the system might appear to hang. Restart the system and get to the SMS utilities menu. Under **Select Boot Options**, verify: • Is the intended boot device correctly specified in the boot list? • Are the IP parameters correct? Look at the server configuration for this client. Attempt to ping the target server using the ping utility in SMS.	
E175	BootP request	Follow the repair actions for checkpoint E174.
E176	TFTP file transfer	Follow the repair actions for checkpoint E174.
E177	Transfer failure due to TFTP error condition	See “Boot problems or concerns” on page 122.
E17B	Processor clock speed measurement	Call service support.
E183	Service processor POST	1. Replace the CEC backplane, location: U0.1-P1. 2. Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E18D	A system reset request has been sent to the service processor.	1. Check for system firmware updates. 2. Call service support.
E191	Create ISA reserved node	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E19A	NVRAM auto-boot? variable not found - assume FALSE	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E19B	NVRAM menu? variable not found - assume FALSE	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E19D	Create NVRAM node	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E19E	Real-time clock (RTC) initialization	Refer to error code 28030xxx in “Checkpoint and error code index” on page 127.
E1A0	User requested boot to SMS menus using keyboard entry	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E1A1	User requested boot to open firmware prompt using keyboard entry	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E1A2	User requested boot using default service mode boot list using keyboard entry	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E1A3	User requested boot using customized service mode boot list using keyboard entry	Go to “MAP 1540: Problem Isolation Procedures” on page 69.

Table 10. Firmware checkpoints (continued)

Checkpoint	Description	Action or possible failing FRU
E1A4	User requested boot to SMS menus using CSP command	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E1A5	User requested boot to open firmware prompt using CSP command	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E1A6	User requested boot using default service mode boot list using CSP command	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E1A7	User requested boot using customized service mode boot list using CSP command	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E1A8	System booting to open firmware prompt	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E1A9	System booting to SMS menus Go to “MAP 1540: Problem Isolation Procedures” on page 69.	
E1AA	System NVRAM settings during boot	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E1AB	System booting using default service mode boot list	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E1AC	System booting using customized service mode boot list	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E1AD	System booting to operating system	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E1AE	System booted to multiboot menu using NVRAM settings	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E1AF	System booted to utilities menu using NVRAM settings	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E1B1	Create serial node	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E1B6	Probe for (ISA) keyboard	Replace the CEC backplane, Location: U0.1-P1.
E1BD	Probe for (ISA) mouse	Replace the CEC backplane, Location: U0.1-P1.
E1C4	Build ISA timer chip node	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E1C5	Create ISA interrupt controller (pic) node	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E1C6	Create DMA node	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E1D0	Create PCI SCSI node	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E1D3	Create SCSI block device node (SD)	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E1D4	Create SCSI byte device node (ST)	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E1DB	Create floppy controller (FDC) node	Go to “MAP 1540: Problem Isolation Procedures” on page 69.

Table 10. Firmware checkpoints (continued)

Checkpoint	Description	Action or possible failing FRU
E1DC	**Description:** Dynamic console selection. **Action possible failing FRU** If selection panels can be seen on the terminals and the appropriate key on the input device is pressed within 60 seconds but there is no response to the keystroke, suspect the terminal or serial cable. Use the problem determination procedures for the terminal.	
E1F0	Start O.B.E.	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
E1F1	Begin self-test sequence on boot devices.	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
E1F2	Power-on password prompt	The prompt should be visible on the firmware console. If a console is attached but nothing is displayed on it, go to the "Quick Entry MAP" on page 40 with the symptom ″All display problems.″
E1F3	Privileged-access password prompt	The prompt should be visible on the firmware console. If a console is attached but nothing is displayed on it, go to the "Quick Entry MAP" on page 40 with the symptom ″All display problems.″
E1F4	End self-test sequence on boot devices; begin SMS.	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
E1F5	Build boot device list	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
E1F6	Determine boot device sequence	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
E1F7	No boot image located	Go to "Boot problems or concerns" on page 122.
E1F8	Building boot device list for SCSI adapters. (The location of the SCSI adapter being scanned is also displayed.)	1. If a location code is available, follow the repair actions listed for firmware error code 21A0 00XX. 2. If no location code is available, go to "MAP 1540: Problem Isolation Procedures" on page 69.
E1F9	Building boot device list for fibre-channel adapters. (The location of the SAN adapter being scanned is also displayed.)	1. If a location code is available, follow the repair actions listed for firmware error code 21A0 00XX. 2. If no location code is available, go to "MAP 1540: Problem Isolation Procedures" on page 69.
E1FA	Building boot device list for SCSI adapters. (The device ID and the device LUN being scanned are also displayed.)	Go to "MAP 1540: Problem Isolation Procedures" on page 69.

Table 10. Firmware checkpoints (continued)

Checkpoint	Description	Action or possible failing FRU
E1FB	Scan SCSI bus for attached devices	1. If a location code is available, follow the repair actions listed for firmware error code 21A0 00XX. 2. If no location code is available, go to "MAP 1540: Problem Isolation Procedures" on page 69.
E1FD	The operator panel alternates between the code E1FD and another Exxx code, where Exxx is the point at which the error occurred.	1. If a location code is available, follow the actions listed for firmware error code 21A0 00xx. 2. If no location code is available, go to "MAP 1540: Problem Isolation Procedures" on page 69.
E1FE	Building boot device list for fibre-channel adapters. (The WWPN of the SAN adapter being scanned is also displayed.)	1. If a location code is available, follow the repair actions listed for error code firmware 21A0 00XX. 2. If no location code is available, go to "MAP 1540: Problem Isolation Procedures" on page 69.
E1FF	Building boot device list for fibre-channel adapters. (The WWPN of the SAN adapter being scanned is also displayed.)	Go to "MAP 1542: I/O Problem Isolation" on page 72.
E20F	System firmware has exited to open firmware prompt	1. Replace the CEC backplane, Location: U0.1-P1. 2. Call service support.
E440	Validate NVRAM, initialize partitions as needed	1. Check for system firmware updates. 2. Replace the CEC backplane, Location: U0.1-P1. 3. Call service support.
E441	Generate /options node NVRAM configuration variable properties	1. Check for system firmware updates. 2. Replace the CEC backplane, Location: U0.1-P1. 3. Call service support.
E442	Validate NVRAM partitions	1. Check for system firmware updates. 2. Replace the CEC backplane, Location: U0.1-P1. 3. Call service support.
E443	Generate NVRAM configuration variable dictionary words	Suspect a system firmware problem if problem persists. If a system firmware update is available, install it. If not, call service support.
E500	Begin I/O drawer configuration	1. Check for system firmware updates. 2. Go to "MAP 1540: Problem Isolation Procedures" on page 69.
E501	Initialize I/O data structures	1. Check for system firmware updates. 2. Go to "MAP 1540: Problem Isolation Procedures" on page 69.

Table 10. Firmware checkpoints (continued)

Checkpoint	Description	Action or possible failing FRU
E502	Set up I/O data structure pointers	1. Check for system firmware updates. 2. Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E503	Initialize location code data structures	1. Check for system firmware updates. 2. Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E504	Initialize memory map data structures	1. Check for system firmware updates. 2. Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E505	Enable the time base for all RIO hubs	1. Check for system firmware updates. 2. Replace the riser card specified by the location code. 3. Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E506	Reset time base of processors	1. Check for system firmware updates. 2. Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E507	RIO hub assignment	1. Check for system firmware updates. 2. Replace the riser card specified by the location code. 3. Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E508	Begin initializing RIO hubs	1. Check for system firmware updates. 2. Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E509	Begin configuring EADS	1. Check for system firmware updates. 2. Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E50A	Check for missing RIO interface chips	1. Check for system firmware updates. 2. Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E50B	Save RIO hub information	1. Check for system firmware updates. 2. Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E50C	Copy all of the memory ranges	1. Check for system firmware updates. 2. Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E50D	Copy all of the I/O data	1. Check for system firmware updates. 2. Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E50E	Copy all of the RIO hub information	1. Check for system firmware updates. 2. Go to “MAP 1540: Problem Isolation Procedures” on page 69.

Table 10. Firmware checkpoints (continued)

Checkpoint	Description	Action or possible failing FRU
E50F	Clean up the error registers	1. Check for system firmware updates. 2. Replace the riser card specified by the location code. 3. Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E51F	End of I/O configuration	1. Check for system firmware updates. 2. Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E520	Set up the RIO architecture registers	1. Check for system firmware updates. 2. Replace the riser card specified by the location code. 3. Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E521	Set up interrupts for the current RIO hub	1. Check for system firmware updates. 2. Replace the riser card specified by the location code. 3. Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E522	Set up miscellaneous registers for the current RIO hub	1. Check for system firmware updates. 2. Replace the riser card specified by the location code. 3. Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E523	Initialize data structures and enable all RIO hub ports	1. Check for system firmware updates. 2. Replace the riser card specified by the location code. 3. Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E524	Determine I/O configuration of current RIO hub	1. Check for system firmware updates. 2. Replace the riser card specified by the location code. 3. Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E525	Set up the ETE of the current RIO hub	1. Check for system firmware updates. 2. Replace the riser card specified by the location code. 3. Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E526	Reassign the I/O subsystems to the closest RIO hub	1. Verify that no cables are attached to the RIO connectors. 2. Replace the riser card that the failing drawer is attached to. 3. Go to “MAP 1540: Problem Isolation Procedures” on page 69.

Table 10. Firmware checkpoints (continued)

Checkpoint	Description	Action or possible failing FRU
E527	Enable the memory MAP and I/O MAP for the current RIO hub port	1. Check for system firmware updates. 2. Replace the riser card specified by the location code. 3. Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E52F	End of configuration of the RIO hub	1. Check for system firmware updates. 2. Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E528	Begin search for the next available I/O drawer from a current RIO port	Replace the CEC backplane, U0.1-P1.
E529	Enable the control port and driver of the current RIO hub	Replace the CEC backplane, U0.1-P1.
E52A	Search for the next available I/O drawer from a current RIO port	Replace the CEC backplane, U0.1-P1.
E52B	The RIO cable connected to the RIO port has been detected	Replace the CEC backplane, U0.1-P1.
E530	Checking RIO hub ports on current RIO hub	1. Check for system firmware updates. 2. Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E531	Get RIO hub node ID	1. Replace the riser card that the failing drawer is attached to. 2. Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E532	RIO cable detected; enable the RIO hub port	1. Replace the riser card that the failing drawer is attached to. 2. Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E533	Set up the RIO hub routing table	1. Replace the riser card that the failing drawer is attached to. 2. Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E534	Get the node ID of the node on the other end of the RIO cable	1. Replace the riser card that the failing drawer is attached to. 2. Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E535	Valid node ID detected at other end of the RIO cable	1. Replace the riser card that the failing drawer is attached to. 2. Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E536	I/O subsystem detected at other end of the RIO cable	1. Check for system firmware updates. 2. Go to “MAP 1540: Problem Isolation Procedures” on page 69.

Table 10. Firmware checkpoints (continued)

Checkpoint	Description	Action or possible failing FRU
E537	Configuring the I/O subsystem	1. Replace the riser card that the failing drawer is attached to. 2. Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E538	Detected the RIO hub on the other end of the RIO cable	1. Check for system firmware updates. 2. Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E539	Enabling the RIO hub ports	1. Check for system firmware updates. 2. Replace the riser card specified by the location code. 3. Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E53A	Set up the RIO port speed of the exit port of the I/O subsystem connected to the RIO hub port	1. Replace the riser card that the failing drawer is attached to. 2. Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E53B	End of looking for next node port	1. Check for system firmware updates. 2. Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E53C	End of looking for next RIO hub port	1. Check for system firmware updates. 2. Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E53D	Disable the anynode mode	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E540	Begin initialization of I/O drawer	1. Check for system firmware updates. 2. Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E541	Initialize the routing table	1. Replace the I/O subsystem planar specified by the location code. 2. Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E544	Enable the RIO ports	Replace the I/O subsystem planar specified by the location code.
E545	Set up the device routing address for this new node ID	Replace the I/O subsystem planar specified by the location code.
E546	Set up the RIO interface chip new node ID	Replace the I/O subsystem planar specified by the location code.
E547	Set up the RIO interface chip routing table	Replace the I/O subsystem planar specified by the location code.
E548	Disable any node mode	Replace the I/O subsystem planar specified by the location code.
E549	Adjust RIO hub table	Replace the I/O subsystem planar specified by the location code.

Table 10. Firmware checkpoints (continued)

Checkpoint	Description	Action or possible failing FRU
E54A	Configure the I/O drawer	1. Check the RIO cable specified by the location code. If the location code specifies an I/O subsystem or its RIO interface, check the RIO cables going into and out of the I/O subsystem. 2. Replace the RIO cables specified by the location code. If the location code specifies an I/O subsystem or its RIO interface, replace the RIO cables going into and out of the I/O subsystem. 3. Replace the I/O subsystem backplane specified by the location code, or the I/O subsystem backplane that the RIO cables in step 1 are attached to.
E54B	Update the I/O drawer routing table of RIO ports	1. Check the RIO cable specified by the location code. If the location code specifies an I/O subsystem or its RIO interface, check the RIO cables going into and out of the I/O subsystem. 2. Replace the RIO cables specified by the location code. If the location code specifies an I/O subsystem or its RIO interface, replace the RIO cables going into and out of the I/O subsystem. 3. Replace the I/O subsystem backplane specified by the location code, or the I/O subsystem backplane that the RIO cables in step 1 are attached to.
E550	Begin to initialize RIO interface chip	Replace the device specified by the location code.
E551	Set up the RIO speed	Replace the device specified by the location code.
E552	Set up RIO interface chip registers	Replace the device specified by the location code.
E553	Set up the RIO interface chip base address	Replace the device specified by the location code.
E554	Set up more RIO interface chip registers	Replace the device specified by the location code.
E555	Set up the RIO interface chip RIO link	Replace the device specified by the location code.
E556	Set up and initialize RIO interface chips under current RIO interface chip	Replace the device specified by the location code.
E55F	End of I/O drawer initialization	Replace the device specified by the location code.
E560	Begin initializing the I/O drawer	1. Check for system firmware updates. 2. Go to “MAP 1540: Problem Isolation Procedures” on page 69.

Table 10. Firmware checkpoints (continued)

Checkpoint	Description	Action or possible failing FRU
E561	Set up RIO interface chip registers	If the location code associated with this checkpoint is either U0.1-P1 or U0.1-P2, do the following: 1. Replace the PCI riser card in the CEC drawer, location: U0.1-P2. 2. Replace the CEC backplane: location U0.1-P1. Otherwise, replace the device specified by the location code.
E562	Set up RIO interface chip registers	If the location code associated with this checkpoint is either U0.1-P1 or U0.1-P2, do the following: 1. Replace the PCI riser card in the CEC drawer, location: U0.1-P2. 2. Replace the CEC backplane: location U0.1-P1. Otherwise, replace the device specified by the location code.
E563	Set up RIO interface chip registers	If the location code associated with this checkpoint is either U0.1-P1 or U0.1-P2, do the following: 1. Replace the PCI riser card in the CEC drawer, location: U0.1-P2. 2. Replace the CEC backplane: location U0.1-P1. Otherwise, replace the device specified by the location code.
E564	Set up RIO interface chip registers	If the location code associated with this checkpoint is either U0.1-P1 or U0.1-P2, do the following: 1. Replace the PCI riser card in the CEC drawer, location: U0.1-P2. 2. Replace the CEC backplane: location U0.1-P1. Otherwise, replace the device specified by the location code.
E565	Set up RIO interface chip registers	If the location code associated with this checkpoint is either U0.1-P1 or U0.1-P2, do the following: 1. Replace the PCI riser card in the CEC drawer, location: U0.1-P2. 2. Replace the CEC backplane: location U0.1-P1. Otherwise, replace the device specified by the location code.

Table 10. Firmware checkpoints (continued)

Checkpoint	Description	Action or possible failing FRU
E566	Enable device arbitration on the RIO interface chip	If the location code associated with this checkpoint is either U0.1-P1 or U0.1-P2, do the following: 1. Replace the PCI riser card in the CEC drawer, location: U0.1-P2. 2. Replace the CEC backplane: location U0.1-P1. Otherwise, replace the device specified by the location code.
E567	Set up RIO interface chip registers	If the location code associated with this checkpoint is either U0.1-P1 or U0.1-P2, do the following: 1. Replace the PCI riser card in the CEC drawer, location: U0.1-P2. 2. Replace the CEC backplane: location U0.1-P1. Otherwise, replace the device specified by the location code.
E568	Set up the external interrupt vector register	If the location code associated with this checkpoint is either U0.1-P1 or U0.1-P2, do the following: 1. Replace the PCI riser card in the CEC drawer, location: U0.1-P2. 2. Replace the CEC backplane: location U0.1-P1. Otherwise, replace the device specified by the location code.
E569	Set up RIO interface chip registers	If the location code associated with this checkpoint is either U0.1-P1 or U0.1-P2, do the following: 1. Replace the PCI riser card in the CEC drawer, location: U0.1-P2. 2. Replace the CEC backplane: location U0.1-P1. Otherwise, replace the device specified by the location code.
E56A	Set up RIO interface chip registers	If the location code associated with this checkpoint is either U0.1-P1 or U0.1-P2, do the following: 1. Replace the PCI riser card in the CEC drawer, location: U0.1-P2. 2. Replace the CEC backplane: location U0.1-P1. Otherwise, replace the device specified by the location code.

Table 10. Firmware checkpoints (continued)

Checkpoint	Description	Action or possible failing FRU
E56B	Set up RIO interface chip registers	If the location code associated with this checkpoint is either U0.1-P1 or U0.1-P2, do the following: 1. Replace the PCI riser card in the CEC drawer, location: U0.1-P2. 2. Replace the CEC backplane: location U0.1-P1. Otherwise, replace the device specified by the location code.
E56C	Set up the RIO interface chip PCI bus	If the location code associated with this checkpoint is either U0.1-P1 or U0.1-P2, do the following: 1. Replace the PCI riser card in the CEC drawer, location: U0.1-P2. 2. Replace the CEC backplane: location U0.1-P1. Otherwise, replace the device specified by the location code.
E56D	Identify devices on current bus	If the location code associated with this checkpoint is either U0.1-P1 or U0.1-P2, do the following: 1. Replace the PCI riser card in the CEC drawer, location: U0.1-P2. 2. Replace the CEC backplane: location U0.1-P1. Otherwise, replace the device specified by the location code.
E56E	Begin initializing the service processor control chip	If the location code associated with this checkpoint is either U0.1-P1 or U0.1-P2, do the following: 1. Replace the PCI riser card in the CEC drawer, location: U0.1-P2. 2. Replace the CEC backplane: location U0.1-P1. Otherwise, replace the device specified by the location code.
E56F	End initializing the service processor control chip	1. Check for system firmware updates. 2. Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E570	Initialize the PCI-ISA bridge chip	Replace the device specified by the location code.
E571	Initialize the integrated Ethernet (if present)	Replace the device specified by the location code.
E572	Initialize the integrated SCSI	Replace the device specified by the location code.

Table 10. Firmware checkpoints (continued)

Checkpoint	Description	Action or possible failing FRU
E57F	End of RIO interface chip initialization	1. Check for system firmware updates. 2. Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E580	Begin initializing the EADS module.	1. Check for system firmware updates. 2. Replace the I/O subsystem backplane specified by the location code. 3. Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E581	Read the PCI bus configuration header.	1. Check for system firmware updates. 2. Replace the I/O subsystem backplane specified by the location code. 3. Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E582	EADS has been detected.	1. Check for system firmware updates. 2. Replace the I/O subsystem backplane specified by the location code. 3. Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E583	Running BIST on the current EADS	1. Check for system firmware updates. 2. Replace the I/O subsystem backplane specified by the location code. 3. Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E584	Checking function of current EADS	1. Check for system firmware updates. 2. Replace the I/O subsystem backplane specified by the location code. 3. Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E585	Valid function of current EADS detected	1. Check for system firmware updates. 2. Replace the I/O subsystem backplane specified by the location code. 3. Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E586	Set up EADS function	1. Check for system firmware updates. 2. Replace the I/O subsystem backplane specified by the location code. 3. Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E587	Set up EADS BIST	1. Check for system firmware updates. 2. Replace the I/O subsystem backplane specified by the location code. 3. Go to “MAP 1540: Problem Isolation Procedures” on page 69.

Table 10. Firmware checkpoints (continued)

Checkpoint	Description	Action or possible failing FRU
E588	Set up EADS function register	1. Check for system firmware updates. 2. Replace the I/O subsystem backplane specified by the location code. 3. Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E589	Set up EADS function registers	1. Check for system firmware updates. 2. Replace the I/O subsystem backplane specified by the location code. 3. Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E58A	Set up EADS function registers	1. Check for system firmware updates. 2. Replace the I/O subsystem backplane specified by the location code. 3. Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E58B	Set up EADS function registers	1. Check for system firmware updates. 2. Replace the I/O subsystem backplane specified by the location code. 3. Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E58C	Set up EADS function registers	1. Check for system firmware updates. 2. Replace the I/O subsystem backplane specified by the location code. 3. Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E58D	Set up EADS function registers	1. Check for system firmware updates. 2. Replace the I/O subsystem backplane specified by the location code. 3. Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E58E	Set up EADS function registers	1. Check for system firmware updates. 2. Replace the I/O subsystem backplane specified by the location code. 3. Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E58F	Set up EADS function registers	1. Check for system firmware updates. 2. Replace the I/O subsystem backplane specified by the location code. 3. Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E590	Set up EADS function registers	1. Check for system firmware updates. 2. Replace the I/O subsystem backplane specified by the location code. 3. Go to “MAP 1540: Problem Isolation Procedures” on page 69.

Table 10. Firmware checkpoints (continued)

Checkpoint	Description	Action or possible failing FRU
E591	Set up EADS function registers	1. Check for system firmware updates. 2. Replace the I/O subsystem backplane specified by the location code. 3. Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E592	Set up EADS function registers	1. Check for system firmware updates. 2. Replace the I/O subsystem backplane specified by the location code. 3. Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E593	Set up EADS function registers	1. Check for system firmware updates. 2. Replace the I/O subsystem backplane specified by the location code. 3. Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E594	Begin probing slots	1. Check for system firmware updates. 2. Replace the I/O subsystem backplane specified by the location code. 3. Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E595	Detected valid adapter in slot	1. Check for system firmware updates. 2. Replace the I/O subsystem backplane specified by the location code. 3. Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E596	Read the EADS revision ID and class code.	1. Replace the RIO cable specified by the location code. 2. Replace the I/O subsystem planar that the RIO cable in step 1 is attached to.
E59E	End of walking bus of current EADS	1. Check for system firmware updates. 2. Replace the I/O subsystem backplane specified by the location code. 3. Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E5E0	Initialize system processor array	1. Check for system firmware updates. 2. Replace the I/O subsystem backplane specified by the location code. 3. Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E5E1	Reserved	
E5E2	Initialization of the hypervisor, phase 1	1. Check for system firmware updates. 2. Go to “MAP 1548: Processor Subsystem Problem Isolation” on page 77.

Table 10. Firmware checkpoints (continued)

Checkpoint	Description	Action or possible failing FRU
E5E3	Not in quick-restart: load and set up open firmware code in memory	1. Check for system firmware updates. 2. Go to “MAP 1548: Processor Subsystem Problem Isolation” on page 77.
E5E4	Activate slave processors	1. Check for system firmware updates. 2. Go to “MAP 1548: Processor Subsystem Problem Isolation” on page 77.
E5E5	Initialize the hypervisor, phase 2	1. Check for system firmware updates. 2. Go to “MAP 1548: Processor Subsystem Problem Isolation” on page 77.
E5E6	Set L2 and processor status	1. Check for system firmware updates. 2. Go to “MAP 1548: Processor Subsystem Problem Isolation” on page 77.
E5E7	Save I/O hub information for RTAS and open firmware	1. Check for system firmware updates. 2. Go to “MAP 1548: Processor Subsystem Problem Isolation” on page 77.
E5E8	Set up registers	1. Check for system firmware updates. 2. Go to “MAP 1548: Processor Subsystem Problem Isolation” on page 77.
E5E9	Reset the quick restart path	1. Check for system firmware updates. 2. Go to “MAP 1548: Processor Subsystem Problem Isolation” on page 77.
E5EE	Hang state in main control code	1. Check for system firmware updates. 2. Go to “MAP 1548: Processor Subsystem Problem Isolation” on page 77.
E5EF	End of low-level firmware	1. Check for system firmware updates. 2. Go to “MAP 1548: Processor Subsystem Problem Isolation” on page 77.
E5FE	Get the system’s licensed memory quantity from the service processor	1. Remove, then reapply AC power to the system using the UEPO switch. 2. Verify that the CUoD capacity card is installed and properly seated. 3. Call service support.
E600	SSA PCI adapter open firmware has run successfully.	Replace the adapter.
E601	SSA PCI adapter BIST has started but failed to complete after 4 seconds.	Replace the adapter.

Table 10. Firmware checkpoints (continued)

Checkpoint	Description	Action or possible failing FRU
E602	SSA PCI open firmware has started.	Replace the adapter.
E603	SSA PCI adapter BIST has completed with an error.	Replace the adapter.
E604	SSA PCI adapter BIST and subsequent POSTs have completed successfully.	Replace the adapter.
E605	SSA PCI adapter BIST has completed successfully but subsequent POSTS have failed.	Replace the adapter.
E60E	SSA PCI open firmware about to exit (no stack corruption).	Replace the adapter.
E60F	SSA PCI open firmware has run unsuccessfully.	Replace the adapter.
E6FF	SSA PCI open firmware about to exit (with stack corruption).	Replace the adapter.
E700	Create system firmware VPD	System firmware might be corrupted. Reinstall system firmware.
E701	Create memory VPD.	1. Check for system firmware updates. 2. Call service support.
E702	Create processor card VPD.	1. Check for system firmware updates. 2. Call service support.
E703	Create operator panel VPD.	1. Check for system firmware updates. 2. Call service support.
E704	Create CEC VPD.	1. Check for system firmware updates. 2. Call service support.
E705	Create VPD.	1. Check for system firmware updates. 2. Call service support.
E706	Create VPD.	1. Check for system firmware updates. 2. Call service support.
E707	Create system VPD.	1. Check for system firmware updates. 2. Call service support.
E708	Create VPD.	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E709	Create VPD using SPCN.	1. Check for system firmware updates. 2. Call service support.
E70A	Create service processor VPD.	1. Check for system firmware updates. 2. Call service support.
E70B	Create L3 module VPD.	1. Check for system firmware updates. 2. Call service support.
E70C	Create I/O backplane VPD (I2C problem).	Go to “MAP 1540: Problem Isolation Procedures” on page 69.

Table 10. Firmware checkpoints (continued)

Checkpoint	Description	Action or possible failing FRU
E70D	Create VPD.	1. Check for system firmware updates. 2. Call service support.
E70F	Collect CEC VPD.	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
E7EE	Delaying while waiting for power subsystem VPD collection to be completed; informational only	1. Check for system firmware updates. 2. Call service support.
E7FF	Successful end of VPD creation	Informational message. If the system hangs here, go to “MAP 1540: Problem Isolation Procedures” on page 69.
E800	RTAS initialization problem	1. Check for system firmware updates. 2. Call service support.
E841	Initializing RTAS/open firmware device tree interface	1. Check for system firmware updates. 2. Call service support.
E842	Initializing RTAS/service processor interface	1. Check for system firmware updates. 2. Replace the CEC backplane Location: U0.1-P1. 3. Call service support.
E843	Initializing RTAS/sensor interface	1. Check for system firmware updates. 2. Call service support.
E844	Initializing RTAS/time-of-day clock interface	1. Check for system firmware updates. 2. Replace the CEC backplane Location: U0.1-P1. 3. Call service support.
E845	Initializing interface/sensor access	1. Check for system firmware updates. 2. Call service support.
E846	Initializing interface/sensor access	1. Check for system firmware updates. 2. Call service support.
E84F	Initializing RTAS/operator panel interface	1. Check for system firmware updates. 2. Call service support.
E850	Initializing RTAS/cache interface	1. Check for system firmware updates. 2. Call service support.
E851	Initializing RTAS/hardware access	1. Check for system firmware updates. 2. Call service support.
E852	Initializing RTAS/PCI bus interface	1. Check for system firmware updates. 2. Go to “MAP 1540: Problem Isolation Procedures” on page 69. 3. Call service support.

Table 10. Firmware checkpoints (continued)

Checkpoint	Description	Action or possible failing FRU
E853	Start cable ID request process	1. Check the SPCN and RIO cabling to the I/O subystems. 2. Remove, then reapply power to the system. 3. Go to “MAP 1542: I/O Problem Isolation” on page 72. 4. Call service support.
E854	**Description:** Start collecting cable IDs **Action:** 1. Check the SPCN and RIO cabling to the I/O subystems. 2. Remove, then reapply power to the system. 3. Go to “MAP 1542: I/O Problem Isolation” on page 72. 4. Call service support.	
E855	**Description:** Start setting RIO link speed **Action:** 1. Check the SPCN and RIO cabling to the I/O subystems. 2. Remove, then reapply power to the system. 3. Go to “MAP 1542: I/O Problem Isolation” on page 72. 4. Call service support.	
E860	Initializing RTAS/power subsystem interface	1. Check for system firmware updates. 2. Call service support.
E861	Initializing RTAS/PCI bus interface	1. Check for system firmware updates. 2. Go to “MAP 1540: Problem Isolation Procedures” on page 69. 3. Call service support.
E870	Initializing RTAS/logs interface	1. Check for system firmware updates. 2. Call service support.
E871	Initializing RTAS/EEH handling interface	1. Check for system firmware updates. 2. Go to “MAP 1540: Problem Isolation Procedures” on page 69. 3. Call service support.
E872	Initializing RTAS/error inject interface	1. Check for system firmware updates. 2. Call service support.
E873	Initializing RTAS/error handling interface	1. Check for system firmware updates. 2. Call service support.
E880	Initializing RTAS/debug interface	1. Check for system firmware updates. 2. Call service support.
E881	Initializing RTAS/utility interface	1. Check for system firmware updates. 2. Call service support.
E882	Initializing RTAS/softpatch register interface	1. Check for system firmware updates. 2. Call service support.
E890	Initializing RTAS/hot-plug interface	1. Check for system firmware updates. 2. Call service support.
E8C1	Initializing interface/client interface access	1. Check for system firmware updates. 2. Call service support.
E8D1	Initializing interface/memory access	1. Check for system firmware updates. 2. Call service support.

Table 10. Firmware checkpoints (continued)

Checkpoint	Description	Action or possible failing FRU
EAA1	Probe PCI-PCI bridge bus	Follow the repair actions for checkpoint E151.

Boot problems or concerns

Depending on the boot device, a checkpoint might be displayed on the operator panel for an extended period of time while the boot image is retrieved from the device. If booting from the CD-ROM, watch for activity on the drive's LED indicator. A blinking LED indicates that the loading of either the boot image or additional information required by the operating system being booted is still in progress. If the checkpoint is displayed for an extended period of time and the drive LED is not indicating any activity, there might be a problem loading the boot image from the device.

Note: NAS Gateway 500 does not support network boot (that is, a NIM server).

This procedure assumes that a diagnostic CD is available and that the IDE CD-ROM drive is connected to the internal IDE connector.

Booting the diagnostics image from CD-ROM or a NIM server is referred to as running standalone diagnostics.

Step 1

Restart the system and access the firmware SMS main menu (see Chapter 10, "Using System Management Services", on page 293). Select **View Error Log**. Look for any errors with time stamps that are close to the boot during which the error was received that sent you here. Perform the actions associated with these error codes if present.

If the problem is resolved, go to "MAP 0410: Repair Checkout" on page 45. If the problem is not resolved, restart the system and access the firmware SMS menu. Select **Select Boot Options**.

1. Check to see if the intended boot device is correctly specified in the boot list. If it is in the boot list:
   a. Remove all removable media from devices in the boot list from which you do not want to boot.
   b. Go to "Step 3" on page 123.
2. If the intended boot device is not correctly identified in the boot sequence, add it to the boot sequence using the SMS menus. If the device can be added to the boot sequence, reboot the system, and then go to "MAP 0410: Repair Checkout" on page 45. If the intended boot device cannot be added to the boot list, go to "Step 3" on page 123.

Step 2

This procedure assumes that the CD-ROM drive is connected to the system.

1. Try to reboot. The power must be cycled before the system can be rebooted. If the reboot is still not successful, continue to substep 2.
2. Boot to the SMS main menu as follows:
   - Start the service processor menus, select option 2, **System Power Control Menu**; then select option 7, **Boot Mode Menu**; then select option 1, **Boot to SMS menu**. Enter 98 to return to the system power control menu, and then select option 4, **Power-on System**. Enter y to confirm.

   At the SMS main menu, select **Select Boot Devices**.
   a. Check to see if the intended boot device is correctly specified in the boot list. If it is in the boot list:
      1) Remove all removable media from devices in the boot list from which you do not want to boot.
      2) Go to "Step 3" on page 123.
   b. If the intended boot device is not correctly listed in the boot sequence, add it to the boot sequence using the SMS menus. If the device can be added to the boot sequence, reboot.

Step 3

Try to boot and run standalone diagnostics against the system, particularly against the intended boot device.

Standalone diagnostics can be run from CD-ROM. To boot standalone diagnostics, follow the detailed procedures in “Considerations for running standalone diagnostics from the diagnostic CD-ROM” on page 242.

If diagnostics do not boot successfully, and a SCSI boot failure (cannot boot from a SCSI attached device) is also occurring, go to “MAP 1548: Processor Subsystem Problem Isolation” on page 77.

If diagnostics do not boot successfully, and a SCSI boot failure (cannot boot from a SCSI attached device) is not occurring:

1. Check IDE cabling to boot device.
2. Check device configuration jumpers.

If no problem is found with the cabling or the jumpers, go to “Step 4” on page 124.

If diagnostics boot successfully and ″No Trouble Found″ was the result when diagnostics were run against the intended boot device, go to substep 4. If the diagnostics boot successfully, but the intended boot device was not present in the output of the ″Display Configuration and Resource List″, which is run from the Task Selection Menu:

1. If you booted standalone diagnostics from IDE CD-ROM, follow these steps. After each action, do the following:

   Restart the system. Stop at the SMS menus and select **Select Boot Options**. If the device is present in the boot list, and it was present previously, go to “MAP 0410: Repair Checkout” on page 45.

   If the device still is not present, continue with the actions shown in the following list.

   a. Check the SCSI cables.
   b. Remove all hot-swap disk drives except the intended boot device if it is a hot-swap drive. If the boot device is present in the boot list when the system is booted to the SMS menus, add the hot-swap disk drives back in, one at a time, until the failing device is isolated.
   c. Disconnect all other internal SCSI devices. If the boot device is present in the boot list when the system is booted to the SMS menus, reconnect the internal SCSI devices, one at a time, until the failing device or cable is isolated.
   d. Replace the SCSI cables.
   e. Replace the PCI riser card.
   f. Replace the SCSI backplane.
   g. Replace the intended boot device.
   h. Replace the CEC backplane.
2. Go to the Task Selection menu and select **Display Configuration and Resource List**. If the intended boot device is not listed, go to ″MAP 0290: Missing Resource Problem Resolution″ in *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*.
3. If an SRN, not an 8-digit error code, is reported, go to *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*.
4. Choose one of the following, and then go to step 5.
   - If the diagnostics are successful, and no other devices have been disconnected, it might be necessary to perform an operating system-specific recovery process, or reinstall the operating system.
   - If the diagnostics are successful, and devices have been removed, reinstall them one at a time. After each device is reinstalled, reboot the system. Continue this procedure until the failing device is isolated. Replace the failing device.

5. If you replaced the indicated FRUs and the problem is not corrected, or the above descriptions did not address your particular situation, go to “MAP 1548: Processor Subsystem Problem Isolation” on page 77.

   If the problem has been corrected, go to “MAP 0410: Repair Checkout” on page 45.

Step 4

It is possible that another installed adapter is causing the problem. Do the following:

1. Remove all installed PCI-X adapters.
2. Try to boot the standalone diagnostics again.
3. If unable to load standalone diagnostics, go to “Step 5”.
4. If standalone diagnostics load, reinstall adapters (and attached devices as applicable) one at a time and retry the boot operation until the problem recurs. Then replace the adapter or device that caused the problem. Go to “MAP 0410: Repair Checkout” on page 45.

Step 5

The CD-ROM drive, IDE cable, or the system board is most likely defective.

1. Replace the CD-ROM drive.
2. Replace the IDE cable.
3. Replace the system board.
4. If you replaced the indicated FRUs and the problem is still not corrected, or the above descriptions did not address your particular situation, go to “MAP 1548: Processor Subsystem Problem Isolation” on page 77.
5. Go to “MAP 0410: Repair Checkout” on page 45.

Chapter 5. Error code to FRU index

Attention: Start your activity in this chapter by going to “Checkpoint and error code index” on page 127. In this section, you might be asked to perform additional isolation procedures before looking up the actions for a four-character checkpoint or 8-character error code.

The Error Code to FRU Index lists fault symptoms and possible causes. The most likely cause is listed first. Use this index to help you decide which FRUs to replace when servicing the system.

- If you replace FRUs or perform an action and the problem is still not corrected, go to “MAP 1548: Processor Subsystem Problem Isolation” on page 77 unless otherwise indicated in the tables.
- If you replace FRUs and the problem is corrected, go to “MAP 0410: Repair Checkout” on page 45.

Note: Do not shut down the system if the FRU was replaced by hot swap.

Performing slow boot

On this system, the error code displayed in the operator panel might not indicate the root cause of the problem. To fully analyze all of the available information, perform the following steps before doing a hardware repair or replacement:

1. Record the 8-character error code (and location code if present) in the operator panel.
2. Power off the system using the white power button. Refer to “Stopping the system” on page 310.
3. Select slow boot mode (select disable fast boot) on the system power control menu from the service processor main menu.
4. Do a slow-mode boot to the SMS menus. This boot speed can be specified using the System Power Control menu on the service processor main menu. See “System power control menu” on page 265. (A fast-mode boot skips much of the built-in diagnostic testing.) A slow-mode boot might yield a new 8-character error code on the operator panel and new errors in the service processor error log. Power on the system. Refer to “Starting the system” on page 311.
   - If a new error code is reported, use it in subsequent steps to continue problem analysis.
   - If the system hangs with the same error code, continue with the next step in the Checkpoints and Error Codes Index.
   - If no 8-character error code is displayed in the operator panel, use the original error code and continue with the next step in the Checkpoints and Error Codes Index.
5. Power off the system.
6. At this point, the service processor menus should be available to examine the service processor error log.

Four-character checkpoints

Four-character progress codes and checkpoints in the form 8xxx, 9xxx, Axxx, Bxxx, and Exxx are listed in “Firmware checkpoints” on page 101. If you have a four-character code that begins with any character other than 8, 9, A, B, or E, refer to the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*.

Replacing the operator panel

Licensed programs frequently rely on system information that is stored in the VPD module on the operator panel. If the MAPs indicate that the operator panel should be replaced, the system VPD must be written into the VPD module on the new operator panel. See “System vital product data (VPD) update procedure” on page 364.

Replacing a PCI-X adapter

If a network adapter is replaced, the network administrator must be notified so that the client MAC addresses of the new adapter card can be propagated to any required locations in the Ethernet. In addition, the operating system configuration of the network adapter will need to be completed based on the information used on the previous network adapter. Also, check to ensure that any client or server access is maintained.

If the fibre-channel HBAs are replaced, you must notify the SAN administrator so that the adapter definitions on the storage and the fibre-channel zones on the SAN switches can be updated with the World Wide Name (WWN) of the new adapter.

Determining location code

If you have an error code in the form 2xxx xxxx or Exxx, and no location code associated with it, the location code might possibly be found in three places, depending on the state of the system:

- If the system will boot into the operating system, you can run an error code log analysis under system diagnostics to report the location code.
- If the system will boot into the System Management Services (SMS) menus, the SMS error log will contain the location code associated with the error code. See “View error log” on page 295.
- If the system halted when the error occurred, the error code and location can be found in the LCD progress indicator log, which can be accessed using the service processor menus. See Chapter 9, “Using the service processor”, on page 255, and then select **Read Progress Indicators From Last System Boot**. Find the error code in the list that directed you to this note, and the location code should be a part of the entry in the log.

FRU identify LEDs

This system is configured with an arrangement of LEDs that help identify various components of the system. These include, but are not limited to the following:

- Various FRU identify LEDs
  - Power subsystem FRUs
  - CEC subsystem FRUs
  - I/O subsystem FRUs
  - PCI-X adapter identify LED
  - DASD identify LED

You can flash any identify LED in the system:

- If the system is in the failed state with power on, use the service processor LED Control menu contained in the “System information menu” on page 268.
- Use the ″Identify and Attention Indicators″ task through diagnostics as outlined in the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*.

Checkpoint and error code index

The following table is an index to the checkpoints or error codes that you might receive to help diagnose a failure. Locate the code that you received, and follow the instructions to determine your next step. If you receive a software error, or the 8-digit error code is not listed in this index, call service support.

Note: Not all checkpoints or error codes are supported.

Table 11. Checkpoint and error code index

Checkpoint or error code	What you should do
0000 xxxx	Operator panel error codes Go to “Operator panel error codes” on page 128 and follow the instructions in the Operator panel error code table.
1xxx xxxx	System power control network (SPCN) error codes Go to “SPCN error codes” on page 129 and follow the instructions in the SPCN error code table.
2xxx xxxx	Firmware error codes Go to “Firmware error codes” on page 137 and follow the instructions in the Firmware error code table.
4xxx xxxx	Service processor error codes 1. Perform slow boot, if not already performed earlier. See “Performing slow boot” on page 125. 2. If the error codes are 450x xxxx, and if their actions call out DIMMs, go to “MAP 1240: Memory Problem Resolution” on page 52. 3. Go to “Service processor error codes” on page 154 and follow the instructions in the Service processor error codes table.
8xxx 9xxx Axxx Bxxx	Service processor checkpoints Go to “Service processor checkpoints” on page 94 for more information on these checkpoints.
A1FD 000x	The system has entered recovery mode. See “Recovery mode” on page 286.
B006 xxxx B1xx xxxx	Common firmware error codes Go to “Common firmware error codes” on page 229 and follow the instructions in the Common firmware error codes table.
Exxx	Firmware checkpoints Go to “Firmware checkpoints” on page 101 for more information on these checkpoints.
Mxxx xxxx	Problem determination-generated error codes Go to “Problem determination generated error codes” on page 238 and follow the instructions in the Problem-determination generated error codes table.

Operator panel error codes

Attention: If you replace FRUs or perform an action and the problem is still not corrected, go to “MAP 1548: Processor Subsystem Problem Isolation” on page 77 unless otherwise indicated in the tables.

If you replace FRUs and the problem is corrected, go to “MAP 0410: Repair Checkout” on page 45.

Note: Not all operator panel error codes are supported.

Table 12. Operator panel error codes

Error code	Description	Action or possible failing FRU
0000 1111	At power on, failure of power-good signal from power supply.	1. CEC backplane Location code: U0.1-P1 2. CEC backplane power supply Locations: U0.1-V1 U0.1-V2
0000 1112	At power off, failure of power-good signal from power supply.	1. CEC backplane Location code: U0.1-P1 2. CEC backplane power supply Locations: U0.1-V1 U0.1-V2
0000 1113	While power on, failure of power-good signal from power supply.	1. CEC backplane Location code: U0.1-P1 2. CEC backplane power supply Locations: U0.1-V1 U0.1-V2
0000 1114	Operator panel and service processor have been reset after main power disturbance.	Information message
0000 2222	Operator panel not communicating with service processor.	1. If system cannot be powered off, reset the service processor (using the pinhole reset or by disconnecting and then reconnecting power). 2. CEC backplane Location code: U0.1-P1
0000 3333	SPCN communications error	CEC backplane Location code: U0.1-P1
0000 3334	I2C repeater error	CEC backplane Location code: UO.1-P1
0000 BBBB	TOD battery malfunction	TOD battery Location code: U0.1-P1-V3

SPCN error codes

Attention: If a power supply or fan is hot-swapped, wait five minutes, and then recheck the operating system error log. If the system has to be shut down to replace a power supply or fan, reboot the system, wait five minutes after the operating system login prompt appears, and then recheck the operating system error log. If the detailed information for the most recent error with the same identifier indicates that the original problem has not been fixed by performing the first action in the action column, continue with the next action in the action column.

Attention: If you replace FRUs or perform an action and the problem is still not corrected, go to "MAP 1548: Processor Subsystem Problem Isolation" on page 77 unless otherwise indicated in the tables.

If you replace FRUs and the problem is corrected, go to "MAP 0410: Repair Checkout" on page 45.

Note: Not all SPCN error codes are supported.

Table 13. SPCN error codes for the CEC (system unit)

Error code	Description	Action or possible failing FRU
1011 00AC	AC loss or brownout detected.	Informational
1011 00EF	Room emergency power off detected.	Informational
1011 1510	Power supply 1 power source failure.	1. Check input power to the power supply. 2. System power supply 1 Location code: U0.1-V1 3. CEC backplane Location code: U0.1-P1
1011 1511	Power supply 1 fault	1. Verify that the media support shelf is installed and properly seated. 2. System power supply 1 Location code: U0.1-V1 3. CEC backplane Location code: U0.1-P1
1011 1512	Power supply 1 non-power fault	1. System power supply 1 Location code: U0.1-V1 2. CEC backplane Location code: U0.1-P1
1011 1513	Power supply 1 domain fault	1. Verify that the media support shelf is installed and properly seated. 2. System power supply 1 Location code: U0.1-V1 3. CEC backplane Location code: U0.1-P1
1011 1520	Power supply 2 power source failure	1. Check input power to power supply 2. 2. System power supply 2 Location code: U0.1-V2 3. CEC backplane Location code: U0.1-P1

Table 13. SPCN error codes for the CEC (system unit) (continued)

Error code	Description	Action or possible failing FRU
1011 1521	Power supply 2 fault	1. System power supply 2 Location code: U0.1-V2 2. CEC backplane Location code: U0.1-P1
1011 1522	Power supply 2 non-power fault	1. System power supply 2 Location code: U0.1-V2 2. CEC backplane Location code: U0.1-P1
1011 1523	Power supply 2 domain fault	1. System power supply 2 Location code: U0.1-V2 2. CEC backplane Location code: U0.1-P1
1011 1B0A	+12 V/-12 V load fault	1. Replace power supply 1. Location code: U0.1-V1 2. If power supply 2 is present, use removed power supply 1 to replace power supply 2. 3. CEC backplane Location code: U0.1-P1
1011 1B0B	1.8 V load fault	1. Replace power supply 1. Location code: U0.1-V1 2. If power supply 2 is present, use removed power supply 1 to replace power supply 2. 3. CEC backplane Location code: U0.1-P1
1011 1B0C	3.3 V/1.5 V load fault	1. Replace power supply 1. Location code: U0.1-V1 2. If power supply 2 is present, use removed power supply 1 to replace power supply 2. 3. CEC backplane Location code: U0.1-P1
1011 1B0D	2.5 V load fault	1. Replace power supply 1. Location code: U0.1-V1 2. If power supply 2 is present, use removed power supply 1 to replace power supply 2. 3. CEC backplane Location code: U0.1-P1
1011 1B0E	+5 V load fault	1. Replace power supply 1. Location code: U0.1-V1 2. If power supply 2 is present, use removed power supply 1 to replace power supply 2. 3. CEC backplane Location code: U0.1-P1

Table 13. SPCN error codes for the CEC (system unit) (continued)

Error code	Description	Action or possible failing FRU
1011 1B0F	1.5 V/1.3 V load fault	1. Replace power supply 1. Location code: U0.1-V1 2. If power supply 2 is present, use removed power supply 1 to replace power supply 2. 3. CEC backplane Location code: U0.1-P1
1011 1F01	TMS log limit reached.	Call service support.
1011 2600	Pgood fault	CEC backplane Location code: U0.1-P1
1011 2603	Pgood fault	CEC backplane Location code: U0.1-P1
1011 2612	Optical converter fault	CEC backplane Location code: U0.1-P1
1011 3100	I2C controller fault	CEC backplane Location code: U0.1-P1
1011 3105	I2C port 5 fault	CEC backplane Location code: U0.1-P1
1011 3114	PCI-riser-card fault	1. PCI riser card Location code: U0.1-P2 2. CEC backplane Location code: U0.1-P1
1011 3116	I^2C VPD interface	CEC backplane Location code: U0.1-P1
1011 3118	SPCN VPD and NVS interface	CEC backplane Location code: U0.1-P1
1011 7610	System processor fan 1 failure	1. Processor fan 1 Location code: U0.1-F1 2. CEC backplane Location code: U0.1-P1
1011 7611	Processor-card cooling fan missing from primary location	1. Processor fan 1 Location code: U0.1-F1 2. CEC backplane Location code: U0.1-P1
1011 7620	System processor fan 2 failure	1. Processor fan 2 Location code: U0.1-F2 2. CEC backplane Location code: U0.1-P1
1011 7621	System processor fan 2 missing	1. Processor fan 2 Location code: U0.1-F2 2. CEC backplane Location code: U0.1-P1
1011 7630	Slow system PCI fan 3 failure	1. PCI fan 3 Location code: U0.1-F3 2. CEC backplane Location code: U0.1-P1

Table 13. SPCN error codes for the CEC (system unit) (continued)

Error code	Description	Action or possible failing FRU
1011 7631	System PCI fan 3 missing	1. PCI fan 3 Location code: U0.1-F3 2. CEC backplane Location code: U0.1-P1
1011 7640	Slow system PCI fan 3 failure	1. PCI fan 3 Location code: U0.1-F3 2. CEC backplane Location code: U0.1-P1
1011 7641	System PCI fan 3 missing	1. PCI fan 3 Location code: U0.1-F3 2. CEC backplane Location code: U0.1-P1
1011 7650	Slow system PCI fan 4 failure	1. PCI fan 4 Location code: U0.1-F4 2. CEC backplane Location code: U0.1-P1
1011 7651	System PCI fan 4 missing	1. PCI fan 4 Location code: U0.1-F4 2. CEC backplane Location code: U0.1-P1
1011 7660	System PCI fan 4 failure	1. PCI fan 4 Location code: U0.1-F4 2. CEC backplane Location code: U0.1-P1
1011 7661	System PCI fan 4 missing	1. PCI fan 4 Location code: U0.1-F4 2. CEC backplane Location code: U0.1-P1
1011 8400	VPD configuration	Ignore all location codes. Go to “MAP 1540: Problem Isolation Procedures” on page 69.
1011 8401	VPD access	Ignore all location codes. Go to “MAP 1540: Problem Isolation Procedures” on page 69.
1011 8402	VPD access-concentrator	CEC backplane, U0.1-P1
1011 8403	VPD level mismatch	1. System VPD module, U0.1-L1-N1 2. CEC backplane, U0.1-P1
1011 8404	PU 2 mismatch	1. Processor card 2 Location code: U0.1-P1-C2 2. CEC backplane Location code: U0.1-P1

Table 13. SPCN error codes for the CEC (system unit) (continued)

Error code	Description	Action or possible failing FRU
1011 8409	No valid processor card VPD found.	1. Verify that the processor card is of the right type for your system and is properly installed. 2. If only one processor card is installed, replace it. If there are two processor cards installed, remove the second processor card. If the problem is resolved, replace that processor card. If it does not resolve the problem, swap the first processor card with the second, just removed, processor card. If this resolves the problem, replace the processor card that was originally in the first slot. If it does not resolve the problem, go to “MAP 1540: Problem Isolation Procedures” on page 69. 3. Go to “MAP 1540: Problem Isolation Procedures” on page 69.
1011 840A	VPD +5 stuck high	Ignore all location codes. Go to “MAP 1540: Problem Isolation Procedures” on page 69 and run minimum configuration.
1011 840B	VPD +5 stuck low	Ignore all location codes. Go to “MAP 1540: Problem Isolation Procedures” on page 69 and run minimum configuration.
1011 840C	DIMM misplugged.	Inspect system memory for proper installation of DIMMs.
1011 840D	SPCN configuration	1. Check cabling. 2. Set the I/O type. See Power Control Network Utilities menu on page 272. 3. CEC backplane Location code: U0.1-P1
1011 840E	SPCN default configuration loaded.	1. Check cabling. 2. Set the I/O type. See Power Control Network Utilities menu on page 272. 3. CEC backplane Location code: U0.1-P1
1011 840F	I/O type not recognized.	1. Check cabling. 2. Set the I/O type. See Power Control Network Utilities menu on page 272. 3. CEC backplane Location code: U0.1-P1
1011 8413	Invalid processor 1 VPD	Processor card Location code: U0.1-P1-C1
1011 8414	Invalid processor 2 VPD	Processor card Location code: U0.1-P1-C2
1011 8423	No processor 1 VPD	Processor card Location code: U0.1-P1-C1
1011 8424	No processor 2 VPD	Processor card Location code: U0.1-P1-C2

Table 13. SPCN error codes for the CEC (system unit) (continued)

Error code	Description	Action or possible failing FRU
1011 9280	SPCN interface failure	1. Check for system firmware updates. Apply the update if it is available. 2. Replace the system backplane, location: U0.1-P1.
1011 9281	SPCN interface failure	1. Check for system firmware updates. Apply the update if it is available. 2. Replace the system backplane, location: U0.1-P1.
1011 9282	SPCN interface failure	1. Check for system firmware updates. Apply the update if it is available. 2. Replace the system backplane, location: U0.1-P1.

Attention: If you replace FRUs or perform an action on an I/O subsystem and the problem is still not corrected, go to "MAP 1542: I/O Problem Isolation" on page 72 unless you were already directed to any MAP 154*x* by the error code. Otherwise, call support if the actions for an error code do not resolve the problem.

Attention: If the error code that brought you to this chapter originated in the operating system error log, please be aware that an error might require an additional 15 minutes to be propagated to the operating system error log.

If you replace FRUs and the problem is corrected, go to "MAP 0410: Repair Checkout" on page 45.

The "nn" in "1nn1 xxxx", where nn is between 2 and 3F hexadecimal, inclusive, is replaced by the I/O subsystem drawer number (in hexadecimal) in the error code that is reported by the system. The I/O drawer number in the location code of a failing FRU will be converted to decimal (which is shown as U0.dd in the following table). The "dd" value ranges from 02 to 63, inclusive. For example, the error code 11F1 1510 will have location codes U0.31-V1 and U0.31-P1 listed.

Table 14. SPCN error codes for I/O subsystems

Error code	Description	Action or possible failing FRU
1nn1 00AC	AC loss or brownout detected.	Informational message.
1nn1 00EF	Remote emergency power off occurred.	Informational message.
1nn1 1510	Power supply 1 source failure	1. Check the input voltage to the power supply. 2. I/O subsystem power supply 1, U0.dd-V1. 3. I/O subsystem backplane, U0.dd-P1.
1nn1 1511	Power supply 1 fault	1. I/O subsystem power supply 1, U0.dd-V1. 2. I/O subsystem backplane, U0.dd-P1.
1nn1 1512	Power supply 1 non-power fault	1. I/O subsystem power supply 1, U0.dd-V1. 2. I/O subsystem backplane, U0.dd-P1.
1nn1 1513	Power supply 1 domain fault	1. I/O subsystem power supply 1, U0.dd-V1. 2. I/O subsystem backplane, U0.dd-P1.

Table 14. SPCN error codes for I/O subsystems (continued)

Error code	Description	Action or possible failing FRU
1nn1 1517	Power supply 1 thermal fault	1. Check for obstructions to the air flow around the I/O subsystem. 2. I/O subsystem power supply 1, U0.dd-V1. 3. I/O subsystem backplane, U0.dd-P1.
1nn1 1520	Power supply 2 source failure	1. Check the input voltage to the power supply. 2. I/O subsystem power supply 2, U0.dd-V2. 3. I/O subsystem backplane, U0.dd-P1.
1nn1 1521	Power supply 2 fault	1. I/O subsystem power supply 2, U0.dd-V2. 2. I/O subsystem backplane, U0.dd-P1.
1nn1 1522	Power supply 2 non-power fault	1. I/O subsystem power supply 2, U0.dd-V2. 2. I/O subsystem backplane, U0.dd-P1.
1nn1 1523	Power supply 2 domain fault	1. I/O subsystem power supply 2, U0.dd-V2. 2. I/O subsystem backplane, U0.dd-P1.
1nn1 1527	Power supply 2 thermal fault	1. Check for obstructions to the air flow around the I/O subsystem. 2. I/O subsystem power supply 2, U0.dd-V2. 3. I/O subsystem backplane, U0.dd-P1.
1nn1 1B01	+12 V load fault	1. Replace power supply 1, U0.dd-V1. 2. If power supply 2 is present, use power supply 1 that was removed to replace power supply 2. 3. I/O subsystem backplane, U0.dd-P1.
1nn1 1B02	+5 V load fault	1. Replace power supply 1, U0.dd-V1. 2. If power supply 2 is present, use power supply 1 that was removed to replace power supply 2. 3. I/O subsystem backplane, U0.dd-P1.
1nn1 1B03	+3.3 V load fault	1. Replace power supply 1, U0.dd-V1. 2. If power supply 2 is present, use power supply 1 that was removed to replace power supply 2. 3. I/O subsystem backplane, U0.dd-P1.
1nn1 1B04	-12 V load fault	1. Replace power supply 1, U0.dd-V1. 2. If power supply 2 is present, use power supply 1 that was removed to replace power supply 2. 3. I/O subsystem backplane, U0.dd-P1.
1nn1 2600	Pgood fault	I/O subsystem backplane, U0.dd-P1.
1nn1 2603	Power domain fault	I/O subsystem backplane, U0.dd-P1.
1nn1 2605	Pgood 1.8 V fault	I/O subsystem backplane, U0.dd-P1.
1nn1 2606	Pgood 2.5 V fault	I/O subsystem backplane, U0.dd-P1.
1nn1 3100	I2C controller fault	I/O subsystem backplane, U0.dd-P1.

Table 14. SPCN error codes for I/O subsystems (continued)

Error code	Description	Action or possible failing FRU
1nn1 3101	I2C bus fault	I/O subsystem backplane, U0.dd-P1.
1nn1 3102	I2C interface fault	I/O subsystem backplane, U0.dd-P1.
1nn1 3103	I2C interface fault	I/O subsystem backplane, U0.dd-P1.
1nn1 3104	I2C interface fault	I/O subsystem backplane, U0.dd-P1.
1nn1 3110	SES module fault on SCSI backplane 1	Replace the SCSI backplane, location: U0.dd-P3
1nn1 3111	SES module fault on SCSI backplane 2	Replace the SCSI backplane, location: U0.dd-P4
1nn1 3113	PCI bridge chip fault	I/O subsystem backplane, U0.dd-P1.
1nn1 3114	I2C fault	I/O subsystem backplane, U0.dd-P1.
1nn1 3115	Operator panel fault	I/O subsystem backplane, U0.dd-P1.
1nn1 3118	SPCN VPD fault	I/O subsystem backplane, U0.dd-P1.
1nn1 3121	I2C VPD fault	I/O subsystem backplane, U0.dd-P1.
1nn1 7610	Blower 1 fault	Blower 1, U0.dd-F1.
1nn1 7611	Blower 1 missing	Blower 1, U0.dd-F1.
1nn1 7620	Blower 2 fault	Blower 2, U0.dd-F2.
1nn1 7621	Blower 2 missing	Blower 2, U0.dd-F2.
1nn1 7630	Blower 3 fault	Blower 3, U0.dd-F3.
1nn1 7631	Blower 3 missing	Blower 3, U0.dd-F3.
1nn1 7640	Blower 4 fault	Blower 4, U0.dd-F4.
1nn1 7641	Blower 4 missing	Blower 4, U0.dd-F4.
1nn1 8400	Configuration ID conflict	1. Set the I/O type using the service processor menus. 2. I/O subsystem backplane, U0.dd-P1.
1nn1 840D	I/O type mismatch	1. Check the RIO and the SPCN cabling. 2. Set the I/O type using the service processor menus. 3. I/O subsystem backplane, U0.dd-P1.
1nn1 840E	I/O type mismatch	1. Check the RIO and the SPCN cabling. 2. Set the I/O type using the service processor menus. 3. I/O subsystem backplane, U0.dd-P1.
1nn1 8A00	The power controlling the CEC changed.	Informational message
1nn1 C62E	Polling error	I/O subsystem backplane, U0.dd-P1.

Firmware error codes

Attention: If you replace FRUs or perform an action and the problem is still not corrected, go to “MAP 1548: Processor Subsystem Problem Isolation” on page 77 unless otherwise indicated in the tables.

If you replace FRUs and the problem is corrected, go to “MAP 0410: Repair Checkout” on page 45.

Note: Not all firmware error codes are supported.

Table 15. Firmware error codes

Error code	Description	Action or possible failing FRU
20A8 0000	Insufficient information to boot.	Verify the IP address.
20A8 0001	The client IP address is already in use by some other network device.	Change IP address.
20A8 0002	Cannot get gateway IP address.	Refer to Table 10 on page 101 using code **E174**.
20A8 0003	Cannot get system hardware address.	Refer to Table 10 on page 101 using code **E174**.
20A8 0004	Bootup failed.	Refer to Table 10 on page 101 using code **E175**.
20A8 0005	File transmission (TFTP) failed.	Check network connection and try again.
20A8 0006	Boot image too large.	Call service support.
20D0 0001	I/O subsystem has changed locations.	This is an informational message. The I/O subsystem at the location code associated with this message was found at another location code during a prior boot of the system. Call service support.
20D0 000F	Self-test failed on a device, no error or location code information available.	Refer to “Mapping AIX and physical location codes” on page 21 to see if a location code is available for the device the error was reported against. 1. Replace device indicated by the location code (if available). 2. Go to “MAP 1540: Problem Isolation Procedures” on page 69.
20D0 0010	Self-test failed on a device; cannot locate package.	Call service support.
20D0 0011	Firmware RTAS attempt to allocate memory failed.	Call service support.
20D0 0800	Firmware update failure.	Retry the flash update.
20D0 0801	System firmware update failure.	Retry the firmware update.
20D0 0997	Operating system terminated with error string.	Call service support.
20D0 0998	Operating system terminated with error string.	Call service support.
20D0 0999	Operating system terminated with error string.	Call service support.
20D0 0A01	Error initializing RTAS NVRAM	1. Check for system firmware updates. Apply update if available. 2. Call service support.

Table 15. Firmware error codes (continued)

Error code	Description	Action or possible failing FRU
20D0 0A02	Error initializing RTAS debugging token	1. Check for system firmware updates. Apply update if available. 2. Call service support.
20D0 0A03	Error initializing interface/service processor access	1. Check for system firmware updates. Apply update if available. 2. Call service support.
20D0 0A04	Error initializing interface/operator panel access	1. Check for system firmware updates. Apply update if available. 2. Call service support.
20D0 0A05	Error initializing hardware access	1. Check for system firmware updates. Apply update if available. 2. Call service support.
20D0 0A06	Error initializing interface/PCI access	1. Check for system firmware updates. Apply update if available. 2. Call service support.
20D0 0A07	Error initializing interface/operating system access	1. Check for system firmware updates. Apply update if available. 2. Call service support.
20D0 0A08	Error initializing interface/client_interface access	1. Check for system firmware updates. Apply update if available. 2. Call service support.
20D0 0A09	Error initializing interface/NUMA access	1. Check for system firmware updates. Apply update if available. 2. Call service support.
20D0 0A0A	Error initializing interface/interrupt access	1. Check for system firmware updates. Apply update if available. 2. Call service support.
20D0 0A0B	Error initializing interface/OFDT access	1. Check for system firmware updates. Apply update if available. 2. Call service support.
20D0 0A0C	Error initializing interface/sensor access	1. Check for system firmware updates. Apply update if available. 2. Call service support.
20D0 0A0D	Error initializing interface/sensors/led_table access	1. Check for system firmware updates. Apply update if available. 2. Call service support.
20D0 0A0E	Error initializing interface/timebase access	1. Check for system firmware updates. Apply update if available. 2. Call service support.
20D0 0A0F	Error initializing interface/time-of-day access	1. Check for system firmware updates. Apply update if available. 2. Call service support.

Table 15. Firmware error codes (continued)

Error code	Description	Action or possible failing FRU
20D0 0A10	Error initializing interface/cache access	1. Check for system firmware updates. Apply update if available. 2. Call service support.
20D0 0A11	Error initializing interface/power access	1. Check for system firmware updates. Apply update if available. 2. Call service support.
20D0 0A12	Error initializing interface/hot-plug access	1. Check for system firmware updates. Apply update if available. 2. Call service support.
20D0 0A13	Error initializing interface/log access	1. Check for system firmware updates. Apply update if available. 2. Call service support.
20D0 0A14	Error initializing interface/EEH access	1. Check for system firmware updates. Apply update if available. 2. Call service support.
20D0 0A15	Error initializing interface/error injection access	1. Check for system firmware updates. Apply update if available. 2. Call service support.
20D0 0A16	Error initializing interface/handling access	1. Check for system firmware updates. Apply update if available. 2. Call service support.
20D0 0A17	Error initializing interface/utility access	1. Check for system firmware updates. Apply update if available. 2. Call service support.
20D0 0A18	Error initializing register softpatch access	1. Check for system firmware updates. Apply update if available. 2. Call service support.
20D0 9001	Subsystem information not found in VPD.	1. Power off, and then power on the system. 2. If the error persists, call service support.
20D0 9002	Subsystem machine type and model information not found in VPD.	1. Power off, and then power on the system. 2. If the error persists, call service support.
20D0 9003	Subsystem serial number information not found in VPD.	1. Power off, and then power on the system. 2. If the error persists, call service support.
20D0 9004	Subsystem machine type and model field is empty in VPD.	1. Power off, and then power on the system. 2. If the error persists, call service support.
20D0 9005	Subsystem serial number field is empty in VPD.	1. Power off, and then power on the system. 2. If the error persists, call service support.
20D0 9006	Duplicate subsystem serial number found in VPD.	1. Power off, and then power on the system. 2. If the error persists, call service support.
20D0 9007	Invalid subsystem machine type and model information in VPD.	1. Power off, and then power on the system. 2. If the error persists, call service support.

Table 15. Firmware error codes (continued)

Error code	Description	Action or possible failing FRU
20D0 9008	Invalid subsystem serial number found in VPD.	1. Power off, and then power on the system. 2. If the error persists, call service support.
20D1 0001	Failed to send state-change message to service processor.	1. Check for system firmware updates. Apply update if available. 2. Call service support.
20D1 0002	Failed to disable heartbeat alarm.	1. Check for system firmware updates. Apply update if available. 2. Call service support.
20D1 0003	Failed to send boot status.	1. Check for system firmware updates. Apply update if available. 2. Call service support.
20D1 0004	Failed to locate service processor device tree node.	1. Check for system firmware updates. Apply update if available. 2. Call service support.
20D1 0005	Failed to reboot system.	1. Check for system firmware updates. Apply update if available. 2. Call service support.
20D1 0006	Failed to reboot a partition.	1. Check for system firmware updates. Apply update if available. 2. Call service support.
20D1 0007	Failed to set PCI read/write permissions array.	1. Check for system firmware updates. Apply update if available. 2. Call service support.
20D1 0008	Failed to set PCI read/write permissions array for slot.	1. Check for system firmware updates. Apply update if available. 2. Call service support.
20D1 0009	Missing or invalid subsystem serial number.	1. Check for system firmware updates. Apply update if available. 2. If a location code is shown with this error code, replace the part at that location. 3. Call service support. **Note:** The location code identifies the failing subsystem.
20D1 000A	Failed to send boot failed message to service processor.	1. Check for system firmware updates. Apply update if available. 2. Call service support.
20D1 000B	Failed to reset PCI read/write permissions array.	1. Check for system firmware updates. Apply update if available. 2. Call service support.
20D1 000C	Failed to send LMB-TABLE-INFO mailbox repair.	1. Check for system firmware updates. Apply update if available. 2. Call service support.

Table 15. Firmware error codes (continued)

Error code	Description	Action or possible failing FRU
20D1 000D	Function to get time-of-day failed.	1. Check for system firmware updates. Apply update if available. 2. Call service support.
20D1 000E	Function to get time-of-day failed.	1. Check for system firmware updates. Apply update if available. 2. Call service support.
20D1 000F	Hypervisor call to reset PHB or to check for drawer existence failed.	1. Check for system firmware updates. Apply update if available. 2. Call service support.
20D1 0010	Stack underflow from fibre-channel adapter	1. Check for microcode updates for the fibre-channel adapter. Apply an update if available. 2. Check for system firmware updates. Apply an update if available. 3. Call service support.
20D1 0011	PHB recovery was not successful. Open firmware received failure in phb-recovery-buff.	1. Check for system firmware updates. Apply update if available. 2. Call service support.
20D1 0012	**Attention:** One of the I/O subsystems has been disconnected from the system.	This is indicates that an I/O subsystem that was previously in the configuration was not found during the current boot. 1. Check for system firmware updates. Apply the update if available. 2. Call service support.
20E0 0001	Privileged-access password entry error.	The password has been entered incorrectly. Retry installing the password.
20E0 0004	Battery drained or needs replacement.	1. Replace battery. Location code: U0.1-P1-V3 2. If problem persists, replace the CEC backplane Location code: U0.1-P1
20E0 0009	Invalid password entered - system locked.	The password has been entered incorrectly three times. Turn off, then turn on the system unit, and then enter the password correctly.
20EE 0003	IP parameter requires 3 dots ″.″	Enter valid IP parameter. Example: 000.000.000.000
20EE 0004	Invalid IP parameter	Enter valid IP parameter. Example: 000.000.000.000
20EE 0005	Invalid IP parameter (>255)	Enter valid IP parameter. Example: 255.192.002.000
20EE 0007	Keyboard not found	Replace the CEC backplane. Location code: U0.1-P1

Table 15. Firmware error codes (continued)

Error code	Description	Action or possible failing FRU
20EE 0008	No configurable adapters were found in the system by the remote IPL menu in the SMS utilities.	This warning occurs when the remote IPL menu in the SMS utilities cannot locate any LAN adapters that are supported by the remote IPL function. If a supported device is installed: 1. Replace the adapter. 2. Go to "MAP 1542: I/O Problem Isolation" on page 72.
20EE 0009	Unable to communicate with the service processor.	Replace the CEC backplane Location code: U0.1-P1.
20EE 000B	The system was not able to find an operating system boot record on the devices listed in the boot list. This can be caused by the wrong devices being in the boot list, a problem that prevents the system from communicating with the device that contains the boot record, or the boot record being corrupted.	Go to "Boot problems or concerns" on page 122.
20EE 000C	Pointer to the operating system not found in non-volatile storage.	Values normally found in non-volatile storage that point to the location of an operating system were not found. This can happen because some event occurred that caused the system to lose non-volatile storage information (drainage or replacement of the battery). This information can be reconstructed by running the **bootlist** command specifying the device that the operating system is installed on. Refer to your documentation for the exact syntax and usage of the **bootlist** command. To boot the operating system so that the above-mentioned values can be reconstructed, power off the system and power it on again. This should cause the system to look for the operating system in the devices contained in the custom boot list or in the default boot list, depending on the condition of the system. If this is not successful, use the System Management Services Menus to modify the boot sequence (also known as *boot list*) to include devices that are known to contain a copy of the operating system. For example, select a hard disk known to have a copy of the operating system as the first and only device in the boot sequence (boot list) and attempt to boot again. If the problem persists, replace the CEC backplane. Location code: U0.1-P1.
20EE 000E	Unable to execute the open firmware method.	1. Reboot the system. 2. Reflash the system with the latest level of system firmware. 3. Call service support.

Table 15. Firmware error codes (continued)

Error code	Description	Action or possible failing FRU
20EE 000F	Unable to find the package node.	1. Reboot the system. 2. Reflash the system with the latest level of system firmware. 3. Call service support.
20EE 0010	Unable to execute the root VPD method.	1. Reboot the system. 2. Reflash the system with the latest level of system firmware. 3. Call service support.
20EE 0011	Unable to execute the VPD method.	1. Reboot the system. 2. Reflash the system with the latest level of system firmware. 3. Call service support.
20EE 0012	Unable to execute the mem-dimm-VPD method.	1. Reboot the system. 2. Reflash the system with the latest level of system firmware. 3. Call service support.
20EE 0013	Unable to allocate memory for VPD.	1. Reboot the system. 2. Reflash the system with the latest level of system firmware. 3. Call service support.
20EE 0014	Unable to allocate memory for location codes.	The system firmware might be corrupted.
20EE 0100	Fcode resident on an I/O adapter is not supported on this system.	Informational message. The adapter's Fcode driver is not supported on this system. Additional information might be available from service support. This error code only affects boot-time operation, not the adapter's functionality under the operating system.
20FC 0020	Failed to retrieve power, packaging, or cooling VPD using SPCN for the corresponding subsystem. Service processor mailbox failed to get VPD.	1. Check for system firmware updates. 2. Replace the part specified by the location code.
20FC 0021	Failed to retrieve power, packaging, or cooling VPD using SPCN for the corresponding subsystem. Service processor mailbox failed to get power, packaging, and cooling device VPD.	1. Check for system firmware updates. 2. Replace the part specified by the location code.
20FC 0030	Corrupted power, packaging, and cooling device VPD format in the SPCN configuration table.	1. Check for system firmware updates. 2. Replace the part specified by the location code.
20FF 0001	Problem with VPD	1. Replace the part indicated by the location code. 2. If no location code is specified, call service support.

Table 15. Firmware error codes (continued)

Error code	Description	Action or possible failing FRU
2100 0xxx	SCSI controller fault	1. Before replacing any system components, refer to the notes in error code 21A00001. 2. Replace the SCSI device.
2101 0010	The IDE device remained busy longer than timeout period allows.	1. Check for system firmware updates. 2. Call service support
21A0 0001	SCSI DASD - test unit ready failed - hardware error	**Note:** 1. Before replacing any system components: a. Ensure that the controller and each device on the SCSI bus is assigned a unique SCSI ID. b. Ensure that the SCSI bus is properly terminated. c. Ensure that the SCSI signal and power cables are securely connected and not damaged. 2. The location code information is required to identify the ID of SCSI device failures as well as to indicate the location of the controller to which the device is attached. Check the system error logs to determine the location code information associated with the error code. a. Replace the SCSI device. b. Replace the SCSI cable. c. Replace the SCSI controller.
21A0 0002	SCSI DASD - test unit ready failed - sense data available	Before replacing any system components, refer to the notes in error code 21A0 0001. 1. Replace the media (removable media devices). 2. Replace the SCSI device.
21A0 0003	SCSI DASD - send diagnostic failed - sense data available	Before replacing any system components, refer to the notes in error code 21A0 0001. Replace the SCSI device.
21A0 0004	SCSI DASD - send diagnostic failed - DevOfl cmd	Before replacing any system components, refer to the notes in error code 21A0 0001. Replace the SCSI device.
21E0 0001	SCSI tape - test unit ready failed - hardware error	Before replacing any system components, refer to the notes in error code 21A0 0001. 1. Replace the SCSI device. 2. Replace the SCSI cable. 3. Replace the SCSI controller.
21E0 0002	SCSI tape - test unit ready failed - sense data available	Before replacing any system components, refer to the notes in error code 21A0 0001. 1. Replace the media. 2. Replace the SCSI device.

Table 15. Firmware error codes (continued)

Error code	Description	Action or possible failing FRU
21E0 0003	SCSI tape - send diagnostic failed - sense data available	Before replacing any system components, refer to the notes in error code 21A0 0001. Replace the SCSI device.
21E0 0004	SCSI tape - send diagnostic failed - DevOfl cmd	Before replacing any system components, refer to the notes in error code 21A0 0001. Replace the SCSI device.
21ED 0001	SCSI changer - test unit ready failed - hardware error	Before replacing any system components, refer to the notes in error code 21A0 0001. 1. Replace the SCSI device. 2. Replace the SCSI cable. 3. Replace the SCSI controller.
21ED 0002	SCSI changer - test unit ready failed - sense data available	Before replacing any system components, refer to the notes in error code 21A0 0001. 1. Replace the media. 2. Replace the SCSI device.
21ED 0003	SCSI changer - send diagnostic failed - sense data available	Before replacing any system components, refer to the notes in error code 21A0 0001. Replace the SCSI device.
21ED 0004	SCSI changer - send diagnostic failed - DevOfl cmd	Before replacing any system components, refer to the notes in error code 21A0 0001. Replace the SCSI device.
21EE 0001	Undetermined SCSI device type - test unit ready failed - hardware error	Before replacing any system components, refer to the notes in error code 21A0 0001. 1. Replace the SCSI device. 2. Replace the SCSI cable. 3. If the missing SCSI devices are connected to the same backplane, replace the SCSI backplane. 4. Replace the SCSI controller.
21EE 0002	Undetermined SCSI device type - test unit ready failed - sense data available	Before replacing any system components, refer to the notes in error code 21A0 0001. 1. Replace the media (removable media devices). 2. Replace the SCSI device.
21EE 0003	Undetermined SCSI device type - send diagnostic failed - sense data available	Before replacing any system components, refer to the notes in error code 21A0 0001. Replace the SCSI device.
21EE 0004	Undetermined SCSI device type - send diagnostic failed - DevOfl cmd	Before replacing any system components, refer to the notes in error code 21A0 0001. Replace the SCSI device.

Table 15. Firmware error codes (continued)

Error code	Description	Action or possible failing FRU
21F0 0001	SCSI CD-ROM - test unit ready failed - hardware error	Before replacing any system components, refer to the notes in error code 21A0 0001. 1. Replace the SCSI device. 2. Replace the SCSI cable. 3. Replace the SCSI controller.
21F0 0002	SCSI CD-ROM - test unit ready failed - sense data available	Before replacing any system components, refer to the notes in error code 21A0 0001. 1. Replace the media. 2. Replace the SCSI device.
21F0 0003	SCSI CD-ROM - send diagnostic failed - sense data available	Before replacing any system components, refer to the notes in error code 21A0 0001. Replace the SCSI device.
21F0 0004	SCSI CD-ROM - send diagnostic failed - DevOfl cmd	Before replacing any system components, refer to the notes in error code 21A0 0001. Replace the SCSI device.
21F2 0001	SCSI read/write optical - test unit ready failed - hardware error	Before replacing any system components, refer to the notes in error code 21A0 0001. 1. Replace the SCSI device. 2. Replace the SCSI cable. 3. Replace the SCSI controller.
21F2 0002	SCSI read/write optical - test unit ready failed - sense data available	Before replacing any system components, refer to the notes in error code 21A0 0001. 1. Replace the media. 2. Replace the SCSI device.
21F2 0003	SCSI read/write optical - send diagnostic failed-sense data available	Before replacing any system components, refer to the notes in error code 21A0 0001. Replace the SCSI device.
21F2 0004	SCSI read/write optical - send diagnostic failed-DevOfl cmd	Before replacing any system components, refer to the notes in error code 21A0 0001. Replace the SCSI device.
2200 0001	PCI Ethernet BNC/RJ-45 or PCI Ethernet AUI/RJ-45 adapter internal wrap test failure	Replace the adapter. See “Checkpoint and error code index” on page 127 for location code information related to this error. Also see “Replacing a PCI-X adapter” on page 126.
2200 1001	10/100 Mbps Ethernet PCI Adapter internal wrap test failure	Replace the adapter. See “Checkpoint and error code index” on page 127 for location code information related to this error. Also see “Replacing a PCI-X adapter” on page 126.
2200 1002	10/100 Mbps Ethernet PCI adapter failure	Replace the adapter. See “Checkpoint and error code index” on page 127 for location code information related to this error. Also see “Replacing a PCI-X adapter” on page 126.

Table 15. Firmware error codes (continued)

Error code	Description	Action or possible failing FRU
2201 0001	PCI Auto LANstreamer token-ring adapter failed to complete hardware initialization.	Replace the adapter. See “Checkpoint and error code index” on page 127 for location code information related to this error. Also see “Replacing a PCI-X adapter” on page 126.
2201 1001	PCI token-ring adapter failed to complete hardware initialization.	Replace the adapter. See “Checkpoint and error code index” on page 127 for location code information related to this error. Also see “Replacing a PCI-X adapter” on page 126.
25A0 0001	Cache L2 controller failure	1. Replace the processor card. Location code: U0.1-P1-C1 2. Replace the CEC backplane assembly. Location code: U0.1-P1.
25A1 0001	Cache L2 SRAM failure	1. Replace the processor card. Location code: U0.1-P1-C1
25A8 0xxx	**Description:** NVRAM problems **Action:** Errors reported against NVRAM can be caused by low battery voltage and (more rarely) power outages that occur during normal system usage. With the exception of the 25A80000 error, these errors are warnings that the NVRAM data content had to be reestablished and do not require any FRU replacement unless the error is persistent. When one of these errors occurs, any system customization (for example, boot device list) information has been lost, the system might need to be reconfigured. If the error is persistent, replace CEC backplane Location code: U0.1-P1	
25A8 0000	Initialization failed; device test failed.	Refer to Action under error code 25A80xxx.
25A8 0100	NVRAM data validation check failed.	Turn off, and then turn on system unit and retry the operation before replacing any system component. Refer to Action under error code 25A80xxx.
25A8 0201	Unable to expand target partition - saving configuration variable.	Refer to Action under error code 25A80xxx.
25A8 0202	Unable to expand target partition - writing error log entry.	Refer to Action under error code 25A80xxx.
25A8 0203	Unable to expand target partition - writing VPD data.	Refer to Action under error code 25A80xxx.
25A8 0210	Setenv/$Setenv parameter error - name contains a null character.	Refer to Action under error code 25A80xxx.
25A8 0211	Setenv/$Setenv parameter error - value contains a null character.	Refer to Action under error code 25A80xxx.

Table 15. Firmware error codes (continued)

Error code	Description	Action or possible failing FRU
25A8 0998	**Description:** NVRAMRC script evaluation error - command line execution error **Action:** Execution of a command line within the nvram configuration variable "nvramrc" (script) resulted in a "throw" being executed. This script can be modified by the system firmware **SMS** utilities, the operating system, PCI adapter ROM code or utility, or an operator (using the open firmware script editing command **nvedit**). It might not be possible to resolve the problem without a detailed analysis of the nvram script, the current system configuration, and device tree contents. 1. The problem can be caused by a SCSI adapter that no longer appears in the system because the SCSI bus ID has been changed from the default setting. This can be caused either by removing a SCSI adapter, or a problem with a SCSI adapter. a. Select the SCSI ID utility from the **SMS** menus. 1) Verify the list of SCSI controllers and adapters. If the list is not correct, suspect a problem with the adapters installed but not listed. 2) Select the option to save the configuration information. 3) Restart the system. b. If the problem persists, boot the operating system and verify the SCSI bus IDs of any installed or available SCSI controllers (change as necessary), and restart the system. 2. Contact support support for further assistance.	
25A8 0999	NVRAMRC script evaluation error - stack unbalanced on completion	This is a firmware debug environment error. There is no user action or FRU replacement for this error.
25A8 0A00	Unable to retrieve NVRAM LPAR table information.	Refer to the actions column for error code 25A8 0xxx.
Memory error notes Use the location code obtained from the SMS Error Log utility (described in "Error log utility procedure" on page 228) to identify which DIMM (or DIMM quad) the error is reported against. Memory error codes are in the form **25Cyyxxx** where **yy** indicates DIMM present detect-bits (PD-bits) and **xxx** indicates the last 3 digits of the error code. See "DIMM present detect bits (PD-bits)" on page 228 for information on how to interpret PD bits.		
25B0 0001	No DIMMs detected.	Go to "MAP 1240: Memory Problem Resolution" on page 52.
25B0 0004	Multiple DIMMs failed a memory test.	Go to "MAP 1240: Memory Problem Resolution" on page 52.
25Cy y001	DIMM is not supported.	Replace unsupported DIMMs. **Note:** DIMMs must be replaced with a supported type of DIMM. If an unsupported type of DIMM is replaced with the same unsupported type, the error persists. See the ″Memory Error Notes″ on page 148 for more information.
25Cy y002	DIMM fails memory test.	Go to "MAP 1240: Memory Problem Resolution" on page 52.

Table 15. Firmware error codes (continued)

Error code	Description	Action or possible failing FRU
2602 0001	**Description:** Invalid PCI adapter vendor ID **Action:** **Attention:** Before moving the adapter to another slot, verify with the customer or system administrator that the slot that the adapter is being moved to is available to the partition in which the adapter presently resides. 1. Move adapter to another slot (behind a different PCI bus). 2. Check for available firmware updates for adapter. Apply update if available. 3. Run diagnostics on the adapter. Replace if indicated. 4. Replace adapter. 5. Check for system firmware updates. Apply update if available. 6. If the card is in the system drawer, replace the PCI riser card, location: U0.1-P2. If the card is in an I/O subsystem, replace the I/O backplane that contains the slot in which the adapter was originally installed, location: U0.dd-P1.	
2602 0002	**Description:** Invalid PCI adapter device ID **Action:** **Attention:** Before moving the adapter to another slot, verify with the customer or system administrator that the slot that the adapter is being moved to is available to the partition in which the adapter presently resides. 1. Move adapter to another slot (behind a different PCI bus). 2. Check for available firmware updates for adapter. Apply update if available. 3. Run diagnostics on the adapter. Replace if indicated. 4. Replace adapter. 5. Check for system firmware updates. Apply update if available. 6. If the card is in the system drawer, replace the PCI riser card, location: U0.1-P2. If the card is in an I/O subsystem, replace the I/O backplane that contains the slot in which the adapter was originally installed, location: U0.dd-P1.	
2602 0007	**Description:** PCI device I/O or memory space request could not be satisfied **Action:** 1. If the location code identifies a slot: a. Reseat the adapter and reboot the system. b. Replace the adapter. c. Check for system firmware update. Apply update if available. 2. If the location code identifies an I/O planar: a. Check for system firmware updates. Apply update if available. b. Replace the I/O planar. 3. Call service support.	

Table 15. Firmware error codes (continued)

Error code	Description	Action or possible failing FRU
2602 0008	**Description:** PCI device Fcode evaluation error **Action:** 1. If the location code identifies a slot: a. Check for adapter firmware updates. Apply update if available. b. Replace the adapter. c. Check for system firmware updates. Apply update if available. 2. If the location code identifies an I/O planar: a. Check for system firmware updates. Apply update if available. b. Replace the I/O planar. 3. Call service support.	
2602 0010	**Description:** PCI probe error, bridge in freeze state **Action:** If the location code identifies a slot, do the following: 1. Check for system firmware updates. Apply update if available. 2. Check the cabling to the adapter, in particular, the adapters that have serial ports. Serial ports might require null modems or special cabling configurations to avoid connecting driver outputs together. This might create a PCI slot power problem and force the adapter to be deconfigured. 3. Use the hot-plug service aid to reseat the card specified by the location code. See "PCI-X adapter replacement" on page 325. If reseating the adapter fixes the problem, go to MAP 410: "Repair Checkout" in the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems* manual. If the problem is not resolved, continue. 4. **Is there an empty slot available into which the adapter could be plugged?** **YES** Use the hot-plug task to move the adapter card to another slot behind a different PCI bridge. The "System logic flow" on page 16 identifies the PCI bridges and the associated slots. See "PCI-X adapter removal" on page 328 when removing the adapter, and "PCI-X adapter installation" on page 329 when installing the card in the new slot. If the card is successfully reconfigured in the new slot (behind a different PCI bridge), the slot in which the card was originally plugged is bad. Replace the PCI riser card, location: U0.1-P2 or U0.dd-P1. If the adapter does not reconfigure successfully in the new slot, replace the adapter. **NO** Replace the adapter. If the problem is not resolved, replace the PCI riser card or I/O planar in which the card was installed, location: U0.1-P2 or U0.dd-P1. 5. Go to "MAP 1542: I/O Problem Isolation" on page 72. If the location code does not identify a slot or PCI adapter, or no location code is specified, go to "MAP 1542: I/O Problem Isolation" on page 72.	
2602 0011	**Description:** PCI probe error; bridge is not usable. **Action:** If the location code identifies a slot: 1. Check the cabling to the adapter, in particular, the adapters that have serial ports. Serial ports might require null modems or special cabling configurations to avoid connecting driver outputs. This might create a PCI-slot power problem and force the adapter to be deconfigured. 2. Move adapter to another slot (behind a different PCI bus). 3. Check for available firmware updates for adapter. Apply update if available. 4. Replace the adapter. 5. Check for system firmware updates. Apply update if available. 6. If the card is in the system drawer, replace the PCI riser card, location: U0.1-P2.	

Table 15. Firmware error codes (continued)

Error code	Description	Action or possible failing FRU
2602 0012	**Description:** PCI device run-time error; bridge in freeze state. **Action:** If the location code identifies a slot: 1. Check the cabling to the adapter, in particular, the adapters that have serial ports. Serial ports might require null modems or special cabling configurations to avoid connecting driver outputs. This might create a PCI-slot power problem and force the adapter to be deconfigured. 2. Move adapter to another slot (behind a different PCI bus). 3. Check for available firmware updates for adapter. Apply update if available. 4. Replace the adapter. 5. Check for system firmware updates. Apply update if available. 6. If the card is in the system drawer, replace the PCI riser card, location: U0.1-P2.	
2680 0Axy	MX-PCI bridge BIST failure	Call service support or: 1. Replace the part identified by the location code associated with this error code. 2. If the location code associated with this error code identifies an adapter, and replacing the adapter does not correct the problem, replace the PCI riser card Location code: U0.1-P2 or U0.dd-P1
2680 0Cxx	Machine check occurred	1. Replace the part identified by the location code associated with this error code. 2. If the location code associated with this error code identifies an adapter, and replacing the adapter does not correct the problem, replace the PCI riser card Location code: U0.1-P2 or U0.dd-P1
2680 0Dxx	Machine check occurred; unable to isolate to a single device.	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
27A0 0001	Error obtaining external RIO cable IDs	1. Check for system firmware updates. 2. Replace the I/O subsystem planar specified by the location code.
2803 0xxx	**Description:** Real time clock (RTC) errors **Action:** 1. Errors reported against the real-time clock can be caused by low battery voltage and (more rarely) power outages that occur during normal system usage. These errors are warnings that the real-time clock data content needs to be reestablished and does not require any FRU replacement unless the error is persistent. When one of these errors occurs, the time and date information has been lost. To set or restore the time and date, use the operating system facility. 2. If the error is persistent, replace the battery. Location code: U0.1-P1-V3 3. If the error is persistent after the battery is replaced, replace the CEC backplane. Location code: U0.1-P1	
2803 0001	RTC not updating - RTC initialization required	1. Set time and date. 2. Refer to Action under error code 2803 0xxx.
2803 0002	Bad time or date values	1. Set time and date. 2. Refer to Action under error code 2803 0xxx.

Table 15. Firmware error codes (continued)

Error code	Description	Action or possible failing FRU
2803 0003	RTC not updating - not correctable	Replace CEC backplane. Location code: U0.1-P1
2803 0004	RTC operating mode parameters (for example, data mode) changed.	1. Set time and date. 2. Refer to Action under error code 28030001.
2803 0005	RTC battery error	1. Replace the battery. **Note:** Password, time, and date need to be set. 2. Refer to Action under error code 2803 0001.
2803 0010	The real-time clock cannot be protected in the LPAR environment.	1. Check for system firmware updates. Apply update if available. 2. Call service support.
2803 F003	Real-time clock not updating - not correctable (detected by hypervisor).	Replace the CEC backplane. Location code: U0.1-P1
2900 0002	Keyboard or mouse controller failed self-test.	Replace CEC backplane. Location code: U0.1-P1
29A0 0003	Keyboard not present or detected.	Replace CEC backplane. Location code: U0.1-P1
29A0 0004	Keyboard stuck key detected.	Replace CEC backplane. Location code: U0.1-P1
29B0 0004	Mouse not present or detected.	Replace CEC backplane. Location code: U0.1-P1
2B20 0011	Processor is manually disabled	Use the service processor menus to re-enable the processor and reboot the system.
2B20 0022	Processor is deconfigured by the system.	The processor has previously failed BIST or POST. Replace the processor card indicated by the location code associated with the error code in the error log.
2B20 0031	Processor is failing POST.	Replace the processor card indicated by the location code associated with the error code in the error log.
2B20 0042	Unknown processor card	Remove the unknown or unsupported processor card.
2B20 8880	Unrecoverable internal hardware error	Replace the FRU indicated in the service processor error log entry. If the system has been rebooted, run diagnostics and look for an operating system error log entry in which the description says cache or cache controller error.
2B20 8881	Software error	Call service support.
2B20 8882	Software error	Call service support.
2B20 8883	Software error	Call service support.
2B20 8884	Unrecoverable processor subsystem error	Replace the FRU indicated in the service processor error log entry. If the system has been rebooted, run diagnostics and look for an operating system error log entry in which the description says cache or cache controller error. Replace the FRUs listed in this entry.

Table 15. Firmware error codes (continued)

Error code	Description	Action or possible failing FRU
2B20 8885	Unrecoverable internal hardware error	Run diagnostics. Look for an operating system error log entry in which the description says I/O bus time out, access, or other error or I/O bridge/device internal error. Replace the FRUs listed in this entry.
2B20 8888	Operating system termination request received	Informational message.
2B2x 00EE	**Description:** An exception error has been reported on a global processor. **Action:** The type of interrupt that caused the exception is specified by the x as follows: **0:** Unknown interrupt **1:** System reset interrupt (SRI) **2.** Machine check interrupt (MCI) **3.** Data storage interrupt (DSI) **4.** Instruction storage interrupt (ISI) **5.** External interrupt (EXI) **6.** Alignment interrupt (ALI) **7.** Program interrupt (SRI) **8.** Floating unavailable interrupt (FUI) 1. Check for system firmware updates. Apply update if available. 2. Call service support.	
2BA0 0000	Service processor POST failure	Replace CEC backplane. Location code: U0.1-P1
2BA0 0012	Service processor reports self-test failure.	Replace CEC backplane. Location code: U0.1-P1
2BA0 0013	Service processor reports bad NVRAM CRC.	Refer to the actions for error code 25A8 0xxx.
2BA0 0017	Service processor reports bad or low battery.	1. Replace the battery. 2. Refer to the actions for error code 25A8 0xxx.
2BA0 0021	Open firmware mailbox call to activate attention LED failed.	Call service support.
2BA0 0041	Service processor VPD is corrupted.	Replace CEC backplane. Location code: U0.1-P1
2BA0 0071	VPD data is corrupted for processor card 1.	Replace the processor card. Location code: U0.1-P1-C1
2BA0 0073	VPD data is corrupted for processor card 2.	Replace the processor card. Location code: U0.1-P1-C2
2BA0 0080	Service processor hardware reset request failed.	1. Check for system firmware updates. Apply update if available. 2. Call service support.

Service processor error codes

Attention: Follow the procedure defined in the “Checkpoint and error code index” on page 127. If you replace FRUs or perform an action and the problem is still not corrected, go to “MAP 1548: Processor Subsystem Problem Isolation” on page 77 unless otherwise indicated in the tables.

If you replace FRUs and the problem is corrected, go to “MAP 0410: Repair Checkout” on page 45.

Note: Not all service processor error codes are supported.

Table 16. Service processor error codes

Error code	Description	Action or possible failing FRU
4064 0001	Scan interface basic assurance tests detected a CEC backplane fault.	CEC backplane Location code: U0.1-P1
4064 0002	CEC backplane fault	CEC backplane Location code: U0.1-P1
4064 0003	Scan interface basic assurance tests detected processor fault.	Processor card Location code: U0.1-P1-C1
4064 0004	Processor fault	Processor card Location code: U0.1-P1-C2
4064 000E	Processor capacity card	Operator panel Location code: U0.1-L1
4064 0010	DIMM fault	DIMM Location code: U0.1-P1-C1-M8
4064 0011	DIMM fault	DIMM Location code: U0.1-P1-C1-M6
4064 0012	DIMM fault	DIMM Location code: U0.1-P1-C1-M1
4064 0013	DIMM fault	DIMM Location code: U0.1-P1-C1-M3
4064 0014	DIMM fault	DIMM Location code: U0.1-P1-C1-M7
4064 0015	DIMM fault	DIMM Location code: U0.1-P1-C1-M5
4064 0016	DIMM fault	DIMM Location code: U0.1-P1-C1-M2
4064 0017	DIMM fault	DIMM Location code: U0.1-P1-C1-M4
4064 0018	DIMM fault	DIMM Location code: U0.1-P1-C2-M8
4064 0019	DIMM fault	DIMM Location code: U0.1-P1-C2-M6
4064 001A	DIMM fault	DIMM Location code: U0.1-P1-C2-M1
4064 001B	DIMM fault	DIMM Location code: U0.1-P1-C2-M3
4064 001C	DIMM fault	DIMM Location code: U0.1-P1-C2-M7

Table 16. Service processor error codes (continued)

Error code	Description	Action or possible failing FRU
4064 001D	DIMM fault	DIMM Location code: U0.1-P1-C2-M5
4064 001E	DIMM fault	DIMM Location code: U0.1-P1-C2-M2
4064 001F	DIMM fault	DIMM Location code: U0.1-P1-C2-M4
4064 00B0	Bus controller failure	1. Check for system firmware updates. 2. PCI riser card Location code: U0.1-P2
4064 00B1	Bus controller failure	1. Check for system firmware updates. 2. PCI riser card Location code: U0.1-P2
4064 00B3	Processor/VPD problem detected	1. Check for system firmware updates. 2. Processor card 1 Location code: U0.1-P1-C1
4064 00B4	Processor/VPD problem detected	1. Check for system firmware updates. 2. Processor card 2 Location code: U0.1-P1-C2
4064 00B7	Insufficient hardware resources were detected to continue IPL of the system after processor subsystem testing and initialization was completed.	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
4064 00D1	Informational message	Informational message
4064 0100	Memory extender 0 on processor card 1	Processor card, Location code: U0.1-P1-C1
4064 0101	Memory extender 2 on processor card 1	Processor card, Location code: U0.1-P1-C1
4064 0130	Memory extender 0 on processor card 2	Processor card, Location code: U0.1-P1-C2
4064 0131	Memory extender 2 on processor card 2	Processor card, Location code: U0.1-P1-C2
4064 0A03	Reboot message on VPD channel 3 processor card 1. Reboot is necessary for run-time array gard to take effect.	Reboot the system in slow mode. Run diagnostics, and then go to ″MAP 0235: System Array Self-Repair Problem Resolution″ in the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*.
4064 0A04	Reboot message on VPD channel 4 processor card 2. Reboot is necessary for run-time array gard to take effect.	Reboot the system in slow mode. Run diagnostics, then go to ″MAP 0235: System Array Self-Repair Problem Resolution″ in the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*.
4064 0B00	Problem with internal RIO interface (I/O slot 0, I/O port 0)	CEC backplane, U0.1-P1.
4064 0B01	Problem with internal RIO interface (I/O slot 0, I/O port 1)	CEC backplane, U0.1-P1.

Table 16. Service processor error codes (continued)

Error code	Description	Action or possible failing FRU
4064 0B02	Problem with internal RIO interface (I/O slot 0, I/O port 2)	1. Check for system firmware updates. 2. Check the cabling between the CEC and the I/O subsystems. 3. CEC backplane, U0.1-P1. 4. Call service support.
4064 0B03	Problem with internal RIO interface (I/O slot 0, I/O port 3)	1. Check for system firmware updates. 2. Check the cabling between the CEC and the I/O subsystems. 3. CEC backplane, U0.1-P1. 4. Call service support.
4064 0B40	Problem with controller chip on CEC backplane	1. CEC backplane, U0.1-P1. 2. Call service support.
4064 0BF0	Problem with RIO interface (I/O slot 0, I/O port 3)	1. Check for system firmware updates. 2. Check the cabling between the CEC and the I/O subsystems. 3. CEC backplane, U0.1-P1. 4. Call service support.
4064 0C10	Processor 0 configuration error: VPD mismatch for processor card 0. (Service processor code problem.)	1. Check for system firmware updates. 2. Call service support.
4064 0C11	Processor 1 configuration error: VPD mismatch for processor card 1. (Service processor code problem.)	1. Check for system firmware updates. 2. Call service support.
4064 0CA5	Invalid system configuration	1. Check that the processor cards and DIMMs are properly installed and configured. 2. If there are any FRUs listed in the service processor error log entry, replace them one at a time. 3. Go to “MAP 1540: Problem Isolation Procedures” on page 69.
4064 0CA6	No usable memory left in the system. The system must be rebooted.	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4064 0CA9	Incorrect or incompatible DIMMs are installed.	Check that the DIMMs are properly configured and are the right type for the system.
4064 0CAA	System memory exceeds the limit for this system type and model.	Remove the DIMMs until the memory does not exceed the limit for this system type and model.
4064 0EA0	MOPS service processor code error.	1. Check for system firmware updates. 2. Call service support.
4064 0EA1	Operating system code on main processor	1. Check for operating system code updates. 2. If there are other symptoms, go (one symptom at a time) to the “Quick Entry MAP” on page 40 and follow the instructions. 3. Call service support.
4064 0EA2	PRD code on service processor error.	1. Check for system firmware updates. 2. Call service support.

Table 16. Service processor error codes (continued)

Error code	Description	Action or possible failing FRU
4064 0EA4	The service processor detected a problem, but was unable to isolate the source.	Call service support.
4064 0EAF	Service processor code and system type are unknown.	1. Check for system firmware updates. 2. Call service support.
4064 0EB0	JTAG problem	Go to "MAP 1541: JTAG Problem Isolation" on page 71.
4064 0EB1	Attention line 0 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
4064 0EB2	Attention line 1 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
4064 0EB3	Attention line 2 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
4064 0EB4	Attention line 3 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
4064 0EB5	Attention line 4 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
4064 0EB6	Attention line 5 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
4064 0EB7	Attention line 6 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
4064 0EB8	Attention line 7 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
4064 0EB9	Attention line 8 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
4064 0EBA	Attention line 9 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
4064 0EBB	Attention line 10 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
4064 0EBC	Attention line 11 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
4064 0EE1	Service processor firmware: invalid MRU to FRU mapping	1. Check for system firmware updates. 2. Call service support.
4064 0EE2	Service processor firmware fault	1. Check for system firmware updates. 2. Call service support.
4064 0EE5	Firmware error, no callout available	1. Check for system firmware updates. 2. Call service support.
4065 0001	Scan interface basic assurance tests detected a CEC backplane fault	CEC backplane Location code: U0.1-P1
4065 0002	CEC backplane fault	1. Check JTAG cable connections. 2. CEC backplane Location code: U0.1-P1
4065 0003	Scan interface basic assurance tests detected processor fault	1. Check JTAG cable connections. 2. Processor card Location code: U0.1-P1-C1

Table 16. Service processor error codes (continued)

Error code	Description	Action or possible failing FRU
4065 0004	Processor fault	1. Check JTAG cable connections. 2. Processor card Location code: U0.1-P1-C2
4065 000E	Processor capacity card	Operator panel Location code: U0.1-L1
4065 0010	DIMM fault	DIMM Location code: U0.1-P1-C1-M8
4065 0011	DIMM fault	DIMM Location code: U0.1-P1-C1-M6
4065 0012	DIMM fault	DIMM Location code: U0.1-P1-C1-M1
4065 0013	DIMM fault	DIMM Location code: U0.1-P1-C1-M3
4065 0014	DIMM fault	DIMM Location code: U0.1-P1-C1-M7
4065 0015	DIMM fault	DIMM Location code: U0.1-P1-C1-M5
4065 0016	DIMM fault	DIMM Location code: U0.1-P1-C1-M2
4065 0017	DIMM fault	DIMM Location code: U0.1-P1-C1-M4
4065 0018	DIMM fault	DIMM Location code: U0.1-P1-C2-M8
4065 0019	DIMM fault	DIMM Location code: U0.1-P1-C2-M6
4065 001A	DIMM fault	DIMM Location code: U0.1-P1-C2-M1
4065 001B	DIMM fault	DIMM Location code: U0.1-P1-C2-M3
4065 001C	DIMM fault	DIMM Location code: U0.1-P1-C2-M7
4065 001D	DIMM fault	DIMM Location code: U0.1-P1-C2-M5
4065 001E	DIMM fault	DIMM Location code: U0.1-P1-C2-M2
4065 001F	DIMM fault	DIMM Location code: U0.1-P1-C2-M4
4065 00B0	Bus controller failure	1. Check for system firmware updates. 2. PCI riser card Location code: U0.1-P2
4065 00B1	Bus controller failure	1. Check for system firmware updates. 2. PCI riser card Location code: U0.1-P2

Table 16. Service processor error codes (continued)

Error code	Description	Action or possible failing FRU
4065 00B3	Processor/VPD problem detected	1. Check for system firmware updates. 2. Processor card 1 Location code: U0.1-P1-C1
4065 00B4	Processor/VPD problem detected	1. Check for system firmware updates. 2. Processor card 2 Location code: U0.1-P1-C2
4065 00B7	Insufficient hardware resources were detected to continue IPL of the system after processor subsystem testing and initialization was completed.	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
4065 00D1	Informational message	Informational message
4065 0100	Memory extender 0 on processor card 1	Processor card, Location code: U0.1-P1-C1
4065 0101	Memory extender 2 on processor card 1	Processor card, Location code: U0.1-P1-C1
4065 0130	Memory extender 0 on processor card 2	Processor card, Location code: U0.1-P1-C2
4065 0131	Memory extender 2 on processor card 2	Processor card, Location code: U0.1-P1-C2
4065 0A03	Reboot message on VPD channel 3 processor card 1. Reboot is necessary for run-time array gard to take effect.	Reboot the system in slow mode. Run diagnostics, and then go to ″MAP 0235: System Array Self-Repair Problem Resolution″ in the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*.
4065 0A04	Reboot message on VPD channel 4 processor card 2. Reboot is necessary for run-time array gard to take effect.	Reboot the system in slow mode. Run diagnostics, then go to ″MAP 0235: System Array Self-Repair Problem Resolution″ in the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*.
4065 0B00	Problem with internal RIO interface (I/O slot 0, I/O port 0)	CEC backplane, U0.1-P1.
4065 0B01	Problem with internal RIO interface (I/O slot 0, I/O port 1)	CEC backplane, U0.1-P1.
4065 0B02	Problem with internal RIO interface (I/O slot 0, I/O port 2)	1. Check for system firmware updates. 2. Check the cabling between the CEC and the I/O subsystems. 3. CEC backplane, U0.1-P1. 4. Call service support.
4065 0B03	Problem with internal RIO interface (I/O slot 0, I/O port 3)	1. Check for system firmware updates. 2. Check the cabling between the CEC and the I/O subsystems. 3. CEC backplane, U0.1-P1. 4. Call service support.
4065 0B40	Problem with controller chip on CEC backplane	1. CEC backplane, U0.1-P1. 2. Call service support.

Table 16. Service processor error codes (continued)

Error code	Description	Action or possible failing FRU
4065 0BF0	Problem with RIO interface (I/O slot 0, I/O port 3)	1. Check for system firmware updates. 2. Check the cabling between the CEC and the I/O subsystems. 3. CEC backplane, U0.1-P1 4. Call service support.
4065 0C10	Processor 0 configuration error: VPD mismatch for processor card 0. (Service processor code problem.)	1. Check for system firmware updates. 2. Call service support.
4065 0C11	Proc 1 configuration error: VPD mismatch for processor card 1. (Service processor code problem.)	1. Check for system firmware updates. 2. Call service support.
4065 0CA5	Invalid system configuration	1. Check that the processor cards and DIMMs are properly installed and configured. 2. If there are any FRUs listed in the service processor error log entry, replace them one at a time. 3. Go to "MAP 1540: Problem Isolation Procedures" on page 69.
4065 0CA6	No usable memory left in the system. The system must be rebooted.	Go to "MAP 1240: Memory Problem Resolution" on page 52.
4065 0CA9	Incorrect or incompatible DIMMs are installed.	Check that the DIMMs are properly configured and are the right type for the system.
4065 0CAA	System memory exceeds the limit for this system type and model.	Remove the DIMMs until the memory does not exceed the limit for this system type and model.
4065 0EA0	MOPS service processor code error.	1. Check for system firmware updates. 2. Call service support.
4065 0EA1	Operating system code on main processor	1. Check for operating system code updates. 2. If there are other symptoms, go (one symptom at a time) to the "Quick Entry MAP" on page 40 and follow the instructions. 3. Call service support.
4065 0EA2	PRD code on service processor error.	1. Check for system firmware updates. 2. Call service support.
4065 0EA4	The service processor detected a problem, but was unable to isolate the source.	Contact next level of support.
4065 0EAF	Service processor code and system type are unknown.	1. Check for system firmware updates. 2. Call service support.
4065 0EB0	JTAG problem	Go to "MAP 1541: JTAG Problem Isolation" on page 71.
4065 0EB1	Attention line 0 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
4065 0EB2	Attention line 1 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
4065 0EB3	Attention line 2 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.

Table 16. Service processor error codes (continued)

Error code	Description	Action or possible failing FRU
4065 0EB4	Attention line 3 stuck fault	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
4065 0EB5	Attention line 4 stuck fault	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
4065 0EB6	Attention line 5 stuck fault	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
4065 0EB7	Attention line 6 stuck fault	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
4065 0EB8	Attention line 7 stuck fault	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
4065 0EB9	Attention line 8 stuck fault	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
4065 0EBA	Attention line 9 stuck fault	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
4065 0EBB	Attention line 10 stuck fault	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
4065 0EBC	Attention line 11 stuck fault	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
4065 0EE1	Service processor firmware: invalid MRU to FRU mapping	1. Check for system firmware updates. 2. Call service support.
4065 0EE2	Service processor firmware fault	1. Check for system firmware updates. 2. Call service support.
4065 0EE5	Firmware error, no callout available	1. Check for system firmware updates. 2. Call service support.
4066 0001	Scan interface basic assurance tests detected a CEC backplane fault	CEC backplane Location code: U0.1-P1
4066 0002	CEC backplane fault	1. Check JTAG cable connections. 2. CEC backplane Location code: U0.1-P1
4066 0003	Scan interface basic assurance tests detected processor fault	1. Check JTAG cable connections. 2. Processor card Location code: U0.1-P1-C1
4066 0004	Processor fault	1. Check JTAG cable connections. 2. Processor card Location code: U0.1-P1-C2
4066 000E	Processor capacity card	Operator panel Location code: U0.1-L1
4066 0010	DIMM fault	DIMM Location code: U0.1-P1-C1-M8
4066 0011	DIMM fault	DIMM Location code: U0.1-P1-C1-M6
4066 0012	DIMM fault	DIMM Location code: U0.1-P1-C1-M1

Table 16. Service processor error codes (continued)

Error code	Description	Action or possible failing FRU
4066 0013	DIMM fault	DIMM Location code: U0.1-P1-C1-M3
4066 0014	DIMM fault	DIMM Location code: U0.1-P1-C1-M7
4066 0015	DIMM fault	DIMM Location code: U0.1-P1-C1-M5
4066 0016	DIMM fault	DIMM Location code: U0.1-P1-C1-M2
4066 0017	DIMM fault	DIMM Location code: U0.1-P1-C1-M4
4066 0018	DIMM fault	DIMM Location code: U0.1-P1-C2-M8
4066 0019	DIMM fault	DIMM Location code: U0.1-P1-C2-M6
4066 001A	DIMM fault	DIMM Location code: U0.1-P1-C2-M1
4066 001B	DIMM fault	DIMM Location code: U0.1-P1-C2-M3
4066 001C	DIMM fault	DIMM Location code: U0.1-P1-C2-M7
4066 001D	DIMM fault	DIMM Location code: U0.1-P1-C2-M5
4066 001E	DIMM fault	DIMM Location code: U0.1-P1-C2-M2
4066 001F	DIMM fault	DIMM Location code: U0.1-P1-C2-M4
4066 00B0	Bus controller failure	1. Check for system firmware updates. 2. PCI riser card Location code: U0.1-P2
4066 00B1	Bus controller failure	1. Check for system firmware updates. 2. PCI riser card Location code: U0.1-P2
4066 00B3	Processor/VPD problem detected	1. Check for system firmware updates. 2. Processor card 1 Location code: U0.1-P1-C1
4066 00B4	Processor/VPD problem detected	1. Check for system firmware updates. 2. Processor card 2 Location code: U0.1-P1-C2
4066 00B7	Insufficient hardware resources were detected to continue IPL of the system after processor subsystem testing and initialization was completed.	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
4066 00D1	Informational message	Informational message
4066 0100	Memory extender 0 on processor card 1	Processor card, Location code: U0.1-P1-C1

Table 16. Service processor error codes (continued)

Error code	Description	Action or possible failing FRU
4066 0101	Memory extender 2 on processor card 1	Processor card, Location code: U0.1-P1-C1
4066 0130	Memory extender 0 on processor card 2	Processor card, Location code: U0.1-P1-C2
4066 0131	Memory extender 2 on processor card 2	Processor card, Location code: U0.1-P1-C2
4066 0A03	Reboot message on VPD channel 3 processor card 1. Reboot is necessary for run-time array gard to take effect.	Reboot the system in slow mode. Run diagnostics, and then go to ″MAP 0235: System Array Self-Repair Problem Resolution″ in the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*.
4066 0A04	Reboot message on VPD channel 4 processor card 2. Reboot is necessary for run-time array gard to take effect.	Reboot the system in slow mode. Run diagnostics, then go to ″MAP 0235: System Array Self-Repair Problem Resolution″ in the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*.
4066 0B00	Problem with internal RIO interface (I/O slot 0, I/O port 0)	CEC backplane, U0.1-P1
4066 0B01	Problem with internal RIO interface (I/O slot 0, I/O port 1)	CEC backplane, U0.1-P1
4066 0B02	Problem with internal RIO interface (I/O slot 0, I/O port 2)	1. Check for system firmware updates. 2. Check the cabling between the CEC and the I/O subsystems. 3. CEC backplane, U0.1-P1 4. Call service support.
4066 0B03	Problem with internal RIO interface (I/O slot 0, I/O port 3)	1. Check for system firmware updates. 2. Check the cabling between the CEC and the I/O subsystems. 3. CEC backplane, U0.1-P1 4. Call service support.
4066 0B40	Problem with controller chip on CEC backplane	1. CEC backplane, U0.1-P1. 2. Call service support.
4066 0BF0	Problem with RIO interface (I/O slot 0, I/O port 3)	1. Check for system firmware updates. 2. Check the cabling between the CEC and the I/O subsystems. 3. CEC backplane, U0.1-P1. 4. Call service support.
4066 0C10	Processor 0 configuration error: VPD mismatch for processor card 0. (Service processor code problem.)	1. Check for system firmware updates. 2. Call service support.
4066 0C11	Processor 1 configuration error: VPD mismatch for processor card 1. (Service processor code problem.)	1. Check for system firmware updates. 2. Call service support.

Table 16. Service processor error codes (continued)

Error code	Description	Action or possible failing FRU
4066 0CA5	Invalid system configuration	1. Check that the processor cards and DIMMs are properly installed and configured. 2. If there are any FRUs listed in the service processor error log entry, replace them one at a time. 3. Go to "MAP 1540: Problem Isolation Procedures" on page 69.
4066 0CA6	No usable memory left in the system. The system must be rebooted.	Go to "MAP 1240: Memory Problem Resolution" on page 52.
4066 0CA9	Incorrect or incompatible DIMMs are installed.	Check that the DIMMs are properly configured and are the right type for the system.
4066 0CAA	System memory exceeds the limit for this system type and model.	Remove the DIMMs until the memory does not exceed the limit for this system type and model.
4066 0EA0	MOPS service processor code error.	1. Check for system firmware updates. 2. Call service support.
4066 0EA1	Operating system code on main processor	1. Check for operating system code updates. 2. If there are other symptoms, go (one symptom at a time) to the "Quick Entry MAP" on page 40 and follow the instructions. 3. Call service support.
4066 0EA2	PRD code on service processor error.	1. Check for system firmware updates. 2. Call service support.
4066 0EA4	The service processor detected a problem, but was unable to isolate the source.	Contact next level of support.
4066 0EAF	Service processor code and system type are unknown.	1. Check for system firmware updates. 2. Call service support.
4066 0EB0	JTAG problem	Go to "MAP 1541: JTAG Problem Isolation" on page 71.
4066 0EB1	Attention line 0 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
4066 0EB2	Attention line 1 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
4066 0EB3	Attention line 2 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
4066 0EB4	Attention line 3 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
4066 0EB5	Attention line 4 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
4066 0EB6	Attention line 5 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
4066 0EB7	Attention line 6 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
4066 0EB8	Attention line 7 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.

Table 16. Service processor error codes (continued)

Error code	Description	Action or possible failing FRU
4066 0EB9	Attention line 8 stuck fault	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
4066 0EBA	Attention line 9 stuck fault	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
4066 0EBB	Attention line 10 stuck fault	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
4066 0EBC	Attention line 11 stuck fault	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
4066 0EE1	Service processor firmware: invalid MRU to FRU mapping	1. Check for system firmware updates. 2. Call service support.
4066 0EE2	Service processor firmware fault	1. Check for system firmware updates. 2. Call service support.
4066 0EE5	Firmware error, no callout available	1. Check for system firmware updates. 2. Call service support.
4067 0001	Scan interface basic assurance tests detected a CEC backplane fault.	CEC backplane Location code: U0.1-P1
4067 0002	CEC backplane fault	1. Check JTAG cable connections. 2. CEC backplane Location code: U0.1-P1
4067 0003	Scan interface basic assurance tests detected processor fault.	1. Check JTAG cable connections. 2. Processor card Location code: U0.1-P1-C1
4067 0004	Processor fault	1. Check JTAG cable connections. 2. Processor card Location code: U0.1-P1-C2
4067 000E	Processor capacity card	Operator panel Location code: U0.1-L1
4067 0010	DIMM fault	DIMM Location code: U0.1-P1-C1-M8
4067 0011	DIMM fault	DIMM Location code: U0.1-P1-C1-M6
4067 0012	DIMM fault	DIMM Location code: U0.1-P1-C1-M1
4067 0013	DIMM fault	DIMM Location code: U0.1-P1-C1-M3
4067 0014	DIMM fault	DIMM Location code: U0.1-P1-C1-M7
4067 0015	DIMM fault	DIMM Location code: U0.1-P1-C1-M5
4067 0016	DIMM fault	DIMM Location code: U0.1-P1-C1-M2
4067 0017	DIMM fault	DIMM Location code: U0.1-P1-C1-M4

Table 16. Service processor error codes (continued)

Error code	Description	Action or possible failing FRU
4067 0018	DIMM fault	DIMM Location code: U0.1-P1-C2-M8
4067 0019	DIMM fault	DIMM Location code: U0.1-P1-C2-M6
4067 001A	DIMM fault	DIMM Location code: U0.1-P1-C2-M1
4067 001B	DIMM fault	DIMM Location code: U0.1-P1-C2-M3
4067 001C	DIMM fault	DIMM Location code: U0.1-P1-C2-M7
4067 001D	DIMM fault	DIMM Location code: U0.1-P1-C2-M5
4067 001E	DIMM fault	DIMM Location code: U0.1-P1-C2-M2
4067 001F	DIMM fault	DIMM Location code: U0.1-P1-C2-M4
4067 00B0	Bus controller failure	1. Check for system firmware updates. 2. PCI riser card Location code: U0.1-P2
4067 00B1	Bus controller failure	1. Check for system firmware updates. 2. PCI riser card Location code: U0.1-P2
4067 00B3	Processor/VPD problem detected	1. Check for system firmware updates. 2. Processor card 1 Location code: U0.1-P1-C1
4067 00B4	Processor/VPD problem detected	1. Check for system firmware updates. 2. Processor card 2 Location code: U0.1-P1-C2
4067 00B7	Insufficient hardware resources were detected to continue IPL of the system after processor subsystem testing and initialization was completed.	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
4067 00D1	Informational message	Informational message
4067 0100	Memory extender 0 on processor card 1	Processor card, Location code: U0.1-P1-C1
4067 0101	Memory extender 2 on processor card 1	Processor card, Location code: U0.1-P1-C1
4067 0130	Memory extender 0 on processor card 2	Processor card, Location code: U0.1-P1-C2
4067 0131	Memory extender 2 on processor card 2	Processor card, Location code: U0.1-P1-C2
4067 0A03	Reboot message on VPD channel 3 processor card 1. Reboot is necessary for run-time array gard to take effect.	Reboot the system in slow mode. Run diagnostics, and then go to ″MAP 0235: System Array Self-Repair Problem Resolution″ in the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*.

Table 16. Service processor error codes (continued)

Error code	Description	Action or possible failing FRU
4067 0A04	Reboot message on VPD channel 4 processor card 2. Reboot is necessary for run-time array gard to take effect.	Reboot the system in slow mode. Run diagnostics, then go to ″MAP 0235: System Array Self-Repair Problem Resolution″ in the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*.
4067 0B00	Problem with internal RIO interface (I/O slot 0, I/O port 0)	CEC backplane, U0.1-P1
4067 0B01	Problem with internal RIO interface (I/O slot 0, I/O port 1)	CEC backplane, U0.1-P1
4067 0B02	Problem with internal RIO interface (I/O slot 0, I/O port 2)	1. Check for system firmware updates. 2. Check the cabling between the CEC and the I/O subsystems. 3. CEC backplane, U0.1-P1 4. Call service support.
4067 0B03	Problem with internal RIO interface (I/O slot 0, I/O port 3)	1. Check for system firmware updates. 2. Check the cabling between the CEC and the I/O subsystems. 3. CEC backplane, U0.1-P1 4. Call service support.
4067 0B40	Problem with controller chip on CEC backplane	1. CEC backplane, U0.1-P1. 2. Call service support.
4067 0BF0	Problem with RIO interface (I/O slot 0, I/O port 3)	1. Check for system firmware updates. 2. Check the cabling between the CEC and the I/O subsystems. 3. CEC backplane, U0.1-P1 4. Call service support.
4067 0C10	Processor 0 configuration error: VPD mismatch for processor card 0. (Service processor code problem.)	1. Check for system firmware updates. 2. Call service support.
4067 0C11	Processor 1 configuration error: VPD mismatch for processor card 1. (Service processor code problem.)	1. Check for system firmware updates. 2. Call service support.
4067 0CA5	Invalid system configuration	1. Check that the processor cards and DIMMs are properly installed and configured. 2. If there are any FRUs listed in the service processor error log entry, replace them one at a time. 3. Go to “MAP 1540: Problem Isolation Procedures” on page 69.
4067 0CA6	No usable memory left in the system. The system must be rebooted.	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4067 0CA9	Incorrect or incompatible DIMMs are installed.	Check that the DIMMs are properly configured and are the right type for the system.
4067 0CAA	System memory exceeds the limit for this system type and model.	Remove the DIMMs until the memory does not exceed the limit for this system type and model.

Table 16. Service processor error codes (continued)

Error code	Description	Action or possible failing FRU
4067 0EA0	MOPS service processor code error.	1. Check for system firmware updates. 2. Call service support.
4067 0EA1	Operating system code on main processor	1. Check for operating system code updates. 2. If there are other symptoms, go (one symptom at a time) to the "Quick Entry MAP" on page 40 and follow the instructions. 3. Call service support.
4067 0EA2	PRD code on service processor error.	1. Check for system firmware updates. 2. Call service support.
4067 0EA4	The service processor detected a problem but was unable to isolate the source.	Contact next level of support.
4067 0EAF	Service processor code and system type are unknown.	1. Check for system firmware updates. 2. Call service support.
4067 0EB0	JTAG problem	Go to "MAP 1541: JTAG Problem Isolation" on page 71.
4067 0EB1	Attention line 0 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
4067 0EB2	Attention line 1 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
4067 0EB3	Attention line 2 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
4067 0EB4	Attention line 3 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
4067 0EB5	Attention line 4 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
4067 0EB6	Attention line 5 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
4067 0EB7	Attention line 6 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
4067 0EB8	Attention line 7 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
4067 0EB9	Attention line 8 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
4067 0EBA	Attention line 9 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
4067 0EBB	Attention line 10 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
4067 0EBC	Attention line 11 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
4067 0EE1	Service processor firmware: invalid MRU to FRU mapping	1. Check for system firmware updates. 2. Call service support.
4067 0EE2	Service processor firmware fault	1. Check for system firmware updates. 2. Call service support.

Table 16. Service processor error codes (continued)

Error code	Description	Action or possible failing FRU
4067 0EE5	Firmware error, no callout available	1. Check for system firmware updates. 2. Call service support.
4068 0001	Scan interface basic assurance tests detected a CEC backplane fault.	CEC backplane Location code: U0.1-P1
4068 0002	CEC backplane fault	1. Check JTAG cable connections 2. CEC backplane Location code: U0.1-P1
4068 0003	Scan interface basic assurance tests detected processor fault.	1. Check JTAG cable connections. 2. Processor card Location code: U0.1-P1-C1
4068 0004	Processor fault	1. Check JTAG cable connections. 2. Processor card Location code: U0.1-P1-C2
4068 000E	Processor capacity card	Operator panel Location code: U0.1-L1
4068 0010	DIMM fault	DIMM Location code: U0.1-P1-C1-M8
4068 0011	DIMM fault	DIMM Location code: U0.1-P1-C1-M6
4068 0012	DIMM fault	DIMM Location code: U0.1-P1-C1-M1
4068 0013	DIMM fault	DIMM Location code: U0.1-P1-C1-M3
4068 0014	DIMM fault	DIMM Location code: U0.1-P1-C1-M7
4068 0015	DIMM fault	DIMM Location code: U0.1-P1-C1-M5
4068 0016	DIMM fault	DIMM Location code: U0.1-P1-C1-M2
4068 0017	DIMM fault	DIMM Location code: U0.1-P1-C1-M4
4068 0018	DIMM fault	DIMM Location code: U0.1-P1-C2-M8
4068 0019	DIMM fault	DIMM Location code: U0.1-P1-C2-M6
4068 001A	DIMM fault	DIMM Location code: U0.1-P1-C2-M1
4068 001B	DIMM fault	DIMM Location code: U0.1-P1-C2-M3
4068 001C	DIMM fault	DIMM Location code: U0.1-P1-C2-M7
4068 001D	DIMM fault	DIMM Location code: U0.1-P1-C2-M5
4068 001E	DIMM fault	DIMM Location code: U0.1-P1-C2-M2

Table 16. Service processor error codes (continued)

Error code	Description	Action or possible failing FRU
4068 001F	DIMM fault	DIMM Location code: U0.1-P1-C2-M4
4068 00B0	Bus controller failure	1. Check for system firmware updates. 2. PCI riser card Location code: U0.1-P2
4068 00B1	Bus controller failure	1. Check for system firmware updates. 2. PCI riser card Location code: U0.1-P2
4068 00B3	Processor/VPD problem detected	1. Check for system firmware updates. 2. Processor card 1 Location code: U0.1-P1-C1
4068 00B4	Processor/VPD problem detected	1. Check for system firmware updates. 2. Processor card 2 Location code: U0.1-P1-C2
4068 00B7	Insufficient hardware resources were detected to continue IPL of the system after processor subsystem testing and initialization was completed.	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
4068 00D1	Informational message	Informational message
4068 0100	Memory extender 0 on processor card 1	Processor card, Location code: U0.1-P1-C1
4068 0101	Memory extender 2 on processor card 1	Processor card, Location code: U0.1-P1-C1
4068 0130	Memory extender 0 on processor card 2	Processor card, Location code: U0.1-P1-C2
4068 0131	Memory extender 2 on processor card 2	Processor card, Location code: U0.1-P1-C2
4068 0A03	Reboot message on VPD channel 3 processor card 1. Reboot is necessary for run-time array gard to take effect.	Reboot the system in slow mode. Run diagnostics, and then go to ″MAP 0235: System Array Self-Repair Problem Resolution″ in the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*.
4068 0A04	Reboot message on VPD channel 4 processor card 2. Reboot is necessary for run-time array gard to take effect.	Reboot the system in slow mode. Run diagnostics, then go to ″MAP 0235: System Array Self-Repair Problem Resolution″ in the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*.
4068 0B00	Problem with internal RIO interface (I/O slot 0, I/O port 0)	CEC backplane, U0.1-P1.
4068 0B01	Problem with internal RIO interface (I/O slot 0, I/O port 1)	CEC backplane, U0.1-P1.
4068 0B02	Problem with internal RIO interface (I/O slot 0, I/O port 2)	1. Check for system firmware updates. 2. Check the cabling between the CEC and the I/O subsystems. 3. CEC backplane, U0.1-P1 4. Call service support.

Table 16. Service processor error codes (continued)

Error code	Description	Action or possible failing FRU
4068 0B03	Problem with internal RIO interface (I/O slot 0, I/O port 3)	1. Check for system firmware updates. 2. Check the cabling between the CEC and the I/O subsystems. 3. CEC backplane, U0.1-P1 4. Call service support.
4068 0B40	Problem with controller chip on CEC backplane	1. CEC backplane, U0.1-P1. 2. Call service support.
4068 0BF0	Problem with RIO interface (I/O slot 0, I/O port 3)	1. Check for system firmware updates. 2. Check the cabling between the CEC and the I/O subsystems. 3. CEC backplane, U0.1-P1. 4. Call service support.
4068 0C10	Processor 0 configuration error: VPD mismatch for processor card 0. (Service processor code problem.)	1. Check for system firmware updates. 2. Call service support.
4068 0C11	Processor 1 configuration error: VPD mismatch for processor card 1. (Service processor code problem.)	1. Check for system firmware updates. 2. Call service support.
4068 0CA5	Invalid system configuration	1. Check that the processor cards and DIMMs are properly installed and configured. 2. If there are any FRUs listed in the service processor error log entry, replace them one at a time. 3. Go to "MAP 1540: Problem Isolation Procedures" on page 69.
4068 0CA6	No usable memory left in the system. The system must be rebooted.	Go to "MAP 1240: Memory Problem Resolution" on page 52.
4068 0CA9	Incorrect or incompatible DIMMs are installed.	Check that the DIMMs are properly configured and are the right type for the system.
4068 0CAA	System memory exceeds the limit for this system type and model.	Remove the DIMMs until the memory does not exceed the limit for this system type and model.
4068 0EA0	MOPS service processor code error.	1. Check for system firmware updates. 2. Call service support.
4068 0EA1	Operating system code on main processor	1. Check for operating system code updates. 2. If there are other symptoms, go (one symptom at a time) to the "Quick Entry MAP" on page 40 and follow the instructions. 3. Call service support.
4068 0EA2	PRD code on service processor error.	1. Check for system firmware updates. 2. Call service support.
4068 0EA4	The service processor detected a problem, but was unable to isolate the source.	Call service support.
4068 0EAF	Service processor code and system type are unknown.	1. Check for system firmware updates. 2. Call service support.

Table 16. Service processor error codes (continued)

Error code	Description	Action or possible failing FRU
4068 0EB0	JTAG problem	Go to “MAP 1541: JTAG Problem Isolation” on page 71.
4068 0EB1	Attention line 0 stuck fault	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
4068 0EB2	Attention line 1 stuck fault	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
4068 0EB3	Attention line 2 stuck fault	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
4068 0EB4	Attention line 3 stuck fault	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
4068 0EB5	Attention line 4 stuck fault	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
4068 0EB6	Attention line 5 stuck fault	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
4068 0EB7	Attention line 6 stuck fault	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
4068 0EB8	Attention line 7 stuck fault	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
4068 0EB9	Attention line 8 stuck fault	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
4068 0EBA	Attention line 9 stuck fault	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
4068 0EBB	Attention line 10 stuck fault	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
4068 0EBC	Attention line 11 stuck fault	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
4068 0EE1	Service processor firmware: invalid MRU to FRU mapping	1. Check for system firmware updates. 2. Call service support.
4068 0EE2	Service processor firmware fault	1. Check for system firmware updates. 2. Call service support.
4068 0EE5	Firmware error, no callout available	1. Check for system firmware updates. 2. Call service support.
4069 0001	Scan interface basic assurance tests detected a CEC backplane fault.	CEC backplane Location code: U0.1-P1
4069 0002	CEC backplane fault	1. Check JTAG cable connections. 2. CEC backplane Location code: U0.1-P1
4069 0003	Scan interface basic assurance tests detected processor fault.	1. Check JTAG cable connections. 2. Processor card Location code: U0.1-P1-C1
4069 0004	Processor fault	1. Check JTAG cable connections. 2. Processor card Location code: U0.1-P1-C2

Table 16. Service processor error codes (continued)

Error code	Description	Action or possible failing FRU
4069 000E	Processor capacity card	Operator panel Location code: U0.1-L1
4069 0010	DIMM fault	DIMM Location code: U0.1-P1-C1-M8
4069 0011	DIMM fault	DIMM Location code: U0.1-P1-C1-M6
4069 0012	DIMM fault	DIMM Location code: U0.1-P1-C1-M1
4069 0013	DIMM fault	DIMM Location code: U0.1-P1-C1-M3
4069 0014	DIMM fault	DIMM Location code: U0.1-P1-C1-M7
4069 0015	DIMM fault	DIMM Location code: U0.1-P1-C1-M5
4069 0016	DIMM fault	DIMM Location code: U0.1-P1-C1-M2
4069 0017	DIMM fault	DIMM Location code: U0.1-P1-C1-M4
4069 0018	DIMM fault	DIMM Location code: U0.1-P1-C2-M8
4069 0019	DIMM fault	DIMM Location code: U0.1-P1-C2-M6
4069 001A	DIMM fault	DIMM Location code: U0.1-P1-C2-M1
4069 001B	DIMM fault	DIMM Location code: U0.1-P1-C2-M3
4069 001C	DIMM fault	DIMM Location code: U0.1-P1-C2-M7
4069 001D	DIMM fault	DIMM Location code: U0.1-P1-C2-M5
4069 001E	DIMM fault	DIMM Location code: U0.1-P1-C2-M2
4069 001F	DIMM fault	DIMM Location code: U0.1-P1-C2-M4
4069 00B0	Bus controller failure	1. Check for system firmware updates. 2. PCI riser card Location code: U0.1-P2
4069 00B1	Bus controller failure	1. Check for system firmware updates. 2. PCI riser card Location code: U0.1-P2
4069 00B3	Processor/VPD problem detected	1. Check for system firmware updates. 2. Processor card 1 Location code: U0.1-P1-C1

Table 16. Service processor error codes (continued)

Error code	Description	Action or possible failing FRU
4069 00B4	Processor/VPD problem detected	1. Check for system firmware updates. 2. Processor card 2 Location code: U0.1-P1-C2
4069 00B7	Insufficient hardware resources were detected to continue IPL of the system after processor subsystem testing and initialization was completed.	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
4069 00D1	Informational message	Informational message
4069 0100	Memory extender 0 on processor card 1	Processor card, Location code: U0.1-P1-C1
4069 0101	Memory extender 2 on processor card 1	Processor card, Location code: U0.1-P1-C1
4069 0130	Memory extender 0 on processor card 2	Processor card, Location code: U0.1-P1-C2
4069 0131	Memory extender 2 on processor card 2	Processor card, Location code: U0.1-P1-C2
4069 0A03	Reboot message on VPD channel 3 processor card 1. Reboot is necessary for run-time array gard to take effect.	Reboot the system in slow mode. Run diagnostics, and then go to ″MAP 0235: System Array Self-Repair Problem Resolution″ in the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*.
4069 0A04	Reboot message on VPD channel 4 processor card 2. Reboot is necessary for run-time array gard to take effect.	Reboot the system in slow mode. Run diagnostics, then go to ″MAP 0235: System Array Self-Repair Problem Resolution″ in the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*.
4069 0B00	Problem with internal RIO interface (I/O slot 0, I/O port 0)	CEC backplane, U0.1-P1
4069 0B01	Problem with internal RIO interface (I/O slot 0, I/O port 1)	CEC backplane, U0.1-P1
4069 0B02	Problem with internal RIO interface (I/O slot 0, I/O port 2)	1. Check for system firmware updates. 2. Check the cabling between the CEC and the I/O subsystems. 3. CEC backplane, U0.1-P1 4. Call service support.
4069 0B03	Problem with internal RIO interface (I/O slot 0, I/O port 3)	1. Check for system firmware updates. 2. Check the cabling between the CEC and the I/O subsystems. 3. CEC backplane, U0.1-P1 4. Call service support.
4069 0B40	Problem with controller chip on CEC backplane	1. CEC backplane, U0.1-P1. 2. Call service support.

Table 16. Service processor error codes (continued)

Error code	Description	Action or possible failing FRU
4069 0BF0	Problem with RIO interface (I/O slot 0, I/O port 3)	1. Check for system firmware updates. 2. Check the cabling between the CEC and the I/O subsystems. 3. CEC backplane, U0.1-P1 4. Call service support.
4069 0C10	Processor 0 configuration error: VPD mismatch for processor card 0. (Service processor code problem.)	1. Check for system firmware updates. 2. Call service support.
4069 0C11	Processor 1 configuration error: VPD mismatch for processor card 1. (Service processor code problem.)	1. Check for system firmware updates. 2. Call service support.
4069 0CA5	Invalid system configuration	1. Check that the processor cards and DIMMs are properly installed and configured. 2. If there are any FRUs listed in the service processor error log entry, replace them one at a time. 3. Go to "MAP 1540: Problem Isolation Procedures" on page 69.
4069 0CA6	No usable memory left in the system. The system must be rebooted.	Go to "MAP 1240: Memory Problem Resolution" on page 52.
4069 0CA9	Incorrect or incompatible DIMMs are installed.	Check that the DIMMs are properly configured and are the right type for the system.
4069 0CAA	System memory exceeds the limit for this system type and model.	Remove the DIMMs until the memory does not exceed the limit for this system type and model.
4069 0EA0	MOPS service processor code error.	1. Check for system firmware updates. 2. Call service support.
4069 0EA1	Operating system code on main processor	1. Check for operating system code updates. 2. If there are other symptoms, go (one symptom at a time) to the "Quick Entry MAP" on page 40 and follow the instructions. 3. Call service support.
4069 0EA2	PRD code on service processor error.	1. Check for system firmware updates. 2. Call service support.
4069 0EA4	The service processor detected a problem, but was unable to isolate the source.	Call service support.
4069 0EAF	Service processor code and system type are unknown.	1. Check for system firmware updates. 2. Call service support.
4069 0EB0	JTAG problem	Go to "MAP 1541: JTAG Problem Isolation" on page 71.
4069 0EB1	Attention line 0 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
4069 0EB2	Attention line 1 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
4069 0EB3	Attention line 2 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.

Table 16. Service processor error codes (continued)

Error code	Description	Action or possible failing FRU
4069 0EB4	Attention line 3 stuck fault	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
4069 0EB5	Attention line 4 stuck fault	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
4069 0EB6	Attention line 5 stuck fault	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
4069 0EB7	Attention line 6 stuck fault	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
4069 0EB8	Attention line 7 stuck fault	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
4069 0EB9	Attention line 8 stuck fault	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
4069 0EBA	Attention line 9 stuck fault	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
4069 0EBB	Attention line 10 stuck fault	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
4069 0EBC	Attention line 11 stuck fault	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
4069 0EE1	Service processor firmware: invalid MRU to FRU mapping	1. Check for system firmware updates. 2. Call service support.
4069 0EE2	Service processor firmware fault	1. Check for system firmware updates. 2. Call service support.
4069 0EE5	Firmware error, no callout available	1. Check for system firmware updates. 2. Call service support.
406A 0001	Scan interface basic assurance tests detected a CEC backplane fault.	CEC backplane Location code: U0.1-P1
406A 0002	CEC backplane fault	1. Check JTAG cable connections. 2. CEC backplane Location code: U0.1-P1
406A 0003	Scan interface basic assurance tests detected processor fault.	1. Check JTAG cable connections. 2. Processor card Location code: U0.1-P1-C1
406A 0004	Processor fault	1. Check JTAG cable connections. 2. Processor card Location code: U0.1-P1-C2
406A 000E	Processor capacity card	Operator panel Location code: U0.1-L1
406A 0010	DIMM fault	DIMM Location code: U0.1-P1-C1-M8
406A 0011	DIMM fault	DIMM Location code: U0.1-P1-C1-M6
406A 0012	DIMM fault	DIMM Location code: U0.1-P1-C1-M1

Table 16. Service processor error codes (continued)

Error code	Description	Action or possible failing FRU
406A 0013	DIMM fault	DIMM Location code: U0.1-P1-C1-M3
406A 0014	DIMM fault	DIMM Location code: U0.1-P1-C1-M7
406A 0015	DIMM fault	DIMM Location code: U0.1-P1-C1-M5
406A 0016	DIMM fault	DIMM Location code: U0.1-P1-C1-M2
406A 0017	DIMM fault	DIMM Location code: U0.1-P1-C1-M4
406A 0018	DIMM fault	DIMM Location code: U0.1-P1-C2-M8
406A 0019	DIMM fault	DIMM Location code: U0.1-P1-C2-M6
406A 001A	DIMM fault	DIMM Location code: U0.1-P1-C2-M1
406A 001B	DIMM fault	DIMM Location code: U0.1-P1-C2-M3
406A 001C	DIMM fault	DIMM Location code: U0.1-P1-C2-M7
406A 001D	DIMM fault	DIMM Location code: U0.1-P1-C2-M5
406A 001E	DIMM fault	DIMM Location code: U0.1-P1-C2-M2
406A 001F	DIMM fault	DIMM Location code: U0.1-P1-C2-M4
406A 00B0	Bus controller failure	1. Check for system firmware updates. 2. PCI riser card Location code: U0.1-P2
406A 00B1	Bus controller failure	1. Check for system firmware updates. 2. PCI riser card Location code: U0.1-P2
406A 00B3	MCM/VPD problem detected.	1. Check for system firmware updates. 2. Processor card 1 Location code: U0.1-P1-C1
406A 00B4	MCM/VPD problem detected.	1. Check for system firmware updates. 2. Processor card 2 Location code: U0.1-P1-C2
406A 00B7	Insufficient hardware resources were detected to continue IPL of the system after processor subsystem testing and initialization was completed.	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
406A 00D1	Informational message	Informational message
406A 0100	Memory extender 0 on processor card 1	Processor card, Location code: U0.1-P1-C1

Table 16. Service processor error codes (continued)

Error code	Description	Action or possible failing FRU
406A 0101	Memory extender 2 on processor card 1	Processor card, Location code: U0.1-P1-C1
406A 0130	Memory extender 0 on processor card 2	Processor card, Location code: U0.1-P1-C2
406A 0131	Memory extender 2 on processor card 2	Processor card, Location code: U0.1-P1-C2
406A 0A03	Reboot message on VPD channel 3 processor card 1. Reboot is necessary for run-time array gard to take effect.	Reboot the system in slow mode. Run diagnostics, and then go to ″MAP 0235: System Array Self-Repair Problem Resolution″ in the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*.
406A 0A04	Reboot message on VPD channel 4 processor card 2. Reboot is necessary for run-time array gard to take effect.	Reboot the system in slow mode. Run diagnostics, then go to ″MAP 0235: System Array Self-Repair Problem Resolution″ in the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*.
406A 0B00	Problem with internal RIO interface (I/O slot 0, I/O port 0)	CEC backplane, U0.1-P1
406A 0B01	Problem with internal RIO interface (I/O slot 0, I/O port 1)	CEC backplane, U0.1-P1
406A 0B02	Problem with internal RIO interface (I/O slot 0, I/O port 2)	1. Check for system firmware updates. 2. Check the cabling between the CEC and the I/O subsystems. 3. CEC backplane, U0.1-P1 4. Call service support.
406A 0B03	Problem with internal RIO interface (I/O slot 0, I/O port 3)	1. Check for system firmware updates. 2. Check the cabling between the CEC and the I/O subsystems. 3. CEC backplane, U0.1-P1 4. Call service support.
406A 0B40	Problem with controller chip on CEC backplane	1. CEC backplane, U0.1-P1. 2. Call service support.
406A 0BF0	Problem with RIO interface (I/O slot 0, I/O port 3)	1. Check for system firmware updates. 2. Check the cabling between the CEC and the I/O subsystems. 3. CEC backplane, U0.1-P1 4. Call service support.
406A 0C10	Processor 0 configuration error: VPD mismatch for processor card 0. (Service processor code problem.)	1. Check for system firmware updates. 2. Call service support.
406A 0C11	Processor 1 configuration error: VPD mismatch for processor card 1. (Service processor code problem.)	1. Check for system firmware updates. 2. Call service support.

Table 16. Service processor error codes (continued)

Error code	Description	Action or possible failing FRU
406A 0CA5	Invalid system configuration	1. Check that the processor cards and DIMMs are properly installed and configured. 2. If there are any FRUs listed in the service processor error log entry, replace them one at a time. 3. Go to "MAP 1540: Problem Isolation Procedures" on page 69.
406A 0CA6	No usable memory left in the system. The system must be rebooted.	Go to "MAP 1240: Memory Problem Resolution" on page 52.
406A 0CA9	Incorrect or incompatible DIMMs are installed.	Check that the DIMMs are properly configured and are the right type for the system.
406A 0CAA	System memory exceeds the limit for this system type and model.	Remove the DIMMs until the memory does not exceed the limit for this system type and model.
406A 0EA0	MOPS service processor code error.	1. Check for system firmware updates. 2. Call service support.
406A 0EA1	Operating system code on main processor	1. Check for operating system code updates. 2. If there are other symptoms, go (one symptom at a time) to the "Quick Entry MAP" on page 40 and follow the instructions. 3. Call service support.
406A 0EA2	PRD code on service processor error.	1. Check for system firmware updates. 2. Call service support.
406A 0EA4	The service processor detected a problem but was unable to isolate the source.	Call service support.
406A 0EAF	Service processor code and system type are unknown.	1. Check for system firmware updates. 2. Call service support.
406A 0EB0	JTAG problem	Go to "MAP 1541: JTAG Problem Isolation" on page 71.
406A 0EB1	Attention line 0 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
406A 0EB2	Attention line 1 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
406A 0EB3	Attention line 2 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
406A 0EB4	Attention line 3 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
406A 0EB5	Attention line 4 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
406A 0EB6	Attention line 5 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
406A 0EB7	Attention line 6 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
406A 0EB8	Attention line 7 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.

Table 16. Service processor error codes (continued)

Error code	Description	Action or possible failing FRU
406A 0EB9	Attention line 8 stuck fault	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
406A 0EBA	Attention line 9 stuck fault	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
406A 0EBB	Attention line 10 stuck fault	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
406A 0EBC	Attention line 11 stuck fault	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
406A 0EE1	Service processor firmware: invalid MRU to FRU mapping	1. Check for system firmware updates. 2. Call service support.
406A 0EE2	Service processor firmware fault	1. Check for system firmware updates. 2. Call service support.
406A 0EE5	Firmware error, no callout available	1. Check for system firmware updates. 2. Call service support.
406B 0001	Scan interface basic assurance tests detected a CEC backplane fault.	CEC backplane Location code: U0.1-P1
406B 0002	CEC backplane fault	1. Check JTAG cable connections. 2. CEC backplane Location code: U0.1-P1
406B 0003	Scan interface basic assurance tests detected processor fault.	1. Check JTAG cable connections. 2. Processor card Location code: U0.1-P1-C1
406B 0004	Processor fault	1. Check JTAG cable connections. 2. Processor card Location code: U0.1-P1-C2
406B 000E	Processor capacity card	Operator panel Location code: U0.1-L1
406B 0010	DIMM fault	DIMM Location code: U0.1-P1-C1-M8
406B 0011	DIMM fault	DIMM Location code: U0.1-P1-C1-M6
406B 0012	DIMM fault	DIMM Location code: U0.1-P1-C1-M1
406B 0013	DIMM fault	DIMM Location code: U0.1-P1-C1-M3
406B 0014	DIMM fault	DIMM Location code: U0.1-P1-C1-M7
406B 0015	DIMM fault	DIMM Location code: U0.1-P1-C1-M5
406B 0016	DIMM fault	DIMM Location code: U0.1-P1-C1-M2
406B 0017	DIMM fault	DIMM Location code: U0.1-P1-C1-M4

Table 16. Service processor error codes (continued)

Error code	Description	Action or possible failing FRU
406B 0018	DIMM fault	DIMM Location code: U0.1-P1-C2-M8
406B 0019	DIMM fault	DIMM Location code: U0.1-P1-C2-M6
406B 001A	DIMM fault	DIMM Location code: U0.1-P1-C2-M1
406B 001B	DIMM fault	DIMM Location code: U0.1-P1-C2-M3
406B 001C	DIMM fault	DIMM Location code: U0.1-P1-C2-M7
406B 001D	DIMM fault	DIMM Location code: U0.1-P1-C2-M5
406B 001E	DIMM fault	DIMM Location code: U0.1-P1-C2-M2
406B 001F	DIMM fault	DIMM Location code: U0.1-P1-C2-M4
406B 00B0	Bus controller failure	1. Check for system firmware updates. 2. PCI riser card Location code: U0.1-P2
406B 00B1	Bus controller failure	1. Check for system firmware updates. 2. PCI riser card Location code: U0.1-P2
406B 00B3	MCM/VPD problem detected.	1. Check for system firmware updates. 2. Processor card 1 Location code: U0.1-P1-C1
406B 00B4	MCM/VPD problem detected.	1. Check for system firmware updates. 2. Processor card 2 Location code: U0.1-P1-C2
406B 00B7	Insufficient hardware resources were detected to continue IPL of the system after processor subsystem testing and initialization was completed.	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
406B 00D1	Informational message	Informational message
406B 0100	Memory extender 0 on processor card 1	Processor card, Location code: U0.1-P1-C1
406B 0101	Memory extender 2 on processor card 1	Processor card, Location code: U0.1-P1-C1
406B 0130	Memory extender 0 on processor card 2	Processor card, Location code: U0.1-P1-C2
406B 0131	Memory extender 2 on processor card 2	Processor card, Location code: U0.1-P1-C2
406B 0A03	Reboot message on VPD channel 3 processor card 1. Reboot is necessary for run-time array gard to take effect.	Reboot the system in slow mode. Run diagnostics, and then go to ″MAP 0235: System Array Self-Repair Problem Resolution″ in the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*.

Table 16. Service processor error codes (continued)

Error code	Description	Action or possible failing FRU
406B 0A04	Reboot message on VPD channel 4 processor card 2. Reboot is necessary for run-time array gard to take effect.	Reboot the system in slow mode. Run diagnostics, then go to ″MAP 0235: System Array Self-Repair Problem Resolution″ in the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*.
406B 0B00	Problem with internal RIO interface (I/O slot 0, I/O port 0)	CEC backplane, U0.1-P1
406B 0B01	Problem with internal RIO interface (I/O slot 0, I/O port 1)	CEC backplane, U0.1-P1
406B 0B02	Problem with internal RIO interface (I/O slot 0, I/O port 2)	1. Check for system firmware updates. 2. Check the cabling between the CEC and the I/O subsystems. 3. CEC backplane, U0.1-P1. 4. Call service support.
406B 0B03	Problem with internal RIO interface (I/O slot 0, I/O port 3)	1. Check for system firmware updates. 2. Check the cabling between the CEC and the I/O subsystems. 3. CEC backplane, U0.1-P1 4. Call service support.
406B 0B40	Problem with controller chip on CEC backplane	1. CEC backplane, U0.1-P1. 2. Call service support.
406B 0BF0	Problem with RIO interface (I/O slot 0, I/O port 3)	1. Check for system firmware updates. 2. Check the cabling between the CEC and the I/O subsystems. 3. CEC backplane, U0.1-P1 4. Call service support.
406B 0C10	Processor 0 configuration error: VPD mismatch for processor card 0. (Service processor code problem.)	1. Check for system firmware updates. 2. Call service support.
406B 0C11	Processor 1 configuration error: VPD mismatch for processor card 1. (Service processor code problem.)	1. Check for system firmware updates. 2. Call service support.
406B 0CA5	Invalid system configuration	1. Check that the processor cards and DIMMs are properly installed and configured. 2. If there are any FRUs listed in the service processor error log entry, replace them one at a time. 3. Go to “MAP 1540: Problem Isolation Procedures” on page 69.
406B 0CA6	No usable memory left in the system. The system must be rebooted.	Go to “MAP 1240: Memory Problem Resolution” on page 52.
406B 0CA9	Incorrect or incompatible DIMMs are installed.	Check that the DIMMs are properly configured and are the right type for the system.
406B 0CAA	System memory exceeds the limit for this system type and model.	Remove the DIMMs until the memory does not exceed the limit for this system type and model.

Table 16. Service processor error codes (continued)

Error code	Description	Action or possible failing FRU
406B 0EA0	MOPS service processor code error.	1. Check for system firmware updates. 2. Call service support.
406B 0EA1	Operating system code on main processor	1. Check for operating system code updates. 2. If there are other symptoms, go (one symptom at a time) to the "Quick Entry MAP" on page 40 and follow the instructions. 3. Call service support.
406B 0EA2	PRD code on service processor error.	1. Check for system firmware updates. 2. Call service support.
406B 0EA4	The service processor detected a problem, but was unable to isolate the source.	Contact next level of support.
406B 0EAF	Service processor code and system type are unknown	1. Check for system firmware updates. 2. Call service support.
406B 0EB0	JTAG problem	Go to "MAP 1541: JTAG Problem Isolation" on page 71.
406B 0EB1	Attention line 0 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
406B 0EB2	Attention line 1 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
406B 0EB3	Attention line 2 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
406B 0EB4	Attention line 3 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
406B 0EB5	Attention line 4 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
406B 0EB6	Attention line 5 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
406B 0EB7	Attention line 6 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
406B 0EB8	Attention line 7 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
406B 0EB9	Attention line 8 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
406B 0EBA	Attention line 9 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
406B 0EBB	Attention line 10 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
406B 0EBC	Attention line 11 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
406B 0EE1	Service processor firmware: invalid MRU to FRU mapping	1. Check for system firmware updates. 2. Call service support.
406B 0EE2	Service processor firmware fault	1. Check for system firmware updates. 2. Call service support.

Table 16. Service processor error codes (continued)

Error code	Description	Action or possible failing FRU
406B 0EE5	Firmware error, no callout available	1. Check for system firmware updates. 2. Call service support.
406C 0001	Scan interface basic assurance tests detected a CEC backplane fault	CEC backplane Location code: U0.1-P1
406C 0002	CEC backplane fault	1. Check JTAG cable connections. 2. CEC backplane Location code: U0.1-P1
406C 0003	Scan interface basic assurance tests detected processor fault	1. Check JTAG cable connections. 2. Processor card Location code: U0.1-P1-C1
406C 0004	Processor fault	1. Check JTAG cable connections. 2. Processor card Location code: U0.1-P1-C2
406C 000E	Processor capacity card	Operator panel Location code: U0.1-L1
406C 0010	DIMM fault	DIMM Location code: U0.1-P1-C1-M8
406C 0011	DIMM fault	DIMM Location code: U0.1-P1-C1-M6
406C 0012	DIMM fault	DIMM Location code: U0.1-P1-C1-M1
406C 0013	DIMM fault	DIMM Location code: U0.1-P1-C1-M3
406C 0014	DIMM fault	DIMM Location code: U0.1-P1-C1-M7
406C 0015	DIMM fault	DIMM Location code: U0.1-P1-C1-M5
406C 0016	DIMM fault	DIMM Location code: U0.1-P1-C1-M2
406C 0017	DIMM fault	DIMM Location code: U0.1-P1-C1-M4
406C 0018	DIMM fault	DIMM Location code: U0.1-P1-C2-M8
406C 0019	DIMM fault	DIMM Location code: U0.1-P1-C2-M6
406C 001A	DIMM fault	DIMM Location code: U0.1-P1-C2-M1
406C 001B	DIMM fault	DIMM Location code: U0.1-P1-C2-M3
406C 001C	DIMM fault	DIMM Location code: U0.1-P1-C2-M7
406C 001D	DIMM fault	DIMM Location code: U0.1-P1-C2-M5
406C 001E	DIMM fault	DIMM Location code: U0.1-P1-C2-M2

Table 16. Service processor error codes (continued)

Error code	Description	Action or possible failing FRU
406C 001F	DIMM fault	DIMM Location code: U0.1-P1-C2-M4
406C 00B0	Bus controller failure	1. Check for system firmware updates. 2. PCI riser card Location code: U0.1-P2
406C 00B1	Bus controller failure	1. Check for system firmware updates. 2. PCI riser card Location code: U0.1-P2
406C 00B3	Processor/VPD problem detected	1. Check for system firmware updates. 2. Processor card 1 Location code: U0.1-P1-C1
406C 00B4	Processor/VPD problem detected	1. Check for system firmware updates. 2. Processor card 2 Location code: U0.1-P1-C2
406C 00B7	Insufficient hardware resources were detected to continue IPL of the system after processor subsystem testing and initialization was completed.	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
406C 00D1	Informational message	Informational message
406C 0100	Memory extender 0 on processor card 1	Processor card, Location code: U0.1-P1-C1
406C 0101	Memory extender 2 on processor card 1	Processor card, Location code: U0.1-P1-C1
406C 0130	Memory extender 0 on processor card 2	Processor card, Location code: U0.1-P1-C2
406C 0131	Memory extender 2 on processor card 2	Processor card, Location code: U0.1-P1-C2
406C 0A03	Reboot message on VPD channel 3 processor card 1. Reboot is necessary for run-time array gard to take effect.	Reboot the system in slow mode. Run diagnostics, and then go to ″MAP 0235: System Array Self-Repair Problem Resolution″ in the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*.
406C 0A04	Reboot message on VPD channel 4 processor card 2. Reboot is necessary for run-time array gard to take effect.	Reboot the system in slow mode. Run diagnostics, then go to ″MAP 0235: System Array Self-Repair Problem Resolution″ in the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*.
406C 0B00	Problem with internal RIO interface (I/O slot 0, I/O port 0)	CEC backplane, U0.1-P1
406C 0B01	Problem with internal RIO interface (I/O slot 0, I/O port 1)	CEC backplane, U0.1-P1
406C 0B02	Problem with internal RIO interface (I/O slot 0, I/O port 2)	1. Check for system firmware updates. 2. Check the cabling between the CEC and the I/O subsystems. 3. CEC backplane, U0.1-P1 4. Call service support.

Table 16. Service processor error codes (continued)

Error code	Description	Action or possible failing FRU
406C 0B03	Problem with internal RIO interface (I/O slot 0, I/O port 3)	1. Check for system firmware updates. 2. Check the cabling between the CEC and the I/O subsystems. 3. CEC backplane, U0.1-P1 4. Call service support.
406C 0B40	Problem with controller chip on CEC backplane	1. CEC backplane, U0.1-P1. 2. Call service support.
406C 0BF0	Problem with RIO interface (I/O slot 0, I/O port 3)	1. Check for system firmware updates. 2. Check the cabling between the CEC and the I/O subsystems. 3. CEC backplane, U0.1-P1 4. Call service support.
406C 0C10	Processor 0 configuration error: VPD mismatch for processor card 0. (Service processor code problem.)	1. Check for system firmware updates. 2. Call service support.
406C 0C11	Processor 1 configuration error: VPD mismatch for processor card 1. (Service processor code problem.)	1. Check for system firmware updates. 2. Call service support.
406C 0CA5	Invalid system configuration.	1. Check that the processor cards and DIMMs are properly installed and configured. 2. If there are any FRUs listed in the service processor error log entry, replace them one at a time. 3. Go to “MAP 1540: Problem Isolation Procedures” on page 69.
406C 0CA6	No usable memory left in the system. The system must be rebooted.	Go to “MAP 1240: Memory Problem Resolution” on page 52.
406C 0CA9	Incorrect or incompatible DIMMs are installed.	Check that the DIMMs are properly configured and are the right type for the system.
406C 0CAA	System memory exceeds the limit for this system type and model.	Remove the DIMMs until the memory does not exceed the limit for this system type and model.
406C 0EA0	MOPS service processor code error.	1. Check for system firmware updates. 2. Call service support.
406C 0EA1	Operating system code on main processor	1. Check for operating system code updates. 2. If there are other symptoms, go (one symptom at a time) to the “Quick Entry MAP” on page 40 and follow the instructions. 3. Call service support.
406C 0EA2	PRD code on service processor error.	1. Check for system firmware updates. 2. Call service support.
406C 0EA4	The service processor detected a problem, but was unable to isolate the source.	Contact next level of support.
406C 0EAF	Service processor code and system type are unknown.	1. Check for system firmware updates. 2. Call service support.

Table 16. Service processor error codes (continued)

Error code	Description	Action or possible failing FRU
406C 0EB0	JTAG problem	Go to “MAP 1541: JTAG Problem Isolation” on page 71.
406C 0EB1	Attention line 0 stuck fault	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
406C 0EB2	Attention line 1 stuck fault	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
406C 0EB3	Attention line 2 stuck fault	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
406C 0EB4	Attention line 3 stuck fault	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
406C 0EB5	Attention line 4 stuck fault	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
406C 0EB6	Attention line 5 stuck fault	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
406C 0EB7	Attention line 6 stuck fault	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
406C 0EB8	Attention line 7 stuck fault	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
406C 0EB9	Attention line 8 stuck fault	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
406C 0EBA	Attention line 9 stuck fault	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
406C 0EBB	Attention line 10 stuck fault	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
406C 0EBC	Attention line 11 stuck fault	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
406C 0EE1	Service processor firmware: invalid MRU to FRU mapping	1. Check for system firmware updates. 2. Call service support.
406C 0EE2	Service processor firmware fault	1. Check for system firmware updates. 2. Call service support.
406C 0EE5	Firmware error, no callout available	1. Check for system firmware updates. 2. Call service support.
406D 0001	Scan interface basic assurance tests detected a CEC backplane fault.	CEC backplane Location code: U0.1-P1
406D 0002	CEC backplane fault	1. Check JTAG cable connections. 2. CEC backplane Location code: U0.1-P1
406D 0003	Scan interface basic assurance tests detected processor fault.	1. Check JTAG cable connections. 2. Processor card Location code: U0.1-P1-C1
406D 0004	Processor fault	1. Check JTAG cable connections. 2. Processor card Location code: U0.1-P1-C2

Table 16. Service processor error codes (continued)

Error code	Description	Action or possible failing FRU
406D 000E	Processor capacity card	Operator panel Location code: U0.1-L1
406D 0010	DIMM fault	DIMM Location code: U0.1-P1-C1-M8
406D 0011	DIMM fault	DIMM Location code: U0.1-P1-C1-M6
406D 0012	DIMM fault	DIMM Location code: U0.1-P1-C1-M1
406D 0013	DIMM fault	DIMM Location code: U0.1-P1-C1-M3
406D 0014	DIMM fault	DIMM Location code: U0.1-P1-C1-M7
406D 0015	DIMM fault	DIMM Location code: U0.1-P1-C1-M5
406D 0016	DIMM fault	DIMM Location code: U0.1-P1-C1-M2
406D 0017	DIMM fault	DIMM Location code: U0.1-P1-C1-M4
406D 0018	DIMM fault	DIMM Location code: U0.1-P1-C2-M8
406D 0019	DIMM fault	DIMM Location code: U0.1-P1-C2-M6
406D 001A	DIMM fault	DIMM Location code: U0.1-P1-C2-M1
406D 001B	DIMM fault	DIMM Location code: U0.1-P1-C2-M3
406D 001C	DIMM fault	DIMM Location code: U0.1-P1-C2-M7
406D 001D	DIMM fault	DIMM Location code: U0.1-P1-C2-M5
406D 001E	DIMM fault	DIMM Location code: U0.1-P1-C2-M2
406D 001F	DIMM fault	DIMM Location code: U0.1-P1-C2-M4
406D 00B0	Bus controller failure	1. Check for system firmware updates. 2. PCI riser card Location code: U0.1-P2
406D 00B1	Bus controller failure	1. Check for system firmware updates. 2. PCI riser card Location code: U0.1-P2
406D 00B3	Processor/VPD problem detected.	1. Check for system firmware updates. 2. Processor card 1 Location code: U0.1-P1-C1

Table 16. Service processor error codes (continued)

Error code	Description	Action or possible failing FRU
406D 00B4	Processor/VPD problem detected.	1. Check for system firmware updates. 2. Processor card 2 Location code: U0.1-P1-C2
406D 00B7	Insufficient hardware resources were detected to continue IPL of the system after processor subsystem testing and initialization was completed.	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
406D 00D1	Informational message	Informational message
406D 0100	Memory extender 0 on processor card 1	Processor card, Location code: U0.1-P1-C1
406D 0101	Memory extender 2 on processor card 1	Processor card, Location code: U0.1-P1-C1
406D 0130	Memory extender 0 on processor card 2	Processor card, Location code: U0.1-P1-C2
406D 0131	Memory extender 2 on processor card 2	Processor card, Location code: U0.1-P1-C2
406D 0A03	Reboot message on VPD channel 3 processor card 1. Reboot is necessary for run-time array gard to take effect.	Reboot the system in slow mode. Run diagnostics, and then go to ″MAP 0235: System Array Self-Repair Problem Resolution″ in the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*.
406D 0A04	Reboot message on VPD channel 4 processor card 2. Reboot is necessary for run-time array gard to take effect.	Reboot the system in slow mode. Run diagnostics, then go to ″MAP 0235: System Array Self-Repair Problem Resolution″ in the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*.
406D 0B00	Problem with internal RIO interface (I/O slot 0, I/O port 0)	CEC backplane, U0.1-P1
406D 0B01	Problem with internal RIO interface (I/O slot 0, I/O port 1)	CEC backplane, U0.1-P1
406D 0B02	Problem with internal RIO interface (I/O slot 0, I/O port 2)	1. Check for system firmware updates. 2. Check the cabling between the CEC and the I/O subsystems. 3. CEC backplane, U0.1-P1. 4. Call service support.
406D 0B03	Problem with internal RIO interface (I/O slot 0, I/O port 3)	1. Check for system firmware updates. 2. Check the cabling between the CEC and the I/O subsystems. 3. CEC backplane, U0.1-P1. 4. Call service support.
406D 0B40	Problem with controller chip on CEC backplane	1. CEC backplane, U0.1-P1. 2. Call service support.

Table 16. Service processor error codes (continued)

Error code	Description	Action or possible failing FRU
406D 0BF0	Problem with RIO interface (I/O slot 0, I/O port 3)	1. Check for system firmware updates. 2. Check the cabling between the CEC and the I/O subsystems. 3. CEC backplane, U0.1-P1 4. Call service support.
406D 0C10	Processor 0 configuration error: VPD mismatch for processor card 0. (Service processor code problem.)	1. Check for system firmware updates. 2. Call service support.
406D 0C11	Processor 1 configuration error: VPD mismatch for processor card 1. (Service processor code problem.)	1. Check for system firmware updates. 2. Call service support.
406D 0CA5	Invalid system configuration	1. Check that the processor cards and DIMMs are properly installed and configured. 2. If there are any FRUs listed in the service processor error log entry, replace them one at a time. 3. Go to "MAP 1540: Problem Isolation Procedures" on page 69.
406D 0CA6	No usable memory left in the system. The system must be rebooted.	Go to "MAP 1240: Memory Problem Resolution" on page 52.
406D 0CA9	Incorrect or incompatible DIMMs are installed.	Check that the DIMMs are properly configured and are the right type for the system.
406D 0CAA	System memory exceeds the limit for this system type and model.	Remove the DIMMs until the memory does not exceed the limit for this system type and model.
406D 0EA0	MOPS service processor code error.	1. Check for system firmware updates. 2. Call service support.
406D 0EA1	Operating system code on main processor	1. Check for operating system code updates. 2. If there are other symptoms, go (one symptom at a time) to the "Quick Entry MAP" on page 40 and follow the instructions. 3. Call service support.
406D 0EA2	PRD code on service processor error.	1. Check for system firmware updates. 2. Call service support.
406D 0EA4	The service processor detected a problem, but was unable to isolate the source.	Contact next level of support.
406D 0EAF	Service processor code and system type are unknown.	1. Check for system firmware updates. 2. Call service support.
406D 0EB0	JTAG problem	Go to "MAP 1541: JTAG Problem Isolation" on page 71.
406D 0EB1	Attention line 0 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
406D 0EB2	Attention line 1 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
406D 0EB3	Attention line 2 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.

Table 16. Service processor error codes (continued)

Error code	Description	Action or possible failing FRU
406D 0EB4	Attention line 3 stuck fault	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
406D 0EB5	Attention line 4 stuck fault	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
406D 0EB6	Attention line 5 stuck fault	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
406D 0EB7	Attention line 6 stuck fault	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
406D 0EB8	Attention line 7 stuck fault	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
406D 0EB9	Attention line 8 stuck fault	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
406D 0EBA	Attention line 9 stuck fault	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
406D 0EBB	Attention line 10 stuck fault	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
406D 0EBC	Attention line 11 stuck fault	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
406D 0EE1	Service processor firmware: invalid MRU to FRU mapping.	1. Check for system firmware updates. 2. Call service support.
406D 0EE2	Service processor firmware fault	1. Check for system firmware updates. 2. Call service support.
406D 0EE5	Firmware error; no callout available.	1. Check for system firmware updates. 2. Call service support.
406E 0001	Scan interface basic assurance tests detected a CEC backplane fault.	CEC backplane Location code: U0.1-P1
406E 0002	CEC backplane fault	1. Check JTAG cable connections. 2. CEC backplane Location code: U0.1-P1
406E 0003	Scan interface basic assurance tests detected processor fault.	1. Check JTAG cable connections. 2. Processor card Location code: U0.1-P1-C1
406E 0004	Processor fault	1. Check JTAG cable connections. 2. Processor card Location code: U0.1-P1-C2
406E 000E	Processor capacity card	Operator panel Location code: U0.1-L1
406E 0010	DIMM fault	DIMM Location code: U0.1-P1-C1-M8
406E 0011	DIMM fault	DIMM Location code: U0.1-P1-C1-M6
406E 0012	DIMM fault	DIMM Location code: U0.1-P1-C1-M1

Table 16. Service processor error codes (continued)

Error code	Description	Action or possible failing FRU
406E 0013	DIMM fault	DIMM Location code: U0.1-P1-C1-M3
406E 0014	DIMM fault	DIMM Location code: U0.1-P1-C1-M7
406E 0015	DIMM fault	DIMM Location code: U0.1-P1-C1-M5
406E 0016	DIMM fault	DIMM Location code: U0.1-P1-C1-M2
406E 0017	DIMM fault	DIMM Location code: U0.1-P1-C1-M4
406E 0018	DIMM fault	DIMM Location code: U0.1-P1-C2-M8
406E 0019	DIMM fault	DIMM Location code: U0.1-P1-C2-M6
406E 001A	DIMM fault	DIMM Location code: U0.1-P1-C2-M1
406E 001B	DIMM fault	DIMM Location code: U0.1-P1-C2-M3
406E 001C	DIMM fault	DIMM Location code: U0.1-P1-C2-M7
406E 001D	DIMM fault	DIMM Location code: U0.1-P1-C2-M5
406E 001E	DIMM fault	DIMM Location code: U0.1-P1-C2-M2
406E 001F	DIMM fault	DIMM Location code: U0.1-P1-C2-M4
406E 00B0	Bus controller failure	1. Check for system firmware updates. 2. PCI riser card Location code: U0.1-P2
406E 00B1	Bus controller failure	1. Check for system firmware updates. 2. PCI riser card Location code: U0.1-P2
406E 00B3	Processor/VPD problem detected.	1. Check for system firmware updates. 2. Processor card 1 Location code: U0.1-P1-C1
406E 00B4	Processor/VPD problem detected.	1. Check for system firmware updates. 2. Processor card 2 Location code: U0.1-P1-C2
406E 00B7	Insufficient hardware resources were detected to continue IPL of the system after processor subsystem testing and initialization was completed.	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
406E 00D1	Informational message	Informational message
406E 0100	Memory extender 0 on processor card 1	Processor card, Location code: U0.1-P1-C1

Table 16. Service processor error codes (continued)

Error code	Description	Action or possible failing FRU
406E 0101	Memory extender 2 on processor card 1	Processor card, Location code: U0.1-P1-C1
406E 0130	Memory extender 0 on processor card 2	Processor card, Location code: U0.1-P1-C2
406E 0131	Memory extender 2 on processor card 2	Processor card, Location code: U0.1-P1-C2
406E 0A03	Reboot message on VPD channel 3 processor card 1. Reboot is necessary for run-time array gard to take effect.	Reboot the system in slow mode. Run diagnostics, and then go to ″MAP 0235: System Array Self-Repair Problem Resolution″ in the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*.
406E 0A04	Reboot message on VPD channel 4 processor card 2. Reboot is necessary for run-time array gard to take effect.	Reboot the system in slow mode. Run diagnostics, then go to ″MAP 0235: System Array Self-Repair Problem Resolution″ in the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*.
406E 0B00	Problem with internal RIO interface (I/O slot 0, I/O port 0)	CEC backplane, U0.1-P1
406E 0B01	Problem with internal RIO interface (I/O slot 0, I/O port 1)	CEC backplane, U0.1-P1
406E 0B02	Problem with internal RIO interface (I/O slot 0, I/O port 2)	1. Check for system firmware updates. 2. Check the cabling between the CEC and the I/O subsystems. 3. CEC backplane, U0.1-P1 4. Call service support.
406E 0B03	Problem with internal RIO interface (I/O slot 0, I/O port 3)	1. Check for system firmware updates. 2. Check the cabling between the CEC and the I/O subsystems. 3. CEC backplane, U0.1-P1 4. Call service support.
406E 0B40	Problem with controller chip on CEC backplane	1. CEC backplane, U0.1-P1. 2. Call service support.
406E 0BF0	Problem with RIO interface (I/O slot 0, I/O port 3)	1. Check for system firmware updates. 2. Check the cabling between the CEC and the I/O subsystems. 3. CEC backplane, U0.1-P1 4. Call service support.
406E 0C10	Processor 0 configuration error: VPD mismatch for processor card 0. (Service processor code problem.)	1. Check for system firmware updates. 2. Call service support.
406E 0C11	Processor 1 configuration error: VPD mismatch for processor card 1. (Service processor code problem.)	1. Check for system firmware updates. 2. Call service support.

Table 16. Service processor error codes (continued)

Error code	Description	Action or possible failing FRU
406E 0CA5	Invalid system configuration	1. Check that the processor cards and DIMMs are properly installed and configured. 2. If there are any FRUs listed in the service processor error log entry, replace them one at a time. 3. Go to "MAP 1540: Problem Isolation Procedures" on page 69.
406E 0CA6	No usable memory left in the system. The system must be rebooted.	Go to "MAP 1240: Memory Problem Resolution" on page 52.
406E 0CA9	Incorrect or incompatible DIMMs are installed.	Check that the DIMMs are properly configured and are the right type for the system.
406E 0CAA	System memory exceeds the limit for this system type and model.	Remove the DIMMs until the memory does not exceed the limit for this system type and model.
406E 0EA0	MOPS service processor code error.	1. Check for system firmware updates. 2. Call service support.
406E 0EA1	Operating system code on main processor	1. Check for operating system code updates. 2. If there are other symptoms, go (one symptom at a time) to the "Quick Entry MAP" on page 40 and follow the instructions. 3. Call service support.
406E 0EA2	PRD code on service processor error.	1. Check for system firmware updates. 2. Call service support.
406E 0EA4	The service processor detected a problem but was unable to isolate the source.	Call service support.
406E 0EAF	Service processor code and system type are unknown.	1. Check for system firmware updates. 2. Call service support.
406E 0EB0	JTAG problem	Go to "MAP 1541: JTAG Problem Isolation" on page 71.
406E 0EB1	Attention line 0 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
406E 0EB2	Attention line 1 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
406E 0EB3	Attention line 2 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
406E 0EB4	Attention line 3 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
406E 0EB5	Attention line 4 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
406E 0EB6	Attention line 5 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
406E 0EB7	Attention line 6 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
406E 0EB8	Attention line 7 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.

Table 16. Service processor error codes (continued)

Error code	Description	Action or possible failing FRU
406E 0EB9	Attention line 8 stuck fault	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
406E 0EBA	Attention line 9 stuck fault	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
406E 0EBB	Attention line 10 stuck fault	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
406E 0EBC	Attention line 11 stuck fault	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
406E 0EE1	Service processor firmware: invalid MRU to FRU mapping.	1. Check for system firmware updates. 2. Call service support.
406E 0EE2	Service processor firmware fault	1. Check for system firmware updates. 2. Call service support.
406E 0EE5	Firmware error, no callout available	1. Check for system firmware updates. 2. Call service support.
406F 0001	Scan interface basic assurance tests detected a CEC backplane fault.	CEC backplane Location code: U0.1-P1
406F 0002	CEC backplane fault	1. Check JTAG cable connections. 2. CEC backplane Location code: U0.1-P1
406F 0003	Scan interface basic assurance tests detected processor fault.	1. Check JTAG cable connections. 2. Processor card Location code: U0.1-P1-C1
406F 0004	Processor fault	1. Check JTAG cable connections. 2. Processor card Location code: U0.1-P1-C2
406F 000E	Processor capacity card	Operator panel Location code: U0.1-L1
406F 0010	DIMM fault	DIMM Location code: U0.1-P1-C1-M8
406F 0011	DIMM fault	DIMM Location code: U0.1-P1-C1-M6
406F 0012	DIMM fault	DIMM Location code: U0.1-P1-C1-M1
406F 0013	DIMM fault	DIMM Location code: U0.1-P1-C1-M3
406F 0014	DIMM fault	DIMM Location code: U0.1-P1-C1-M7
406F 0015	DIMM fault	DIMM Location code: U0.1-P1-C1-M5
406F 0016	DIMM fault	DIMM Location code: U0.1-P1-C1-M2
406F 0017	DIMM fault	DIMM Location code: U0.1-P1-C1-M4

Table 16. Service processor error codes (continued)

Error code	Description	Action or possible failing FRU
406F 0018	DIMM fault	DIMM Location code: U0.1-P1-C2-M8
406F 0019	DIMM fault	DIMM Location code: U0.1-P1-C2-M6
406F 001A	DIMM fault	DIMM Location code: U0.1-P1-C2-M1
406F 001B	DIMM fault	DIMM Location code: U0.1-P1-C2-M3
406F 001C	DIMM fault	DIMM Location code: U0.1-P1-C2-M7
406F 001D	DIMM fault	DIMM Location code: U0.1-P1-C2-M5
406F 001E	DIMM fault	DIMM Location code: U0.1-P1-C2-M2
406F 001F	DIMM fault	DIMM Location code: U0.1-P1-C2-M4
406F 00B0	Bus controller failure	1. Check for system firmware updates. 2. PCI riser card Location code: U0.1-P2
406F 00B1	Bus controller failure	1. Check for system firmware updates. 2. PCI riser card Location code: U0.1-P2
406F 00B3	Processor/VPD problem detected.	1. Check for system firmware updates. 2. Processor card 1 Location code: U0.1-P1-C1
406F 00B4	Processor/VPD problem detected.	1. Check for system firmware updates. 2. Processor card 2 Location code: U0.1-P1-C2
406F 00B7	Insufficient hardware resources were detected to continue IPL of the system after processor subsystem testing and initialization was completed.	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
406F 00D1	Informational message	Informational message
406F 0100	Memory extender 0 on processor card 1	Processor card, Location code: U0.1-P1-C1
406F 0101	Memory extender 2 on processor card 1	Processor card, Location code: U0.1-P1-C1
406F 0130	Memory extender 0 on processor card 2	Processor card, Location code: U0.1-P1-C2
406F 0131	Memory extender 2 on processor card 2	Processor card, Location code: U0.1-P1-C2
406F 0A03	Reboot message on VPD channel 3 processor card 1. Reboot is necessary for run-time array gard to take effect.	Reboot the system in slow mode. Run diagnostics, and then go to ″MAP 0235: System Array Self-Repair Problem Resolution″ in the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*.

Table 16. Service processor error codes (continued)

Error code	Description	Action or possible failing FRU
406F 0A04	Reboot message on VPD channel 4 processor card 2. Reboot is necessary for run-time array gard to take effect.	Reboot the system in slow mode. Run diagnostics, and then go to ″MAP 0235: System Array Self-Repair Problem Resolution″ in the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*.
406F 0B00	Problem with internal RIO interface (I/O slot 0, I/O port 0)	CEC backplane, U0.1-P1
406F 0B01	Problem with internal RIO interface (I/O slot 0, I/O port 1)	CEC backplane, U0.1-P1
406F 0B02	Problem with internal RIO interface (I/O slot 0, I/O port 2)	1. Check for system firmware updates. 2. Check the cabling between the CEC and the I/O subsystems. 3. CEC backplane, U0.1-P1 4. Call service support.
406F 0B03	Problem with internal RIO interface (I/O slot 0, I/O port 3)	1. Check for system firmware updates. 2. Check the cabling between the CEC and the I/O subsystems. 3. CEC backplane, U0.1-P1 4. Call service support.
406F 0B40	Problem with controller chip on CEC backplane	1. CEC backplane, U0.1-P1. 2. Call service support.
406F 0BF0	Problem with RIO interface (I/O slot 0, I/O port 3)	1. Check for system firmware updates. 2. Check the cabling between the CEC and the I/O subsystems. 3. CEC backplane, U0.1-P1 4. Call service support.
406F 0C10	Processor 0 configuration error: VPD mismatch for processor card 0. (Service processor code problem.)	1. Check for system firmware updates. 2. Call service support.
406F 0C11	Processor 1 configuration error: VPD mismatch for processor card 1. (Service processor code problem.)	1. Check for system firmware updates. 2. Call service support.
406F 0CA5	Invalid system configuration	1. Check that the processor cards and DIMMs are properly installed and configured. 2. If there are any FRUs listed in the service processor error log entry, replace them one at a time. 3. Go to “MAP 1540: Problem Isolation Procedures” on page 69.
406F 0CA6	No usable memory left in the system. The system must be rebooted.	Go to “MAP 1240: Memory Problem Resolution” on page 52.
406F 0CA9	Incorrect or incompatible DIMMs are installed.	Check that the DIMMs are properly configured and are the right type for the system.
406F 0CAA	System memory exceeds the limit for this system type and model.	Remove the DIMMs until the memory does not exceed the limit for this system type and model.

Table 16. Service processor error codes (continued)

Error code	Description	Action or possible failing FRU
406F 0EA0	MOPS service processor code error.	1. Check for system firmware updates. 2. Call service support.
406F 0EA1	Operating system code on main processor	1. Check for operating system code updates. 2. If there are other symptoms, go (one symptom at a time) to the "Quick Entry MAP" on page 40 and follow the instructions. 3. Call service support.
406F 0EA2	PRD code on service processor error.	1. Check for system firmware updates. 2. Call service support.
406F 0EA4	The service processor detected a problem, but was unable to isolate the source.	Call service support.
406F 0EAF	Service processor code and system type are unknown.	1. Check for system firmware updates. 2. Call service support.
406F 0EB0	JTAG problem	Go to "MAP 1541: JTAG Problem Isolation" on page 71.
406F 0EB1	Attention line 0 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
406F 0EB2	Attention line 1 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
406F 0EB3	Attention line 2 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
406F 0EB4	Attention line 3 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
406F 0EB5	Attention line 4 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
406F 0EB6	Attention line 5 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
406F 0EB7	Attention line 6 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
406F 0EB8	Attention line 7 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
406F 0EB9	Attention line 8 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
406F 0EBA	Attention line 9 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
406F 0EBB	Attention line 10 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
406F 0EBC	Attention line 11 stuck fault	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
406F 0EE1	Service processor firmware: invalid MRU to FRU mapping	1. Check for system firmware updates. 2. Call service support.
406F 0EE2	Service processor firmware fault	1. Check for system firmware updates. 2. Call service support.

Table 16. Service processor error codes (continued)

Error code	Description	Action or possible failing FRU
406F 0EE5	Firmware error; no callout available.	1. Check for system firmware updates. 2. Call service support.
4503 26F6	**Description:** 1-way processor card fault **Action:** This error code indicates that the processor repeat gard function has deconfigured a processor. Do the following: 1. Go to the processor configuration/deconfiguration menu, located under the system information menu in the service processor menus. Look at the status of the processors. If any of the processors has a status of *manually deconfigured*, reconfigure the processors and boot the system to the SMS menus. Power off the system using the white power button and look again at the status of the processors. If all of the processors are configured in the processor configuration/deconfiguration menu, the problem has been resolved. If any of the processors has a status of *deconfigured by the system*, either before or after the boot to the SMS menus, go to step 2. 2. Replace the processor card (on which the deconfigured processor resides) specified by the location code.	
4503 26F7	**Description:** 2-way processor card fault **Action:** This error code indicates that the processor repeat gard function has deconfigured a processor. Do the following: 1. Go to the processor configuration/deconfiguration menu, located under the system information menu in the service processor menus. Look at the status of the processors. If any of the processors has a status of *manually deconfigured*, reconfigure the processors and boot the system to the SMS menus. Power off the system using the white power button and look again at the status of the processors. If all of the processors are configured in the processor configuration/deconfiguration menu, the problem has been resolved. If any of the processors has a status of *deconfigured by the system*, either before or after the boot to the SMS menus, go to step 2. 2. Replace the processor card (on which the deconfigured processor resides) specified by the location code.	
4503 26F8	**Description:** 1-way processor card fault **Action:** This error code indicates that the processor repeat gard function has deconfigured a processor. Do the following: 1. Go to the processor configuration/deconfiguration menu, located under the system information menu in the service processor menus. Look at the status of the processors. If any of the processors has a status of *manually deconfigured*, reconfigure the processors and boot the system to the SMS menus. Power off the system using the white power button and look again at the status of the processors. If all of the processors are configured in the processor configuration/deconfiguration menu, the problem has been resolved. If any of the processors has a status of *deconfigured by the system*, either before or after the boot to the SMS menus, go to step 2. 2. Replace the processor card (on which the deconfigured processor resides) specified by the location code.	

Table 16. Service processor error codes (continued)

Error code	Description	Action or possible failing FRU
4503 26FA	**Description:** 2-way processor card fault **Action:** This error code indicates that the processor repeat gard function has deconfigured a processor. Do the following: 1. Go to the processor configuration/deconfiguration menu, located under the system information menu in the service processor menus. Look at the status of the processors. If any of the processors has a status of *manually deconfigured*, reconfigure the processors and boot the system to the SMS menus. Power off the system using the white power button and look again at the status of the processors. If all of the processors are configured in the processor configuration/deconfiguration menu, the problem has been resolved. If any of the processors has a status of *deconfigured by the system*, either before or after the boot to the SMS menus, go to step 2. 2. Replace the processor card (on which the deconfigured processor resides) specified by the location code.	
4503 26FB	**Description:** 2-way processor card fault **Action:** This error code indicates that the processor repeat gard function has deconfigured a processor. Do the following: 1. Go to the processor configuration/deconfiguration menu, located under the system information menu in the service processor menus. Look at the status of the processors. If any of the processors has a status of *manually deconfigured*, reconfigure the processors and boot the system to the SMS menus. Power off the system using the white power button and look again at the status of the processors. If all of the processors are configured in the processor configuration/deconfiguration menu, the problem has been resolved. If any of the processors has a status of *deconfigured by the system*, either before or after the boot to the SMS menus, go to step 2. 2. Replace the processor card (on which the deconfigured processor resides) specified by the location code.	
4503 26FD	**Description:** 1-way processor card fault **Action:** This error code indicates that the processor repeat gard function has deconfigured a processor. Do the following: 1. Go to the processor configuration/deconfiguration menu, located under the system information menu in the service processor menus. Look at the status of the processors. If any of the processors has a status of *manually deconfigured*, reconfigure the processors and boot the system to the SMS menus. Power off the system using the white power button and look again at the status of the processors. If all of the processors are configured in the processor configuration/deconfiguration menu, the problem has been resolved. If any of the processors has a status of *deconfigured by the system*, either before or after the boot to the SMS menus, go to step 2. 2. Replace the processor card (on which the deconfigured processor resides) specified by the location code.	

Table 16. Service processor error codes (continued)

Error code	Description	Action or possible failing FRU
4503 26FE	**Description:** 2-way processor card fault **Action:** This error code indicates that the processor repeat gard function has deconfigured a processor. Do the following: 1. Go to the processor configuration/deconfiguration menu, located under the system information menu in the service processor menus. Look at the status of the processors. If any of the processors has a status of *manually deconfigured*, reconfigure the processors and boot the system to the SMS menus. Power off the system using the white power button and look again at the status of the processors. If all of the processors are configured in the processor configuration/deconfiguration menu, the problem has been resolved. If any of the processors has a status of *deconfigured by the system*, either before or after the boot to the SMS menus, go to step 2. 2. Replace the processor card (on which the deconfigured processor resides) specified by the location code.	
4503 26FF	**Description:** 1-way processor card fault **Action:** This error code indicates that the processor repeat gard function has deconfigured a processor. Do the following: 1. Go to the processor configuration/deconfiguration menu, located under the system information menu in the service processor menus. Look at the status of the processors. If any of the processors has a status of *manually deconfigured*, reconfigure the processors and boot the system to the SMS menus. Power off the system using the white power button and look again at the status of the processors. If all of the processors are configured in the processor configuration/deconfiguration menu, the problem has been resolved. If any of the processors has a status of *deconfigured by the system*, either before or after the boot to the SMS menus, go to step 2. 2. Replace the processor card (on which the deconfigured processor resides) specified by the location code.	
4503 301A	**Description:** 128 MB DIMM fault **Action:** This error code indicates that the memory repeat gard function has deconfigured a quad of memory. Do the following: 1. Go to the memory configuration/deconfiguration menu, located under the system information menu in the service processor menus. Look at the status of the DIMMs. If any of the DIMMs has a status of *manually deconfigured*, reconfigure the DIMMs and boot the system to the SMS menus. Power off the system using the white power button and look again at the status of the DIMMs. If all of the DIMMs are configured in the memory configuration/deconfiguration menu, the problem has been resolved. If any of the DIMMs has a status of *deconfigured by the system*, either before or after the boot to the SMS menus, go to step 2. 2. Replace the quad of memory containing the DIMM specified by the location code. The entire quad of memory must be replaced.	

Table 16. Service processor error codes (continued)

Error code	Description	Action or possible failing FRU
4503 301B	**Description:** 1 GB DIMM fault **Action:**This error code indicates that the memory repeat gard function has deconfigured a quad of memory. Do the following: 1. Go to the memory configuration/deconfiguration menu, located under the system information menu in the service processor menus. Look at the status of the DIMMs. If any of the DIMMs has a status of *manually deconfigured*, reconfigure the DIMMs and boot the system to the SMS menus. Power off the system using the white power button and look again at the status of the DIMMs. If all of the DIMMs are configured in the memory configuration/deconfiguration menu, the problem has been resolved. If any of the DIMMs has a status of *deconfigured by the system*, either before or after the boot to the SMS menus, go to step 2. 2. Replace the quad of memory containing the DIMM specified by the location code. The entire quad of memory must be replaced.	
4503 301C	**Description:** 256 MB DIMM fault **Action:** This error code indicates that the memory repeat gard function has deconfigured a quad of memory. Do the following: 1. Go to the memory configuration/deconfiguration menu, located under the system information menu in the service processor menus. Look at the status of the DIMMs. If any of the DIMMs has a status of *manually deconfigured*, reconfigure the DIMMs and boot the system to the SMS menus. Power off the system using the white power button and look again at the status of the DIMMs. If all of the DIMMs are configured in the memory configuration/deconfiguration menu, the problem has been resolved. If any of the DIMMs has a status of *deconfigured by the system*, either before or after the boot to the SMS menus, go to step 2. 2. Replace the quad of memory containing the DIMM specified by the location code. The entire quad of memory must be replaced.	
4503 301D	**Description:** 512 MB DIMM fault **Action:** This error code indicates that the memory repeat gard function has deconfigured a quad of memory. Do the following: 1. Go to the memory configuration/deconfiguration menu, located under the system information menu in the service processor menus. Look at the status of the DIMMs. If any of the DIMMs has a status of *manually deconfigured*, reconfigure the DIMMs and boot the system to the SMS menus. Power off the system using the white power button and look again at the status of the DIMMs. If all of the DIMMs are configured in the memory configuration/deconfiguration menu, the problem has been resolved. If any of the DIMMs has a status of *deconfigured by the system*, either before or after the boot to the SMS menus, go to step 2. 2. Replace the quad of memory containing the DIMM specified by the location code. The entire quad of memory must be replaced.	

Table 16. Service processor error codes (continued)

Error code	Description	Action or possible failing FRU
4503 301E	**Description:** 1 GB DIMM fault **Action:** This error code indicates that the memory repeat gard function has deconfigured a quad of memory. Do the following: 1. Go to the memory configuration/deconfiguration menu, located under the system information menu in the service processor menus. Look at the status of the DIMMs. If any of the DIMMs has a status of *manually deconfigured*, reconfigure the DIMMs and boot the system to the SMS menus. Power off the system using the white power button and look again at the status of the DIMMs. If all of the DIMMs are configured in the memory configuration/deconfiguration menu, the problem has been resolved. If any of the DIMMs has a status of *deconfigured by the system*, either before or after the boot to the SMS menus, go to step 2. 2. Replace the quad of memory containing the DIMM specified by the location code. The entire quad of memory must be replaced.	
4503 302E	**Description:** 2 GB DIMM fault **Action:** This error code indicates that the memory repeat gard function has deconfigured a quad of memory. Do the following: 1. Go to the memory configuration/deconfiguration menu, located under the system information menu in the service processor menus. Look at the status of the DIMMs. If any of the DIMMs has a status of *manually deconfigured*, reconfigure the DIMMs and boot the system to the SMS menus. Power off the system using the white power button and look again at the status of the DIMMs. If all of the DIMMs are configured in the memory configuration/deconfiguration menu, the problem has been resolved. If any of the DIMMs has a status of *deconfigured by the system*, either before or after the boot to the SMS menus, go to step 2. 2. Replace the quad of memory containing the DIMM specified by the location code. The entire quad of memory must be replaced.	
4503 302F	**Description:** 256 MB DIMM fault **Action:** This error code indicates that the memory repeat gard function has deconfigured a quad of memory. Do the following: 1. Go to the memory configuration/deconfiguration menu, located under the system information menu in the service processor menus. Look at the status of the DIMMs. If any of the DIMMs has a status of *manually deconfigured*, reconfigure the DIMMs and boot the system to the SMS menus. Power off the system using the white power button and look again at the status of the DIMMs. If all of the DIMMs are configured in the memory configuration/deconfiguration menu, the problem has been resolved. If any of the DIMMs has a status of *deconfigured by the system*, either before or after the boot to the SMS menus, go to step 2. 2. Replace the quad of memory containing the DIMM specified by the location code. The entire quad of memory must be replaced.	

Table 16. Service processor error codes (continued)

Error code	Description	Action or possible failing FRU
4503 303B	**Description:** 1 GB DIMM fault **Action:** This error code indicates that the memory repeat gard function has deconfigured a quad of memory. Do the following: 1. Go to the memory configuration/deconfiguration menu, located under the system information menu in the service processor menus. Look at the status of the DIMMs. If any of the DIMMs has a status of *manually deconfigured*, reconfigure the DIMMs and boot the system to the SMS menus. Power off the system using the white power button and look again at the status of the DIMMs. If all of the DIMMs are configured in the memory configuration/deconfiguration menu, the problem has been resolved. If any of the DIMMs has a status of *deconfigured by the system*, either before or after the boot to the SMS menus, go to step 2. 2. Replace the quad of memory containing the DIMM specified by the location code. The entire quad of memory must be replaced.	
4503 303C	**Description:** 1 GB DIMM fault **Action:** This error code indicates that the memory repeat gard function has deconfigured a quad of memory. Do the following: 1. Go to the memory configuration/deconfiguration menu, located under the system information menu in the service processor menus. Look at the status of the DIMMs. If any of the DIMMs has a status of *manually deconfigured*, reconfigure the DIMMs and boot the system to the SMS menus. Power off the system using the white power button and look again at the status of the DIMMs. If all of the DIMMs are configured in the memory configuration/deconfiguration menu, the problem has been resolved. If any of the DIMMs has a status of *deconfigured by the system*, either before or after the boot to the SMS menus, go to step 2. 2. Replace the quad of memory containing the DIMM specified by the location code. The entire quad of memory must be replaced.	
4503 303D	**Description:** 2 GB DIMM fault **Action:** This error code indicates that the memory repeat gard function has deconfigured a quad of memory. Do the following: 1. Go to the memory configuration/deconfiguration menu, located under the system information menu in the service processor menus. Look at the status of the DIMMs. If any of the DIMMs has a status of *manually deconfigured*, reconfigure the DIMMs and boot the system to the SMS menus. Power off the system using the white power button and look again at the status of the DIMMs. If all of the DIMMs are configured in the memory configuration/deconfiguration menu, the problem has been resolved. If any of the DIMMs has a status of *deconfigured by the system*, either before or after the boot to the SMS menus, go to step 2. 2. Replace the quad of memory containing the DIMM specified by the location code. The entire quad of memory must be replaced.	

Table 16. Service processor error codes (continued)

Error code	Description	Action or possible failing FRU
4503 309A	**Description:** 128 MB DIMM fault **Action:** This error code indicates that the memory repeat gard function has deconfigured a quad of memory. Do the following: 1. Go to the memory configuration/deconfiguration menu, located under the system information menu in the service processor menus. Look at the status of the DIMMs. If any of the DIMMs has a status of *manually deconfigured*, reconfigure the DIMMs and boot the system to the SMS menus. Power off the system using the white power button and look again at the status of the DIMMs. If all of the DIMMs are configured in the memory configuration/deconfiguration menu, the problem has been resolved. If any of the DIMMs has a status of *deconfigured by the system*, either before or after the boot to the SMS menus, go to step 2. 2. Replace the quad of memory containing the DIMM specified by the location code. The entire quad of memory must be replaced.	
4503 309B	**Description:** 256 MB DIMM fault **Action:** This error code indicates that the memory repeat gard function has deconfigured a quad of memory. Do the following: 1. Go to the memory configuration/deconfiguration menu, located under the system information menu in the service processor menus. Look at the status of the DIMMs. If any of the DIMMs has a status of *manually deconfigured*, reconfigure the DIMMs and boot the system to the SMS menus. Power off the system using the white power button and look again at the status of the DIMMs. If all of the DIMMs are configured in the memory configuration/deconfiguration menu, the problem has been resolved. If any of the DIMMs has a status of *deconfigured by the system*, either before or after the boot to the SMS menus, go to step 2. 2. Replace the quad of memory containing the DIMM specified by the location code. The entire quad of memory must be replaced.	
4503 309C	**Description:** 256 MB DIMM fault **Action:** This error code indicates that the memory repeat gard function has deconfigured a quad of memory. Do the following: 1. Go to the memory configuration/deconfiguration menu, located under the system information menu in the service processor menus. Look at the status of the DIMMs. If any of the DIMMs has a status of *manually deconfigured*, reconfigure the DIMMs and boot the system to the SMS menus. Power off the system using the white power button and look again at the status of the DIMMs. If all of the DIMMs are configured in the memory configuration/deconfiguration menu, the problem has been resolved. If any of the DIMMs has a status of *deconfigured by the system*, either before or after the boot to the SMS menus, go to step 2. 2. Replace the quad of memory containing the DIMM specified by the location code. The entire quad of memory must be replaced.	

Table 16. Service processor error codes (continued)

Error code	Description	Action or possible failing FRU
4503 309D	**Description:** 512 MB DIMM fault **Action:** This error code indicates that the memory repeat gard function has deconfigured a quad of memory. Do the following: 1. Go to the memory configuration/deconfiguration menu, located under the system information menu in the service processor menus. Look at the status of the DIMMs. If any of the DIMMs has a status of *manually deconfigured*, reconfigure the DIMMs and boot the system to the SMS menus. Power off the system using the white power button and look again at the status of the DIMMs. If all of the DIMMs are configured in the memory configuration/deconfiguration menu, the problem has been resolved. If any of the DIMMs has a status of *deconfigured by the system*, either before or after the boot to the SMS menus, go to step 2. 2. Replace the quad of memory containing the DIMM specified by the location code. The entire quad of memory must be replaced.	
4503 309E	**Description:** 1 GB DIMM fault **Action:** This error code indicates that the memory repeat gard function has deconfigured a quad of memory. Do the following: 1. Go to the memory configuration/deconfiguration menu, located under the system information menu in the service processor menus. Look at the status of the DIMMs. If any of the DIMMs has a status of *manually deconfigured*, reconfigure the DIMMs and boot the system to the SMS menus. Power off the system using the white power button and look again at the status of the DIMMs. If all of the DIMMs are configured in the memory configuration/deconfiguration menu, the problem has been resolved. If any of the DIMMs has a status of *deconfigured by the system*, either before or after the boot to the SMS menus, go to step 2. 2. Replace the quad of memory containing the DIMM specified by the location code. The entire quad of memory must be replaced.	
4503 309F	**Description:** 1 GB DIMM fault **Action:** This error code indicates that the memory repeat gard function has deconfigured a quad of memory. Do the following: 1. Go to the memory configuration/deconfiguration menu, located under the system information menu in the service processor menus. Look at the status of the DIMMs. If any of the DIMMs has a status of *manually deconfigured*, reconfigure the DIMMs and boot the system to the SMS menus. Power off the system using the white power button and look again at the status of the DIMMs. If all of the DIMMs are configured in the memory configuration/deconfiguration menu, the problem has been resolved. If any of the DIMMs has a status of *deconfigured by the system*, either before or after the boot to the SMS menus, go to step 2. 2. Replace the quad of memory containing the DIMM specified by the location code. The entire quad of memory must be replaced.	

Table 16. Service processor error codes (continued)

Error code	Description	Action or possible failing FRU
4503 30AA	**Description:** 2 GB DIMM fault **Action:** This error code indicates that the memory repeat gard function has deconfigured a quad of memory. Do the following: 1. Go to the memory configuration/deconfiguration menu, located under the system information menu in the service processor menus. Look at the status of the DIMMs. If any of the DIMMs has a status of *manually deconfigured*, reconfigure the DIMMs and boot the system to the SMS menus. Power off the system using the white power button and look again at the status of the DIMMs. If all of the DIMMs are configured in the memory configuration/deconfiguration menu, the problem has been resolved. If any of the DIMMs has a status of *deconfigured by the system*, either before or after the boot to the SMS menus, go to step 2. 2. Replace the quad of memory containing the DIMM specified by the location code. The entire quad of memory must be replaced.	
4504 26F6	1-way processor card fault	Replace the processor card specified by the location code.
4504 26F7	2-way processor card fault	Replace the processor card specified by the location code.
4504 26F8	1-way processor card fault	Replace the processor card specified by the location code.
4504 26FA	2-way processor card fault	Replace the processor card specified by the location code.
4504 26FB	2-way processor card fault	Replace the processor card specified by the location code.
4504 26FD	1-way processor card fault	Replace the processor card specified by the location code.
4504 26FE	2-way processor card fault	Replace the processor card specified by the location code.
4504 26FF	1-way processor card fault	Replace the processor card specified by the location code.
4504 301A	128 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4504 301B	1 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4504 301C	256 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4504 301D	512 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4504 301E	1 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4504 302E	2 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4504 302F	256 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4504 303B	1 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.

Table 16. Service processor error codes (continued)

Error code	Description	Action or possible failing FRU
4504 303C	1 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4504 303D	2 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4504 309A	128 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4504 309B	256 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4504 309C	256 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4504 309D	512 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4504 309E	1 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4504 309F	1 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4504 30AA	2 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4505 26F6	1-way processor card fault	Replace the processor card specified by the location code.
4505 26F7	2-way processor card fault	Replace the processor card specified by the location code.
4505 26F8	1-way processor card fault	Replace the processor card specified by the location code.
4505 26FA	2-way processor card fault	Replace the processor card specified by the location code.
4505 26FB	2-way processor card fault	Replace the processor card specified by the location code.
4505 26FD	1-way processor card fault	Replace the processor card specified by the location code.
4505 26FE	2-way processor card fault	Replace the processor card specified by the location code.
4505 26FF	1-way processor card fault	Replace the processor card specified by the location code.
4505 301A	128 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4505 301B	1 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4505 301C	256 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4505 301D	512 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4505 301E	1 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4505 302E	2 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.

Table 16. Service processor error codes (continued)

Error code	Description	Action or possible failing FRU
4505 302F	256 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4505 303B	1 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4505 303C	1 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4505 303D	2 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4505 309A	128 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4505 309B	256 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4505 309C	256 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4505 309D	512 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4505 309E	1 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4505 309F	1 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4505 30AA	2 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4506 26F6	1-way processor card fault	Replace the processor card specified by the location code.
4506 26F7	2-way processor card fault	Replace the processor card specified by the location code.
4506 26F8	1-way processor card fault	Replace the processor card specified by the location code.
4506 26FA	2-way processor card fault	Replace the processor card specified by the location code.
4506 26FB	2-way processor card fault	Replace the processor card specified by the location code.
4506 26FD	1-way processor card fault	Replace the processor card specified by the location code.
4506 26FE	2-way processor card fault	Replace the processor card specified by the location code.
4506 26FF	1-way processor card fault	Replace the processor card specified by the location code.
4506 301A	128 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4506 301B	1 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4506 301C	256 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4506 301D	512 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.

Table 16. Service processor error codes (continued)

Error code	Description	Action or possible failing FRU
4506 301E	1 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4506 302E	2 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4506 302F	256 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4506 303B	1 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4506 303C	1 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4506 303D	2 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4506 309A	128 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4506 309B	256 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4506 309C	256 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4506 309D	512 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4506 309E	1 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4506 309F	1 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4506 30AA	2 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4507 26F6	1-way processor card fault	Replace the processor card specified by the location code.
4507 26F7	2-way processor card fault	Replace the processor card specified by the location code.
4507 26F8	1-way processor card fault	Replace the processor card specified by the location code.
4507 26FA	2-way processor card fault	Replace the processor card specified by the location code.
4507 26FB	2-way processor card fault	Replace the processor card specified by the location code.
4507 26FD	1-way processor card fault	Replace the processor card specified by the location code.
4507 26FE	2-way processor card fault	Replace the processor card specified by the location code.
4507 26FF	1-way processor card fault	Replace the processor card specified by the location code.
4507 301A	128 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4507 301B	1 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.

Table 16. Service processor error codes (continued)

Error code	Description	Action or possible failing FRU
4507 301C	256 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4507 301D	512 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4507 301E	1 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4507 302E	2 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4507 302F	256 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4507 303B	1 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4507 303C	1 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4507 303D	2 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4507 309A	128 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4507 309B	256 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4507 309C	256 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4507 309D	512 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4507 309E	1 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4507 309F	1 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4507 30AA	2 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4508 26F6	1-way processor card fault	Replace the processor card specified by the location code.
4508 26F7	2-way processor card fault	Replace the processor card specified by the location code.
4508 26F8	1-way processor card fault	Replace the processor card specified by the location code.
4508 26FA	2-way processor card fault	Replace the processor card specified by the location code.
4508 26FB	2-way processor card fault	Replace the processor card specified by the location code.
4508 26FD	1-way processor card fault	Replace the processor card specified by the location code.
4508 26FE	2-way processor card fault	Replace the processor card specified by the location code.
4508 26FF	1-way processor card fault	Replace the processor card specified by the location code.

Table 16. Service processor error codes (continued)

Error code	Description	Action or possible failing FRU
4508 301A	128 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4508 301B	1 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4508 301C	256 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4508 301D	512 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4508 301E	1 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4508 302E	2 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4508 302F	256 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4508 303B	1 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4508 303C	1 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4508 303D	2 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4508 309A	128 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4508 309B	256 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4508 309C	256 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4508 309D	512 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4508 309E	1 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4508 309F	1 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4508 30AA	2 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4509 26F6	1-way processor card fault	Replace the processor card specified by the location code.
4509 26F7	2-way processor card fault	Replace the processor card specified by the location code.
4509 26F8	1-way processor card fault	Replace the processor card specified by the location code.
4509 26FA	2-way processor card fault	Replace the processor card specified by the location code.
4509 26FB	2-way processor card fault	Replace the processor card specified by the location code.
4509 26FD	1-way processor card fault	Replace the processor card specified by the location code.

Table 16. Service processor error codes (continued)

Error code	Description	Action or possible failing FRU
4509 26FE	2-way processor card fault	Replace the processor card specified by the location code.
4509 26FF	1-way processor card fault	Replace the processor card specified by the location code.
4509 301A	128 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4509 301B	1 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4509 301C	256 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4509 301D	512 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4509 301E	1 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4509 302E	2 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4509 302F	256 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4509 303B	1 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4509 303C	1 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4509 303D	2 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4509 309A	128 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4509 309B	256 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4509 309C	256 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4509 309D	512 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4509 309E	1 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4509 309F	1 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4509 30AA	2 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450A 26F6	1-way processor card fault	Replace the processor card specified by the location code.
450A 26F7	2-way processor card fault	Replace the processor card specified by the location code.
450A 26F8	1-way processor card fault	Replace the processor card specified by the location code.
450A 26FA	2-way processor card fault	Replace the processor card specified by the location code.

Table 16. Service processor error codes (continued)

Error code	Description	Action or possible failing FRU
450A 26FB	2-way processor card fault	Replace the processor card specified by the location code.
450A 26FD	1-way processor card fault	Replace the processor card specified by the location code.
450A 26FE	2-way processor card fault	Replace the processor card specified by the location code.
450A 26FF	1-way processor card fault	Replace the processor card specified by the location code.
450A 301A	128 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450A 301B	1 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450A 301C	256 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450A 301D	512 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450A 301E	1 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450A 302E	2 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450A 302F	256 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450A 303B	1 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450A 303C	1 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450A 303D	2 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450A 309A	128 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450A 309B	256 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450A 309C	256 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450A 309D	512 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450A 309E	1 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450A 309F	1 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450A 30AA	2 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450B 26F6	1-way processor card fault	Replace the processor card specified by the location code.
450B 26F7	2-way processor card fault	Replace the processor card specified by the location code.

Table 16. Service processor error codes (continued)

Error code	Description	Action or possible failing FRU
450B 26F8	1-way processor card fault	Replace the processor card specified by the location code.
450B 26FA	2-way processor card fault	Replace the processor card specified by the location code.
450B 26FB	2-way processor card fault	Replace the processor card specified by the location code.
450B 26FD	1-way processor card fault	Replace the processor card specified by the location code.
450B 26FE	2-way processor card fault	Replace the processor card specified by the location code.
450B 26FF	1-way processor card fault	Replace the processor card specified by the location code.
450B 301A	128 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450B 301B	1 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450B 301C	256 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450B 301D	512 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450B 301E	1 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450B 302E	2 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450B 302F	256 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450B 303B	1 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450B 303C	1 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450B 303D	2 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450B 309A	128 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450B 309B	256 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450B 309C	256 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450B 309D	512 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450B 309E	1 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450B 309F	1 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450B 30AA	2 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.

Table 16. Service processor error codes (continued)

Error code	Description	Action or possible failing FRU
450C 26F6	1-way processor card fault	Replace the processor card specified by the location code.
450C 26F7	2-way processor card fault	Replace the processor card specified by the location code.
450C 26F8	1-way processor card fault	Replace the processor card specified by the location code.
450C 26FA	2-way processor card fault	Replace the processor card specified by the location code.
450C 26FB	2-way processor card fault	Replace the processor card specified by the location code.
450C 26FD	1-way processor card fault	Replace the processor card specified by the location code.
450C 26FE	2-way processor card fault	Replace the processor card specified by the location code.
450C 26FF	1-way processor card fault	Replace the processor card specified by the location code.
450C 301A	128 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450C 301B	1 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450C 301C	256 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450C 301D	512 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450C 301E	1 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450C 302E	2 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450C 302F	256 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450C 303B	1 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450C 303C	1 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450C 303D	2 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450C 309A	128 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450C 309B	256 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450C 309C	256 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450C 309D	512 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450C 309E	1 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.

Table 16. Service processor error codes (continued)

Error code	Description	Action or possible failing FRU
450C 309F	1 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450C 30AA	2 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450D 26F6	1-way processor card fault	Replace the processor card specified by the location code.
450D 26F7	2-way processor card fault	Replace the processor card specified by the location code.
450D 26F8	1-way processor card fault	Replace the processor card specified by the location code.
450D 26FA	2-way processor card fault	Replace the processor card specified by the location code.
450D 26FB	2-way processor card fault	Replace the processor card specified by the location code.
450D 26FD	1-way processor card fault	Replace the processor card specified by the location code.
450D 26FE	2-way processor card fault	Replace the processor card specified by the location code.
450D 26FF	1-way processor card fault	Replace the processor card specified by the location code.
450D 301A	128 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450D 301B	1 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450D 301C	256 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450D 301D	512 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450D 301E	1 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450D 302E	2 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450D 302F	256 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450D 303B	1 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450D 303C	1 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450D 303D	2 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450D 309A	128 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450D 309B	256 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450D 309C	256 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.

Table 16. Service processor error codes (continued)

Error code	Description	Action or possible failing FRU
450D 309D	512 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450D 309E	1 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450D 309F	1 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450D 30AA	2 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450E 26F6	1-way processor card fault	Replace the processor card specified by the location code.
450E 26F7	2-way processor card fault	Replace the processor card specified by the location code.
450E 26F8	1-way processor card fault	Replace the processor card specified by the location code.
450E 26FA	2-way processor card fault	Replace the processor card specified by the location code.
450E 26FB	2-way processor card fault	Replace the processor card specified by the location code.
450E 26FD	1-way processor card fault	Replace the processor card specified by the location code.
450E 26FE	2-way processor card fault	Replace the processor card specified by the location code.
450E 26FF	1-way processor card fault	Replace the processor card specified by the location code.
450E 301A	128 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450E 301B	1 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450E 301C	256 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450E 301D	512 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450E 301E	1 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450E 302E	2 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450E 302F	256 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450E 303B	1 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450E 303C	1 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450E 303D	2 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450E 309A	128 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.

Table 16. Service processor error codes (continued)

Error code	Description	Action or possible failing FRU
450E 309B	256 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450E 309C	256 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450E 309D	512 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450E 309E	1 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450E 309F	1 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450E 30AA	2 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450F 26F6	1-way processor card fault	Replace the processor card specified by the location code.
450F 26F7	2-way processor card fault	Replace the processor card specified by the location code.
450F 26F8	1-way processor card fault	Replace the processor card specified by the location code.
450F 26FA	2-way processor card fault	Replace the processor card specified by the location code.
450F 26FB	2-way processor card fault	Replace the processor card specified by the location code.
450F 26FD	1-way processor card fault	Replace the processor card specified by the location code.
450F 26FE	2-way processor card fault	Replace the processor card specified by the location code.
450F 26FF	1-way processor card fault	Replace the processor card specified by the location code.
450F 301A	128 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450F 301B	1 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450F 301C	256 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450F 301D	512 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450F 301E	1 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450F 302E	2 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450F 302F	256 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450F 303B	1 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450F 303C	1 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.

Table 16. Service processor error codes (continued)

Error code	Description	Action or possible failing FRU
450F 303D	2 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450F 309A	128 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450F 309B	256 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450F 309C	256 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450F 309D	512 MB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450F 309E	1 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450F 309F	1 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
450F 30AA	2 GB DIMM fault	Go to “MAP 1240: Memory Problem Resolution” on page 52.
4604 287A	CEC backplane	Replace the CEC backplane, Location code: U0.1-P1
4604 28C4	CEC backplane fault	Replace the CEC backplane, Location code: U0.1-P1
4605 287A	CEC backplane	Replace the CEC backplane, Location code: U0.1-P1
4605 28C4	CEC backplane fault	Replace the CEC backplane, Location code: U0.1-P1
4606 287A	CEC backplane	Replace the CEC backplane, Location code: U0.1-P1
4606 28C4	CEC backplane fault	Replace the CEC backplane, Location code: U0.1-P1
4607 287A	CEC backplane	Replace the CEC backplane, Location code: U0.1-P1
4607 28C4	CEC backplane fault	Replace the CEC backplane, Location code: U0.1-P1
4608 287A	CEC backplane	Replace the CEC backplane, Location code: U0.1-P1
4608 28C4	CEC backplane fault	Replace the CEC backplane, Location code: U0.1-P1
4609 287A	CEC backplane	Replace the CEC backplane, Location code: U0.1-P1
4609 28C4	CEC backplane fault	Replace the CEC backplane, Location code: U0.1-P1
460A 287A	CEC backplane	Replace the CEC backplane, Location code: U0.1-P1
460A 28C4	CEC backplane fault	Replace the CEC backplane, Location code: U0.1-P1
460B 287A	CEC backplane	Replace the CEC backplane, Location code: U0.1-P1

Table 16. Service processor error codes (continued)

Error code	Description	Action or possible failing FRU
460B 28C4	CEC backplane fault	Replace the CEC backplane, Location code: U0.1-P1
460C 287A	CEC backplane	Replace the CEC backplane, Location code: U0.1-P1
460C 28C4	CEC backplane fault	Replace the CEC backplane, Location code: U0.1-P1
460D 287A	CEC backplane	Replace the CEC backplane, Location code: U0.1-P1
460D 28C4	CEC backplane fault	Replace the CEC backplane, Location code: U0.1-P1
460E 287A	CEC backplane	Replace the CEC backplane, Location code: U0.1-P1
460E 28C4	CEC backplane fault	Replace the CEC backplane, Location code: U0.1-P1
460F 287A	CEC backplane	Replace the CEC backplane, Location code: U0.1-P1
460F 28C4	CEC backplane fault	Replace the CEC backplane, Location code: U0.1-P1
4B23 26F6	**Description:** 1-way processor card fault **Action:** This error code indicates that the processor repeat gard function has deconfigured a processor. Do the following: 1. Go to the processor configuration/deconfiguration menu, located under the system information menu in the service processor menus. Look at the status of the processors. If any of the processors has a status of *manually deconfigured*, reconfigure the processors and boot the system to the SMS menus. Power down the system using the white power button and look again at the status of the processors. If all of the processors are configured in the processor configuration/deconfiguration menu, the problem has been resolved. If any of the processors has a status of *deconfigured by the system*, either before or after the boot to the SMS menus, go to step 2. 2. Replace the processor card (on which the deconfigured processor resides) specified by the location code.	
4B23 26F7	**Description:** 2-way processor card fault **Action:** This error code indicates that the processor repeat gard function has deconfigured a processor. Do the following: 1. Go to the processor configuration/deconfiguration menu, located under the system information menu in the service processor menus. Look at the status of the processors. If any of the processors has a status of *manually deconfigured*, reconfigure the processors and boot the system to the SMS menus. Power off the system using the white power button and look again at the status of the processors. If all of the processors are configured in the processor configuration/deconfiguration menu, the problem has been resolved. If any of the processors has a status of *deconfigured by the system*, either before or after the boot to the SMS menus, go to step 2. 2. Replace the processor card (on which the deconfigured processor resides) specified by the location code.	

Table 16. Service processor error codes (continued)

Error code	Description	Action or possible failing FRU
4B23 26F8	**Description:** 1-way processor card fault **Action:** This error code indicates that the processor repeat gard function has deconfigured a processor. Do the following: 1. Go to the processor configuration/deconfiguration menu, located under the system information menu in the service processor menus. Look at the status of the processors. If any of the processors has a status of *manually deconfigured*, reconfigure the processors and boot the system to the SMS menus. Power off the system using the white power button and look again at the status of the processors. If all of the processors are configured in the processor configuration/deconfiguration menu, the problem has been resolved. If any of the processors has a status of *deconfigured by the system*, either before or after the boot to the SMS menus, go to step 2. 2. Replace the processor card (on which the deconfigured processor resides) specified by the location code.	
4B23 26FA	**Description:** 2-way processor card fault **Action:** This error code indicates that the processor repeat gard function has deconfigured a processor. Do the following: 1. Go to the processor configuration/deconfiguration menu, located under the system information menu in the service processor menus. Look at the status of the processors. If any of the processors has a status of *manually deconfigured*, reconfigure the processors and boot the system to the SMS menus. Power off the system using the white power button and look again at the status of the processors. If all of the processors are configured in the processor configuration/deconfiguration menu, the problem has been resolved. If any of the processors has a status of *deconfigured by the system*, either before or after the boot to the SMS menus, go to step 2. 2. Replace the processor card (on which the deconfigured processor resides) specified by the location code.	
4B23 26FB	**Description:** 2-way processor card fault **Action:** This error code indicates that the processor repeat gard function has deconfigured a processor. Do the following: 1. Go to the processor configuration/deconfiguration menu, located under the system information menu in the service processor menus. Look at the status of the processors. If any of the processors has a status of *manually deconfigured*, reconfigure the processors and boot the system to the SMS menus. Power off the system using the white power button and look again at the status of the processors. If all of the processors are configured in the processor configuration/deconfiguration menu, the problem has been resolved. If any of the processors has a status of *deconfigured by the system*, either before or after the boot to the SMS menus, go to step 2. 2. Replace the processor card (on which the deconfigured processor resides) specified by the location code.	

Table 16. Service processor error codes (continued)

Error code	Description	Action or possible failing FRU
4B23 26FD	**Description:** 1-way processor card fault **Action:** This error code indicates that the processor repeat gard function has deconfigured a processor. Do the following: 1. Go to the processor configuration/deconfiguration menu, located under the system information menu in the service processor menus. Look at the status of the processors. If any of the processors has a status of *manually deconfigured*, reconfigure the processors and boot the system to the SMS menus. Power off the system using the white power button and look again at the status of the processors. If all of the processors are configured in the processor configuration/deconfiguration menu, the problem has been resolved. If any of the processors has a status of *deconfigured by the system*, either before or after the boot to the SMS menus, go to step 2. 2. Replace the processor card (on which the deconfigured processor resides) specified by the location code.	
4B23 26FE	**Description:** 2-way processor card fault **Action:** This error code indicates that the processor repeat gard function has deconfigured a processor. Do the following: 1. Go to the processor configuration/deconfiguration menu, located under the system information menu in the service processor menus. Look at the status of the processors. If any of the processors has a status of *manually deconfigured*, reconfigure the processors and boot the system to the SMS menus. Power off the system using the white power button and look again at the status of the processors. If all of the processors are configured in the processor configuration/deconfiguration menu, the problem has been resolved. If any of the processors has a status of *deconfigured by the system*, either before or after the boot to the SMS menus, go to step 2. 2. Replace the processor card (on which the deconfigured processor resides) specified by the location code.	
4B23 26FF	**Description:** 1-way processor card fault **Action:** This error code indicates that the processor repeat gard function has deconfigured a processor. Do the following: 1. Go to the processor configuration/deconfiguration menu, located under the system information menu in the service processor menus. Look at the status of the processors. If any of the processors has a status of *manually deconfigured*, reconfigure the processors and boot the system to the SMS menus. Power off the system using the white power button and look again at the status of the processors. If all of the processors are configured in the processor configuration/deconfiguration menu, the problem has been resolved. If any of the processors has a status of *deconfigured by the system*, either before or after the boot to the SMS menus, go to step 2. 2. Replace the processor card (on which the deconfigured processor resides) specified by the location code.	
4B24 26F6	1-way processor card fault	Replace the processor card specified by the location code.
4B24 26F7	2-way processor card fault	Replace the processor card specified by the location code.
4B24 26F8	1-way processor card fault	Replace the processor card specified by the location code.
4B24 26FA	2-way processor card fault	Replace the processor card specified by the location code.

Table 16. Service processor error codes (continued)

Error code	Description	Action or possible failing FRU
4B24 26FB	2-way processor card fault	Replace the processor card specified by the location code.
4B24 26FD	1-way processor card fault	Replace the processor card specified by the location code.
4B24 26FE	2-way processor card fault	Replace the processor card specified by the location code.
4B24 26FF	1-way processor card fault	Replace the processor card specified by the location code.
4B25 26F6	1-way processor card fault	Replace the processor card specified by the location code.
4B25 26F7	2-way processor card fault	Replace the processor card specified by the location code.
4B25 26F8	1-way processor card fault	Replace the processor card specified by the location code.
4B25 26FA	2-way processor card fault	Replace the processor card specified by the location code.
4B25 26FB	2-way processor card fault	Replace the processor card specified by the location code.
4B25 26FD	1-way processor card fault	Replace the processor card specified by the location code.
4B25 26FE	2-way processor card fault	Replace the processor card specified by the location code.
4B25 26FF	1-way processor card fault	Replace the processor card specified by the location code.
4B26 26F6	1-way processor card fault	Replace the processor card specified by the location code.
4B26 26F7	2-way processor card fault	Replace the processor card specified by the location code.
4B26 26F8	1-way processor card fault	Replace the processor card specified by the location code.
4B26 26FA	2-way processor card fault	Replace the processor card specified by the location code.
4B26 26FB	2-way processor card fault	Replace the processor card specified by the location code.
4B26 26FD	1-way processor card fault	Replace the processor card specified by the location code.
4B26 26FE	2-way processor card fault	Replace the processor card specified by the location code.
4B26 26FF	1-way processor card fault	Replace the processor card specified by the location code.
4B27 26F6	1-way processor card fault	Replace the processor card specified by the location code.
4B27 26F7	2-way processor card fault	Replace the processor card specified by the location code.
4B27 26F8	1-way processor card fault	Replace the processor card specified by the location code.

Table 16. Service processor error codes (continued)

Error code	Description	Action or possible failing FRU
4B27 26FA	2-way processor card fault	Replace the processor card specified by the location code.
4B27 26FB	**Description:** 2-way processor card fault **Action:** 1. If the system has one 2-way processor card or two 2-way processor cards, look at word 13 in the service processor error log entry detail data. If word 13 is not 7xxxD023 or 7xxxD0E1, replace the processor card specified by the location code. If word 13 is 7xxxD023 or 7xxxD0E1, look for an earlier entry in the service processor error log of the form 4067xxxx, 4507xxxx, 4607xxxx, or 4B2726FB that has not already been corrected by a parts replacement. If you find an earlier entry, replace the FRU identified by that error, not the latest occurrence of 4B2726FB. 2. If this does not resolve the problem, call service support.	
4B27 26FD	1-way processor card fault	Replace the processor card specified by the location code.
4B27 26FE	2-way processor card fault	Replace the processor card specified by the location code.
4B27 26FF	1-way processor card fault	Replace the processor card specified by the location code.
4B28 26F6	1-way processor card fault	Replace the processor card specified by the location code.
4B28 26F7	2-way processor card fault	Replace the processor card specified by the location code.
4B28 26F8	1-way processor card fault	Replace the processor card specified by the location code.
4B28 26FA	2-way processor card fault	Replace the processor card specified by the location code.
4B28 26FB	2-way processor card fault	Replace the processor card specified by the location code.
4B28 26FD	1-way processor card fault	Replace the processor card specified by the location code.
4B28 26FE	2-way processor card fault	Replace the processor card specified by the location code.
4B28 26FF	1-way processor card fault	Replace the processor card specified by the location code.
4B29 26F6	1-way processor card fault	Replace the processor card specified by the location code.
4B29 26F7	2-way processor card fault	Replace the processor card specified by the location code.
4B29 26F8	1-way processor card fault	Replace the processor card specified by the location code.
4B29 26FA	2-way processor card fault	Replace the processor card specified by the location code.
4B29 26FB	2-way processor card fault	Replace the processor card specified by the location code.
4B29 26FD	1-way processor card fault	Replace the processor card specified by the location code.
4B29 26FE	2-way processor card fault	Replace the processor card specified by the location code.

Table 16. Service processor error codes (continued)

Error code	Description	Action or possible failing FRU
4B29 26FF	1-way processor card fault	Replace the processor card specified by the location code.
4B2A 26F6	1-way processor card fault	Replace the processor card specified by the location code.
4B2A 26F7	2-way processor card fault	Replace the processor card specified by the location code.
4B2A 26F8	1-way processor card fault	Replace the processor card specified by the location code.
4B2A 26FA	2-way processor card fault	Replace the processor card specified by the location code.
4B2A 26FB	2-way processor card fault	Replace the processor card specified by the location code.
4B2A 26FD	1-way processor card fault	Replace the processor card specified by the location code.
4B2A 26FE	2-way processor card fault	Replace the processor card specified by the location code.
4B2A 26FF	1-way processor card fault	Replace the processor card specified by the location code.
4B2B 26F6	1-way processor card fault	Replace the processor card specified by the location code.
4B2B 26F7	2-way processor card fault	Replace the processor card specified by the location code.
4B2B 26F8	1-way processor card fault	Replace the processor card specified by the location code.
4B2B 26FA	2-way processor card fault	Replace the processor card specified by the location code.
4B2B 26FB	**Description:** 2-way processor card fault **Action:** 1. Replace the processor card at location U0.1-P1-C2. 2. If the problem is not resolved, remove the processor card at U0.1-P1-C1 and replace it with the processor card that was removed in the previous step. 3. If the problem is still not resolved, replace the CEC backplane, at location U0.1-P1.	
4B2B 26FD	1-way processor card fault	Replace the processor card specified by the location code.
4B2B 26FE	2-way processor card fault	Replace the processor card specified by the location code.
4B2B 26FF	1-way processor card fault	Replace the processor card specified by the location code.
4B2C 26F6	1-way processor card fault	Replace the processor card specified by the location code.
4B2C 26F7	2-way processor card fault	Replace the processor card specified by the location code.
4B2C 26F8	1-way processor card fault	Replace the processor card specified by the location code.
4B2C 26FA	2-way processor card fault	Replace the processor card specified by the location code.

Table 16. Service processor error codes (continued)

Error code	Description	Action or possible failing FRU
4B2C 26FB	2-way processor card fault	Replace the processor card specified by the location code.
4B2C 26FD	1-way processor card fault	Replace the processor card specified by the location code.
4B2C 26FE	2-way processor card fault	Replace the processor card specified by the location code.
4B2C 26FF	1-way processor card fault	Replace the processor card specified by the location code.
4B2D 26F6	1-way processor card fault	Replace the processor card specified by the location code.
4B2D 26F7	2-way processor card fault	Replace the processor card specified by the location code.
4B2D 26F8	1-way processor card fault	Replace the processor card specified by the location code.
4B2D 26FA	2-way processor card fault	Replace the processor card specified by the location code.
4B2D 26FB	2-way processor card fault	Replace the processor card specified by the location code.
4B2D 26FD	1-way processor card fault	Replace the processor card specified by the location code.
4B2D 26FE	2-way processor card fault	Replace the processor card specified by the location code.
4B2D 26FF	1-way processor card fault	Replace the processor card specified by the location code.
4B2E 26F6	1-way processor card fault	Replace the processor card specified by the location code.
4B2E 26F7	2-way processor card fault	Replace the processor card specified by the location code.
4B2E 26F8	1-way processor card fault	Replace the processor card specified by the location code.
4B2E 26FA	2-way processor card fault	Replace the processor card specified by the location code.
4B2E 26FB	2-way processor card fault	Replace the processor card specified by the location code.
4B2E 26FD	1-way processor card fault	Replace the processor card specified by the location code.
4B2E 26FE	2-way processor card fault	Replace the processor card specified by the location code.
4B2E 26FF	1-way processor card fault	Replace the processor card specified by the location code.
4B2F 26F6	1-way processor card fault	Replace the processor card specified by the location code.
4B2F 26F7	2-way processor card fault	Replace the processor card specified by the location code.
4B2F 26F8	1-way processor card fault	Replace the processor card specified by the location code.

Table 16. Service processor error codes (continued)

Error code	Description	Action or possible failing FRU
4B2F 26FA	2-way processor card fault	Replace the processor card specified by the location code.
4B2F 26FB	2-way processor card fault	Replace the processor card specified by the location code.
4B2F 26FD	1-way processor card fault	Replace the processor card specified by the location code.
4B2F 26FE	2-way processor card fault	Replace the processor card specified by the location code.
4B2F 26FF	1-way processor card fault	Replace the processor card specified by the location code.

DIMM present detect bits (PD-bits)

The following table expands on the Memory error notes found on page 148, where *yy* is the PD value in the table below and *xxx* are the last three digits of the error code. Use these values to identify the type of memory that generated the error.

If you replace FRUs or perform an action, and the problem is still not corrected, go to "MAP 1548: Processor Subsystem Problem Isolation" on page 77 unless otherwise indicated in the Memory Error Notes found on page 148.

PD value	Size
28	512 MB
78	1024 MB
88	2048 MB

Note: DIMMs can be replaced singly or in quads. See "DIMMs" on page 346.

Error log utility procedure

When the System Management Services menu appears, check the error log for any errors. Use the location code obtained from the SMS error log utility to identify the component that the error is reported against. To obtain the location code from the error log utility, do the following:

1. From the SMS main menu, select **View Error Log**.
2. If an error is logged, check the time stamp.
3. If the error was logged during the current boot attempt, record it.
4. Look up the error in the Chapter 5, "Error code to FRU index", on page 125 and perform the listed action.
5. If no recent error is logged in the error log, go to "MAP 1548: Processor Subsystem Problem Isolation" on page 77.

System firmware update messages

Error code	Description	Action or possible failing FRU
A1FD 0000	Recovery mode entered	Information message

Error code	Description	Action or possible failing FRU
A1FD 0001	Service processor flash recovery	Insert Diskette #1
A1FD 0002	Service processor flash recovery	Insert Diskette #2
A1FD 0003	Service processor flash recovery	Insert Diskette #3
A1FD 0004	Service processor flash recovery	Insert Diskette #4

Scan dump messages

Error code	Description	Action or possible failing FRU
A100 3000	Successful completion of scan dump	Informational message; might or might not be seen during a scan log dump.
A1FF 3000	Scan dump has been disabled	Informational message; might or might not be seen during a scan log dump.

Common firmware error codes

Attention: Follow the procedure defined in “Checkpoint and error code index” on page 127. If you replace FRUs or perform an action and the problem is still not corrected, go to “MAP 1548: Processor Subsystem Problem Isolation” on page 77 unless otherwise indicated in the tables.

If you replace FRUs and the problem is corrected, go to “MAP 0410: Repair Checkout” on page 45.

Note: Not all firmware error codes are supported.

Table 17. Common firmware error codes

Error code	Description	Action or possible failing FRU
B006 1403	Missing service processor resource	1. Update system firmware. 2. CEC backplane Location code: U0.1-P1
B006 1404	Service processor firmware fault	1. Update system firmware. 2. CEC backplane Location code: U0.1-P1
B006 1405	Service processor firmware fault	1. Update system firmware. 2. CEC backplane Location code: U0.1-P1
B006 1406	Service processor program error	1. Update system firmware. 2. Check for operating system updates. 3. CEC backplane Location code: U0.1-P1
B006 1407	Service processor resource allocation problem	1. Update system firmware. 2. Check for operating system updates. 3. CEC backplane Location code: U0.1-P1

Table 17. Common firmware error codes (continued)

Error code	Description	Action or possible failing FRU
B006 1408	Service processor program error	1. Update system firmware. 2. Check for operating system updates. 3. CEC backplane Location code: U0.1-P1
B006 1409	Service processor program error	1. Update system firmware. 2. CEC backplane Location code: U0.1-P1
B10F 1000	Service processor DRAM failure	CEC backplane Location code: U0.1-P1
B10F 1002	Service processor failure	CEC backplane Location code: U0.1-P1
B10F 1005	Service processor failure	CEC backplane Location code: U0.1-P1
B10F 1007	Service processor failure	CEC backplane Location code: U0.1-P1
B10F 1008	Service processor failure	CEC backplane Location code: U0.1-P1
B10F 100E	Service processor boot flash corrupted	CEC backplane Location code: U0.1-P1
B10F 100F	Service processor base flash corrupted	CEC backplane Location code: U0.1-P1
B10F 1300	Service processor failure	CEC backplane Location code: U0.1-P1
B10F 1370	Service processor flash update failure	1. Retry flash update. 2. CEC backplane Location code: U0.1-P1
B10F 1380	Service processor program failure	1. Update system firmware. 2. CEC backplane Location code: U0.1-P1
B10F 1381	Service processor flash error	1. Update system firmware. 2. CEC backplane Location code: U0.1-P1
B10F 1384	Service processor failure	CEC backplane Location code: U0.1-P1
B10F 1387	Service processor failure	CEC backplane Location code: U0.1-P1
B10F 1400	Service processor failure	CEC backplane Location code: U0.1-P1
B10F 1401	Service processor failure	CEC backplane Location code: U0.1-P1
B10F 1670	Service processor flash update failure	1. Retry flash update. 2. CEC backplane Location code: U0.1-P1
B10F 1672	Service processor firmware update invalid	Call service support.

Table 17. Common firmware error codes (continued)

Error code	Description	Action or possible failing FRU
B10F 1675	Service processor failure	CEC backplane Location code: U0.1-P1
B10F 1681	Service processor firmware update invalid	Call service support.
B10F 1682	Service processor firmware update invalid	Call service support.
B10F 1683	Service processor firmware update invalid	Call service support.
B1xx 0013	A firmware update has failed because the update image is invalid. The update was stopped before any changes were made to the currently installed firmware.	Install a valid firmware image for the specific type and model.
B1xx 4600	Service processor failure	CEC backplane Location code: U0.1-P1
B1xx 4601	System processor failure	Go to "MAP 1540: Problem Isolation Procedures" on page 69.
B1xx 4602	Service processor firmware failure	1. Do a slow boot (see "Performing slow boot" on page 125), and then look at the service processor error log. Look for the first new error after the B1xx 4602. Go to the "Checkpoint and error code index" on page 127 with the new error code and perform the action indicated. If there are no new error codes, go to "MAP 1540: Problem Isolation Procedures" on page 69. 2. Call service support.
B1xx 4603	Service processor firmware corrupted	1. Reload system firmware. 2. CEC backplane Location code: U0.1-P1
B1xx 4606	Firmware failure	1. Check for system firmware updates. 2. Operator panel Location code: U0.1-L1 3. CEC backplane Location code: U0.1-P1
B1xx 4608	Service processor early termination	1. Reset the system by disconnecting and reconnecting system power. 2. Reload system firmware. 3. CEC backplane Location code: U0.1-P1
B1xx 460A	TOD clock has been reset	1. Set TOD clock. 2. CEC backplane Location code: U0.1-P1
B1xx 460B	TOD battery failure	TOD battery Location code: U0.1-P1-V3
B1xx 4611	Service processor failure	1. Processor card Location code: U0.1-P1-C1 2. CEC backplane Location code: U0.1-P1

Table 17. Common firmware error codes (continued)

Error code	Description	Action or possible failing FRU
B1xx 4620	Modem configuration failure	1. Check modem configuration files. 2. Check for system firmware update. 3. Modem 4. CEC backplane Location code: U0.1-P1
B1xx 4621	Modem disconnect failure	1. Check modem configuration files. 2. Check for system firmware update. 3. Modem 4. CEC backplane Location code: U0.1-P1
B1xx 4622	Service processor failure	1. Operator panel Location code: U0.1-L1 2. Check for system firmware update. 3. CEC backplane Location code: U0.1-P1
B1xx 4633	System power control network failure	1. Check for system firmware update. 2. CEC backplane Location code: U0.1-P1
B1xx 4634	SPCN loop fault	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
B1xx 4643	I2C card/flex cable detection error	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
B1xx 4644	Processor VPD system fault	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
B1xx 4645	I2C (Non-processor) VPD System Fault	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
B1xx 4646	General VPD fault	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
B1xx 4647	Write TM field in system VPD	Replace the operator panel, location: U0.1-L1. Do not swap the VPD module from the old operator panel onto the new operator panel; leave the new, unprogrammed VPD module on the new operator panel. Call service support for instructions.
B1xx 4648	CPU Backplane VPD or Power Source	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
B1xx 4649	Power supply VPD failure	CEC power supply Location code: U0.1-V1, U0.1-V2
B1xx 4650	A system processor failure has been detected by the service processor. All system processors have been reset in an attempt to recover operations.	Information only. If the problem persists, check the error logs for other fault indications. If no other fault indications are found, go to “MAP 1540: Problem Isolation Procedures” on page 69.
B1xx 4651	CPU VPD fault	Processor card Location code: U0.1-P1-C1, U0.1-P1-C2

Table 17. Common firmware error codes (continued)

Error code	Description	Action or possible failing FRU
B1xx 4660	Memory subsystem failure	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
B1xx 4661	Memory card VPD failure	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
B1xx 4662	DIMM VPD failure	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
B1xx 4670	Processor drawer cooling	1. Check ambient temperature. 2. Check air supply to fans. 3. Check fans for proper installation and operation. 4. Check for any unsupported cards (that might be too hot). 5. CEC backplane Location code: U0.1-P1
B1xx 4671	Critical temperature in CEC drawer	1. Check ambient temperature. 2. Check air supply to fans. 3. Check fans for proper installation and operation. 4. Check for unsupported cards (which might be too hot). 5. CEC planar, U0.1-P1
B1xx 4672	Critical temperature in I/O subsystem	1. Check ambient temperature. 2. Check air supply to fans. 3. Check fans for proper installation and operation. 4. Check for unsupported cards (which might be too hot). 5. I/O subsystem planar, U0.dd-P1
B1xx 4681	JTAG scan interface	1. JTAG cabling 2. CEC backplane Location code: U0.1-P1 3. Processor card Location code: U0.1-P1-C1
B1xx 4682	Problem with system VPD on operator panel.	1. Replace the operator panel, location: U0.1-L1. Do not swap the old VPD module onto the new operator panel. Call service support for instructions on programming the new VPD module. 2. Call service support.

Table 17. Common firmware error codes (continued)

Error code	Description	Action or possible failing FRU
B1xx 4690	**Description:** Operating system surveillance timeout (AIX to service processor interface failure). **Action:** 1. This error code indicates that the operating system terminated early (which usually implies an operating system crash). This error code might appear in the service processor error log by itself. However, in the operating system error log, another error points to the cause of the operating system crash. Use the other error as the starting point for your service action. If the system will not boot, power off and look at the service processor error log. Look for error codes (with time stamps that correspond to the boot that was just attempted) that indicate hardware failures. If these error codes are found, record them, find the error code listed in the Chapter 5, "Error code to FRU index", on page 125, and perform the indicated actions. 2. The other possibility is that the operating system was not found during a prior boot attempt. To determine if this occurred, do the following: a. Look at the operating system error log entry containing B1xx4690. This is a ″SCAN_ERROR_CHRP″ error with an identifier of BFEC0425. Look at the operating system error log entry containing B1xx4690. This is a ″SCAN_ERROR_CHRP″ error with an identifier of BFEC0425. b. In the detail data, find the string ″B1xx4690″ (If present, it will be at byte 60 of the detail data.) c. Go forward eight bytes after the ″B1″ to byte 68, and look at bytes 68 and 69. If the values of bytes 68 and 69 are A2B0, this indicates that the firmware was unable to find a bootable device in the boot list that is set in the SMS menus. If the system is up, the boot list problem has been corrected and the B1xx 4690 can be treated as an informational message with no actions required. 3. Call service support.	
B1xx 4691	**Description:** System firmware to service processor interface failure. (System firmware surveillance timeout) **Action:** 1. Check for system firmware updates. 2. Go to the service processor main menu and select **System Information menu**. Then select **Read Progress Indicators From Last System Boot.** Begin your repair action with the error code or checkpoint immediately preceding B1xx 4691: If a location code is displayed with the error code or checkpoint, replace the part at that location. **Note:** If the location code is U0.1-P1/E1 or U0.1-P1/E2, change the PCI riser card (U0.1-P2) first, and then change the CEC backplane (U0.1-P1). If no location code is specified, and you have an 8-character error code, go to the "Checkpoint and error code index" on page 127. If no location code is specified, and you have a four-character checkpoint (for example, Exxx), go to "Firmware checkpoints" on page 101. 3. If your checkpoint is 91FF, perform the following: a. Remove any cables. b. Replace the CEC backplane, location U0.1-P1. 4. If the problem is not resolved, call service support.	
B1xx 4692	Operator panel task interface failure	1. Check for system firmware updates. 2. Call service support.
B1xx 4693	Service processor firmware error	1. Check for system firmware updates. 2. Call service support.
B1xx 4694	System processor firmware failure	1. Check for system firmware updates. 2. CEC backplane Location code: U0.1-P1

Table 17. Common firmware error codes (continued)

Error code	Description	Action or possible failing FRU
B1xx 4695	System power control network to service processor interface failure	1. Check for system firmware updates. 2. CEC backplane Location code: U0.1-P1
B1xx 4696	System firmware interface failure	1. Check for system firmware updates. 2. Call service support.
B1xx 4698	Firmware problem	1. Check for system firmware updates. 2. Call service support.
B1xx 4699	Service processor firmware: If the managed system is down, go to the service processor error log and find the error log entry containing B1xx 4699. Look at the first two bytes of word 13 of the detailed entry information. If the managed system is running, look at the AIX error log entry containing B1xx 4699. This is a ″SCAN_ERROR_CHRP″ error with an identifier of BFE4C025. In the detail data, find the string ″B1xx 4699″. (If present, it will be at byte 60 of the detail data.) Go forward eight bytes after the ″B1″ to byte 68 and look at bytes 68 and 69. Perform the following actions based on the following values of bytes 68 and 69 from the AIX error log entry, or on the first two bytes of word 13 from the service processor error log entry: **2306** No processor card is detected in slot one (U0.1-P1-C1); a processor card is required in the first slot for the system to boot. **Actions:** 1. If a processor card is not plugged into slot one (U0.1-P1-C1), plug one in. 2. If a processor card is plugged into slot one (U0.1-P1-C1), reseat it. If reseating the processor card does not fix the problem, replace it. **A205:** Machine type and model fields are not valid in the VPD module. Obtain an operator panel. Do not swap the old VPD module onto the new operator panel. Call service support for instructions on how to write the machine type and model into the new VPD module. **A20B:** Error requesting trace buffer for service processor. **Actions:** 1. Reset the service processor, if possible. 2. Check for system firmware updates. Apply the updates if they are available. **A218:** Unknown return code detected. **Actions:** Check for system firmware updates. Apply the updates if they are available. **A21A:** Error allocating an internal service processor memory space. **Actions:** 1. Reset the service processor, if possible. 2. Check for system firmware updates. Apply the updates if they are available. **A800:** Hardware Management Console (HMC) service processor initialization failure. **Actions:** 1. Check for system firmware updates. 2. Replace the service processor, location: U0.1-P1. **A801:** HMC wrap failure. **Actions:** Replace the service processor, location: U0.1-P1.	

Table 17. Common firmware error codes (continued)

Error code	Description	Action or possible failing FRU
B1xx 4699 (continued)	(Continued from the previous page.) **A806:** Loss of the surveillance heartbeat between the HMC and the service processor. **Actions:** 1. Disconnect HMC (not supported). 2. Call service support. If there are no other error codes or indications of a problem, the A806 (loss of surveillance heartbeat) was a temporary condition and has been resolved; the B1xx 4699 code is then an informational message only. Values of A009 and A719 of bytes 68 and 69 in the AIX error log entry or the first two bytes of word 13 in the service processor error log entry are also informational entries: **A009:** The system received a power-off request at run time from the HMC. **A719:** Primary power failed; the system switched to battery backup power. For all other values of bytes 68 and 69, or the first two bytes of word 13, do the following: 1. Check for system firmware updates. 2. Reset the service processor by activating the pinhole reset switch on the operator panel. 3. Call service support.	
B1xx 469A	System firmware interface	1. Check for system firmware updates. 2. Call service support.
B1xx 469B	Firmware to I/O interface	1. Check for system firmware updates. 2. CEC backplane Location code: U0.1-P1
B1xx 469C	Firmware to I/O interface	1. Check for system firmware updates. 2. CEC backplane Location code: U0.1-P1
B1xx 469E	Service processor firmware failure	1. Check for system firmware updates. 2. Go to “MAP 1540: Problem Isolation Procedures” on page 69, CEC minimum configuration. 3. CEC backplane Location code: U0.1-P1
B1xx 469F	Service processor failure	1. Check for system firmware updates. 2. Go to “MAP 1540: Problem Isolation Procedures” on page 69, CEC minimum configuration 3. CEC backplane Location code: U0.1-P1
B1xx 8FF0	Informational message	No action required.
B1FD 0013	A firmware update has failed because the update image is invalid. The update was stopped before any changes were made to the currently installed firmware.	Reset the service processor (by activating the pinhole reset switch or by disconnecting, and then reconnecting power). Install a valid firmware update image for the specific system type and model.

Table 17. Common firmware error codes (continued)

Error code	Description	Action or possible failing FRU
B1FD 0015	Too many firmware update diskettes inserted (or wrong or faulty update image)	1. Ensure the firmware update image is correct for the specific system type and model. 2. Replace the update diskettes with a new set of firmware update diskettes.
B1FD 0016	Diskette read error	1. The firmware diskette might be faulty. Try another diskette. 2. Replace the diskette drive. 3. Replace the CEC backplane Location code: U0.1-P1
B1FD 001A	Service processor recovery mode update fault	Reset service processor (by activating pinhole reset switch or by disconnecting, and then reconnecting power).
B1FD 001E	Service processor recovery mode update fault	Wrong firmware update diskette. (Insert correct diskette.)
B1FD 001F	Bad firmware update diskette	Replace diskette.

Scan log dump progress codes

A scan dump is the collection of chip data that the service processor gathers after a system malfunction, such as a checkstop or hang. The scan dump data might contain chip scan rings, chip trace arrays, and SCOM contents. For more information on scan dumps, refer to “Scan Log Dump Policy” on page 262.

The following table shows the error code produced by a scan dump.

Table 18. Scan log dump progress codes

Error Code	Description	Action/Possible Failing FRU
A1FF 3000	Scan log dump request rejected	This is an informational message. The service processor firmware was not able to perform a scan log dump even though one was requested.
D130 xxxx	Scan log dump in progress	Informational message only. As the dump progresses, the xxx characters in the display changes. When completed, the system might reboot, depending on the reboot policy settings.

Problem determination generated error codes

Table 19. Problem determination-generated error codes

Error code	Description	Action or possible failing FRU
M0BT 0000	The system hung during speaker POST. This error code is generated by the customer performing Chapter 8, “Hardware problem determination”, on page 247.	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
M0BT 0001	The system hung during “Starting Software...”. This error code is generated by the customer performing Chapter 8, “Hardware problem determination”, on page 247.	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
M0KB D000	The system hung during keyboard POST. This error code is generated by the customer performing Chapter 8, “Hardware problem determination”, on page 247.	CEC backplane Location code: U0.1-P1
M0KB D001	The system did not respond to a keyboard entry. This error code is generated by the customer performing Chapter 8, “Hardware problem determination”, on page 247.	CEC backplane Location code: U0.1-P1
M0KB D002	The system did not respond to a keyboard entry. This error code is generated by the customer performing Chapter 8, “Hardware problem determination”, on page 247.	CEC backplane Location code: U0.1-P1
M0KB D003	The system did not respond to a keyboard entry. This error code is generated by the customer performing Chapter 8, “Hardware problem determination”, on page 247.	CEC backplane Location code: U0.1-P1
M0ME M002	The system hung during memory POST. This error code is generated by the customer performing Chapter 8, “Hardware problem determination”, on page 247.	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
M0NE T000	The system hung during network POST. This error code is generated by the customer performing Chapter 8, “Hardware problem determination”, on page 247.	Go to “MAP 1540: Problem Isolation Procedures” on page 69.
M0PS 0000	Power failure. This error code is generated by the customer performing Chapter 8, “Hardware problem determination”, on page 247.	Go to “MAP 1520: Power” on page 58.
M0SC SI00	Unable to load diagnostics. This error code is generated by the customer performing Chapter 8, “Hardware problem determination”, on page 247.	Go to “Boot problems or concerns” on page 122.
M0SC SI01	Unable to load diagnostics. This error code is generated by the customer performing Chapter 8, “Hardware problem determination”, on page 247.	Go to “Boot problems or concerns” on page 122.

Chapter 6. Using the online and standalone diagnostics

The NAS diagnostics consist of online diagnostics and standalone diagnostics.

Online diagnostics, when they are installed, reside with AIX in the file system. They can be booted:

- In single user mode (referred to as *service mode*)
- To run in maintenance mode (referred to as *maintenance mode*)
- To run concurrently with other applications (referred to as *concurrent mode*)

Standalone diagnostics must be booted before they can be run. If booted, the diagnostics have no access to the system error log or the NAS configuration data.

- If you want to run online diagnostics:
  - In service mode, go to "Service mode".
  - In concurrent mode, go to "Concurrent mode" on page 240.
  - In maintenance mode, go to "Maintenance mode" on page 241.
- If you want to run standalone diagnostics, go to "Running the standalone diagnostics" on page 242.

Operating considerations for online and standalone diagnostics

Note: When possible, run online diagnostics in service mode. Online diagnostics perform additional functions compared to standalone diagnostics. Running online diagnostics in service mode ensures that the error state of the system that has been captured in NVRAM is available for your use in analyzing the problem. The system error log and certain SMIT functions are available only when diagnostics are run from the disk drive.

Before using the diagnostics, consider that when diagnostics are installed, the device support for some devices might not get installed. If this is the case, that device is not displayed in the diagnostic test list when running disk-based diagnostics.

Identifying the terminal type to the diagnostics

When you run diagnostics, you must identify which type of terminal you are using. If the terminal type is not known when the Function Selection menu is displayed, the diagnostics do not allow you to continue until a terminal is selected from the Define Terminal option menu.

Undefined terminal types

If you specify an undefined terminal type from the Define Terminal option menu, the menu prompts the user to enter a valid terminal type. The menu is redisplayed until either a valid type is entered or you exit the Define Terminal option. From the command line, type: `export term=vt320`.

Service mode

Service mode provides the most complete checkout of the system resources. This mode also requires that no other programs be running on the system. All resources on the system, except the SCSI adapter and the disk drives used for paging, can be tested. However, note that the memory and processor are only tested during POST, and the results of the POST tests are reported by diagnostics.

Error-log analysis is done in service mode when you select **Problem Determination** on the Diagnostic Mode Selection menu.

Running the online diagnostics in service mode

To run online diagnostics in service mode, perform the following steps:

1. Verify with the system administrator and users that all programs may be stopped, then do so. If the system software is running, shut down the system as described in “Stopping the system” on page 310, without removing power.
2. Wait until the power-on LED stops flashing and remains off, then press the power button to turn the system on.
3. When the **keyboard** indicator appears during startup, press the numeric 6 key on the keyboard.
4. Enter any requested passwords.

   After any requested passwords have been entered, the system attempts to boot from the first device of each type found on the list. If no bootable image is found on the first device of each type on the list, the system does not search through the other devices of that type for a bootable image; instead, it polls the first device of the next type.

   If all types of devices in the boot list have been polled without finding a bootable image, the system restarts. This action gives the user the opportunity to start the System Management Services (by pressing the number 1 key on a console) before the system attempts to boot again.

For more information, see Chapter 7, “Verifying the hardware operation”, on page 243.

Concurrent mode

Use concurrent mode to run online diagnostics on some of the system resources while the system is running normal activity.

Because the system is running in normal operation, the following resources cannot be tested in concurrent mode:

- SCSI adapters connected to paging devices
- Disk drive used for paging
- Memory (tested during POST)
- Processor (tested during POST)

The following levels of testing exist in concurrent mode:

- The **share-test level** tests a resource while the resource is being shared by programs running in the normal operation. This testing is mostly limited to normal commands that test for the presence of a device or adapter.
- The **sub-test level** tests a portion of a resource while the remaining part of the resource is being used in normal operation. For example, this test could test one port of a multiport device while the other ports are being used in normal operation.
- The **full-test level** requires the device not be assigned to or used by any other operation. This level of testing on a disk drive might require the use of the **varyoff** command. The diagnostics display menus to allow you to vary off the needed resource.

Error-log analysis is done in concurrent mode when you select **Problem Determination** on the Diagnostic Mode Selection menu.

To run the online diagnostics in concurrent mode, you must be logged in to the and have proper authority to issue the commands (if help is needed, see the system operator).

The **diag** command loads the diagnostic controller and displays the online diagnostic menus.

Running the online diagnostics in concurrent mode

To run online diagnostics in concurrent mode, do the following:

1. Log in to the system as root user.
2. Enter the **diag** command.
3. When the Diagnostic Operating Instructions are displayed, follow the instructions to check out the resources that you want.
4. When testing is complete, press F3 to return to the Diagnostic Operating Instructions. Press F3 again to return to the NAS Gateway 500 System Software prompt. Be sure to vary on any resource that you had varied to off.
5. Press Ctrl-D to log off from root user.

Maintenance mode

Maintenance mode runs the online diagnostics using the customer's version of the NAS Gateway 500 System Software. This mode requires that all activity be stopped so that the online diagnostics have most of the resources available to check. All of the system resources, except the SCSI adapters, memory, processor, and the disk drive used for paging, can be checked.

Error log analysis is done in maintenance mode when you select **Problem Determination** on the Diagnostic Mode Selection menu.

Use the **shutdown -m** command to stop all activity on the NAS Gateway 500 System Software and put the NAS Gateway 500 System Software into maintenance mode. The **diag** command is then used to invoke the diagnostic controller so you can run the diagnostics. After the diagnostic controller is loaded, follow the normal diagnostic instructions.

Running the online diagnostics in maintenance mode

To run the online diagnostics in maintenance mode, do the following:

1. Stop all programs running except the NAS Gateway 500 System Software (if help is needed, see the system operator).
2. Log in to the NAS Gateway 500 System Software as root user. If clustering, you need to relocate this node's volumes over to the other cluster node (if help is needed, see "Stopping the system" on page 310).
3. Type the `shutdown -m` command.
4. When a message indicates the system is in maintenance mode, enter the **diag** command.

   Note: It might be necessary to set *TERM* type again.
5. When the Diagnostic Operating Instructions panel is displayed, follow the displayed instructions to check out the resources that you want.
6. When testing is complete, press F3 to return to Diagnostic Operating Instructions. Press F3 again to return to the NAS Gateway 500 System Software prompt.
7. Press Ctrl-D to log off from root user.

Standalone diagnostics operations

Use standalone diagnostics to test the system when the online diagnostics are not installed and as a method of testing the disk drives that cannot be tested by the online diagnostics.

Note: No error log analysis is done by the standalone diagnostics. The CD-ROM drive and the controller that controls it cannot be tested by the standalone diagnostics. Standalone diagnostics have these characteristics:

- Are resident on CD-ROM or a Network Installation Management (NIM) server
- Provide a method to test the system when the online diagnostics are not installed or cannot be loaded from the disk drive
- Allow testing of the disk drives and other resources that cannot be tested by the online diagnostics
- Do not have access to the NAS configuration data
- Do not have access to the system error log
- Do not allow for running of error log analysis

Performing slow boot

To fully analyze all of the available information, perform the following steps before doing a hardware repair or replacement:

1. Record the 8-character error code (and location code if present) that was in the operator panel or reported by the customer.
2. Do a slow-mode boot in service mode. This boot can be specified using the System Power Control Menu on the service processor main menu. (A fast-mode boot skips much of the built-in diagnostic testing.) A slow-mode boot might yield a new 8-character error code on the operator panel and new errors in the service processor error log. If a new error code is reported, use this code to continue problem analysis.

Considerations for running standalone diagnostics from the diagnostic CD-ROM

Consider the following when you run standalone diagnostics:

- The diagnostic CD-ROM must remain in the CD-ROM drive for the entire time that diagnostics are running.
- The diagnostic CD-ROM cannot be ejected from the CD-ROM drive after the diagnostics have loaded. The CD-ROM can only be ejected after the system has been turned off and then turned on (standalone mode) or after the diagnostics program has terminated (online concurrent mode).
- The CD-ROM drive from which diagnostics were loaded cannot be tested.
- The adapter (or circuitry) controlling the CD-ROM drive from which diagnostics were loaded cannot be tested.

Running the standalone diagnostics

To load standalone diagnostics from the default boot list, perform the following procedure:

1. Verify with the system administrator and users that all programs might be stopped, and then do so.
2. Stop the system without removing power. See “Stopping the system” on page 310.
3. Wait until the power-on LED stops flashing and remains off, and then press the power button to turn on the system.
4. Immediately insert the diagnostic CD-ROM into the CD-ROM drive.
5. When or after the word **keyboard** appears during startup, press the numeric 5 key on the keyboard.
6. Enter any requested passwords.

Chapter 7. Verifying the hardware operation

The system verification procedure checks the system for correct hardware operation. If you have a problem with your system in the future, use this procedure to test the system hardware to help you determine if you have a hardware problem.

Run the system verification procedure as described in the following steps.

Step 1. Considerations before running this procedure

Read the following before using this procedure:

- If this system unit is directly attached to another system unit or attached to a network, be sure that communication with the other systems is stopped.
- This procedure requires use of all of the system resources. No other activity can be running on the system while you are performing this procedure.
- This procedure requires an ASCII terminal, or its equivalent, attached to the S1 port.
- This procedure runs the NAS online diagnostics in service mode. See the documentation for your type of ASCII terminal to find the key sequences that you need in order to respond to the diagnostics.
- If a console display is not selected, the diagnostics stop. The instructions for selecting a console display are displayed on the terminal attached to the S1 port. Follow the displayed instructions to select a console display.

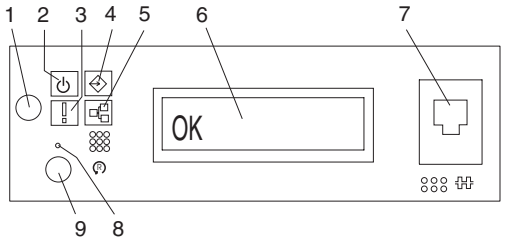
Step 2. Load the diagnostics

Note: If the system is in standby mode (power-on LED on the operator panel is slowly blinking and the operator panel displays `0K`), or if your system is not running, go to step 4 on page 244.

To begin loading the diagnostics on the system, do the following:

1. Stop all application programs running on the operating system.
2. If the system software is running, shut down the system as described in “Stopping the system” on page 310, without removing power.
3. Wait for the system to go into standby mode.
   - The operator panel LED starts to blink at a slow rate.
   - The `0K` message is displayed in the operator panel.

The following figure shows the operator panel and the locations of operator panel components that are referred to in this procedure.



1 Power-on button
2 Power LED
3 Attention LED
4 SCSI port activity
5 Ethernet port activity
6 Operator panel display
7 (FS1) front serial connector (RJ-48 connector)
8 Service processor reset switch (pinhole)
9 System reset button

4. Turn on the system unit power.
5. After the **keyboard** POST indicator is displayed on the ASCII terminal and before the last POST indicator (**speaker**) is displayed, press the numeric 6 key on the ASCII terminal to initiate a service mode boot using the customized service mode boot list.
6. Enter any requested password.

   Note: If you cannot load the diagnostics to the point when the `DIAGNOSTIC OPERATING INSTRUCTIONS` is displayed, call your support center for assistance.

Step 3. Run the verification procedure

When the Diagnostic Operating Instructions are displayed, do the following to run system verification:

1. Press **Enter**.
2. If the terminal type has not been defined, the diagnostics prompt you to define your terminal by using the **Initialize Terminal** option on the Function Selection menu to initialize the operating system environment before you can continue with the diagnostics.
3. If you want to do a general checkout, with minimal operator action, select the **Diagnostic Routines** option on the Function Selection menu.

   If you want to do a more complete checkout, including the use of customer-supplied wrap plugs, select the **Advanced Diagnostics** option on the Function Selection menu. The advanced diagnostics are primarily for the service representative; the diagnostics might instruct you to install wrap plugs to better isolate a problem.
4. Select the **System Verification** option on the Diagnostic Mode Selection menu.
5. If you want to run a general checkout of all installed resources, select the **All Resource** option on the Diagnostic Selection menu.

   If you want to check one particular resource, select that resource on the Diagnostic Selection menu.

Checkout programs end with either of the following results:

- The Testing Complete menu is displayed with a message stating `No trouble was found`.
- The A Problem Was Detected On (Time Stamp) menu is displayed, with either a service request number (SRN) or an error code. Make a note of any codes displayed on the console or operator panel.

Step 4. Perform additional system verification

To perform additional system verification, do the following:

1. Press **Enter** to return to the Diagnostic Selection menu.

2. To check other resources, select the resource. When you have checked all of the resources that you need to check, go to “Step 5. Stop the diagnostics”.

Step 5. Stop the diagnostics

To stop the diagnostics, do the following:

1. To exit the diagnostics, press F3 (from a defined terminal) or press 99 (from an undefined terminal).
2. If you changed any attributes on your ASCII terminal to run the diagnostics, change the settings back to normal.
3. This completes system verification. If you received an error code, record the code and report it to the service organization.

If the system passed all the diagnostic tests, the verification process is complete and your system is ready to use.

Chapter 8. Hardware problem determination

This chapter provides information about using standalone or online diagnostics to help you solve hardware problems.

Problem determination using the standalone or online diagnostics

Use this procedure to obtain a service request number (SRN) when you are able to load the standalone or online diagnostics. If you are unable to load the standalone or online diagnostics, go to “Problem determination when unable to load diagnostics” on page 252. The service organization uses the SRN to determine which field replaceable units (FRUs) are needed to restore the system to correct operation.

Step 1. Considerations before running this procedure

Note: See the operator manual for your ASCII terminal to find the key sequences you need to respond to the diagnostic programs.

- The diagnostics uses an ASCII terminal, or its equivalent, attached to serial port S1 as a console.
- This procedure asks you to select the type of diagnostics you want to run. If you need more information about the types, see Chapter 6, “Using the online and standalone diagnostics”, on page 239.
- Go to “Step 2”.

Step 2

Is the attention LED on?

NO Go to “Step 3”.

YES Go to “System LEDs” on page 36 for more information about your system LEDs.

Step 3

Do you want to run online diagnostics (as opposed to standalone)?

NO Go to “Step 16” on page 250.

YES Go to “Step 4”.

Step 4

Determine if the operating system is accepting commands.

Is the operating system accepting commands?

NO The system must be turned off in order to run diagnostics.

Verify with the system administrator and users that the system can be turned off. If so, turn off the system unit and go to “Step 7” on page 248.

YES Go to “Step 5” on page 248.

Step 5

Diagnostic tests can be run on many resources while the operating system is running. However, you can obtain more extensive problem isolation by running online diagnostics in service mode.

Do you want to run the online diagnostics in service mode?

NO Go to “Step 6”.

YES Shut down the system as described in “Stopping the system” on page 310, without removing power. Then, go to “Step 7”.

Step 6

This step invokes the online diagnostics in concurrent mode.

1. Log in as root user.
2. Enter the **diag** command.
3. Wait until the Diagnostic Operating Instructions are displayed, or wait for three minutes.

Are the Diagnostic Operating Instructions displayed without any obvious console display problems?

NO Shut down the system as described in “Stopping the system” on page 310, without removing power. Then, go to “Step 7”.

YES Go to “Step 10” on page 249.

Step 7

This step loads online diagnostics in service mode. If you are unable to load the diagnostics, go to “Step 8”.

1. Turn on the power.
2. When the **keyboard** indicator appears, press 6 on the ASCII terminal keyboard, to indicate that diagnostics should be loaded.
3. Enter any requested passwords.
4. Follow any instructions to select a console.

Are the Diagnostics Operating Instructions displayed without any obvious display problems?

NO Go to “Step 8”.

YES Go to “Step 10” on page 249.

Step 8

Starting at the top of the following table, find your symptom and follow the instructions given in the Action column.

Symptom	Action
Display problem	Go to “Step 9”.
All other symptoms	Go to “Problem determination when unable to load diagnostics” on page 252.

Step 9

Go to the problem-determination documentation for your ASCII terminal.

Step 10

The diagnostics loaded correctly.

Press Enter.

Is the Function Selection menu displayed?

NO Go to “Step 11”.

YES Go to “Step 12”.

Step 11

There is a problem with the ASCII-terminal keyboard.

Go to the problem determination documentation for your ASCII terminal.

Step 12

1. If you get a message that the terminal type has not been initialized, use the **Initialize Terminal** option on the Function Selection menu to initialize the operating system environment before you continue with the diagnostics. This is a separate and different operation from selecting the console display.
2. Select **Diagnostics**.
3. Press Enter.
4. In the following table, find the menu or system response that you received when you selected **Diagnostics**. Follow the instructions given in the Action column.

System response	Action
The Diagnostic Mode Selection menu is displayed.	Select Problem Determination and go to “Step 13” on page 250.
The Missing Resource menu is displayed.	Follow the displayed instructions until either the Diagnostic Mode Selection menu or an SRN is displayed. If the Diagnostic Mode Selection menu is displayed, select Problem Determination and go to “Step 13” on page 250. If you get an SRN, record it, and go to “Step 15” on page 250.
The New Resource menu is displayed.	Follow the displayed instructions. **Note:** Devices attached to serial ports S1 or S2 do not appear on the New Resource menu. If the Diagnostic Mode Selection menu is displayed, select Problem Determination and go to “Step 13” on page 250. If you get an SRN, record it, and go to “Step 15” on page 250. If you do not get an SRN, go to “Step 18” on page 251.
The system does not respond to selecting **Diagnostics**.	Go to “Step 11”.

Step 13

Is the Diagnostic Selection Menu displayed?

NO If **Problem Determination** was selected from the Diagnostic Mode Selection menu, and if a recent error has been logged in the error log, the diagnostics automatically begin testing the resource. Follow the displayed instructions.

- If the **No Trouble Found** screen is displayed, press Enter.
- If another resource is tested, repeat this step.
- If the **Diagnostic Selection** menu is displayed, go to "Step 14".
- If an SRN is displayed, record it, and go to "Step 15".

YES Go to "Step 14".

Step 14

The **All Resources** option checks most of the configured adapters and devices.

Select and run the diagnostic tests on the resources that you are having problems with or select the **All Resources** option to check all of the configured resources. Find the response in the following table, and follow the instructions given in the Action column.

Diagnostic response	Action
An SRN is displayed.	Go to "Step 15".
The system hangs.	Report SRN 109-200.
The Testing Complete menu and the `No trouble was found` message are displayed and you have not tested all of the resources.	Press Enter and continue with the testing.
The Testing Complete menu and the `No trouble was found` message are displayed and you have tested all of the resources.	Go to "Step 18" on page 251.

Step 15

The diagnostics produced an SRN for this problem. Do the following:

1. Record the SRN and other numbers read out.
2. Report the SRN to the service organization.
3. **STOP.** You have completed these procedures.

Step 16

When you are loading the standalone diagnostics, the attributes for the terminal must be set to match the defaults of the diagnostic programs. The ASCII terminal must be attached to serial port 1 on the system unit.

Are you going to load standalone diagnostics and run them from an ASCII terminal?

NO Go to "Step 17" on page 251.

YES Go to Chapter 6, "Using the online and standalone diagnostics", on page 239 and verify that your terminal attributes are set to work with the diagnostic programs.

Return to "Step 17" on page 251 when you finish checking the attributes. Record any settings that have changed.

Step 17

This step loads the standalone diagnostics. If you are unable to load the diagnostics, go to “Step 8” on page 248.

1. Turn on the power.
2. Insert the diagnostic CD-ROM into the CD-ROM drive.
3. When the **keyboard** indicator is displayed, press 5 on the ASCII keyboard to indicate that diagnostics are to be loaded.
4. Enter any requested passwords.
5. Follow any instructions to select a console.

Are the Diagnostics Operating Instructions displayed without any obvious display problems?

NO Go to “Step 8” on page 248.

YES Go to “Step 10” on page 249.

Step 18

The diagnostics did not find a hardware problem. If you still have a problem, contact your software support center.

Problem determination when unable to load diagnostics

Use this procedure to obtain an error code. Service personnel use the error code to determine which field replaceable units (FRUs) are needed to restore the system to correct operation.

Step 1. Considerations before running this procedure

- The diagnostics uses an ASCII terminal attached to serial port 1.
- Go to “Step 2”.

Step 2

Do you want to run online diagnostics (as opposed to standalone)?

NO Go to “Step 4”.

YES Go to “Step 3”.

Step 3

This step attempts to load online diagnostics in service mode.

1. If the system software is running, shut down the system as described in “Stopping the system” on page 310, without removing power.
2. Turn on the power.
3. If the **keyboard** indicator is displayed, press 6 on the ASCII keyboard to indicate that diagnostics are to be loaded.
4. Enter any requested passwords.
5. Follow any instructions to select a console.
6. Wait until the diagnostics load or the system appears to stop.

Did the diagnostics load?

NO Go to “Step 5”.

YES Go to “Step 6” on page 254.

Step 4

This step loads the standalone diagnostics.

1. Turn off the power.
2. Turn on the power.
3. Insert the diagnostic CD-ROM into the CD-ROM drive.
4. If the **keyboard** indicator is displayed, press 5 on the ASCII keyboard to indicate that diagnostics are to be loaded.
5. Enter any requested passwords.
6. Follow any instructions to select a console.
7. Wait until the diagnostics load or the system appears to stop.

Did the diagnostics load?

NO Go to “Step 5”.

YES Go to “Step 6” on page 254.

Step 5

Starting at the top of the following table, find your symptom and follow the instructions given in the Action column.

Symptom	Action
The power LED does not come on, or comes on and does not stay on.	Check the power cable to the outlet. Check the circuit breakers and check for power at the outlet. Ensure that the room temperature is within 16 to 32°C (60 to 90°F). If you do not find a problem, record error code M0PS0000 and report the problem to the service organization.
The system appears to be stopped and *no* beep was heard from the system unit.	Processor POST failure. Report error code M0CPU000.
The system appears to be stopped and *no* beep was heard from the system unit. E122, E123, or E124 is displayed on the operator panel display.	No good memory could be found. Report error code M0MEM000.
The system appears to be stopped. A beep was heard from the system unit.	No good memory could be found. Report error code M0MEM001.
The diagnostics are loaded and there was *no* beep heard from the system unit during the IPL sequence.	Record error code M0SPK001.
The system stops with the Diagnostic Operating Instructions displayed.	Go to “Step 6” on page 254.
The diskette LED is blinking rapidly, or E1EA or E1EB is displayed on the operator panel.	The flash EPROM data is corrupted. Run the recovery procedure for the flash EPROM.
The system stops with a prompt to enter a password.	Enter the password. You are not allowed to continue until a correct password has been entered. When you have entered a valid password, wait for one of the other conditions to occur.
The system stops with eight-digit error codes displayed on the console.	Record the error codes and report the problem to the service organization.
The system login prompt is displayed.	You might not have pressed the correct key, or you might not have pressed the key soon enough when you were to indicate a Service Mode boot of diagnostic programs. If this was the case, start over at the beginning of this step. If you are sure that you pressed the correct key in a timely manner, go to “Step 7” on page 254.
The system does not respond when the password is entered.	Go to “Step 7” on page 254.
The system stopped and an indicator is displayed on the system console and an eight-digit error code is not displayed.	If the indicator (text or icon) represents: • A keyboard, record error code M0KBD000 and report the problem to the service organization. • Memory, record error code M0MEM002 and report the problem to the service organization. • SCSI, record error code M0CON000 and report the problem to the service organization. • Network, record error code M0NET000 and report the problem to the service organization. • Speaker/Audio, record error code M0BT0000 and report the problem to the service organization.

Symptom	Action
The System Management Services menu is displayed.	The device or media that you are attempting to boot from might be faulty. 1. Check the SMS error log for any errors. To check the error log: • View **Error Log** • If an error is logged, check the time stamp. • If the error was logged during the current boot attempt, record it and report it to your service representative. • If no recent error is logged in the error log, continue to the next step below. 2. If you are attempting to load the online diagnostics, try loading the standalone diagnostics. Otherwise, record error code M0SCSI01 and report the problem to the service organization.
The system appears to be stopped, the disk activity light is on continuously, and a beep was heard from the system unit.	Record error code M0MEM001 and report the problem to the service organization.
The system stops with the message `STARTING SOFTWARE PLEASE WAIT` displayed.	Report error code M0BT0000 and report the problem to the service organization.
The message `The system will continue the boot process` is displayed continuously on the system unit's console.	Report error code M0SCSI01 and report the problem to the service organization.

Step 6

The diagnostics loaded correctly.

Go to "Problem determination using the standalone or online diagnostics" on page 247.

Step 7

There is a problem with the keyboard.

Go to the problem determination documentation for your ASCII terminal.

Chapter 9. Using the service processor

Note: The information in this chapter regarding the configuring of serial ports (and modems attached to those serial ports), applies only to serial port 1 and 2 on the CEC backplane (location U0.1-P1).

The service processor runs on its own power boundary and continually monitors hardware attributes and the environmental conditions within the system. The service processor is controlled by firmware and does not require the operating system to be operational to perform its tasks.

The service processor menus allow you to configure service processor options, as well as enable and disable functions.

Service processor menus are available using an ASCII terminal when `0K` is displayed on the operator panel or when the service processor has detected a system problem (such as a surveillance failure).

Service processor menus

The service processor menus are divided into the following groups:

- General user menu - the user must know the general-access password.
- Privileged user menus - the user must know the privileged-access password.

If the system is powered off, the service processor menus can be accessed locally on serial port 1 (S1) or remotely using a modem on serial port 2 (S2).

The service processor menu prompt, represented by `0>` or `1>`, indicates the serial port to which the terminal is connected. A terminal can have the following prompts:

- `0>` indicates serial port 1 (S1)
- `1>` indicates serial port 2 (S2)

Accessing the service processor menus locally

Service processor menus can be accessed by attaching an ASCII terminal to serial port 1 (S1). After `0K` is displayed in the operator panel, press any key on the keyboard to signal the service processor.

When you gain access, the service processor prompts you for a password (if one is set) and, when verified, displays the service processor menus.

Accessing the service processor menus remotely

If your system has a modem connected to serial port 2 and is configured for call-in (see “Modem configuration menu” on page 277), the service processor menus can be accessed remotely as follows:

1. With the system powered off, call in from a remote terminal.
2. The service processor detects ring-indicate and prompts you for a password (if one is set). When verified, the service processor menus are displayed remotely.

Saving and restoring service processor settings

All the settings that you make (except language) from the service processor menus can be backed up, either for recovering from a fault that may corrupt these settings, or for replicating these settings to other NAS Gateway 500s.

The service aid “Save or restore hardware management policies” can be used to save your settings after initial setup or whenever the settings must be changed for system operation purposes. Refer to “Save or restore hardware management policies,” in the *NAS Gateway 500 Advanced Configuration and Problem Determination Guide*.

It is strongly recommended that you use this service aid for backing up service processor settings to protect the usefulness of the service processor and the availability of the system.

Menu inactivity

The service processor exits menu mode after ten minutes of inactivity and displays a message indicating that it has done so. Press any key on the virtual terminal window to display the main menu .

General user menu

The menu options presented to the general user are a subset of the options available to the privileged user. The user must know the general-access password, if one is set, to access this menu.

```
       GENERAL USER MENU

 1. Power-on System

 2. Power-off System

 3. Read VPD Image from Last System Boot

 4. Read Progress Indicators from Last System Boot

 5. Read Service Processor Error Logs

 6. Read System POST Errors

99. Exit from Menus

 0>
```

- **Power-on System**

  Allows the user to start the system using the current virtual terminal window as the active console.
- **Power-off System**

  This option is not available on this system.
- **Read VPD Image from Last System Boot**

  Displays manufacturer vital product data, such as serial numbers, part numbers, and so on, that were stored from the system boot prior to the one in progress now, for the entire system.
- **Read Progress Indicators from Last System Boot**

Displays a number of the boot progress indicators, which may include service processor checkpoints, IPL checkpoints, or configuration codes, from the previous system boot. This information can be useful in diagnosing system faults.

The progress indicator codes are listed from top (latest) to bottom (oldest).

This information is not stored in nonvolatile storage. If the system is powered off using the power-on button on the operator panel, this information is retained. If all power is disconnected from the system, this information will be lost. For an example, refer to “LCD progress indicator log” on page 290.

- **Read Service Processor Error Logs**

  Displays the service processor error logs. For an example, refer to “Service processor error logs” on page 289.
- **Read System POST Errors**

  Displays additional error log information (this option is only for service personnel).
- **Exit from Menus**

  Selecting this option will exit the service processor menus. You can re-enter the menus by pressing any key on the console.

Privileged user menus

The following menus are available to privileged users only. The user must know the privileged-access password, if one is set, to access these menus.

Main menu

A listing at the top of the main menu contains the following:

- Current firmware version on the system
- Firmware copyright notice
- System name provided at setup

You need the firmware version for reference when you either update or repair the functions of your service processor.

The system name, an optional field, is the name that your system reports in problem messages. This name helps your support team (for example, your system administrator, network administrator, or service representative) to more quickly identify the location, configuration, and history of your system. Set the system name, from the main menu, using option 6.

Note: The information under the Service Processor Firmware heading in the following Main Menu illustration is example information only.

```
        Service Processor Firmware
        VERSION: RH011007
        Copyright 2001 IBM Corporation
             SYSTEM NAME


        MAIN MENU

 1. Service Processor Setup Menu

 2. System Power Control Menu

 3. System Information Menu

 4. Language Selection Menu

 5. Call-In/Call-Out Setup Menu

 6. Set System Name

99. Exit from Menus

 0>
```

- **Service Processor Setup Menu**
  See “Service processor setup menu” on page 259 for more information.
- **System Power Control Menu**
  See “System power control menu” on page 265 for more information.
- **System Information Menu**
  See “System information menu” on page 268 for more information.
- **Language Selection Menu**
  See “Language selection menu” on page 275 for more information.
- **Call-In/Call-Out Setup Menu**
  See “Call-in/call-out setup menu” on page 276 for more information.
- **Set System Name**
  Allows you to set the system name.

Service processor setup menu

The following Service Processor Setup Menu is accessed from the Main Menu:

```
        SERVICE PROCESSOR SETUP MENU

  1. Change Privileged Access Password

  2. Change General Access Password

  3. Enable/Disable Console Mirroring:
      Currently Enabled

  4. Start Talk Mode

  5. OS Surveillance Setup Menu
   NOT supported in LPAR mode

  6. Reset Service Processor

  7. Reprogram Flash EPROM Menu

  8. Serial Port Snoop Setup Menu
  NOT supported in LPAR mode

  9. Scan Log Dump Setup Menu:
  Currently As Needed

 98. Return to Previous Menu

 99. Exit from Menus

 0>
```

Note: Unless otherwise stated in menu responses, settings become effective when a menu is exited using option 98 or 99.

Passwords

Passwords can be any combination of up to eight alphanumeric characters. You can enter longer passwords, but the entries are truncated to include only the first eight characters. The privileged-access password can be set from service processor menus or from System Management Services (SMS) utilities. See the *IBM TotalStorage NAS Gateway 500 Service Guide* for information about System Management Services. The general-access password can be set only from service processor menus.

Note: Before disabling passwords, you must disable the general password before you disable the privileged password. Failure to disable the general password first will result in the privileged user being locked out.

Attention:

For security purposes, the service processor counts the number of attempts to enter passwords. The results of not recognizing a password within this error threshold are different, depending on whether the attempts are being made locally (at the system) or remotely (through a modem). The error threshold is three attempts.

If the error threshold is reached by someone entering passwords at the system, the service processor commands the system to resume the initial program load (IPL). This action is taken based on the assumption that the system is in an adequately secure location with only authorized users having access. Such users must still successfully enter a login password to access the operating system.

If the error threshold is reached by someone entering passwords remotely, the service processor commands the system to power off to prevent potential security attacks on the system by unauthorized remote users. The following table lists what you can access with the privileged-access password and the general-access password.

Privileged access password	General access password	Resulting menu
None	None	Service processor main menu is displayed.
Set	None	Users with the password see the service processor main menu. Users without password cannot log in.
Set	Set	Users see menus associated with the entered password.

If you forget the password, you must remove the battery for at least 30 seconds to disable the password.

- **Change Privileged-Access Password**

  Set or change the privileged-access password. It provides the user with the capability to access all service processor functions. This password is usually used by the system administrator or root user.
- **Change General-Access Password**

  Set or change the general-access password. It provides limited access to service processor menus, and is usually available to all users who are allowed to power on the system, especially remotely.

  Note: The general-access password can only be set or changed after the privileged-access password is set.
- **Enable/Disable Console Mirroring** (not supported)
- **Start Talk Mode**

  In a console-mirroring session, it is useful for those who are monitoring the session to be able to communicate with each other. Selecting **Start Talk Mode** activates the keyboards and consoles for such communications while console mirroring is established. This is a full-duplex link, so message interference is possible. Alternating messages between users works best.
- **OS Surveillance Setup Menu**

  This menu can be used to set up operating system (OS) surveillance.

```
       OS Surveillance Setup Menu

 1. Surveillance:
      Currently Enabled

 2. Surveillance Time Interval:
      2 minutes

 3. Surveillance Delay:
      2 minutes


98. Return to Previous Menu

0>
```

  - **Surveillance**

    Can be set to Enabled or Disabled.

  - **Surveillance Time Interval**

    Can be set to any number from 2 through 255.

  - **Surveillance Delay**

    Can be set to any number from 0 through 255.

  Refer to “Service processor system monitoring - surveillance” on page 287 for more information about surveillance.

- **Reset Service Processor**

  If this option is selected, entering `Y` causes the service processor to reboot.

- **Reprogram Flash EPROM Menu**

  This option requires a diskette drive to be installed in the system. If this option is selected, and no diskette drive is present in the system, the service processor will display ″Not Supported.″

  This option updates the system EPROMs. After entering `Y` to indicate that you want to continue, you are prompted to enter the update diskettes. Follow the instructions on the console. When the update is complete, the service processor reboots.

  All system EPROMs that can be reprogrammed are updated at the same time and are as follows:

  - System-power-control network programming
  - Service processor programming
  - System firmware programming
  - Run-Time Abstraction Services

- **Serial Port Snoop Setup Menu**

  This menu can be used to set up serial port snooping, in which the user can configure serial port 1 as a “catch-all” reset device.

  From the service processor main menu, select option 1, service processor setup menu, and then select option 8 (Serial Port Snoop Setup Menu).

```
        SERIAL PORT SNOOP SETUP MENU

   1. System reset string:
        Currently Unassigned

   2. Snoop Serial Port:
       Currently Unassigned

  98. Return to Previous Menu

1>
```

Use the **Snoop Serial Port** option to select the serial port to snoop.

Note: Only serial port 1 is supported.

Use the system reset string option to enter the system reset string, which resets the machine when it is detected on the main console on serial port 1.

After serial port snooping is correctly configured, at any point after the system is booted to the operating system, whenever the reset string is typed on the main console, the system uses the service-processor-reboot policy to restart.

Because pressing Enter after the reset string is not required, make sure that the string is not common or trivial. A mixed-case string is recommended.

- **Scan Log Dump Policy**

  A scan dump is the collection of chip data that the service processor gathers after a system malfunction, such as a checkstop or hang. The scan dump data may contain chip-scan rings, chip-trace arrays, and SCOM contents.

  The scan dump data is stored in the system control store. The size of the scan dump area is approximately 4 MB.

  During the scan-log dump, A8xx (in the range A810 to A8FF) is displayed in the operator panel. The xx characters will change as the scan-log dump progresses. If the xx characters do not change after five minutes, the service processor is hung and must be reset.

  When the scan-log dump is complete, depending on how the reboot policy is set, the system will either:

  – Go to the standby state (and the service processor menus will be available), indicated by OK or STBY in the operator panel.

  OR

  – Attempt to reboot.

```
Scan Log Dump Setup Menu

      1.  Scan Log Dump Policy:
            Currently As Needed

      2.  Scan Log Dump Content:
            Currently As Requested

      3.  Immediate Dump

     98.  Return to Previous Menu

0> 1
   Select from the following options:
   (As Needed=2, Always=3)

   Enter New Option:

0>
```

The scan-log-dump policy can be set to the following:

2 = As Needed
The processor run-time diagnostics record the dump data based on the error type. This is the default value.

3 = Always
Selecting this option allows the service processor to record a scan-log dump for all error types.

The scan-log-dump policy can also be set from the Tasks menu in the diagnostic service aids.

Option 2 displays the following:

```
               Scan Log Dump Setup Menu

      1.  Scan Log Dump Policy:
            Currently As Needed

      2.  Scan Log Dump Content:
            Currently As Requested

      3.  Immediate Dump

     98.  Return to Previous Menu

0> 2
   Select from the following options:
   (As Requested=1, Optimum=2, Complete=3, Minimum=4)

   Enter New Option:

0>
```

The scan-log-dump content can be set to the following:

1 = As Requested
The processor run-time diagnostics will select the contents of the dump file based on the type of error that occurs. This is the default.

2 = Optimum
The dump will include the smallest amount of information to diagnose a hardware error.

3 = Complete
The dump will include as much information as possible to allow the complete analysis of hardware and software errors.

4 = Minimum
The dump will include the smallest amount of information possible (a minimum number of hardware scan log rings).

The complete dump will take the longest time to finish; it may take as long as 1.5 hours on a fully configured system.

Option 3, **Immediate Dump**, can be used only when the system is in the standby state with power on. It is used to dump the system data after a checkstop or machine check occurs when the system firmware is running, or when the operating system is booting or running.

The scan-log-dump policy can also be set from the Tasks menu in the diagnostic service aids.

If a valid dump file already exists, the dump control code will stop because the contents of the prior dump must be protected.

System power control menu

This menu is used to set power-control options. Other menus that control boot options are available from this menu.

```
       SYSTEM POWER CONTROL MENU

  1. Enable/Disable Unattended Start Mode:
        Currently Enabled

  2. Ring Indicate Power-On Menu

  3. Reboot/Restart Policy Setup Menu

  4. Power-On System

  5. Power-Off System

  6. Enable/Disable Fast System Boot
        Currently Fast Boot

  7. Boot Mode Menu

 98. Return to Previous Menu

 99. Exit from Menus

 0>
```

- **Enable/Disable Unattended Start Mode**

  Use this option to instruct the service processor to restore the power state of the system after a temporary power failure. Unattended start mode can also be set through the System Management Services (SMS) menus. This option is intended to be used on systems that require automatic power-on after a power failure. For more information, see “System power-on methods” on page 281.

- **Ring Indicate Power-On Menu**

```
        RING INDICATE POWER-ON MENU

   1. Ring indicate power-on :
       Currently Enabled

   2. Number of rings:
       Currently  3

  30. Refresh Modem Settings

  98. Return to Previous Menu
```

  Ring-indicate power-on is enabled by default on both serial port 1 (S1) and serial port 2 (S2). When ring-indicate power-on is enabled, call-in is disabled.

  If ring-indicate power-on is enabled and call-in is already enabled, you will be asked to confirm your choice. Refer to the message displayed on your console.

  If the ring indicate power-on setting is changed, you must select option 30, **Refresh Modem Settings** to update the modem settings. If **Refresh Modem Settings** is selected, and the modems have not been configured, you will be asked to configure the modems first. See “Call-in/call-out setup menu” on page 276 for information on configuring modems.

  Option 2 is used to set the number of rings.

- **Reboot/Restart Policy Setup Menu**

  The following menu controls the Reboot/Restart Policy:

```
        Reboot/Restart Policy Setup Menu

  1. Number of reboot attempts:
       Currently 1

  2. Use OS-Defined restart policy?
       Currently No

  3. Enable supplemental restart policy?
       Currently Yes

  4. Call-Out before restart:
       Currently Disabled

 98. Return to Previous Menu

  0>
```

  Reboot is the process of bringing up the system hardware; for example, from a system reset or power on. *Restart* is activating the operating system after the system hardware is reinitialized. Restart must follow a successful reboot.

  – **Number of reboot attempts** - If the system fails to successfully complete the boot process, it attempts to reboot the number of times specified. Entry values equal to or greater than 0 are valid. Only successive failed reboot or restart attempts are counted.

  – **Use OS-Defined restart policy** - This allows the service processor to react in the same way that the operating system does to major system faults by reading the setting of the operating system parameter **Automatically Restart/Reboot After a System Crash**. This parameter might already be defined, depending on the operating system (or its version or level). If the operating system automatic-restart setting is defined, it can be set to respond to a major fault by restarting or by not restarting. See your operating system documentation for details on setting up operating system automatic restarts. The default value is No.

  – **Enable supplemental restart policy** - The default setting is Yes. When set to Yes, the service processor restarts the system when the system loses control as detected by service processor surveillance, and either:

    The **Use OS-Defined restart policy** is set to No.

    OR

    The **Use OS-Defined restart policy** is set to Yes, and the operating system has no automatic restart policy.

  – **Call-Out before restart (Enabled/Disabled)** - If a restart is necessary due to a system fault, you can enable the service processor to call out and report the event. This option can be valuable if the number of these events becomes excessive, which might signal a bigger problem.

- **Power-On System**

  Allows immediate power-on of the system.
- **Power-Off System**

  This option is not available on this system.
- **Enable/Disable Fast System Boot**

  Allows the user to select the IPL type, mode, and speed of the system boot.

  Attention: Selecting the fast IPL results in several diagnostic tests being skipped and a shorter memory test being run.
- **Boot Mode Menu**

  The Boot Mode Menu allows you to select a boot mode.

```
       Boot Mode Menu

 1. Boot to SMS Menu:
      Currently Disabled

 2. Service Mode Boot from Saved List:
      Currently Disabled

 3. Service Mode Boot from Default List:
      Currently Disabled

 4. Boot to Open Firmware Prompt:
      Currently Disabled

98. Return to Previous Menu

 0>
```

  To select a boot mode, select a number and press Enter. The item corresponding to the selected number toggles between Disabled to Enabled. If a boot mode is Enabled, the boot mode selected is performed, and the Disabled/Enabled selection is reset to Disabled. The following describes each boot mode:

  – **Boot to SMS Menu**

    When this selection is enabled, the system boots to the System Management Services (SMS) Menu.

  – **Service Mode Boot from Saved List**

    This selection causes the system to perform a service mode boot using the service mode boot list saved in NVRAM. If the system boots from the disk drive and diagnostics are loaded on the disk drive, the NAS Gateway 500 boots to the diagnostics menu.

    Using this option to boot the system is the preferred way to run online diagnostics.

  – **Service Mode Boot from Default List**

    This selection is similar to *Service Mode Boot from Saved List*, except the system boots using the default boot list that is stored in the system firmware. This is typically used to try to boot customer diagnostics from the CD-ROM drive.

    Using this option to boot the system is the preferred way to run standalone diagnostics.

  – **Boot to Open Firmware**

    This option should only be used by service personnel to obtain additional debug information. When this selection is enabled, the system boots to the open firmware prompt.

System information menu

This menu provides access to system configuration information, error logs, system resources, and processor configuration.

```
        SYSTEM INFORMATION MENU

  1. Read VPD Image from Last System Boot

  2. Read Progress Indicators from Last System Boot

  3. Read Service Processor Error Logs

  4. Read System POST Errors

  5. Read NVRAM

  6. Read Service Processor Configuration

  7. Processor Configuration/Deconfiguration Menu

  8. Memory Configuration/Deconfiguration Menu

  9. Power Control Network Utilities Menu

 10. LED Control Menu

 11. MCM/L3 Interposer Plug Count Menu
      Not Supported

 12. Performance Mode Setup Menu

 98. Return to Previous Menu

 99. Exit from Menus

 0>
```

- **Read VPD Image from Last System Boot**

  Displays manufacturer's vital product data (VPD), such as serial numbers, part numbers, and so on, that was stored from the system boot prior to the one in progress now. VPD from all devices in the system is displayed.

- **Read Progress Indicators from Last System Boot**

  Displays a number of the boot progress indicators, which may include service processor checkpoints, IPL checkpoints, or configuration codes, from the previous system boot. This information can be useful in diagnosing system faults.

  The progress indicator codes are listed from top (latest) to bottom (oldest).

  This information is not stored in nonvolatile storage. If the system is powered off using the power-on button on the operator panel, this information is retained. If the AC power is disconnected from the system, this information will be lost. For an example, refer to "LCD progress indicator log" on page 290.

- **Read Service Processor Error Logs**

  Displays error conditions detected by the service processor. Refer to "Service processor error logs" on page 289 for an example of this error log.

- **Read System POST Errors**

  This option should only be used by service personnel to obtain additional debug information.
- **Read NVRAM**

  Displays Non Volatile Random Access Memory (NVRAM) content.
- **Read Service Processor Configuration**

  Displays current service processor configuration.
- **Processor Configuration/Deconfiguration Menu**

  Enable/Disable CPU Repeat Gard

  CPU repeat gard will automatically deconfigure a CPU during a system boot if a processor has failed BIST (power-on self-test), caused a machine check or check stop, or has reached a threshold of recoverable errors. The processor will remain deconfigured until repeat gard is disabled or the processor is replaced.

  The default is enabled.

  For more information, see “Configuring and deconfiguring processors or memory” on page 287.

  Dynamic Processor Hot Sparing

  This option is not available on this system.

  This menu allows the user to change the system processor configuration. If it is necessary to take one of the processors offline, use this menu to deconfigure a processor, and then reconfigure the processor at a later time. An example of this menu follows:

```
        PROCESSOR CONFIGURATION/DECONFIGURATION MENU

77. Enable/Disable CPU Repeat Gard: Currently Enabled
78. Enable/Disable Dynamic Processor Hot Sparing (if available): Currently Disabled

 1.  0   3.0  (00)  Configured by system     2.  1   3.1  (00)  Deconfigured by system
 3.  24  4.0  (00)  Configured by system     4.  25  4.1  (00)  Configured by system



98. Return to Previous Menu

0>
```

Note: This table is built from vital product data collected during the last boot sequence. The first time the system is powered on, or after the system’s nonvolatile RAM (NVRAM) has been erased, this table may be empty. The table is rebuilt during the next boot into the operating system.

The fields of the previous table represent the following:

Column 1

(1.) Menu selection index.

Column 2

(0) Logical processor device number assigned by the NAS operating system. You can display these logical device numbers by issuing the following command on the NAS operating system command line:

```
lsdev -C | grep proc
```

Column 3

(3.0) Processor address list used by the service processor.

Column 4

(00) Error status of the processors.

The error status of each processor is indicated by AB, where B indicates the number of errors and A indicates the type of error according to the following:

1. Bring-up failure
2. Run-time non-recoverable failure
3. Run-time recoverable failure
4. Group integrity failure
5. Non-repeat-gardable error. The resource may be reconfigured on the next boot.

A status of 00 indicates that the CPU has not had any errors logged against it by the service processor.

To enable or disable CPU repeat gard, use menu option 77. CPU repeat gard is enabled by default.

If CPU repeat gard is disabled, processors that are in the ″deconfigured by system″ state will be reconfigured. These reconfigured processors are then tested during the boot process, and if they pass, they remain online. If they fail the boot testing, they are deconfigured even though CPU repeat gard is disabled.

The failure history of each CPU is retained. If a processor with a history of failures is brought back online by disabling repeat gard, it remains online if it passes testing during the boot process. However, if repeat gard is enabled, the processor is taken offline again because of its history of failures.

Notes:

1. The processor numbering scheme used by the service processor is different from the numbering scheme used by the operating system. Consult the operating system documentation before configuring or deconfiguring a processor to ensure that the correct processor is selected.
2. To determine the number of processors available to the NAS operating system, run the following command on the command line: `bindprocessor -q`

- **Memory Configuration/Deconfiguration Menu**

  Enable/Disable Memory Repeat Gard

  Memory repeat gard will automatically deconfigure a quad of memory during a system boot if a DIMM has failed BIST (power-on self-test), caused a machine check or check stop, or has reached a threshold of recoverable errors. The quad will remain deconfigured until repeat gard is disabled or the memory is replaced.

  The default is enabled.

  For more information, see “Configuring and deconfiguring processors or memory” on page 287.

  Runtime Recoverable Error Repeat Gard

  The runtime-recoverable-error-repeat-gard flag controls the deallocation of the memory if a recoverable error occurs during runtime. If a recoverable-memory error occurs, and runtime-recoverable-error-repeat gard is disabled, the system will continue running with no change in the memory configuration. If a recoverable-memory error occurs, and runtime-recoverable-error-repeat gard is enabled, the memory quad in which the error occurred will be taken offline.

  The default is disabled.

These menus allow the user to change the system memory configuration. If it is necessary to take one of the DIMMs offline, this menu allows you to deconfigure a DIMM, and then reconfigure the DIMM at a later time.

When this option is selected, a menu is displayed. The following is an example of this menu:

```
       MEMORY CONFIGURATION/DECONFIGURATION MENU

77. Enable/Disable Memory Repeat Gard: Currently Enabled

78. Runtime Recoverable Error Repeat Gard: Currently Disabled

 1. Memory card

98. Return to Previous Menu
```

After you select the memory card option by entering 1, a menu lets you select a DIMM. The following is an example of this menu.

```
       MEMORY CONFIGURATION/DECONFIGURATION MENU


 1. 3.16(00)  Configured by system   2. 3.17(00) Configured by system
 3. 3.18(00)  Configured by system   4. 3.19(00) Configured by system
 5. 4.24(00)  Configured by system   6. 4.25(00) Configured by system
 7. 4.26(00)  Configured by system   8. 4.27(00) Configured by system


98. Return to Previous Menu
```

Note: This table is built from vital product data collected during the last boot sequence. The first time the system is powered on, or after the system's nonvolatile RAM (NVRAM) has been erased, this table may be empty. The table is rebuilt during the next boot into the operating system.

The fields in the previous table represent the following:

Column 1

1. Menu selection index/DIMM number

Column 2

xx.xx : DIMM address used by service processor

Column 3

(00) Error status

The error status of the each DIMM is indicated by AB, where B indicates the number of errors and A indicates the type of error according to the following table:

1. Bring-up failure
2. Run-time non-recoverable failure
3. Run-time recoverable failure
4. Group integrity failure
5. Non-repeat-gardable error. The resource may be reconfigured on the next boot.

An error status of 00 (for example, `3.16(00)`) indicates that the DIMM has not had any errors logged against it by the service processor.

To change the memory configuration, select the number of the DIMM. The DIMM state will change from `configured` to `deconfigured` or from `deconfigured` to `configured`.

In the previous example menu, each line shows two DIMMs and indicates whether they are configured.

To enable or disable Memory Repeat Gard, use menu option 77 of the Memory Configuration/Deconfiguration Menu.

To enable or disable runtime recoverable error repeat gard, use option 78 of the memory configuration/deconfiguration menu.

The failure history of each DIMM is retained. If a DIMM with a history of failures is brought back online by disabling Repeat Gard, it remains online if it passes testing during the boot process. However, if Repeat Gard is enabled, the DIMM is taken offline again because of its history of failures.

- **Power Control Network Utilities Menu**

```
        POWER CONTROL NETWORK UTILITIES MENU

 1. Lamp Test for all Operator Panels

 2. Display I/O Type

 3. Change I/O Type

98. Return to Previous Menu

0>
```

  - **Lamp Test for All Operator Panels**

    Selecting this option tests the indicators on the operator panel by causing them to blink on and off for approximately 30 seconds.

    Note: SCSI and Ethernet LEDs do not blink.
  - **Display I/O Type**

    This option is not available on this system.
  - **Change I/O Type**

    Use this option to change the I/O type after a service action or configuration change, if the I/O type is incorrect. If this option is chosen, you will be asked to type `A3` for the I/O type of the PCI riser card that has been replaced or is present in the system. If the value is not valid, a failure message is displayed on the console. Press Enter to return to the Power Control Network Utilities Menu.

- **LED Control Menu**

  This menu displays the state of the system attention LED. Use this menu to toggle the attention LED between identify (blinking) and off. It is not available when the system is in standby. An example of this menu follows:

```
        LED Control


   1. Set/Reset Identify LED state

   2. Clear System Attention Indicator

  98. Return to Previous Menu

   Enter LED index

0 >
```

  Option 1 is only available when the system is in the error state (the CEC is powered on and the service processor menus are available). If Option 1 is selected, a list of location codes of the system unit drawer is shown. The panel is similar to the following:

```
   1. U0.2-P1

   2. U0.3-P1


   Enter number corresponding to the location code, or
   press Return to continue, or 'x' to return to the menu
```

  If one of the devices is selected using the index number, the present state of its LED is displayed, and you are given the option to toggle it as shown in the following example panel. The final state of the LED is then displayed whether or not its state was changed.

```
U0.2-P1 is currently in the off state

Select from the following (1=IDENTIFY ON, 2=IDENTIFY OFF)
0>2
Please wait

U0.2-P1 is currently in the OFF state
        (Press Return to continue)
```

  Option 2, **Clear System Attention Indicator**, clears the attention indicator on the operator panel.

  The processor subsystem disturbance/LED is on the operator panel. The I/O drawer fault/identify LED is located on the front of each I/O subsystem.

- **MCM/L3 Interposer Plug Count Menu**

  This option is not available on this system.

- **Performance Mode Setup Menu**

  If certain types of processor cards are installed in the system, this menu is not available. For other types of processor cards, this menu is active after the first boot.

  Note: The first time the system is booted after NVRAM is cleared, `Not Applicable` is displayed under **Performance Mode Setup Menu** on the panel. This might also happen if the service processor is replaced, or the processor cards are upgraded.

  If **Performance Mode Setup Menu** is selected when `Not Applicable` is displayed on the panel, the system responds with `Not Applicable` and redisplays the system information menu. The setup menu can be displayed after the performance mode is set, which occurs when the system is rebooted for the first time.

The default performance mode is set by the firmware during IPL. The default mode provides the optimum performance for the hardware configuration of the system.

You can override the default setting by using the Default Performance Mode menu, which will be similar to the following:

```
                    Default Performance Mode:  Standard Operation

 1. Current Performance Mode:
    Standard Operation


98. Return to Previous Menu

0>1
```

Selecting option 1 displays the following performance modes:

```
Select from the following options:

1. Large Commercial System optimization
2. Standard Operation
3. Turbo Database Mode

0>
```

Notes:

1. Some processor card changes cause the default performance mode to change. This new setting is not reflected in the menu until after the system is rebooted with the new configuration.
2. If the NVRAM has been cleared, the default performance mode and the current performance mode will indicate `uninitialized`.

If you want to override the default setting, a brief description of each performance mode follows:

Large Commercial System Optimization
The setting for systems that do not fall into the other two categories, standard operation and turbo database mode. This setting provides the optimum performance for most applications.

Standard Operation
Optimizes the system for large-memory-bandwidth applications where minimal sharing of data occurs and the likelihood of significant hardware data-prefetching exists.

Turbo Database Mode
Optimizes system operation for environments where there is a large amount of data sharing among processes running concurrently on the system.

Language selection menu

The service processor menus and messages are available in various languages. This menu allows selecting languages in which the service processor and system firmware menus and messages are displayed.

```
       LANGUAGE SELECTION MENU

 1. English

 2. Francais

 3. Deutsch

 4. Italiano

 5. Espanol

98. Return to Previous Menu

99. Exit from Menus

0>
```

Note: Your virtual terminal window must support the ISO-8859 character set to correctly display languages other than English.

Call-in/call-out setup menu

Note: The information in this section regarding the configuring of serial ports, and modems attached to those serial ports, applies only to the serial port S2 on the CEC backplane (location U0.1-P1). These serial ports are typically used for call-in and call-out.

```
        CALL-IN/CALL-OUT SETUP MENU

  1. Modem Configuration Menu

  2. Serial Port Selection Menu

  3. Serial Port Speed Setup Menu

  4. Telephone Number Setup Menu

  5. Call-Out Policy Setup Menu

  6. Customer Account Setup Menu

  7. Call-Out Test
  NOT supported in LPAR mode

 98. Return to Previous Menu

 99. Exit from Menus

  0>
```

- **Modem Configuration Menu**, see “Modem configuration menu” on page 277.
- **Serial Port Selection Menu**, see “Serial port selection menu” on page 277.
- **Serial Port Speed Setup Menu**, see “Serial port speed setup menu” on page 278.
- **Telephone Number Setup Menu**, see “Telephone number setup menu” on page 278.
- **Call-Out Policy Setup Menu**, see “Call-out policy setup menu” on page 279.
- **Customer Account Setup Menu**, see “Customer account setup menu” on page 280.
- **Call-Out Test** tests the configuration after the modem is installed and configured correctly.

Modem configuration menu

Note: This option applies only to a modem attached to serial port 2 (S2) on the CEC backplane.

The first two lines of the Modem Configuration Menu contain status of the current selections. Selections are made in the sections labeled Modem Ports and Modem Configuration File Name. Select the serial port that you want to activate and then select the modem configuration file for the modem on the port. If you want to set up all of the serial ports with modems, make your selections one port at a time.

```
        Modem Configuration Menu

   Port 1 Modem Configuration File Name:
   Port 2 Modem Configuration File Name:

To make changes, First select the port and then the configuration file
name

Modem Ports:
   1. Serial port 1
   2. Serial port 2

Modem Configuration File Name:

   5. none                 9. modem_z_sp
   6. modem_f_sp          10. modem_z0_sp
   7. modem_f0_sp         11. modem_m0_sp
   8. modem_f1_sp         12. modem_m1_sp

  30. Save configuration to NVRAM and Configure modem
  98. Return to Previous Menu

  0>
```

For information on choosing a modem configuration file, see the *IBM TotalStorage NAS Gateway 500 Service Guide* for information about modem configuration.

Serial port selection menu

This menu allows you to enable or disable the call-in and call-out functions of each serial port in any combination.

```
        Serial Port Selection Menu

   1. Serial Port 1 Call-Out:
      Currently Disabled
    NOT supported in LPAR mode

   2. Serial Port 2 Call-Out:
        Currently Disabled
    NOT supported in LPAR mode

   3. Serial Port 1 Call-In:
        Currently Disabled

    4. Serial Port 2 Call-In:
        Currently Disabled
  98. Return to Previous Menu

 0>
```

Call-in and ring-indicate power-on cannot be enabled at the same time. If ring-indicate power-on is already enabled and you try to enable call-in, a message prompts you for confirmation. Refer to the message displayed on the console.

Serial port speed setup menu

This menu allows you to set serial port speed to enhance terminal performance or to accommodate modem capabilities.

```
       Serial Port Speed Setup Menu

  1. Serial Port 1 Speed:
       Currently 9600

  2. Serial Port 2 Speed:
       Currently 9600

 98. Return to Previous Menu

  0>
```

A serial port speed of 9600 baud or higher is recommended. The following are valid serial port speeds:

50	600	4800
75	1200	7200
110	1800	9600
134	2000	19200
150	2400	38000
300	3600	57600
		115200

Telephone number setup menu

Use this menu to set or change the telephone numbers for reporting a system failure.

```
       Telephone Number Setup Menu

  1. Service Center Telephone Number:
      Currently Unassigned

  2. Customer Administration Center Telephone Number:
      Currently Unassigned

  3. Digital Pager Telephone Number:
      Currently Unassigned

  4. Customer Voice Telephone Number:
      Currently Unassigned

  5. Customer System Telephone Number:
      Currently Unassigned

 98. Return to Previous Menu

  0>
```

- **Service Center Telephone Number** is the number of the service center computer. The service center usually includes a computer that takes calls from servers with call-out capability. This computer is referred to as the *catcher*. The catcher expects messages in a specific format to which the service processor conforms.

  For more information about the format and catcher computers, refer to the readme file in the **/usr/samples/syscatch** directory. Contact your service provider for the correct service center telephone number to enter. Until you have that number, leave this field unassigned.
- **Customer Administration Center Telephone Number** is the number of the System Administration Center computer (catcher) that receives problem calls from servers. Contact your system administrator for the correct telephone number to enter here. Until you have that number, leave this field unassigned.
- **Digital Pager Telephone Number** is the number for a numeric pager carried by someone who responds to problem calls from your system. Contact your administration center representative for the correct telephone number to enter. For test purposes, use a test number that you can change later (see the note on page 289).
- **Customer Voice Telephone Number** is the telephone number of a phone near the system or answered by someone responsible for the system. This is the telephone number left on the pager for callback. For test purposes, use a test number, which you can change later.
- **Customer System Telephone Number** is the telephone number to which your system's modem is connected. The service or administrative center representatives need this number to make direct contact with your system for problem investigation. This is also referred to as the *call-in* phone number.

Call-out policy setup menu

Call-out settings can be set using the following menu:

```
       CALL-OUT POLICY SETUP MENU

 1. Call-Out policy (First/All):
     Currently First

 2. Remote timeout, (in seconds):
     Currently 120

 3. Remote latency, (in seconds):
     Currently 2

 4. Number of retries:
     Currently 2

98. Return to Previous Menu

0>
```

- **Call-Out policy** can be set to `first` or `all`. If call-out policy is set to `first`, the service processor stops at the first successful call-out to one of the following numbers in the order listed:
  1. Service Center
  2. Customer Administrative Center
  3. Pager

  If call-out policy is set to `all`, the service processor attempts a call-out to all of the following numbers in the order listed:
  1. Service Center
  2. Customer Administrative Center
  3. Pager
- **Remote timeout** and **remote latency** are functions of your service provider's catcher computer. Either use the defaults or contact your service provider for recommended settings.
- **Number of retries** is the number of times that you want the system to retry calls that failed to complete.

Customer account setup menu

This menu allows users to enter information that is specific to their account.

```
       Customer Account Setup Menu

 1. Customer Account Number:
     Currently Unassigned

 2. Customer RETAIN Login userid:
     Currently Unassigned

 3. Customer RETAIN login password:
     Currently Unassigned

98. Return to Previous Menu

0>
```

- **Customer Account Number** is assigned by your service provider for record-keeping and billing. If you have an account number, enter it. Otherwise, leave this field unassigned.
- **Customer RETAIN Login User ID** and **Customer RETAIN Login Password** apply to a service function to which your service provider might have access. If your service provider does not use RETAIN, leave these fields unassigned.

Call-out test menu

Use this menu to test the configuration after the modem is installed and configured. To execute this test successfully, at least one of the following numbers must be assigned:

- Service center telephone number
- Customer administration center telephone number
- Digital pager telephone number

Service processor parameters in service mode

When the system is in service mode, the following service-processor parameters are suspended:

- Unattended Start Mode
- Reboot/Restart Policy
- Call-Out
- Surveillance

When you exit service mode, the service processor functions are reactivated.

System power-on methods

This section discusses the following system power-on methods:

- Power-on switch
- Service processor menus

  Privileged users can power on the system by selecting the **System Control Power Menu** option from the main menu and then selecting the **Power-on System** option from the System Power Control Menu. General users should select **Power-on System** on the General User Menu.
- Remote Power-on using Ring-Indicate Signal

  The system automatically powers on when it detects a “ring indicate” signal from a modem attached to serial port 2 (S2).

  A remote user can call the system to activate ring-detection by the modem. Listen for a few more rings than the threshold number for starting the system. The system powers on without answering the call.
- Unattended start mode - refer to **Enable/Disable Unattended Start Mode** on page 265.

  The service processor can be enabled to recover from the loss of AC power (see Enable/Disable Unattended Power-On Mode in the SYSTEM POWER CONTROL MENU). When AC power is restored, the system returns to the power state at the time AC loss occurred. For example, if the system was powered on when AC loss occurred, it reboots or restarts when power is restored. If the system was powered off when AC loss occurred, it remains off when power is restored.
- Timed power-on - refer to the **shutdown -t** command.

  Working in conjunction with the operating system, the service processor in your system can operate a timer, much like a wake-up timer on your alarm clock. You can set the timer so that your system powers on at a certain time after shutting down. The timer is battery-operated, so power interruptions that occur while the system is off do not affect its accuracy. Refer to the **shutdown -t** command for details on setting the timer.

  Note: If an AC power loss is in progress when the timed power-on attempt occurs, the system cannot power on when AC power is restored.
- Follow-up to a Failed Boot Attempt

  The service processor initiates a power-on sequence if a failed boot attempt is detected (due to a hardware or software failure).
- Fast or Slow Boot (IPL)

  Using the service processor menus, you can select the IPL type, mode, and speed of your system.

  Attention: If you select fast IPL results, the system skips several diagnostic tests and runs a shorter memory test.

Service processor reboot/restart recovery

Reboot describes bringing the system hardware back up; for example, from a system reset or power-on. The boot process ends when control passes to the operating system process.

Restart describes activating the operating system after the system hardware is reinitialized. Restart must follow a successful reboot.

Boot (IPL) speed

When the system enters reboot recovery, slow IPL is automatically started, which gives the POST an opportunity to locate and report any problems that might otherwise be unreported.

Failure during boot process

During the boot process, either initially after system power-on or upon reboot after a system failure, the service processor monitors the boot progress. If progress stops, the service processor can re-initiate the boot process (reboot) if enabled to do so. The service processor can reattempt this process according to the number of retries selected in the Reboot/Restart Policy Setup Menu.

Failure during normal system operation

When the boot process completes and control transfers to the operating system (OS), the service processor can monitor operating system activity (see the Set Surveillance Parameters option in the “Service processor setup menu” on page 259). If OS activity stops due to a hardware- or software-induced failure, the service processor can initiate a reboot or restart process based on the settings in the Service Processor Reboot/Restart Policy Setup Menu and the OS automatic restart settings (see the operating system documentation).

The menu item under SMIT for setting the restart policy is **Automatically Reboot After Crash**. The default is false. When the setting is true, and if the service processor parameter “Use OS-Defined Restart Policy” is yes (the default), the service processor takes over for the operating system to reboot or restart after a hardware or surveillance failure.

Service processor reboot/restart policy controls

The operating system’s automatic restart policy (see operating system documentation) indicates the operating system response to a system crash. The service processor can be instructed to refer to that policy by the Use OS-Defined Restart Policy setup menu.

If the operating system has the automatic restart policy disabled, then the service processor-restart policy can be controlled from the service processor menus. Use the Enable Supplemental Restart Policy selection.

Use OS-Defined restart policy - The default setting is no. This causes the service processor to refer to the OS Automatic Restart Policy setting and take action (the same action that the operating system would take if it could have responded to the problem causing the restart).

When this setting is no, or if the operating system did not set a policy, the service processor refers to the Enable Supplemental Restart Policy for its action.

Enable supplemental restart policy - The default setting is yes. When set to yes , the service processor restarts the server when the operating system loses control and either:

- The **Use OS-Defined restart policy** is set to No.

OR

- The **Use OS-Defined restart policy** is set to Yes and the operating system has no automatic restart policy.

If set to Yes, the service processor restarts the system when the system loses control and it is detected by service processor surveillance. Refer to “Service processor reboot/restart recovery” on page 282.

The following table describes the relationship among the operating system and service processor restart controls:

OS automatic reboot/restart after crash setting	Service processor to use OS-defined restart policy?	Service processor enable supplemental restart policy?	System response
None	No[1]	No	
None	No[1]	Yes[1]	Restarts
None	Yes	No	
None	Yes	Yes[1]	Restarts
False[2]	No[1]	No	
False[2]	No[1]	Yes[1]	Restarts (default)
False[2]	Yes	No	
False[2]	Yes	Yes[1]	
True	No[1]	No	
True	No[1]	Yes[1]	Restarts
True	Yes	No	Restarts
True	Yes	Yes[1]	Restarts

[1] Service processor default
[2] NAS Gateway 500 System Software default

Note: When clustering, it is very important to disable the system’s automatic restart by changing at least one of the service processor’s default settings.

System firmware updates

This section provides information and instructions for updating the system firmware. You may need to perform these steps if you are installing an option or if your support representative has instructed you to update your firmware.

Downloading the firmware update image and update instructions from the Web is preferred.

Always check the NAS Gateway 500 Support Web site for the latest firmware images and update instructions. The Web address is: http://www.ibm.com/servers/storage/support/download.html.

Notes:

1. Firmware update installation is not concurrent. Installation of the firmware will cause an unconditional reboot of the system. Therefore, all user operations should be gracefully terminated before firmware updates are applied.

2. **Never power off the system during the firmware update process.** The update will fail, and the process must be repeated.

If you cannot download from the Web, do the following:

- If the system is running, but access to the Web is not available, see “Using the CLI method” on page 286.
- If the system cannot be powered on, but the service processor menus are available, see “Using the service processor menu method” on page 285.
- If the service processor programming has been corrupted, the service processor will automatically enter recovery mode when power is applied to the system. For more information on recovery mode, go to “Recovery mode” on page 286.

To check the level of firmware that is currently on the system, see “Determining the level of firmware on the system” on page 285.

General information on system firmware updates

All the system firmware types that can be reprogrammed are updated at the same time. They are:

- System-power-control network programming
- Service processor programming
- IPL programming
- Run-time abstraction services

It is strongly recommended that you create a set of firmware update diskettes from the Web site as soon as possible after a system is installed. The diskette images can be downloaded to any personal computer or NAS Gateway 500 system with Internet access. This method and contacting your service representative are the only two ways to acquire a set of firmware update diskettes; they cannot be created by using the service processor menus or by using the operating system.

Retain and store the latest firmware diskettes each time the firmware gets updated in the event that the firmware becomes corrupted and must be reloaded.

Download the detailed instructions, as well as the latest flash images, from the following Web address: http://www.ibm.com/servers/storage/support/download.html. Before doing a system firmware update, check the Web site for the latest code and images. Do not attempt a firmware update if you are unsure of the image that you have, or of the procedure required for the update.

The images are available on the Web site in either DOS format or AIX (backup) format:

- If downloading to a PC, download the DOS image and follow the instructions. The diskettes that are created will be in AIX (backup) format.
- If downloading to a NAS Gateway 500 system, follow the instructions to create diskettes or a local image on a disk drive.

Determining the level of firmware on the system

Note: This information may be superseded by the information that is available on the Web site listed below. Always check the Web site for the latest images and instructions for checking the firmware level. The Web address is: http://www.ibm.com/servers/storage/support/download.html.

The firmware level can be checked using the CLI or in the service processor main menu.

The firmware level is denoted by XXYYMMDD, where XX = model designation, YY = year, MM = month, and DD = day of the release.

Using the CLI to read currently installed firmware levels

Use the **lscfg -vp | grep -p Platform** command for checking the firmware level. This command will produce a system configuration report similar to the following:

```
Platform Firmware:
ROM Level.(alterable).......3R031014
Version.....................RS6K
System Info Specific.(YL)...U1.1-P1/Y1
Physical Location:U1.1-P1/Y1
```

The ROM Level line lists the level of the currently installed firmware. In this example, the current firmware level is 3R031014. If the firmware level is correct and no update is needed, installation is complete.

Using the service processor main menu to read currently installed firmware levels

The second line of the service process main menu title, Version: 3R031014, shows the currently installed firmware level. If the firmware level is correct and no update is needed, installation is complete

Updating the firmware

The system, service processor (SvP), and the System Power Control Network (SPCN) firmware are combined into a single file. This allows all the firmware to be updated together and assures that they are compatible. Once the system and service processor firmware has been updated, the NAS Gateway 500 will reboot. The SPCN update will continue to run in the background.

Attention: Ensure that the system is not running any user applications when you begin the update process. Do not power off the system at any time before the update process completes.

Checksums should be used to verify that files have not been corrupted or altered during transmission. At the command line, enter: `sum XXYYMMDD.img`. The output will look similar to the following:

```
12129 4837 XXYYMMDD.img
```

In this example, the checksum is 12129.

Updating firmware must be initiated directly from the service processor menus or from the command line.

Using the service processor menu method

Service processor menus allow updating from diskettes only. You must have privileged user authority on the NAS Gateway 500 to update its firmware, and you must have console attached to serial port 1.

Note: All firmware (system, service processor and SPCN) will be updated when using this method.

1. Shutdown the server from a tty terminal window connection.
2. When the operator panel on the server says `0K`, press **Enter** to bring up the service processor menu.
3. Select **Service Processor Setup Menu**. Press **Enter**.
4. Select **Reprogram Flash EPROM Menu**. Press **Enter**.

5. Enter **y** to continue. Press **Enter**.
6. Follow the on-screen update steps as they are presented.
7. The Rebooting Service Processor message appears on the screen. The NAS Gateway 500 will reboot. This can take up to thirty minutes, depending on the configuration of the target server. Because the update occurs during this shutdown/reboot sequence, it is important to protect the server from interruptions.
8. Begin watching the operator panel.
9. When the panel indicates `0K`, press **Enter**. The service processor menu appears on the screen. The second line of the title, Version: XXYYMMDD, should match the firmware level you just installed.

   The firmware update is complete.

Using the CLI method

You must have root authority on the NAS Gateway 500 to update its firmware. This method allows updating from files already loaded onto the NAS Gateway 500. Update with the file located in the /tmp/fwupdate/ subdirectory. Enter the following commands:

```
cd /usr/lpp/diagnostics/bin
./update_flash -f /tmp/fwupdate/3R030718.img
```

Note: Do not overlook the periods (.) in the above command.
You will be asked for confirmation to proceed with the firmware update and the required reboot. If you confirm, the NAS Gateway 500 automatically performs the update and reboots. The checkpoints 99FF and 99FD alternately appear while the update is in progress. This may take up to thirty minutes, depending on the configuration of the system. Because the update occurs during this shutdown/reboot sequence, it is important to protect the NAS Gateway 500 from interruptions.

To verify that the update was successful, the firmware level can be checked as described in “Determining the level of firmware on the system” on page 285.

Recovery mode

If the service processor detects that its programming has been corrupted when it is powering on to standby mode, it will enter recovery mode. In recovery mode, it prompts for the firmware update diskettes by putting eight-digit codes on the operator panel, as shown in the following table. After the update process is complete, the service processor resets itself and performs a complete reboot.

Code	Action
A1FD 0000	System firmware has been corrupted and must be reflashed.
A1FD 0001	Insert update diskette 1.
A1FD 0002	Insert update diskette 2.
A1FD 0003	Insert update diskette 3.
A1FD 000*n*	Insert update diskette *n*.

Notes:

1. If the wrong diskette is inserted at any time, or if the diskette is left in the drive after it has been read, `B1FD 001F` is displayed, indicating that the wrong diskette is in the drive.
2. If `B1FD 001A` is displayed at any time during the process, the service processor must be reset by activating the pinhole reset switch on the operator panel.

Archiving the update files

In the event that it becomes necessary to restore the server to a certain firmware level, you should identify and archive the materials for each update you install. If the download process produced diskettes, label and store them in a safe place. If the download process produced files, archive and identify the files for convenient retrieval.

Configuring and deconfiguring processors or memory

All failures that crash the system with a machine check or check stop, even if intermittent, are reported as a diagnostic callout for service repair. To prevent the recurrence of intermittent problems and improve the availability of the system until a scheduled maintenance window, processors and DIMMs with a failure history are marked “bad” to prevent them from being configured on subsequent boots. This function is called *repeat gard*.

A processor or DIMM is marked “bad” under the following circumstances:

- A processor or DIMM fails built-in self-test (BIST) or power-on self-test (POST) testing during boot (as determined by the service processor).
- A processor or DIMM causes a machine check or check stop during runtime, and the failure can be isolated specifically to that processor or DIMM (as determined by the processor runtime diagnostics in the service processor).
- A processor or DIMM reaches a threshold of recovered failures that results in a predictive callout (as determined by the processor run-time diagnostics in the service processor).

During boot time, the service processor does not configure processors or DIMMs that are marked “bad.”

If a processor or DIMM is deconfigured, the processor or DIMM remains offline for subsequent reboots until it is replaced or memory repeat gard is disabled. The repeat gard function also provides the user with the option of manually deconfiguring a processor or DIMM, or re-enabling a previously deconfigured processor or DIMM.

For information about configuring or deconfiguring a processor, see the Processor Configuration/Deconfiguration Menu on page 269. For information on configuring or deconfiguring a DIMM, see the Memory Configuration/Deconfiguration Menu on page 270. Both of these menus are submenus under the System Information Menu. You can enable or disable CPU Repeat Gard or Memory Repeat Gard using the Processor Configuration/Deconfiguration Menu.

Run-time CPU deconfiguration (CPU repeat gard)

L1 instruction cache recoverable errors, L1 data cache correctable errors, and L2 cache correctable errors are monitored by the processor runtime diagnostics (PRD) code running in the service processor. When a predefined error threshold is met, an error log with warning severity and threshold exceed. The NAS Gateway 500 will attempt to migrate all resources associated with that processor to another processor and then stop the defective processor.

Service processor system monitoring - surveillance

Surveillance is a function in which the service processor monitors the system, and the system monitors the service processor. This monitoring is accomplished by periodic samplings called *heartbeats*.

Surveillance is available during the following phases:

- System firmware bring-up (automatic)
- Operating system runtime (optional)

System firmware surveillance

System firmware surveillance is automatically enabled during system power-on. It cannot be disabled by the user, and the surveillance interval and surveillance delay cannot be changed by the user.

If the service processor detects no heartbeats during system IPL (for a set period of time), it cycles the system power to attempt a reboot. The maximum number of retries is set from the service processor menus. If the fail condition persists, the service processor leaves the machine powered on, logs an error, and displays menus to the user. If Call-out is enabled, the service processor calls to report the failure and displays the operating-system surveillance failure code on the operator panel.

Operating system surveillance

Operating system surveillance provides the service processor with a means to detect hang conditions, as well as hardware or software failures, while the operating system is running. It also provides the operating system with a means to detect a service processor failure caused by the lack of a return heartbeat.

Operating system surveillance is not enabled by default, allowing you to run operating systems that do not support this service processor option.

For operating system surveillance to work correctly, you must set these parameters:

- Surveillance enable/disable
- Surveillance interval

  The maximum time the service processor should wait for a heartbeat from the operating system before timeout.
- Surveillance delay

  The length of time to wait from the time the operating system is started to when the first heartbeat is expected.

Surveillance does not take effect until the next time the operating system is started after the parameters have been set.

You can initiate surveillance mode immediately from service aids. In addition to the previously discussed options, another option allows you to select immediate surveillance, and rebooting of the system is not necessarily required.

If operating system surveillance is enabled (and system firmware has passed control to the operating system), and the service processor does not detect any heartbeats from the operating system, the service processor assumes that the system is hung and takes action according to the reboot/restart policy settings. See “Service processor reboot/restart recovery” on page 282.

If surveillance is selected from the service processor menus that are only available at system boot, surveillance is enabled by default as soon as the system boots. From service aids, the selection is optional.

Call-out (call-home)

The service processor can call out (call-home) when it detects one of the following conditions:

- System firmware surveillance failure
- Operating system surveillance failure (if supported by operating system)
- Restarts
- Critical hardware failure
- Abnormal operating system termination

For more information, see the “Call home” section in the *NAS Gateway 500 Administrator’s Guide*.

To enable the call-out feature, do the following:

1. Connect a modem to serial port 2 (S2).
2. Set up the following using the service processor menus or diagnostic service aids:
   - Enable call-out for the serial port where the modem is connected.
   - Enter the modem configuration file name.
   - Set up site-specific parameters (phone numbers for call-out, call-out policy, number of call-out retries, and so on).
3. To call out before restart, set **Call-out before restart** to ENABLED from the Reboot/Restart Policy Setup menu.

Note: Some modems, such as IBM 7857-017, are not designed for the paging function. Although they can be used for paging, they will return an error message when they do not get the expected response from another modem. Therefore, even though the paging was successful, the error message will cause the service processor to retry, continuing to place pager calls for the number of retries specified in the call-out policy setup menu. These retries result in redundant pages.

Service processor error logs

The service processor error logs, an example of which follows, contain error conditions detected by the service processor.

```
                          Error Log

1. 11/30/99    19:41:56 Service Processor Firmware Failure
   B1004999

   Enter error number for more details.
   Press Return to continue, or 'x' to return to menu.
     Press "C" to clear error log, any other key to continue. >
```

Note: The time stamp in this error log is coordinated universal time (UTC), which is also referred to as Greenwich mean time (GMT). Operating system error logs have additional information available and can time stamp with local time.

Entering an error number provides nine words of system reference code (SRC) data; an example menu follows.

```
Detail:    6005

SRC
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
word11:B1004999      word12:0110005D      word13:00000000
word14:00000000      word15:00001111      word16:00000000
word17:B1004AAA      word18:0114005D      word19:A4F1E909

B1004999

   Press Return to continue, or 'x' to return to menu.
```

If you press Enter, the contents of NVRAM will be dumped 320 bytes at a time, starting at address 0000.

LCD progress indicator log

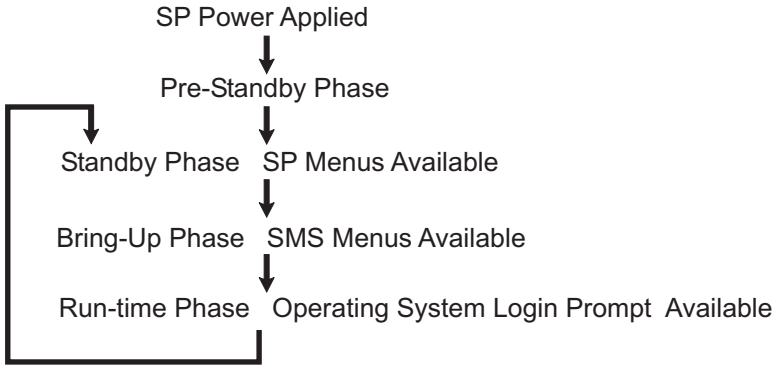
The following is an example of the LCD progress indicator log. It shows the types of entries that can appear in the log, and is for example purposes only.

The progress indicator codes are listed from top (latest) to bottom (oldest).

```
                        LCD Progress Indicator Log
          B0FF
          0539..17
          0538..17
          0539..17
          0538..17
          0539..17
          0581
          0538..17
          0539..12
          0538..12
          0539..
          0821..01-K1-00
          0539..
          0728..01-R1-00-00
          0539..
          0664..40-60-00-1,0
          0539..
          0777..U0.1-P2-I1/E1
          0539..
          0742..U0.1-P2-I2/E1
          0539..
          0776..U0.1-P2-I3/T1
          E139
          E1FB
          E139
          E183
Press Return to continue, or 'x' to return to menu. >
          EAA1..U0.1-P1-I4
          E172..U0.1-P1
          E172..U0.1-P1-I4
          E172..U0.1-P1
          94BB
          9109
          9380
          9108
          9107
          9106
          9105
          9118
          9104
          9103
          9102
          90FD
```

Service processor operational phases

This section provides a high-level flow of the phases of the service processor.



Pre-standby phase

This phase is entered when the system is connected to a power source. The system may or may not be fully powered on. This phase is exited when the power-on self-tests (POSTs) and configuration tasks are completed.

The pre-standby phase components are:

- Service Processor Initialization - Service processor performs any necessary hardware and software initialization.
- Service Processor POST - Service processor conducts Power-on self-tests on its various work and code areas.
- Service Processor Unattended Start Mode Checks - To assist fault recovery. If unattended start mode is set, the service processor automatically reboots the system. The service processor does not wait for user input or power-on command, but moves through the phase and into the bring-up phase. Access the SMS menus or the service processor menus to reset the unattended start mode.

Standby phase

The standby phase can be reached in either of the following ways:

- With the system off and power connected (the normal path), recognized by `0K` in the operator panel.

  OR
- With the system on after an operating system fault, recognized by an 8-digit code in the operator panel.

In the standby phase, the service processor takes care of some automatic duties and is available for menus operation. The service processor remains in the standby phase until a power-on request is detected.

The standby phase components are as follows:

- Modem Configuration

  The service processor configures the modem (if installed) so that incoming calls can be received, or outgoing calls can be placed.
- Dial In

  Monitors incoming phone line to answer calls, prompts for a password, verifies the password, and remotely displays the standby menu.
- Menus

  The service processor menus are password-protected. If the passwords have been set before you can access them, you need either the general user-password or privileged-user password.

Service processor menus are available on ASCII terminals attached to serial port S1.

Bring-up phase

This phase is entered upon power-on, and exited upon loading of the operating system.

The bring-up phase components are as follows:

- Retry Request Check

  The service processor checks to see if the previous boot attempt failed. If the specified number of failures are detected, the service processor displays an error code and places an outgoing call to notify an external party if the user has enabled this option.
- Dial Out

  The service processor can dial a preprogrammed telephone number in the event of an IPL failure. The service processor issues an error report with the last reported IPL status indicated and any other available error information.
- Update Operator Panel
- Environmental Monitoring

  The service processor provides expanded error recording and reporting.
- System Firmware Surveillance (Heartbeat Monitoring)

  The service processor monitors and times the interval between system firmware heartbeats.
- Responding to System Processor Commands

  The service processor responds to any command issued by the system processor.

Runtime phase

This phase includes the tasks that the service processor performs during steady-state execution of the operating system.

- Environmental Monitoring

  The service processor monitors voltages, temperatures, and fan speeds (on some servers).
- Responding to System Processor Commands

  The service processor responds to any command issued by the system processor.
- Run-Time Surveillance

  If the device driver is installed and surveillance enabled, the service processor monitors the system heartbeat. If the heartbeat times out, the service processor places an outgoing call. This is different from the bring-up phase scenario, where the specified number of reboot attempts is made before placing an outgoing call.

Chapter 10. Using System Management Services

Use the System Management Services menus to view information about your system, and to perform tasks such as setting a password, changing the boot list, and setting the network parameters.

To start the System Management Services, do the following:

1. Restart the system.
2. Watch the console.
3. Look for the POST indicators **memory, keyboard, network, scsi, speaker**, which appear across the bottom of the panel. Press the numeric 1 key after the word **keyboard** appears, and before the word **speaker** appears.

   For more information on the POST indicator words, refer to “POST indicators” on page 7.

After the System Management Services starts, the following panel is displayed:

```
Main Menu

 1   Select Language
 2   Change Password Options
 3   View Error Log
 4   Setup Remote IPL (Initial Program Load)
 5   Change SCSI Settings
 6   Select Console
 7   Select Boot Options


-------------------------------------------------------------------------------
Navigation keys:

                                                  X = eXit System Management Services
-------------------------------------------------------------------------------
Type the number of the menu item and press Enter or Select a Navigation key: _
```

Note: The System Management Services can also be started using the Service Processor Boot Mode Menu. See “System power control menu” on page 265.

On all menus except the Main Menu, there are several navigation keys:

M Return to the main menu.

ESC Return to the previous menu.

X Exit the System Management Services and start the operating system.

If X is entered, you are asked to confirm your choice to exit the SMS menus and start the operating system.

When there is more than one page of information to display, there are two additional navigation keys:

N Display the next page of the list.

P Display the previous page of the list.

Note: The lowercase navigation key has the same effect as the uppercase key. For example, **m** or **M** returns you to the main menu.

On each menu, you are given the option of choosing a menu item and pressing Enter (if applicable), or selecting a navigation key.

Select language

Note: Your terminal must support the ISO-8859 character set to properly display languages other than English.

This option allows you to change the language used by the text-based System Management Services menus.

```
SELECT LANGUAGE

 1.  English
 2.  Francais
 3.  Deutsch
 4.  Italiano
 5.  Espanol









--------------------------------------------------------------------------------
Navigation keys:
M = return to main menu
ESC key = return to previous screen                    X = eXit System Management Services
--------------------------------------------------------------------------------
Type the number of the menu item and press Enter or Select a Navigation key: _
```

Change password options

The Change Password Options menu enables you to select from password utilities.

```
Change Password Options

 1 Set Privileged-Access Password
 2 Remove Privileged-Access Password



-------------------------------------------------------------------------------------------------
Navigation keys:
M = return to main menu
ESC key = return to previous screen                          X = eXit System Management Services
-------------------------------------------------------------------------------------------------
Type the number of the menu item and press Enter or Select a Navigation key: _
```

The privileged-access password protects against the unauthorized starting of the system programs.

Note: If the privileged-access password has been enabled, you are asked for the privileged-access password at startup every time you boot your system.

If you had set a privileged-access password previously and want to remove it, select **Remove Privileged-Access Password**.

View error log

Use this option to view or clear your system's error log. A menu similar to the following is displayed when you select this option.

```
 Error Log

          Date       Time       Error Code   Location
 Entry 1. 01/04/96   12:13:22   25A80011     00-00
 Entry 2. no error logged




1. Clear error log
-------------------------------------------------------------------------------------------------
Navigation keys:
M = return to main menu
ESC key = return to previous screen                          X = eXit System Management Services
-------------------------------------------------------------------------------------------------
Type the number of the menu item and press Enter or Select a Navigation key: _
```

Note: The time stamp in this error log is coordinated universal time (UTC), which is also referred to as Greenwich mean time (GMT). The operating system error logs have more information available and can time stamp with your local time.

Setup remote IPL (initial program load)

This option allows you to enable and set up the remote startup capability of your system. You must first specify the network parameters.

```
Network Parameters

 1. IP Parameters
 2. Adapter Parameters
 3. Ping Test



-------------------------------------------------------------------------------------------------
Navigation keys:
M = return to main menu
ESC key = return to previous screen                          X = eXit System Management Services
-------------------------------------------------------------------------------------------------
Type the number of the menu item and press Enter or Select a Navigation key: _
```

Selecting **IP Parameters** displays the following menu.

```
IP Parameters

 1. Client IP Address    [000.000.000.000]
 2. Server IP Address    [000.000.000.000]
 3. Gateway IP Address   [000.000.000.000]
 4. Subnet Mask          [255.255.255.000]




-------------------------------------------------------------------------------------------------
Navigation keys:
M = return to main menu
ESC key = return to previous screen                          X = eXit System Management Services
-------------------------------------------------------------------------------------------------
Type the number of the menu item and press Enter or Select a Navigation key: _
```

To change IP (Internet Protocol) parameters, type the number of the parameters for which you want to change the value.

Attention: If the client system and the server are on the same subnet, set the gateway IP address to [0.0.0.0].

Selecting **Adapter Parameters** allows you to view an adapter's hardware address, as well as configure network adapters that require setup. A menu similar to the following is displayed.

Attention: All network adapters in the system are listed in the adapter parameters menu.

```
Adapter Parameters

            Device                              Slot              Hardware Address
 1. 10/100 Mbps Ethernet PCI Adapt         Integrated:U0.1-P1/E2   0002554f50c3
 2. Port 1 - IBM 2 PORT 10/100/100         6:U0.1-P2-I6/E1         00096bae31fc
 3. Port 2 - IBM 2 PORT 10/100/100         6:U0.1-P2-I6/E2         00096bae31fd
 4. 10/100 Mbps Ethernet PCI Adapt         Integrated:U0.1-P1/E1   0002554f50c4


-------------------------------------------------------------------------------------------------
Navigation keys:
M = return to main menu
ESC key = return to previous screen                          X = eXit System Management Services
-------------------------------------------------------------------------------------------------
Type the number of the menu item and press Enter or Select a Navigation key: _
```

Entering adapter parameters on these panels will automatically update the parameters on the ping test panel.

Selecting an adapter on this menu displays configuration options for that adapter. The current setting is indicated by <===.

```
Adapter Parameters

10/100 Mbps Ethernet PCI Adapter II

1. ethernet, 10, rj45, half
2. ethernet, 10, rj45, full
3. ethernet, 100, rj45, half
4. ethernet, 100, rj45, full
5. Continue with Ping


-------------------------------------------------------------------------------------------------
Navigation keys:
M = return to main menu
ESC key = return to previous screen                          X = eXit System Management Services
-------------------------------------------------------------------------------------------------
Type the number of the menu item and press Enter or Select a Navigation key: _
```

To change the adapter parameters, select an option from the list.

To test a connection to a remote system unit, select **Ping Test** from the Network Parameters Menu. After selecting the **Ping Test** option, you must select which adapter communicates with the remote system.

```
Adapter Parameters

Device                                      Slot              Hardware Address

1. 2-Gbps Fibre Channel HBA               4:U0.1-P1-I4/E1          000629aca72d
2. Gigabit Ethernet SX Adapter            Integrated:U0.1-P1/E1    0020357A0530
3. Gigabit Ethernet TX Adapter            1:U0.1-P1-I1/T1          000629be04e1
4. Gigabit Ethernet SX Adapter            3:U0.1-P1-I3/E1          0004ac7c9ec7









-------------------------------------------------------------------------------------------------
Navigation keys:
M = return to main menu
ESC key = return to previous screen                          X = eXit System Management Services
-------------------------------------------------------------------------------------------------
Type the number of the menu item and press Enter or Select a Navigation key: _
```

After selecting an adapter, you will be asked to set the parameters for the adapter; a menu similar to the following is displayed:

```
Adapter Parameters

Gigabit Ethernet SX Adapter

1. ethernet, 10, rj45, full
2. ethernet, 10, rj45, half
3. ethernet, 100, rj45, full
4. ethernet, 100, rj45, half <===
5. ethernet, auto, rj45, auto
6. Execute Ping Test

-------------------------------------------------------------------------------------------------
Navigation keys:
M = return to main menu
ESC key = return to previous screen                          X = eXit System Management Services
-------------------------------------------------------------------------------------------------
Type the number of the menu item and press Enter or Select a Navigation key: _
```

After selecting which adapter and its parameters to use to ping the remote system, you must provide the addresses needed to communicate with the remote system.

```
Ping Test

 1. Client IP Address    [129.132.4.20]
 2. Server IP Address    [129.132.4.10]
 3. Gateway IP Address   [129.132.4.30]
 4. Subnet Mask          [255.255.255.0]
 5. Execute Ping Test




-------------------------------------------------------------------------------
Navigation keys:
M = return to main menu
ESC key = return to previous screen                    X = eXit System Management Services
-------------------------------------------------------------------------------
Type the number of the menu item and press Enter or Select a Navigation key: _
```

Notes:

1. After the ping test is initiated, it might take up to 60 seconds to return a result.
2. If the ping test passes or fails, the firmware will stop and wait for you to press a key before continuing.

Change SCSI settings

This option allows you to view and change the addresses of the SCSI controllers attached to your system.

```
SCSI Settings

  1. Hard Drive Spin Up Delay
  2. Change SCSI Id




-------------------------------------------------------------------------------
Navigation keys:
M = return to main menu
ESC key = return to previous screen                    X = eXit System Management Services
-------------------------------------------------------------------------------
Type the number of the menu item and press Enter or Select a Navigation key: _
```

Select console

The Select Console utility allows the user to select which console to use to display the SMS menus. This selection is only for the SMS menus and does not affect where the operating system is displayed.

Follow the instructions that are displayed on the screen. The firmware automatically returns to the SMS main menu.

Select boot options

Use this menu to view and set various options regarding the installation devices and boot devices.

```
  1. Select Install or Boot a Device
  2. Select Boot Devices
  3. Multiboot Startup <OFF>




-------------------------------------------------------------------------------------------------
Navigation keys:
M = return to main menu
ESC key = return to previous screen                          X = eXit System Management Services
-------------------------------------------------------------------------------------------------
Type the number of the menu item and press Enter or Select a Navigation key: _
```

Select Install or Boot a Device
Allows you to select a device from which to boot or install the operating system. This option is for the current boot only.

Select Boot Devices
Allows you to set the boot list.

Multiboot Startup
Toggles the multiboot startup flag, which controls whether the multiboot menu is invoked automatically on startup.

If **Select Install or Boot a Device** is selected, the following menu is displayed:

```
  Select Device Type
 1.  Diskette
 2.  Tape
 3.  CD/DVD
 4.  IDE
 5.  Hard Drive
 6.  Network
 7.  None
 8.  List All Devices




-------------------------------------------------------------------------------------------------
Navigation keys:
M = return to main menu
ESC key = return to previous screen                          X = eXit System Management Services
-------------------------------------------------------------------------------------------------
Type the number of the menu item and press Enter or Select a Navigation key: _
```

If a device is selected that is not in the system, a menu with the following message is displayed:

```
.-------------------------------------------------------.
| THE SELECTED DEVICES WERE NOT DETECTED IN THE SYSTEM ! |
| Press any key to continue.                            |
`-------------------------------------------------------'
```

If **Hard Drive** is selected, the following menu is displayed:

```
  Select Hard Drive Type
 1.  SCSI
 2.  SSA
 3.  SAN
 4.  IDE
 5.  ISA
 6.  List All Devices



-------------------------------------------------------------------------------------------------
Navigation keys:
M = return to main menu
ESC key = return to previous screen                          X = eXit System Management Services
-------------------------------------------------------------------------------------------------
Type the number of the menu item and press Enter or Select a Navigation key: _
```

If **List All Devices** is selected, a menu similar to the following is displayed, depending on the devices that are installed in the system:

```
 Select Device
Device  Current  Device
Number  Position  Name
 1.        1      Diskette
 2.        -      IDE CD-ROM
 3.        -      Ethernet (loc=U0.1-P1/E2)
 4.        -      Ethernet (loc=U0.1-P2/I6/E1)
 5.        -      Ethernet (loc=U0.1-P2/I6/E2)
 6.        -      Ethernet (loc=U0.1-P1/E1)


-------------------------------------------------------------------------------------------------
Navigation keys:
M = return to main menu
ESC key = return to previous screen                          X = eXit System Management Services
-------------------------------------------------------------------------------------------------
Type the number of the menu item and press Enter or Select a Navigation key: _
```

The appropriate device can then be selected for this boot or installation.

When a device is selected for installing the operating system, or to boot from, the Select Task menu allows you to get more information about the device, or to boot from that device in normal mode or service mode. The following is an example of this menu.

```
 Select Task

SCSI 18200 MB Harddisk (loc=U0.1-Ethernet)

 1.  Information
 2.  Normal Mode Boot
 3.  Service Mode Boot



--------------------------------------------------------------------------------
Navigation keys:
M = return to main menu
ESC key = return to previous screen                    X = eXit System Management Services
--------------------------------------------------------------------------------
Type the number of the menu item and press Enter or Select a Navigation key: _
```

If either **Normal Mode Boot** or **Service Mode Boot** is selected, the next panel will prompt, `Are you sure?`. If you answer yes, the device will be booted in the appropriate mode. If you answer no, the firmware will return to the Select Task menu.

Select boot devices

Attention: Devices from which an operating system can be booted are displayed on the Select Boot Devices menu.

Select this option to view and change the customized boot list, which is the sequence of devices read at startup.

```
 Configure Boot Device Order
 1.  Select 1st Boot Device
 2.  Select 2nd Boot Device
 3.  Select 3rd Boot Device
 4.  Select 4th Boot Device
 5.  Select 5th Boot Device
 6.  Display Current Setting
 7.  Restore Default Setting



--------------------------------------------------------------------------------
Navigation keys:
M = return to main menu
ESC key = return to previous screen                    X = eXit System Management Services
--------------------------------------------------------------------------------
Type the number of the menu item and press Enter or Select a Navigation key: _
```

When any of the options 1-5 is selected, the Select Device Type panel is displayed, which is similar to the following example panel:

```
 Select Device Type
 1.  Diskette
 2.  Tape
 3.  CD/DVD
 4.  IDE
 5.  Hard Drive
 6.  Network
 7.  None
 8.  List All Devices


-------------------------------------------------------------------------------
Navigation keys:
M = return to main menu
ESC key = return to previous screen                    X = eXit System Management Services
-------------------------------------------------------------------------------
Type the number of the menu item and press Enter or Select a Navigation key: _
```

When a device type is selected, such as item 4, a Select Media Type menu is displayed. The following is an example of that menu for IDE.

```
  Select Media Type
 1.  SCSI
 2.  SSA
 3.  SAN
 4.  IDE
 5.  ISA
 6.  None
 7.  List All Devices


-------------------------------------------------------------------------------
Navigation keys:
M = return to main menu
ESC key = return to previous screen                    X = eXit System Management Services
-------------------------------------------------------------------------------
Type the number of the menu item and press Enter or Select a Navigation key: _
```

When a media type is selected, such as item 4, a Select Device menu is displayed. The following is an example of that menu for IDE.

```
 Select Device
Device  Current  Device
Number  Position  Name
 1.        1      IDE CD-ROM
 2.        -      None




-------------------------------------------------------------------------------
Navigation keys:
M = return to main menu
ESC key = return to previous screen                    X = eXit System Management Services
-------------------------------------------------------------------------------
Type the number of the menu item and press Enter or Select a Navigation key: _
```

When a device type is selected, such as item 1, a Select Task menu is displayed. The following is an example of that menu for an IDE CD-ROM.

```
 Select Task

IDE CD-ROM

 1.  Information
 2.  Set Boot Sequence: Configure as 1st Boot Device




-------------------------------------------------------------------------------
Navigation keys:
M = return to main menu
ESC key = return to previous screen                    X = eXit System Management Services
-------------------------------------------------------------------------------
Type the number of the menu item and press Enter or Select a Navigation key: _
```

Selecting **Information** displays a menu similar to the following for an IDE CD-ROM.

```
 Device Information
    /pci@400000000110/ide@3,1/disk@0:1,\ppc\bootinfo.txt
                   :  (Bootable)       (Installable)
DEVICE             : IDE CD-ROM
NAME               : disk
DEVICE-TYPE        : block

Parent Information
NAME               : ide
DEVICE-TYPE        : ide

-------------------------------------------------------------------------------
Navigation keys:
M = return to main menu
ESC key = return to previous screen                    X = eXit System Management Services
-------------------------------------------------------------------------------
Type the number of the menu item and press Enter or Select a Navigation key: _
```

The **Set Boot Sequence** option allows you to set the location of the device in the boot list.

Display current settings

This option displays the current setting of the customized boot list. An example of this menu, with one device in the boot list, follows.

```
 Current Boot Sequence
 1.  IDE CD-ROM
 2.   None
 3.   None
 4.   None
 5.   None




-----------------------------------------------------------------------------------------------
Navigation keys:
M = return to main menu
ESC key = return to previous screen                          X = eXit System Management Services
-----------------------------------------------------------------------------------------------
Type the number of the menu item and press Enter or Select a Navigation key: _
```

Restore default settings

This option restores the boot list to the default boot list. The default boot list varies depending on the devices that are installed in the system.

The default boot list is as follows:

1. Primary diskette drive
2. CD-ROM drive
3. Hard disk drive
4. Network adapters

Multiboot startup

Multiboot Startup toggles the multiboot startup flag, which controls whether the multiboot menu is invoked automatically on startup.

Exiting System Management Services

After you have finished using the System Management Services, type **x** (for exit) to boot your system.

Chapter 11. Removal and replacement procedures

Safety considerations

Notes:

1. Servicing of the NAS Gateway 500 is typically performed with the system in the rack and placed into the service position. The service position for the NAS Gateway 500 is described in “Placing the NAS Gateway 500 into the service position” on page 312.
2. Before performing any of the removal or replacement procedures in this chapter, read the following danger and caution notices.

In the system that you are about to set up or service:

- The AC power interface connectors are considered the main power disconnect devices.
- This system has redundant power supply capabilities, meaning that it has the ability to have two power supplies running simultaneously in the same system unit. When instructed to disconnect the power source, ensure that all power cables have been unplugged.

DANGER

An electrical outlet that is not correctly wired could place hazardous voltage on metal parts of the system or the devices that attach to the system. It is the responsibility of the customer to ensure that the outlet is correctly wired and grounded to prevent an electrical shock. (D09)

Before installing or removing signal cables, ensure that the power cables for the system unit and all attached devices are unplugged.

When adding or removing any additional devices to or from the system, ensure that the power cables for those devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.

Use one hand, when possible, to connect or disconnect signal cables to prevent a possible shock from touching two surfaces with different electrical potentials.

CAUTION:
This product is equipped with a 3-wire power cable and plug for the user’s safety. Use this power cable in conjunction with a correctly grounded electrical outlet to avoid an electrical shock. (C10)

CAUTION:
This unit has more than one power supply cord. To reduce the risk of electrical shock, disconnect two power supply cords before servicing. (D10)

Procedure list

Procedure	Procedure name and page location
Adapters	“PCI-X adapters” on page 324
Battery	“Battery” on page 348
Bezel	“Bezel” on page 315
Cable-management arm	“Cable management arm” on page 323
CD-ROM drive	“Media drives (diskette and CD-ROM)” on page 337
CEC backplane	“Central electronics complex (CEC) backplane” on page 366
Cover	“Service cover” on page 314
Disk drive	“Disk drives” on page 339
Disk drive backplane	“Disk drive backplane” on page 359
Disk drive configuration or deconfiguration	“Deconfiguring (removing) a disk drive” on page 339
Diskette drive	“Media drives (diskette and CD-ROM)” on page 337
Drawer release latch and brackets	“Drawer-release latch and brackets” on page 320
Fans	“Fans” on page 334
I/O card	(Refer to PCI riser card)
Media drives	“Media drives (diskette and CD-ROM)” on page 337
DIMMs	“DIMMs” on page 346
Operating position	“Returning the NAS Gateway 500 to the operating position” on page 313
Operator panel	“Operator panel” on page 362
PCI riser card	“PCI riser card” on page 354
Power supply	“Power supplies” on page 351
Processor book	“Processor book” on page 343
Rack installation	“System rack removal and replacement” on page 316
Release latch and brackets	“Drawer-release latch and brackets” on page 320
Service position	“Placing the NAS Gateway 500 into the service position” on page 312
Starting the system	“Starting the system” on page 311
Static-sensitive devices	“Handling static-sensitive devices” on page 310
Stopping the system	“Stopping the system” on page 310
System board	(Refer to CEC backplane)
Rack hardware	“System rack removal and replacement” on page 316
VPD update	“System vital product data (VPD) update procedure” on page 364

Handling static-sensitive devices

Attention: Electronic boards, diskette drives, and disk drives are sensitive to static electricity discharge. These devices are wrapped in antistatic bags to prevent this damage.

Take the following precautions:

- If you have an antistatic wrist strap available, use it while handling the device.
- Do not remove the device from the antistatic bag until you are ready to install the device in the system.
- Limit your movement. Movement can cause static electricity to build up around you.
- While the device is still in its anti-static package, touch it to an unpainted metal part of the system unit for at least two seconds. (This drains static electricity from the package and from your body).
- Handle the device carefully, holding it by its edges or its frame.
- Do not touch solder joints, pins, or other printed circuitry. Avoid touching the components and gold-edge connectors on the adapter.
- Do not leave the device where others can handle and possibly damage the device.
- Remove the device from its package and install it directly into your system unit without setting it down. If it is necessary to set the device down, place it on its static-protective package. (If your device is an adapter, place it component-side up). Do not place the device on your system unit cover or on a metal table. Before picking it up again, touch the antistatic bag and the metal frame of the system at the same time.
- Take additional care when handling devices during cold weather, as heating reduces indoor humidity and increases static electricity.
- Take care not to damage the EMC gaskets on the PCI-X slots at the back of the system unit.
- Handle the devices carefully to prevent permanent damage.

Stopping the system

Attention: When shutting down your system to install options, shut down all applications first and then shut down the operating system. The system power turns off and the system goes into standby mode when the operating system is shut down. Before removing power from the system, ensure that the shutdown process is complete. Failure to do so can result in the loss of data. Some option-installation procedures do not require the system to be stopped for installation. The option-installation procedures in this chapter will direct you here if stopping the system is required.

1. Log in to the system as root user.
2. Have your system administrator stop all applications that are running on the system. If the operator panel displays the `OK` prompt, go to step 5 on page 311.
3. If clustering, you need to relocate this node's volumes over to the other cluster node.
   a. To display the hostname of this node, type **hostname** on the command line.
   b. To display the group name of the volumes being served on this node, type `/opt/nas/bin/clnasshowvol -a -n <hostname>`.

      Note: Record both the hostname and the group name.
   c. Relocate the volumes to the other node in this cluster by typing `/opt/nas/bin/clnasrelocate -g <groupname> -n <other node's hostname>`.
   d. Stop the cluster on the node being serviced by typing `/opt/nas/bin/cldisnode -n <hostname>`.
4. At a command line, type `shutdown` to stop the operating system. If you cannot use this method, you can power off the system by pressing the operator panel power button.

   Attention: Using the operator panel power button to power off the system can cause unpredictable results, and the next IPL will take longer to complete. It will also cause the attention LED to light the next time.

5. After you shut down the operating system, set the power switches of any attached devices to Off.
6. If necessary, disconnect the power sources to both of the NAS Gateway 500's power supplies.

Starting the system

To power on the system, perform the following steps in sequence.

1. Open the front rack door.
2. If they were disconnected, reconnect both power sources to the system.
3. Before you press the power button on your operator panel, observe the following:
   - The power LED is slowly blinking.
   - An `OK` prompt is visible in the operator panel.
4. Press the power-on button on the operator panel.

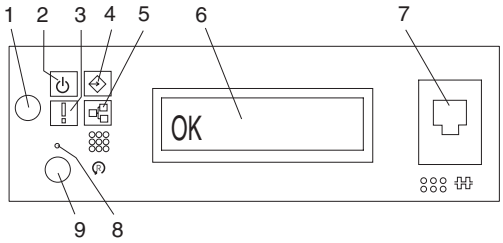
   After pressing the power button located on the operator panel, observe the following:

   a. The power LED begins to blink visibly faster.

   b. The system cooling fans are activated and begin to accelerate up to operating speed.

      Note: There is approximately a 40-second transition period between the time the power button is pressed and the power LED remains on solid (no longer blinking).

   c. The power LED stays on solid and progress indicators, also referred to as *checkpoints*, are visible on the operator panel.



1 Power-on button
2 Power LED
3 Attention LED
4 SCSI port activity
5 Ethernet port activity
6 Operator panel display
7 (FS1) front serial connector (RJ-48 connector)
8 Service processor reset switch (pinhole)
9 System reset button

Note: The boot process can take 15-30 minutes, depending on the system configuration and attachments. Approximately 30 seconds after the boot process has completed, the operator panel will go blank (unless this is the very first boot before initial configuration is complete; then the IP address for Ethernet port 1 is displayed). At this point, you can ping or telnet into the machine. If a console is attached to serial port 1, the POST messages and checkpoints are displayed on the console, and, when boot is complete, the login: prompt displays. Messages might continue to display after the login prompt.

5. If you are clustering, you need to bring this node back into the cluster pair to resume file serving using the hostname and group name recorded at shutdown.

   a. Log in to the system as root user.

   b. Rejoin the cluster by typing on the command line: `/opt/nas/bin/clnasrennode -n <hostname>`

   c. Poll status until the node has finished stabilizing: `/opt/nas/bin/clnasnodestate -n <hostname>`

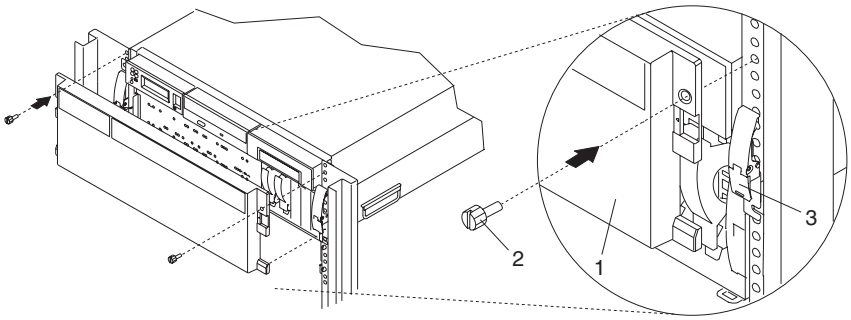
   d. Once the status changes to "stable," relocate the volumes back to this node for file serving: `/opt/nas/bin/clnasrelocate -g <groupname> -n <hostname>`

Placing the NAS Gateway 500 into the service position

Attention: When placing the NAS Gateway 500 into the service position, it is essential that all stability plates are firmly in position to prevent the rack from toppling. Ensure that only one system drawer at a time is in the service position.

Before doing any service actions inside the NAS Gateway 500, you must place the system into the service position. To place the system into the service position, perform the following steps:

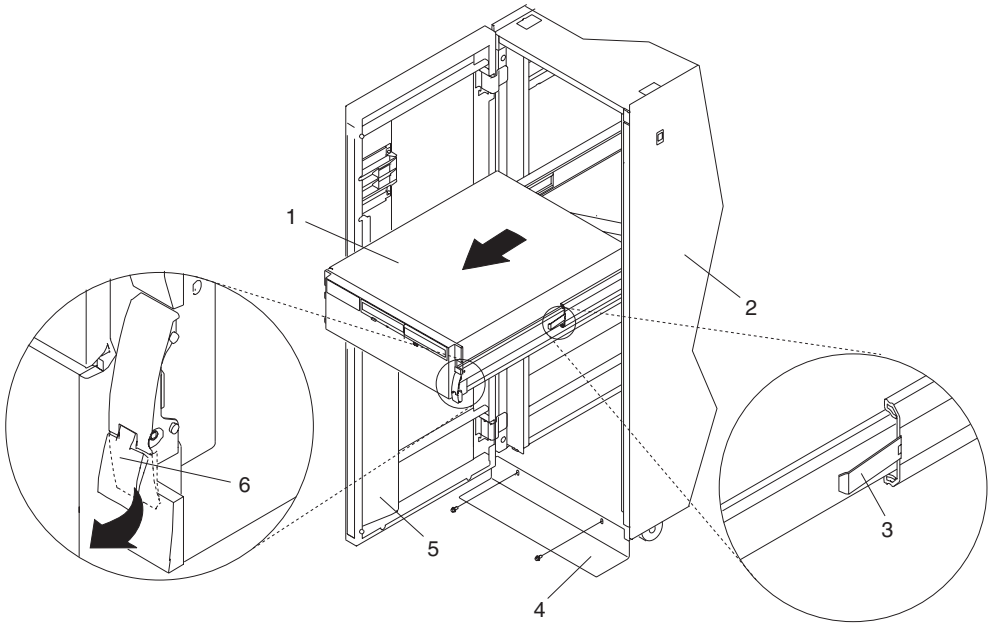
1. Open the front rack door.
2. If your system is equipped with two thumbscrews securing it to the rack, remove the thumbscrews. The screws are located on the bezel, just above each system drawer-release latch.



1 NAS Gateway 500 front bezel
2 M5 16-mm retaining screw
3 System drawer-release latch

3. Release the system-release latches on both the left and right sides.
4. Pull the system drawer out from the rack until the rails are fully extended.

Note: When the system rails are fully extended, safety latches on the slide rails lock into place. This prevents the system from being accidentally pulled out too far and dropped. The following illustration shows a system drawer in the service position.



1 NAS Gateway 500
2 19-inch rack
3 Extension rail safety-release tab
4 Stabilizing bar
5 Front rack door
6 System drawer-release latch

After completing the service actions, return the system to the operating position.

Returning the NAS Gateway 500 to the operating position

To return the NAS Gateway 500 to the operating position, perform the following steps:

1. Press in on both spring-loaded safety release tabs, located on each rail. See the illustration on page 313 for the location of the release tabs.
2. Ensure that the system drawer-release latches, located on the system drawer, are in the open position. See the illustration on page 313 for the location of the system drawer-release latches.
3. Push the system drawer straight back into the rack until both system drawer-release latches have locked into position.
4. If you removed two thumbscrews from the bezel front, replace them at this time.
5. Close the front rack door.

Service cover

Before performing the following procedures, read the “Safety notices” on page xv.

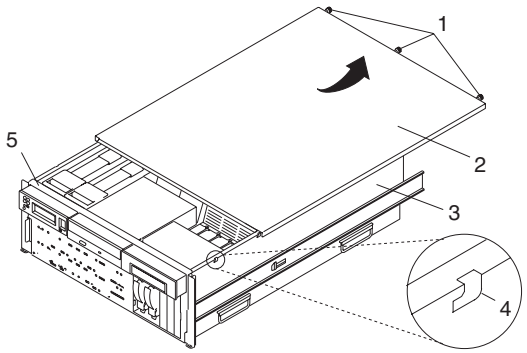
Service access cover removal

Before performing this procedure, the rack should be correctly stabilized and the system unit placed in the service position, as described in “Placing the NAS Gateway 500 into the service position” on page 312.

To remove the service access cover, perform the following steps:

1. Loosen the three captive thumbscrews located on the back of the cover. See the following illustration for thumbscrew locations.
2. Placing both hands on each side of the cover, slide the cover toward the back of the system drawer.
3. After the front of the service access cover has cleared the upper-chassis ledge, lift the cover up and off the system drawer.

Attention: For proper cooling and airflow, replace the cover before turning on the system. Operating the system for extended periods of time (over 30 minutes) with the cover removed might damage the system components.



1 Thumbscrews
2 Service access cover
3 NAS Gateway 500
4 Access cover locking tab
5 Upper-chassis ledge

Service access cover replacement

To replace the service access cover, perform the following steps:

1. Align the service access cover with the top of the system, about 25 mm (1 inch) from the front of the system. The flanges on the left and right sides of the cover should be on the outside of the system chassis.
2. Hold the service access cover against the system drawer, slide it toward the front of the system. The front edge of the service access cover slides beneath the upper-chassis ledge.
3. Tighten the three thumbscrews located on the back of the cover.

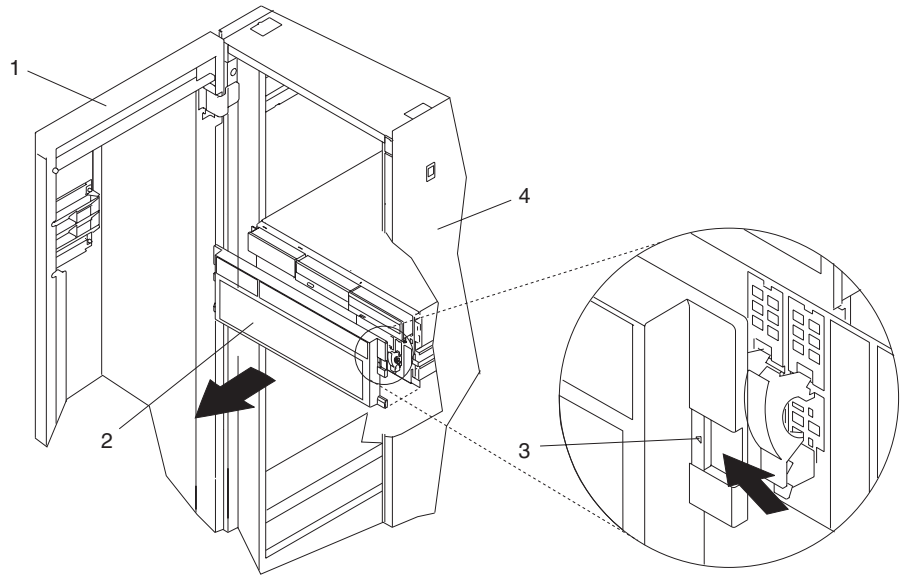
Bezel

Before performing the following procedures, read the “Safety notices” on page xv.

Front bezel removal

To remove the bezel, perform the following steps:

1. Press in on both bezel-release tabs at the same time. See the following illustration for the bezel-release tabs.
2. Gently pull the bezel away from the system.
3. Put the bezel in a safe place.



1 Rack door
2 Bezel
3 Bezel-release tab (Located on each side of bezel)
4 19-inch rack

Front bezel replacement

To replace the front bezel, perform the following steps:

1. Seat the two tabs located on the bottom edge of the bezel into their mating slots located on the bottom edge of the system.
2. Pivot the bezel up, aligning the release tabs to the mating slots located on the front of the system.
3. Gently push the tabs into the slots until the bezel seats against the front of the system.

System rack removal and replacement

Before performing these procedures, read “Safety notices” on page xv.

System drawer removal

≥18 kg (37 lbs)

≥32 kg (70.5 lbs)

≥55 kg (121.2 lbs)

CAUTION:
Use safe practices when lifting. (C24)

To remove the system drawer from the rack, do the following:

1. If you have not already done so, shut down the system as described in “Stopping the system” on page 310.
2. Open the front and back rack doors.
3. Disconnect all cables from the back of the system drawer.
4. Disconnect the cable-management arm by pulling out the two captive snap buttons from the back of the system drawer.
5. From the front of the system drawer, lift the lower section of the system drawer-release latches, which are located on each side of the system drawer. The system drawer release-latch clicks as it is put into the release position.
6. Grasp the top section of both latches, and slowly pull the system drawer out.
7. Depress both safety release tabs located on each inner rail, and pull the system drawer out about two inches.
8. Put the system drawer into the service position.
9. Using three persons, grasp the system drawer handles located on each side of the system.
10. Depress the safety latches located on each rail.
11. Remove the system by pulling it completely out and away from the rack and outer rack rails.
12. Push the extended outer rails carefully back into the rack.

    Note: There is a gravity-activated locking tab at the back of each extended outer rail. The locking tab locks the outer rails into their fully extended position and is unlocked by the action of the inner rail being pushed back into the rack. To compensate for the separation of the inner rail from the outer rail, center the lock tab with your hand, and then push the outer rail back into its retracted position.
13. Close the front and back rack doors.

System drawer replacement

CAUTION:
The stabilizer must be firmly attached to the bottom rear of the rack to prevent the rack from turning over when the drawers are pulled out of the rack. Do not pull out or install any drawer or feature if the stabilizer is not attached to the rack. (C02)

≥18 kg (37 lbs)

≥32 kg (70.5 lbs)

≥55 kg (121.2 lbs)

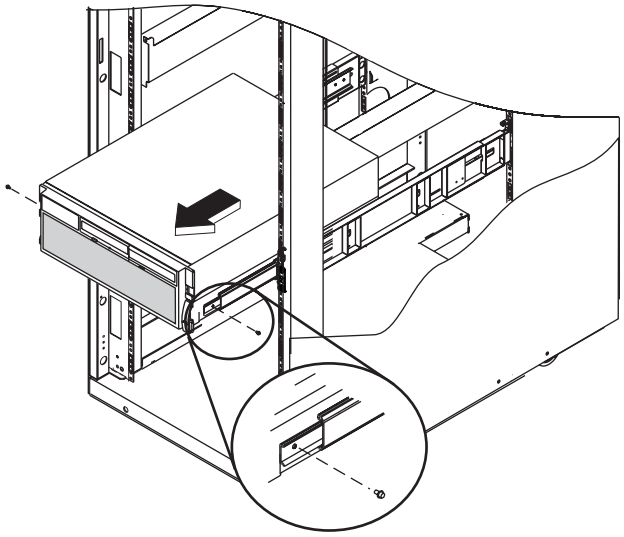
CAUTION:
Use safe practices when lifting. (C24)

1. Ensure that both rails are in the retracted position in the rack.
2. Using three persons, grasp the two handles located on each side of the system drawer, and lift the system drawer.
3. Place the system drawer on top of the retracted slide rails.

   Note: Built-in ledges located on each side of the system prevent the system from falling past the slide rails.
4. Push the system all the way into the rack.

   Note: At one point, the sides of the system might catch on the rack. If this occurs, lift the front of the system slightly to free the obstruction and continue pushing the system into the rack.

5. Pull the system out of the rack, making sure that the inner rails follow the system drawer, until you can see the first screw hole located on the inner rail.



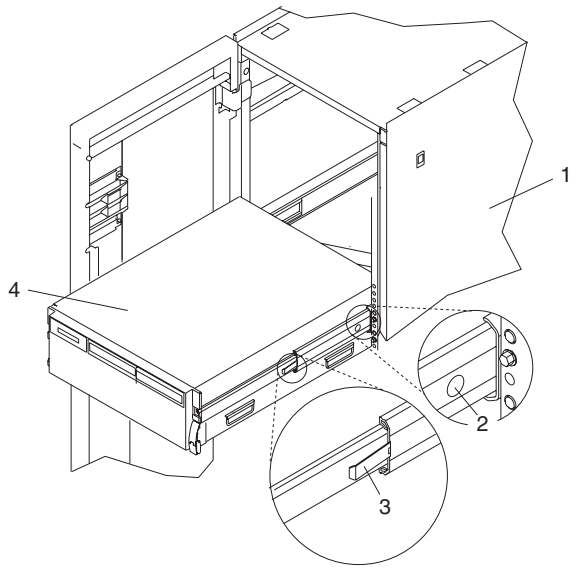
Notes:

a. If necessary, push the middle rails back to prevent them from following the system drawer.

b. Do not expose more than one empty screw hole on each side at a time. This prevents the server from tilting and falling before it is secured to the rails.

6. Align the first screw holes of each rail with the threaded screw holes on the system drawer. Install the M4 screws, but do not tighten them completely.
7. Align the second screw hole, located on the inner rail, with the second threaded screw hole, located on the side of the system drawer. Install the M4 screws, but do not tighten them completely.

8. To secure the third and fourth M4 retaining screws to the system, perform the following steps:
   a. Pull the system further out from the rack until you can see the fourth screw hole.
   b. Align the third screw hole located on the middle rail to the third screw hole located on the inner rail, and install the M4 screws. Do not tighten them completely.
   c. Align the fourth screw hole located on the middle rail to the fourth screw hole located on the inner rail, install the M4 screws, and tighten.

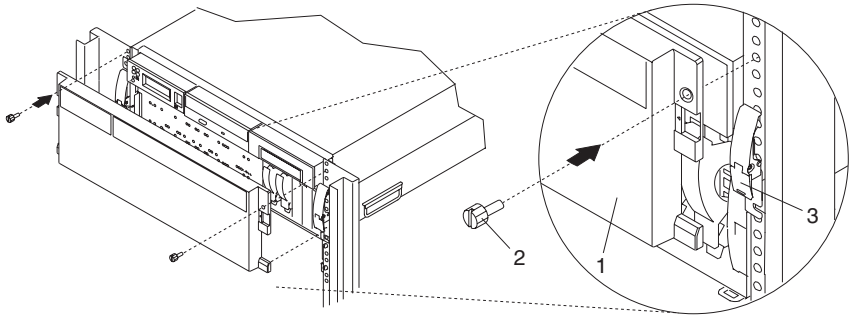


1 Rack enclosure
2 System retaining-screw access hole
3 Safety release latch
4 NAS Gateway 500

9. Tighten the previously installed M4 screws, securing the inner rails to the system drawer side.
10. Push the system drawer about halfway back into the rack. You might have to press the safety release latches on the side rails to push the system drawer back. Use a screwdriver to tighten the front four M7 screws that secure the system rail assemblies to the rack.
11. Push the system drawer completely into the rack. Use a screwdriver to tighten the back four M7 screws that secure the system rail assemblies to the rack.

    Note: After the system rail assemblies are installed, do not extend each rail section past its safety release latch. The safety release latches stop the rails from overextending and separating. This action prevents the system drawer from being accidentally pulled out too far and dropped.
12. Slide the system out about 20 cm (8 in.), and tighten the two M4 screws that secure each rail-length adjusting plate.
13. Slowly slide the system drawer back and forth on the rails, watching for any signs of binding.
14. For additional stability needed when transporting the rack, fasten the system drawer to the rack enclosure by inserting an M8 thumbscrew through the bezel and chassis bracket, and screwing it to

the rack flange with a screw clip nut.



1 NAS Gateway 500 front bezel
2 M8 16-mm retaining screw
3 System-drawer release latch

Drawer-release latch and brackets

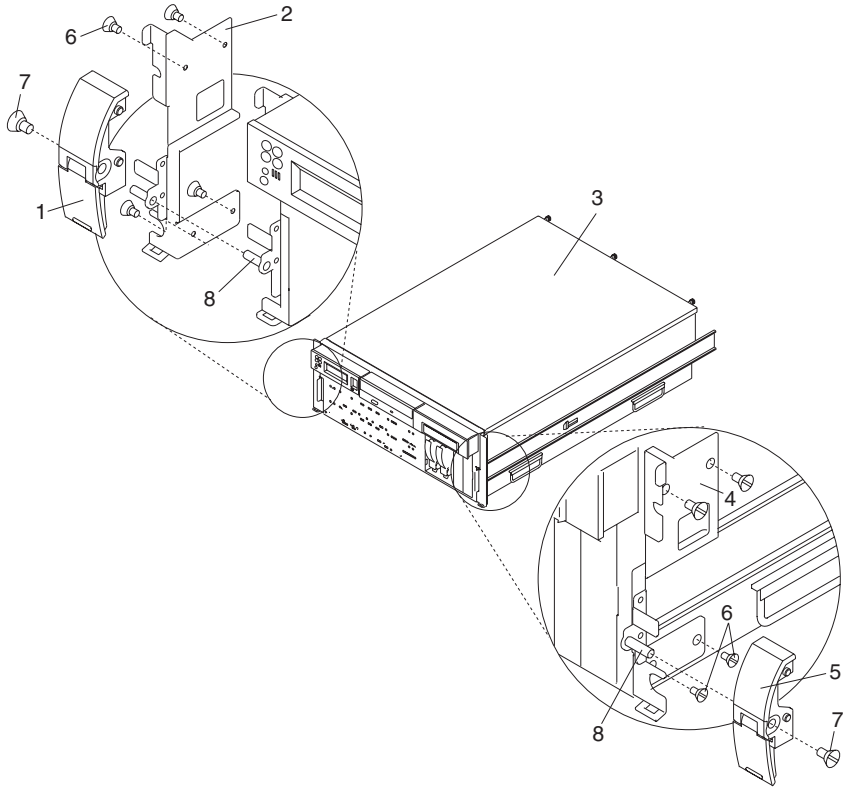
The following procedure covers the removal and replacement of the system's drawer-release latch.

Drawer-release latch removal

To remove one of the NAS Gateway 500 drawer-release latches, do the following:

1. Open the front rack door and place the system into the service position as described in "Placing the NAS Gateway 500 into the service position" on page 312.
2. Remove the retaining screw located on the side of the release latch.

3. Pull the release latch off the latch bracket post.



1 System drawer-release latch
2 System drawer-release latch bracket (right)
3 NAS Gateway 500
4 System drawer-release latch bracket (left)
5 System drawer-release latch
6 Retaining screws
7 Release latch retaining screw
8 Latch bracket post

Drawer-release latch replacement

To replace one of the NAS Gateway 500 drawer-release latches, do the following:

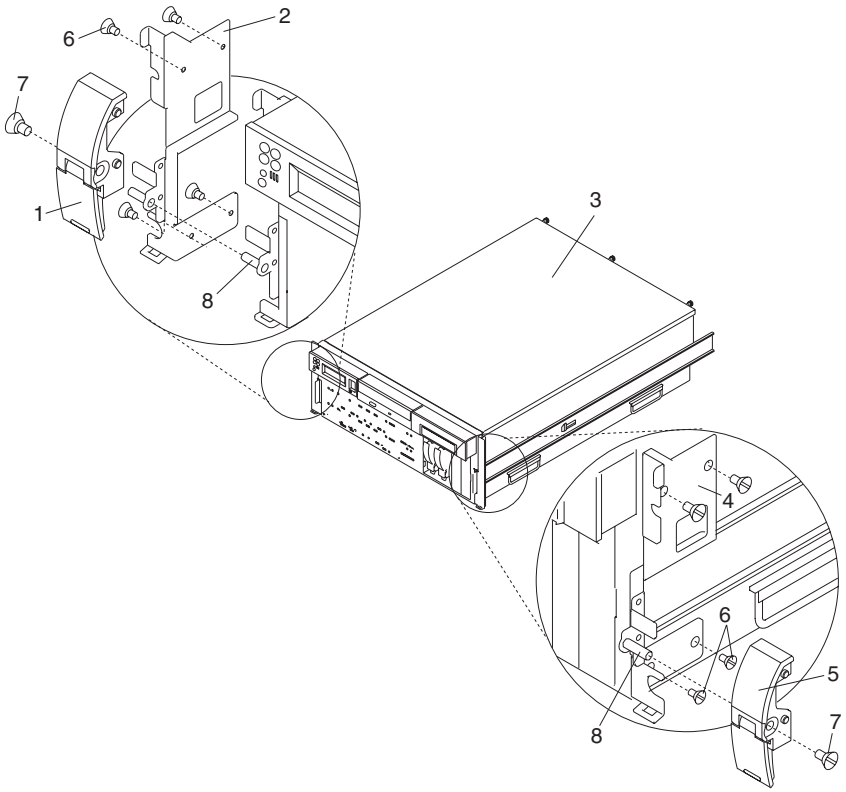
1. If you have not already done so, open the front rack door and place the system into the service position as described in “Placing the NAS Gateway 500 into the service position” on page 312.
2. Push the release latch onto the latch bracket post.
3. Secure the drawer-release latch onto the latch bracket post with a release latch retaining screw.
4. Push the system drawer back into the operating position as described in “Returning the NAS Gateway 500 to the operating position” on page 313.

Drawer-release latch bracket removal

To remove the NAS Gateway 500 drawer-release latch brackets, do the following:

1. Open the front rack door and place the system into the service position as described in “Placing the NAS Gateway 500 into the service position” on page 312.
2. Remove the front bezel as described in “Front bezel removal” on page 315.
3. Remove the drawer-release latch as described in “Drawer-release latch removal” on page 320.

4. Remove the retaining screws that secure the latch bracket to the side of the NAS Gateway 500.



1 System drawer-release latch
2 System drawer-release latch bracket (right)
3 NAS Gateway 500
4 System drawer-release latch bracket (left)
5 System drawer-release latch
6 Retaining screws
7 Release latch retaining screw
8 Latch bracket post

Drawer-release latch bracket replacement

To replace the NAS Gateway 500 drawer-release latch brackets, do the following:

1. If you have not already done so, open the front rack door and place the system into the service position as described in “Placing the NAS Gateway 500 into the service position” on page 312.
2. Using the supplied retaining screws, secure the latch brackets to the side of the NAS Gateway 500.

   Note: The latch brackets are right-side and left-side dependent.
3. Replace the release latch as described in “Drawer-release latch replacement” on page 321.
4. Replace the front bezel as described in “Front bezel replacement” on page 315.
5. Push the system drawer back into the operating position as described in “Returning the NAS Gateway 500 to the operating position” on page 313.

Cable management arm

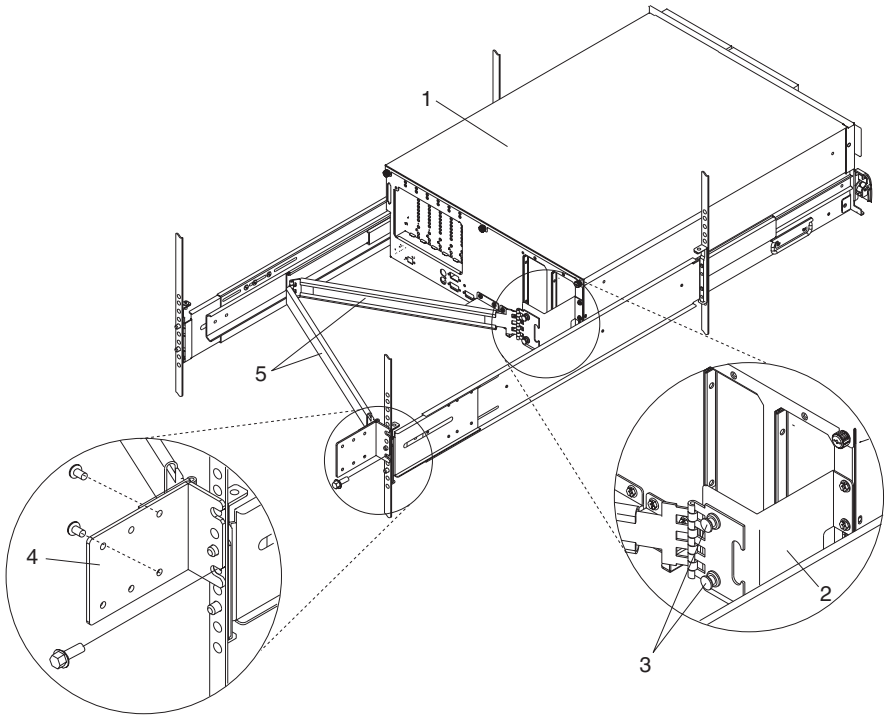
Cable management arm removal

1. Make sure that the system drawer is in the service position as described in “Placing the NAS Gateway 500 into the service position” on page 312.
2. Carefully unbundle the external cables by unfastening the Velcro fastener strips on the cable management arm. Take extra care not to crimp or crease the cables.
3. Place the two captive snap buttons, located on the cable management arm, into the unlocked (pulled out) position.
4. Unscrew the two M7 screws that secure the cable management arm to the rack-flange mounting bracket.
5. Carefully remove the arm.

Cable management arm replacement

To replace the NAS Gateway 500 cable-management arm, do the following:

1. Attach the cable carrier support bracket to the back of the chassis with two screws.
2. Place the two captive snap buttons, located on the cable management arm, into the unlocked (pulled out) position.
3. Align and insert the two captive snap buttons into the holes located on the cable carrier-support bracket. Push in on the head of the snap buttons to lock them into position.



1 NAS Gateway 500
2 Cable carrier-support bracket
3 Captive snap button (2)
4 Rack-flange mounting bracket
5 Cable management arm

4. Open the cable-management arm so that the hinged mounting plate lies flat against the flange-mounting bracket.
5. Align the holes, located on the cable-management arm mounting plate, with the threaded holes on the rack-flange mounting bracket. Secure the bracket with two screws.

6. Carefully bundle the external cables together, starting with the thickest (most durable first). Fiber optic cable should be gathered last and take extra care not to crimp or crease the cables.
7. Loosely wrap the Velcro strips around the external cables and the cable management arm.

   Note: To allow for cable movement, do not wrap the Velcro fastener strips tightly around the cable bundle. This is particularly important for fiber optic cables, which are delicate.
8. After attaching the cables to the cable management arm, go to the front of the rack and move the system drawer in and out. Observe cable bundle and cable management arm movement to verify that the cable is not binding.

   Note: To avoid any binding of the cable management arm, ensure that the cable management arm is level.

PCI-X adapters

Before performing this procedure, read “Safety notices” on page xv.

Notes:

1. Before performing this procedure, read “Safety notices” on page xv.
2. This system supports hotpluggable PCI-X adapters, so you do not need to shut down the system or remove the power cables before adding or replacing an adapter. All NAS Gateway 500 adapter options are hot-pluggable.
3. Removing or replacing a PCI-X adapter requires the system administrator to take the PCI-X adapter offline before performing any PCI-X adapter hot-plug procedures. Before taking an adapter offline, the devices attached to the adapter must be taken offline as well. This action prevents a service representative or user from causing an unexpected outage for system users.
4. Before handling any card, board, or DIMM, be sure to use your electrostatic discharge strap to minimize static-electric discharge. See “Handling static-sensitive devices” on page 310.
5. If a network adapter is replaced, the network administrator must be notified so that the client MAC addresses of the new adapter card can be propagated to any required locations in the Ethernet. In addition, the operating system configuration of the network adapter may need to be updated based on the information used on the previous network adapter. Also check to ensure that any client or server access is maintained.
6. If a fibre-channel HBA is replaced, the SAN administrator must be notified so that the adapter definitions on the back-end storage and the fibre-channel zones on the SAN switches can be updated with the World Wide Name (WWN) of the new adapter

Fibre-channel HBAs use only these PCI-X slots: 3, 5, 2, 1, and **always** in that order. The first two slots provide the better performance. Network Ethernet adapters use only these PCI-X slots: 6, 4, 5, 2, 1; again, **always** in that order.

For information on operating system configuration of the adapters, refer to the *NAS Gateway 500 Administrator's Guide* or ask your system administrator.

PCI-X hot-plug manager access

To access the hot-plug menus, perform the following steps:

1. Log in as root user.
2. At the command line, type `smitty`.
3. Select **Devices**.
4. Select **PCI-X Hot Plug Manager** and press **Enter**.
5. The PCI-X Hot-Plug Manager menu is displayed. Return to the procedure that directed you here.

Note: For information about the PCI-X slot LED states, see “Component LEDs” on page 384.

PCI-X adapter replacement

Note: Use this procedure only when you are replacing an adapter with an identical adapter. If you are replacing an adapter with an adapter that is not identical to the adapter removed, go to “PCI-X adapter removal” on page 328 and “PCI-X adapter installation” on page 329.

To replace a PCI-X adapter, do the following:

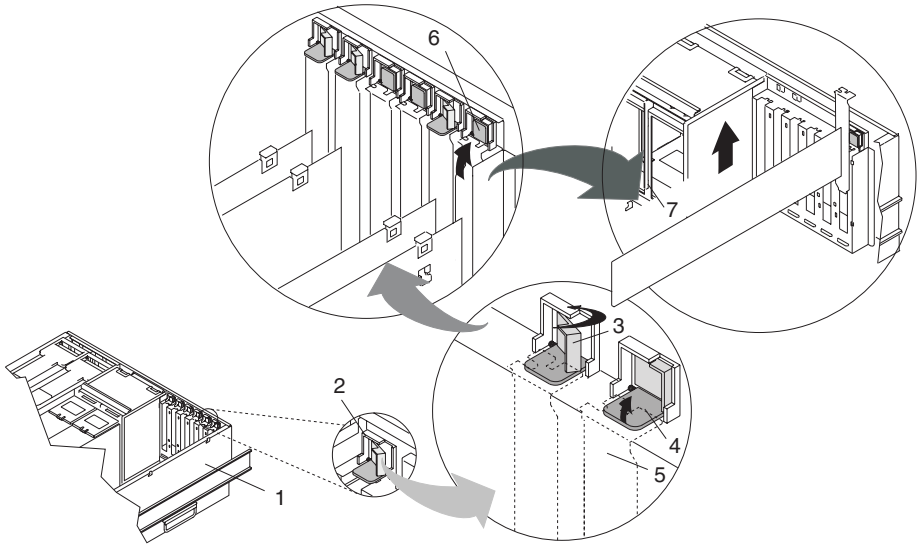
1. Open the front and back rack doors and place the system into the service position as described in “Placing the NAS Gateway 500 into the service position” on page 312.
2. Remove the service access cover as described in “Service access cover removal” on page 314.
3. See “PCI-X hot-plug manager access” on page 324, and follow the steps in the access procedure to select **PCI-X Hot Plug Manager**. Then return here to continue.
4. Determine which adapter you plan to replace. Record the slot number of each adapter being removed.

   Note: Adapter slots are numbered on the rear of the system unit.
5. Ensure that any processes or applications that might use the adapter are stopped.

   Note: Removing a PCI-X adapter requires the system administrator to take the PCI-X adapter offline before performing any PCI-X adapter hot-plug procedures. Before taking an adapter offline, the devices attached to the adapter must also be taken offline. This action prevents a service representative or user from causing an unexpected outage for system users.
6. From the PCI-X Hot-Plug Manager menu, select **List PCI-X Hot-Plug Slots**. This provides a descriptive list of all six slots in the NAS Gateway 500, and the device names in each slot. Record all of the device names associated with the slot to be emptied, in the sequence shown.
7. From the PCI-X Hot-Plug Manager menu, select **Unconfigure a Device**. This step must be completed successfully before starting any removal or replacement operation. If this step fails, the customer must take action to release the device.
   a. Press F4 to display the Device Names menu or type it in. Select the (rightmost) reported device name associated with the adapter that you are removing.
   b. Use the Tab key to answer YES to **Keep Definition** and YES to set **Unconfigure Child Devices**. Press Enter.
   c. The ARE YOU SURE prompt is displayed. Press Enter to verify the information. Successful unconfiguration is indicated by the `OK` message displayed next to the **Command** field at the top of the screen.
   d. Repeat this step for each and every device name in that slot, in sequence right to left.
8. Label and disconnect all cables attached to that adapter.
9. Select **Replace/Remove a PCI-X Hot-Plug Adapter** and press **Enter** to display the Replace/Remove a PCI-X Hot-Plug Adapter menu.
10. Move the cursor to select the adapter that you are removing, and press **Enter**.
11. Press the Tab key until the entry field displays the replace operation, and then press **Enter**. Follow the instructions that are displayed on the screen until you are instructed to remove the adapter.
12. The selected PCI-X slot will go into the Identify state. Press **Enter** again. The selected PCI-X slot will go into the Action state. See “Component LEDs” on page 384.

    Note: Before handling the adapter, be sure to use your electrostatic discharge strap to minimize static-electric discharge. See “Handling static-sensitive devices” on page 310.

13. Turn the locking latch and lift the plastic retainer seat off the adapter.

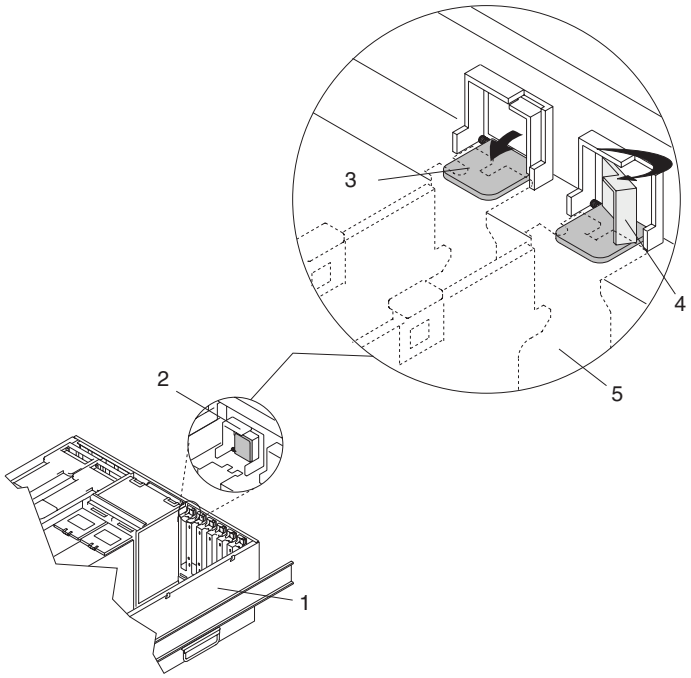


1 System unit
2 Adapter retainer assembly
3 Adapter retainer assembly (retainer seat down and the retainer clip in the locked position)
4 Adapter retainer assembly (retainer seat down and the retainer clip in the unlocked position)
5 PCI-X adapter faceplate (dotted lines)
6 Adapter retainer assembly (in the unlocked position)
7 PCI-X adapter

14. Carefully grasp the adapter by the edges, pull it straight out from the PCI riser card, and place in a safe place.
15. If necessary, remove the adapter from the antistatic package and place the adapter, component-side up, on a flat, static-protective surface.

    Attention: Avoid touching the components and gold-edge connectors on the adapter.
16. Verify jumper settings. See “Verifying jumpers on PCI-X adapter options” on page 332.
17. To install the adapter in the adapter slot, carefully grasp the adapter by the edges and align the adapter in the slot guides. Insert the adapter fully into the adapter slot connector. If you are installing a full-length adapter, ensure that both ends of the adapter engage the card guides.

18. Lower the plastic retainer seat over the PCI-X adapter faceplate, and rotate the locking latch clockwise until it clicks into the locked position.



1 System unit
2 Adapter retainer assembly (in the unlocked position)
3 Adapter retainer assembly (retainer seat down and the retainer clip in the unlocked position)
4 Adapter retainer assembly (retainer seat down and the retainer clip in the locked position)
5 PCI-X adapter faceplate (dotted lines)

19. Continue to follow the screen instructions until you receive a message that the adapter replacement is successful, indicated by the OK message displayed next to the **Command** field at the top of the screen.

    If you receive a failure message indicating a hardware error, the problem might be either the adapter or the PCI-X slot. First, press **PF3** to back up and repeat these steps to verify the adapter has been seated correctly. You can also try isolating the problem by swapping an identical adapter into the slot and retrying. If you determine that you have failing hardware, call your service representative.

    Note: Be sure to swap the adapters back to their original slots after isolating the problem.

    Using the device names associated with this slot (from the List PCI-X Hot-Plug Slots menu), use the Configure a Defined Device procedure to make the devices available. Enter the names in sequence from left to right. Repeat this step for each and every device name in that slot.

    Now that the hardware installation of the new adapters is complete, you can run concurrent diagnostics to verify the additional hardware. See “Concurrent mode” on page 240.
20. Replace the service access cover as described in “Service access cover replacement” on page 314.
21. Push the system drawer back into the operating position as described in “Returning the NAS Gateway 500 to the operating position” on page 313.
22. Reconnect the adapter cables.
23. Close the rack doors.
24. To configure the system software to use the new adapter, refer to the *NAS Gateway 500 Administrator's Guide*.

PCI-X adapter removal

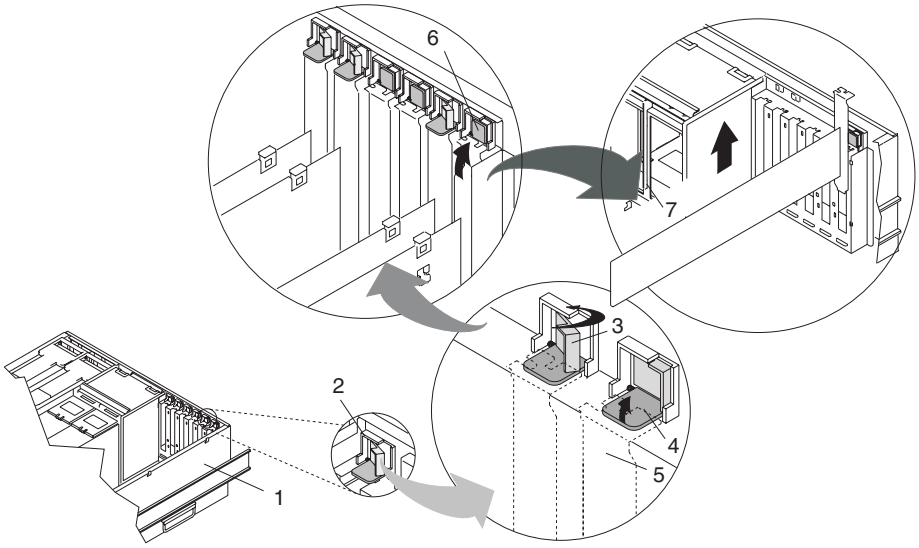
To remove a PCI-X adapter, perform the following steps:

1. Determine which adapters you plan to remove.
2. Record the slot number and location of each adapter being removed.

   Note: Adapter slots are numbered on the back of the system unit.
3. Ensure that any processes or applications that might use the adapter are stopped. Removing a PCI-X adapter requires the system administrator to take the PCI-X adapter offline before performing any PCI-X adapter hot-plug procedures. Before taking an adapter offline, the devices attached to the adapter must also be taken offline. This action prevents a service representative or user from causing an unexpected outage for system users.
4. From the PCI-X Hot-Plug Manager menu, select **List PCI-X Hot-Plug Slots**. This provides a descriptive list of all six slots in the NAS Gateway 500 and the device names in each slot. Record all of the device names associated with the slots to be emptied.
5. From the PCI-X Hot-Plug Manager menu, select **Unconfigure a Device**. This step must be completed successfully before starting any removal or replacement operation. If this step fails, the customer must take action to release the device.
   a. Press **F4** to display the Device Names menu or type it in. Select the device names associated with the adapter that you are removing.
   b. Use the Tab key to answer NO to **Keep Definition** and YES to **Unconfigure Child Devices**. Press **Enter**.
   c. The ARE YOU SURE prompt is displayed. Press **Enter** to verify the information. Successful unconfiguration is indicated by the `OK` message displayed next to the **Command** field at the top of the screen.
   d. Repeat this step for each and every device name in that slot.

      Note: Once the devices are unconfigured, they will display as unknown on the **List PCI-X Hot-Plug Slots** menu.
6. Label and disconnect all cables attached to that adapter.
7. Select **Replace/Remove a PCI-X Hot-Plug Adapter** and press **Enter** to display the Replace/Remove a PCI-X Hot-Plug Adapter menu.
8. Move the cursor to select the adapter that you are removing and press **Enter**. (The description entry is `unknown`).
9. Press the Tab key until the entry field displays the remove operation and then press **Enter**. Follow the instructions on the screen until you are instructed to remove the adapter.
10. The selected PCI-X slot will go into the Identify state. Press **Enter** again. The selected PCI-X slot will go into the Action state. See “Component LEDs” on page 384.
11. Before handling the adapter, be sure to use your electrostatic discharge strap to minimize static-electric discharge. Refer to “Handling static-sensitive devices” on page 310.

12. Turn the locking latch and lift the plastic retainer seat off the adapter.



1 System unit
2 Adapter retainer assembly
3 Adapter retainer assembly (retainer seat down and the retainer clip in the locked position)
4 Adapter retainer assembly (retainer seat down and the retainer clip in the unlocked position)
5 PCI-X adapter faceplate (dotted lines)
6 Adapter retainer assembly (in the unlocked position)
7 PCI-X adapter

13. Carefully grasp the adapter by the edges and pull it straight out from the PCI riser card.
14. If you are not installing another adapter in this slot, place an expansion slot cover in the adapter slot opening.
15. Lower the plastic retainer seat over the PCI-X adapter faceplate, and rotate the locking latch clockwise until it clicks into the locked position.
16. Continue to follow the screen instructions until you receive a message that the adapter removal is successful. Successful removal is indicated by the `OK` message displayed next to the **Command** field at the top of the screen.

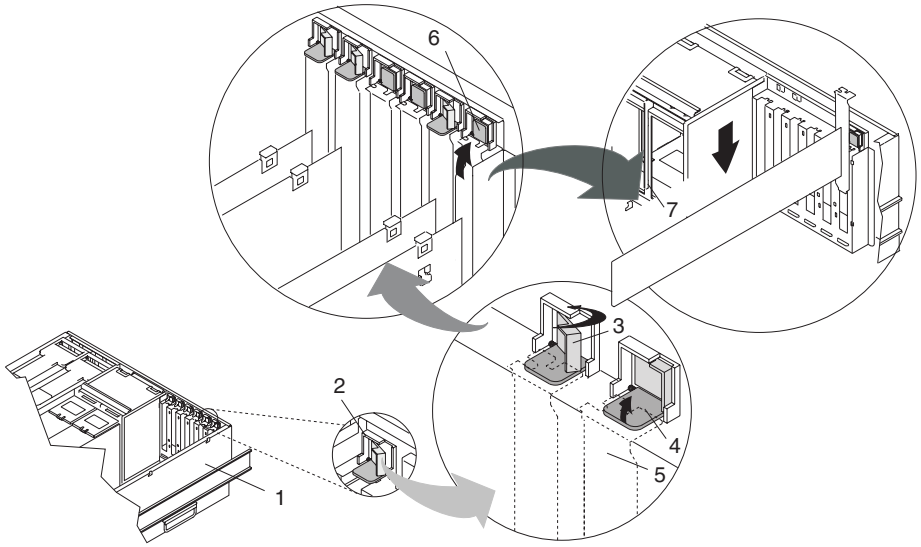
PCI-X adapter installation

To add an adapter, there must be an empty slot available. This procedure is used sometimes to help isolate a problem. To add an adapter option as an upgrade, refer to the *NAS Gateway 500 Hardware Installation Guide*.

1. If necessary, remove the adapter from the antistatic package.

   Attention: Avoid touching the components and gold-edge connectors on the adapter.
2. Place the adapter, component-side up, on a flat, static-protective surface.
3. Verify the jumper settings. See “Verifying jumpers on PCI-X adapter options” on page 332.
4. From the PCI-X Hot-Plug Manager menu, select **Add a PCI-X Hot-Plug Adapter** and press **Enter** to display the Add a Hot-Plug Adapter window.
5. Select the appropriate empty PCI-X slot from the ones listed on the screen, and press **Enter**. The selected PCI-X slot will go into the Identify state. Press **Enter** again. The selected PCI-X slot will go into the Action state. See “Component LEDs” on page 384.

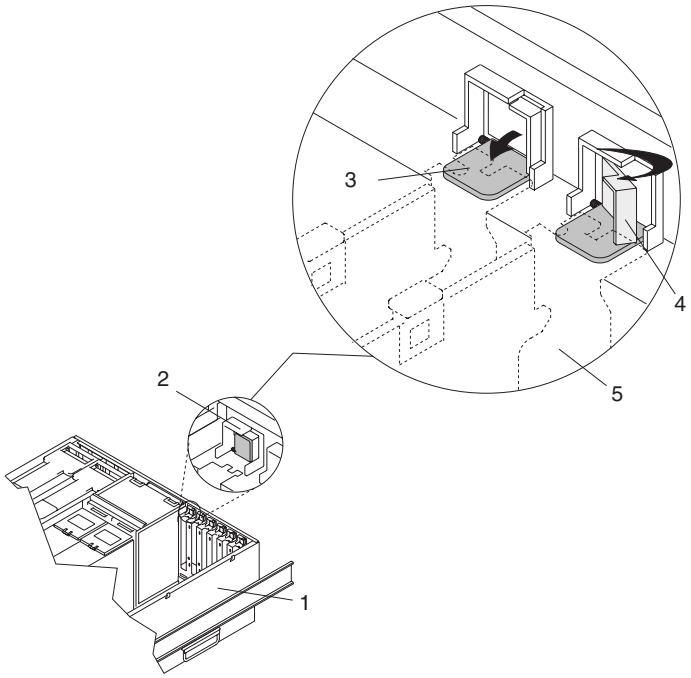
6. Rotate the locking retainer clip on the identified slot, lift the plastic stop, and remove the expansion slot cover.



1 System unit
2 Adapter retainer assembly
3 Adapter retainer assembly (retainer seat down and the retainer clip in the locked position)
4 Adapter retainer assembly (retainer seat down and the retainer clip in the unlocked position)
5 PCI-X adapter faceplate (dotted lines)
6 Adapter retainer assembly (in the unlocked position)
7 PCI-X adapter

7. When you are instructed to install the adapter in the adapter slot, carefully grasp the adapter by the edges and align the adapter in the slot guides. Insert the adapter fully into the adapter slot connector. If you are installing a full-length adapter, ensure that both ends of the adapter engage the card guides.

8. Lower the tab onto the PCI-X adapter face plate. Rotate the adapter retainer clip clockwise until it covers the tab at approximately a 45-degree angle. See the following illustration.



1 System unit
2 Adapter retainer assembly (in the unlocked position)
3 Adapter retainer assembly (retainer seat down and the retainer clip in the unlocked position)
4 Adapter retainer assembly (retainer seat down and the retainer clip in the locked position)
5 PCI-X adapter face plate (dotted lines)

9. Press **Enter** to continue.

   If you receive a failure message indicating a hardware error, the problem might be either the adapter or the PCI-X slot. First, press **PF3** to back up and repeat this step to verify that the adapter has been seated correctly. Isolate the problem by swapping an identical adapter into the slot and retrying. If you determine that you have failing hardware, call your service representative.

   Note: After isolating the problem, be sure to swap the adapters back to their original slots, doing a PCI-X adapter removal and another PCI-X adapter insertion as needed.

10. Connect the adapter cables, and route the cables through the cable-management arm.
11. From the PCI-X Hot-Plug Manager menu, select **List PCI-X Hot-Plug Slots**. This provides a descriptive list of all six slots in the NAS Gateway 500 and the device names in each slot.

    Note: Do not use **Install/Configure Devices Added After IPL** if your system is set up to run clustering. Instead, if clustered, you must always run the NAS command /opt/nas/bin/cfgmgr outside of smit. **Never** execute the root cfgmgr command (which is what the Hot Plug Manager option **Install/Configure Devices Added After IPL** uses). For more information, refer to the *NAS Gateway 500 Command Reference*.

    - If the adapter is listed as Unknown, perform the Install/Configure Devices Added After IPL option to configure the adapter.
    - If the adapter devices are listed by name, use the Configure a Defined Device procedure to make the devices available.
    - If you receive a warning indicating that needed device packages are not installed, the system administrator must install the specified packages before you can configure or diagnose the adapter.

- If you receive a failure message indicating a hardware error, the problem might be either the adapter or the PCI-X slot. Isolate the problem by swapping an identical adapter into the slot and retrying. If you determine that you have failing hardware, call your service representative.

  Note: After isolating the problem, be sure to swap the adapters back to their original slots.

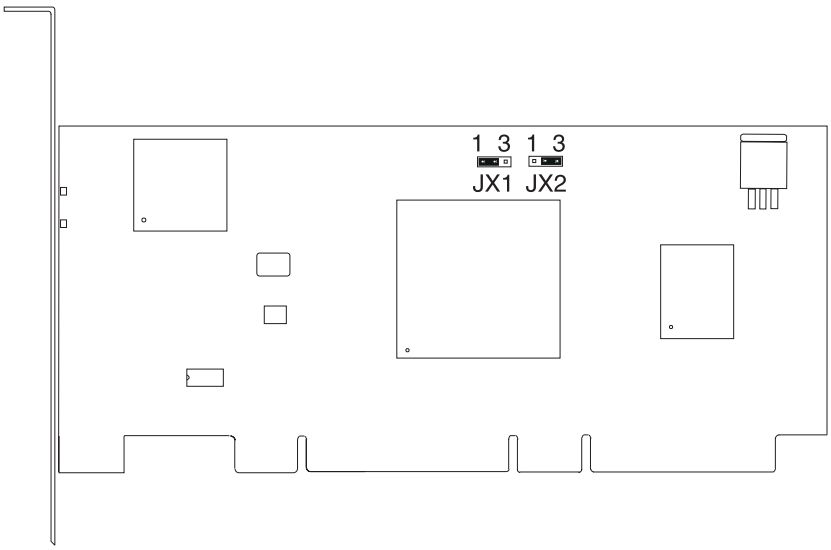
Verifying jumpers on PCI-X adapter options

The Ethernet adapters used in NAS Gateway 500 do not have any hardware jumpers or switches to set.

The fibre-channel HBAs do have jumpers. The jumpers have been installed into the correct positions at the factory, but this should be verified before installation.

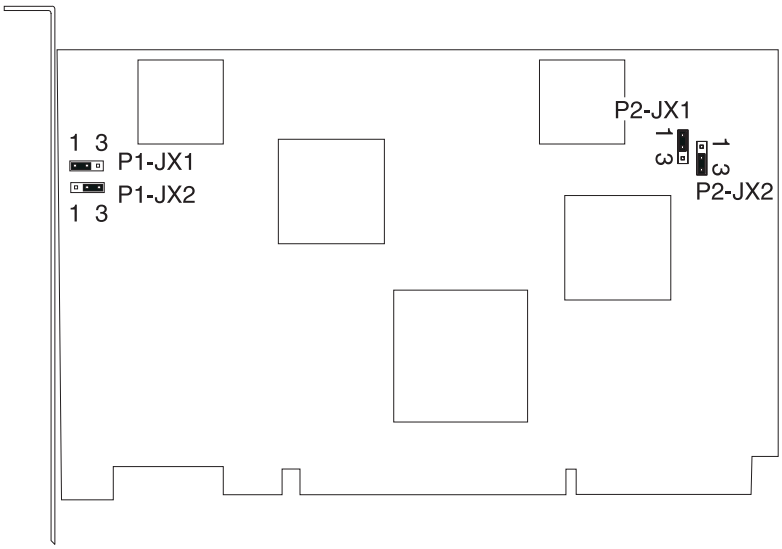
FC 6239, the single-port fibre-channel HBA has two physical jumpers which should be set as follows:

- Jumper JX1, pins 1 to 2 only
- Jumper JX2, pins 2 to 3 only



FC 6240, the dual-port fibre-channel adapter, has two pairs of jumper blocks, one pair for each port. These four jumpers should be set as follows:

- Jumper P1_JX1, pins 1 to 2 only
- Jumper P1_JX2, pins 2 to 3 only
- Jumper P2_JX1, pins 1 to 2 only
- Jumper P2_JX2, pins 2 to 3 only


1 3
P1-JX1
P1-JX2
1 3
P2-JX1
1 3
1 3
P2-JX2

Fans

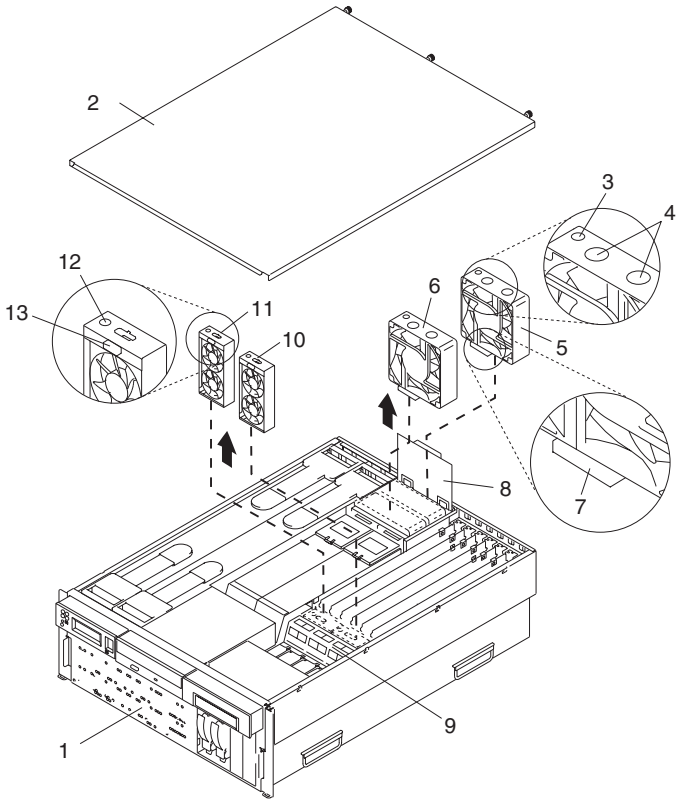
Before performing the following procedures, read “Safety notices” on page xv.

Fan assembly removal

This section contains procedures for removing processor cooling fans and PCI-X adapter cooling fans. Select the removal procedure according to the fan assembly that you are servicing.

To remove a fan, do the following:

1. Open the front and back rack doors and place the system into the service position as described in “Placing the NAS Gateway 500 into the service position” on page 312.
2. Remove the service access cover as described in “Service access cover removal” on page 314.
3. Locate the cooling fan assemblies, as shown in the following illustration.



1 NAS Gateway 500
2 Service access cover
3 Processor fan amber LED
4 Finger holes
5 Processor-book cooling fan (fan #1)
6 Processor-book cooling fan (fan #2)
7 Processor-fan-bottom connector
8 Processor-cooling-fan access cover
9 Adapter-cooling-fan retaining bracket
10 Adapter-cooling fan assembly (fan #4)
11 Adapter-cooling fan assembly (fan #3)
12 Adapter-fan amber LED
13 Adapter-cooling-fan front connector

4. The failing fan assembly has the amber-colored LED that is lit.

   Note: All of the fan assemblies used in your system have an amber-colored LED located on the top of the fan assembly. When lit, this LED indicates that its fan assembly has a problem. The fan might not be spinning or is not spinning fast enough to help cool the system unit.

Processor fan removal

If you are servicing one of the processor-cooling fan assemblies, do the following:

1. Lift the processor-fan-access cover.
2. Place your thumb and index finger into the two finger holes, located on the top of the faulty fan.
3. Lift the faulty fan out of the system.

   Notes:

   a. The processor-cooling fans have a docking connector, located on the bottom of the fan assembly. The docking connectors automatically disconnect as the fan is being removed from the chassis.

   b. Unless you are performing a hot-swap removal or replacement of the processor fans, keep the processor-fan-access cover closed.

PCI-X adapter fan removal

Attention: The system will power off if the failing PCI cooling fan has not been exchanged within five minutes.

If you are servicing one of the PCI-X adapter cooling fan assemblies, do the following:

1. Disconnect the cooling fan's power cable from the connector, located on the front of the fan assembly.
2. Place your index finger below the front connector and slide the fan out of the fan cage.

   Note: The adapter-cooling fan assemblies are arranged in stacked pairs. You cannot replace a single fan in the stacked pair.

Fan assembly replacement

Note: If a fan assembly is being replaced for a redundant failure, after the service repair action is completed, ask the customer to check the **crontab** file for any power/cooling warning messages. When a power or cooling error is encountered, the system software adds an entry to the **crontab** file to "wall" a warning message every 12 hours, to alert or remind the customer of the problem. Replacing the faulty part does not clear this **crontab** entry, so unless the **crontab** file is edited to remove this entry, the customer continues to be reminded of the failure despite its having been repaired. Use the **crontab -l** command to read the **crontab** file to determine if an entry exists. Use the **crontab -e** command to edit the file.

The fan removal section has a procedure for processor cooling fans and PCI-X adapter cooling fans. Select the removal procedure according to the fan assembly that you are servicing.

To replace your system's cooling fans, do the following:

Processor fan replacement

When installing a processor-cooling fan, do the following:

1. Lift the processor-fan-access cover.
2. Place your thumb and index finger into the two holes located on the top of the replacement fan.
3. Align the connector located on the fan assembly with the docking connector located on the CEC backplane.
4. Insert the replacement fan and firmly press it into its docking connector.
5. Verify that the replaced cooling fan's LED is not lit. If the fan LED is lit, reseat the fan or the fan cable.
6. For proper cooling of the processor, ensure that the processor-cooling-fan access cover springs back to the closed position.
7. Replace the service access cover as described in "Service access cover replacement" on page 314.
8. Push the system drawer back into the operating position as described in "Returning the NAS Gateway 500 to the operating position" on page 313 and close the rack doors.

PCI-X adapter fan replacement

Attention: The system will power off if the failing PCI cooling fan has not been exchanged within five minutes.

When installing a PCI-X adapter cooling fan, do the following:

1. Before inserting the fan assembly into the fan cage, ensure that the fan connector located on the fan housing is facing the front of the system.
2. Insert the replacement-adapter-cooling-fan assembly into the cooling fan cage.

   Note: When seated correctly, the top edge of the fan assembly and the fan cage are flush with each other.
3. Reconnect the power cable to the connector located on the front of the fan assembly.
4. Verify that the replaced cooling fan's LED is not lit. If the fan LED is lit, reseat the fan or the fan cable.
5. Replace the service access cover as described in "Service access cover replacement" on page 314.
6. Push the system drawer back into the operating position as described in "Returning the NAS Gateway 500 to the operating position" on page 313 and close the rack doors.

Media drives (diskette and CD-ROM)

Note: The two media bays are used to house an IDE CD-ROM (media bay 1) and diskette drive (media bay 2). See the illustrations on page 338 for the location of the two media bays.

Before performing this procedure, read the following:

- "Safety notices" on page xv
- "Laser safety information" on page xvi
- Before handling any card, board, or DIMM, be sure to use your electrostatic discharge strap to minimize static-electric discharge. Refer to "Handling static-sensitive devices" on page 310.
- The rack should be correctly stabilized and the system unit placed in the service position, as described in "Placing the NAS Gateway 500 into the service position" on page 312.
- These media drives are not hot-pluggable, and system power must be completely off during these steps. This system is equipped with a second power supply. Before continuing with this procedure, ensure that the power source to the system has been completely disconnected.
- You must have removed the service access cover as described in "Service access cover removal" on page 314 and the front bezel as described in "Front bezel removal" on page 315.

CD-ROM or diskette drive

To pull a media drive for replacement, remove the drive as described in "Media drive removal", but leave the media-device-support shelf in place. Then remove the four screws holding the media carrier tray to the drive, so the tray can be used on the replacement part.

Before replacing the media drive, attach the media carrier tray to the bottom of the drive to be inserted, with the same four screws. Place the media drive into its media bay, pushing the drive in until the release tab clicks into the locked position. Reconnect the appropriate media signal and power cables to the drives.

Note: The CD-ROM drive goes in center bay, and the diskette drive install in the right media bay.

Media drive removal

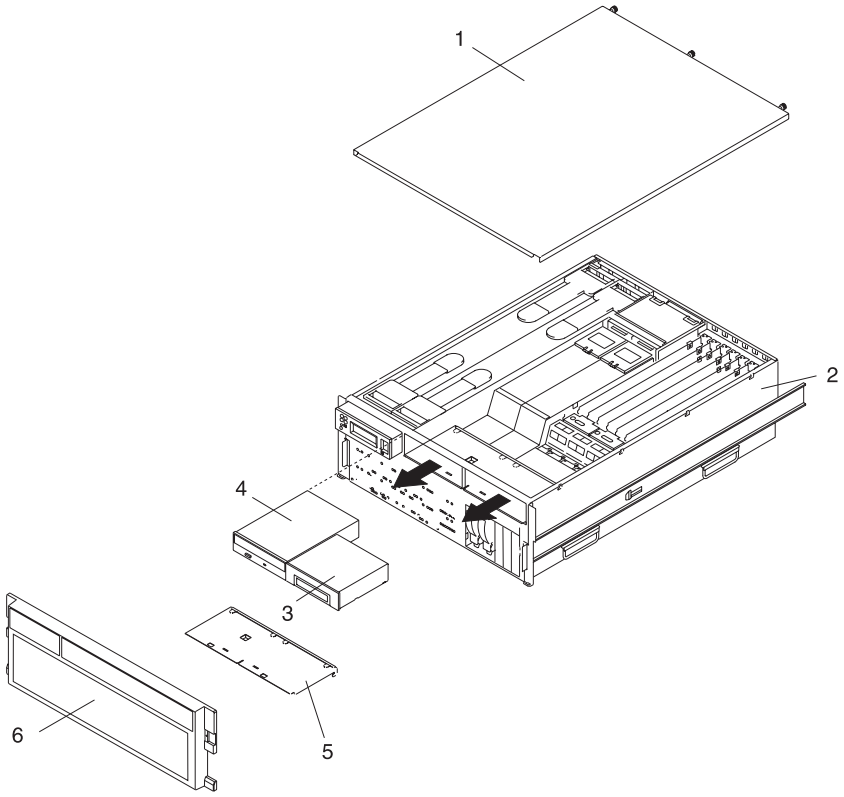
Some procedures require both media drives to be removed as part of other access procedures.

To remove the media drives located in media bay 1 and media bay 2, perform the following steps:

1. Disconnect the power and signal cables from both media devices.
2. Grasping the top front of the media device, depress the release tab located on the bottom center of the media drive and slide the media drive out of the media bay. Repeat for the other media device.
3. Remove the media-device-support shelf by loosening the thumbscrew and grasping the back edge of the shelf, sliding it back, then lifting it up and out of the system chassis.

   Note: The support leg located on the bottom of the support shelf is used to deactivate a microswitch. The microswitch is located on the CEC backplane and, when deactivated, cuts off power to many of the components and connectors located on the CEC backplane. This support shelf must be correctly seated and secured in position after any new FRU is added to the system and before you perform a system boot.

4. Put the media drive and carrier-tray assembly in a safe place.



1 Service access cover
2 NAS Gateway 500
3 Diskette drive
4 IDE CD-ROM
5 Media-device support shelf
6 Front bezel

Media drive replacement

To replace a media drive, perform the following steps:

1. Replace the media-device-support shelf. Tighten the thumbscrew located on the support shelf.

   Note: When replacing the media-device-support shelf, ensure that the lower support leg, located on the bottom side of the support shelf, activates the microswitch located on the CEC backplane. Failure to do so results in the system not being able to power on.

2. Insert each media drive into its media bay, pushing the drive in until the release tab clicks into the locked position.

   Note: The CD-ROM drive goes in center bay and the diskette drive install in the right media bay.

3. Reconnect all media signal and power cables to their respective drives.

Disk drives

Before performing the following procedure, read “Safety notices” on page xv.

The procedure to replace a disk drive depends on whether or not the NAS Gateway 500 has the mirroring feature code installed.

Attention: You do not have to power off the system to remove a hot-plug disk drive. Before you perform these procedures, ensure that the customer has taken appropriate actions to back up the data for the drive you are removing, and that the drive has been removed from the configuration. Physically removing a hot-plug disk drive from the system before it has been removed from the system configuration can cause unrecoverable data corruption.

Non-mirrored disk drive replacement

Without mirroring, a bad disk drive means that there is no operating system access. If the system is not already powered down, shutdown the system (see “Stopping the system” on page 310).

1. Open the rack front door.
2. Remove the front bezel as described in “Front bezel removal” on page 315.
3. Remove the disk drive by placing the handle on the disk drive into the open position (perpendicular to the drive) and pulling the hot-plug disk drive away from the bay.
4. Ensure that the tray handle is open (perpendicular to the drive).
5. Align the drive/tray assembly so that it engages the guide rails in the bay.
6. Push the drive assembly into the bay until the tray handle engages the lock mechanism.
7. Push the tray handle in until it locks.
8. Go to “System backup and recovery” in the *NAS Gateway 500 Administrator’s Guide* for instructions on restoring the operating system.

Mirrored disk drive replacement

Attention: You do not have to power off the system to remove a hot-plug disk drive. Before you perform these procedures, ensure that the customer has taken appropriate actions to back up the data for the drive you are removing and that the drive has been removed from the configuration. Physically removing a hot-plug disk drive from the system before it has been removed from the system configuration can cause unrecoverable data corruption.

Use this procedure if you are replacing, removing, or installing a drive while the system power is turned on.

Deconfiguring (removing) a disk drive

Use this procedure if you are removing or installing a drive while the system power is turned on.

Before removing a disk drive from a volume group, do the following:

1. Log in as root user.
2. Before a disk can be removed from a volume group, all data must be backed up and the data removed from the disk to be replaced. Use AIX Logical Volume Manager to perform this task.
3. At the command line, type `smitty`.
4. Select **System Storage Manager (Physical and Logical Storage)** and press **Enter**.
5. Select **Logical Volume Manager** and press **Enter**.
6. Select **Volume Groups** and press **Enter**.
7. Select **Set Characteristics of a Volume Group** and press **Enter**.
8. Select **Remove a Physical Volume from a Volume Group**.

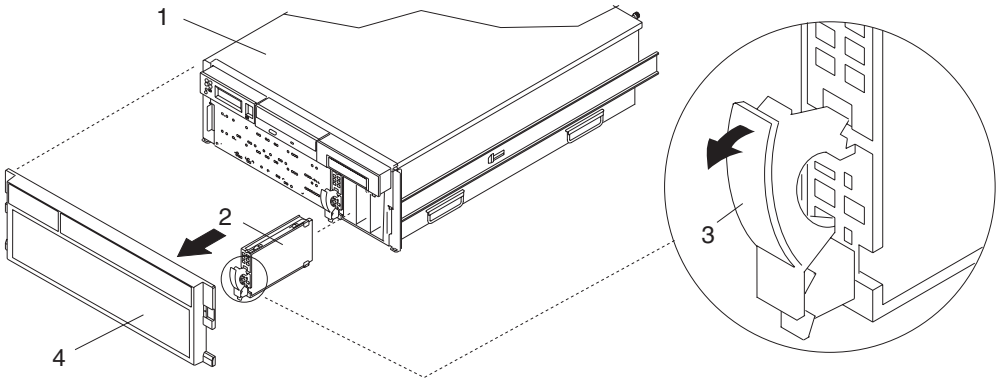
9. Press F4 to list the available volume groups, then select the volume group name and press **Enter**.
10. Press F4 to select a physical volume, and follow the instructions on the screen to select the physical volume. Then press **Enter**.
11. Remove the disk drive as described in “Disk drive removal”.
12. Press F10 to exit **smitty**.

Disk drive removal

Attention: Before you perform the following procedure, ensure that the customer has taken appropriate actions to back up the data for the drive you are removing, and that the drive has been removed from the configuration. Physically removing a hot-plug drive from the system before it has been removed from the system configuration can cause unrecoverable data corruption. Refer to “Deconfiguring (removing) a disk drive” on page 339.

To remove a hot-plug disk drive, do the following:

1. Before removing the disk, ensure that all data has been saved.
2. Deconfigure the drive that you are removing from the system. See “Deconfiguring (removing) a disk drive” on page 339.
3. Open the rack front door.
4. Remove the front bezel as described in “Front bezel removal” on page 315.
5. Locate the hot-plug disk drive that you plan to remove. If you are removing a faulty disk drive, a lit amber LED located at the front right side of each disk drive will help you isolate the faulty drive.
6. Log in as root user.
7. At the command line, type `smitty`.
8. Select **System Storage Management (Physical and Logical Storage)**.
9. Select **Removable Disk Management**.
10. Select **Remove a Disk**.
11. Select the disk that you want to remove from the list and press **Enter**.
12. Remove the disk drive by placing the handle on the disk drive into the open position (perpendicular to the drive) and pulling the hot-plug disk drive away from the bay. The lit LED on the disk drive will turn off when the disk drive is removed.



1 NAS Gateway 500
2 Disk drive
3 Disk drive release handle
4 Front bezel

13. Press F10 to exit **smitty**.

Disk drive replacement

Attention: Before you perform these procedures, ensure that the customer has taken appropriate actions to back up the data for the drive you are removing, and that the drive has been removed from the configuration. Physically removing a hot-plug drive from the system before it has been removed from the system configuration can cause unrecoverable data corruption. Refer to “Deconfiguring (removing) a disk drive” on page 339.

To install a hot-plug disk drive, do the following:

1. Ensure the tray handle is open (perpendicular to the drive).
2. Align the drive/tray assembly so that it engages the guide rails in the bay.
3. Push the drive assembly into the bay until the tray handle engages the lock mechanism.
4. Push the tray handle in until it locks. The lit LED on the disk drive will turn on.
5. Log in as root user.
6. At the command line, type `smitty`.
7. Select **Devices**.
8. Select **Install/Configure Devices Added After IPL** and press **Enter**. Successful configuration is indicated by the `OK` message displayed next to the **Command** field at the top of the screen.

   Note: Do not use **Install/Configure Devices Added After IPL** if your system is set up to run clustering. Instead, if clustered, you must always run the NAS command /opt/nas/bin/cfgmgr outside of smit. **Never** execute the root cfgmgr command (which is what the Hot Plug Manager option **Install/Configure Devices Added After IPL** uses). For more information, refer to the *NAS Gateway 500 Command Reference*.
9. Press F10 to exit **smitty**.
10. Replace the front bezel as described in “Front bezel replacement” on page 315.
11. Close the rack doors.

Configuring (mirroring)

Attention: You do not have to power off the system to add a hot-plug disk drive. Before you perform these procedures, ensure that you have taken the appropriate actions to back up the data for the drive that you are mirroring.

To install a hot-plug disk drive, perform the following steps:

1. Install the disk drive as described in “Disk drive replacement” on page 341.
2. If you have not already done so, log in as root.
3. Type **/opt/nas/bin/cfgmgr** on the command line. This configures the hard drive and makes the hard drive available to perform operations on.
4. At the command line, type **lspv**. A list appears with the available hdisks. Record the first available local hdisk after rootvg. This hdisk will be used at a later time in this procedure.
5. At the command line, type **smit extendvg**.
6. Enter the following code for each empty section:
   a. In the volume group name section, type **rootvg**.
   b. In the physical volume name section, type the name of the hdisk from step 4 and press **Enter**.
7. Once completed, press **esc 0** and, at the command line, type **smit vg**.
8. Select **Mirror a Volume Group** and press **Enter**.
9. In the volume group name section, type **rootvg**.
10. In the physical volume name section, type the name of the hdisk from step 4 and press **Enter**.
11. When you have finished, exit out of SMIT.
12. At the command line, type **bosboot -a**. This command checks to see if you are able to boot from both drives.
13. At the command line, type **bootlist -m normal hdisk0 hdisk1**. This institutes the proper boot order.

    Note: If you used an hdisk# other than hdisk1, enter that hdisk# there.
14. To verify a successful mirror, type **lsvg rootvg** at the command line.
15. Verify that the active PV number is 2.
16. Replace the bezel as described in “Front bezel replacement” on page 315.
17. Push the system drawer back into the operating position as described in “Returning the NAS Gateway 500 to the operating position” on page 313.

Processor book

Before performing the following procedure, read “Safety notices” on page xv.

Notes:

1. Installing a new processor book into your system might require the updating of the system firmware.
2. Before handling any card, board, or DIMM, touch any metal surface of the chassis with one hand to minimize static electricity discharge. See “Handling static-sensitive devices” on page 310.
3. A two-way system has one processor book installed in location U0.1-P1-C1 on the CEC backplane. The remaining processor location must have the processor filler panel in place. The filler panel, in the secondary-processor-bay location U0.1-P1-C2, protects the connector located on the CEC backplane from dust or damage and assists in airflow and cooling.

Processor book removal

To remove the processor card, do the following:

1. Open the front and back rack doors and put the system into the service position as described in “Placing the NAS Gateway 500 into the service position” on page 312.
2. Shut down the system as described in “Stopping the system” on page 310.
3. Disconnect the power sources to the system.

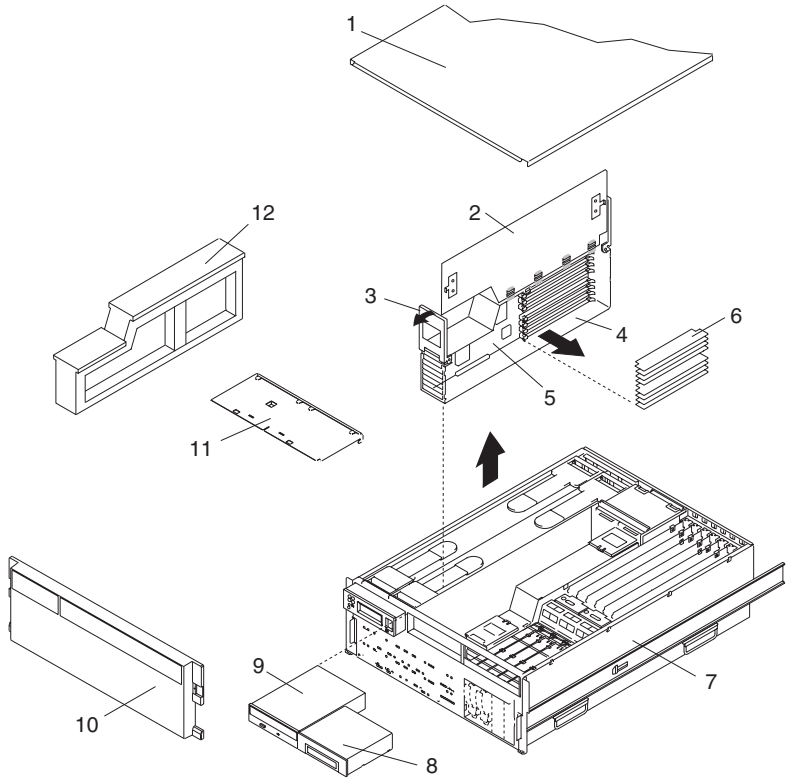
   Note: This system is equipped with a second power supply. Before continuing with this procedure, ensure that the power source to the system has been completely disconnected.
4. Remove the service access cover as described in “Service access cover removal” on page 314.
5. Remove the front bezel as described in “Front bezel removal” on page 315.
6. Remove both media drives as described in ″Media Drive removal″ on page 52. #. Grasp the ends of both processor book release handles. Lift each handle until
7. Grasp the ends of both processor book release handles. Lift each handle until it is perpendicular (90 degrees) to the top of the processor book. By placing the handle perpendicular to the top of the processor book, the base or hinged portion of each handle acts as a cam and will gently pry the processor book connector from the docking connector located on the CEC backplane.
8. Remove the processor book from the system unit.

   Attention: To prevent damage to the card and the card connectors, open or close the retention latches at the same time.

Processor book replacement

You must first transfer the DIMMs from the old processor book to the new processor book:

1. Lay the old processor book, cover-side up, on a flat, static-protective surface.
2. From the bottom of the old processor book, lift the side access cover. Four hinges hold the cover to the top of the processor book. Pivot the cover up to reveal the DIMMs or DIMM connectors.
3. Remove all DIMMs as described in “DIMM removal” on page 346. Put the DIMMs in a safe place (you will need to install these DIMMs onto the new processor book).
4. Lay the new processor book, cover-side up, on a flat, static-protective surface.
5. From the bottom of the new processor book, lift the side access cover. Four hinges hold the cover to the top of the processor book. Pivot the cover up to reveal the DIMMs or DIMM connectors. Install the DIMMs previously removed as described in “DIMM insertion” on page 347.



1 Service access cover
2 Processor access cover
3 Processor book lifting and release handles
4 Processor book
5 Processor card
6 DIMMs
7 NAS Gateway 500
8 Diskette drive
9 IDE CD-ROM drive
10 Front bezel
11 Media device support shelf
12 Processor filler

Processor book insertion

To insert a processor book, perform the following steps:

1. Pivot the processor assembly cover back into the closed position.
2. Grasp the release handles located on top of the processor assembly. Pivot the handle upward to 90 degrees. This action puts the handle cams into the correct position to help seat the processor-card connector into the docking connector located on the CEC backplane.

   Attention: To prevent damage to the processor assembly and the processor card connector, open or close both release handles at the same time.

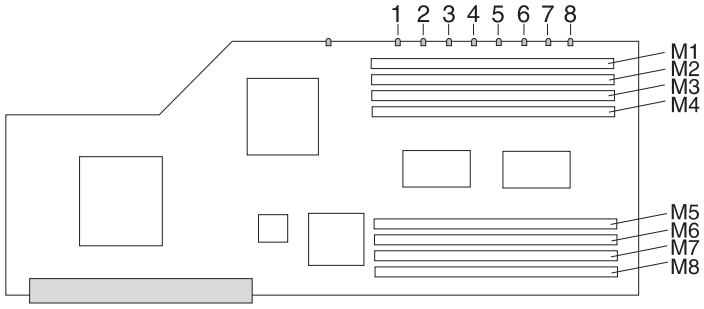
3. Align the processor-card connector with the docking connector located on the CEC backplane.
4. Carefully insert the processor assembly into the system.
5. As the processor connector is seated into its CEC backplane docking connector, begin lowering the processor-assembly release handles. This action correctly seats and locks the processor assembly to the CEC backplane.
6. If necessary, replace the processor filler panel.
7. Replace both removed media drives as described in “Media drive replacement” on page 338.
8. Replace the front bezel as described in “Front bezel replacement” on page 315.
9. Replace the service access cover as described in “Service access cover replacement” on page 314.
10. Reconnect both system power sources.
11. Push the system drawer back into the operating position as described in “Returning the NAS Gateway 500 to the operating position” on page 313.
12. Power on the system as described in “Starting the system” on page 311. If you want to run system verification during this power up, see Chapter 7, “Verifying the hardware operation”, on page 243.
13. If the NAS Gateway 500 has successfully powered on, close the rack doors.

DIMMs

Before performing the following procedures, read “Safety notices” on page xv.

Notes:

1. Adding an additional processor card or installing a new processor card into your system might require that you update the system firmware.
2. Before handling any card, drive, book, or DIMM, touch any metal surface of the chassis with one hand to minimize static-electricity discharge. See “Handling static-sensitive devices” on page 310.
3. To prevent damage to the DIMM and the DIMM connectors, open or close the retention latches at the same time.
4. DIMMs must be installed in quads (groups of 4) and in the correct slot. The only two valid slot combinations that you can use are M1, M3, M6, and M8 OR M2, M4, M5, and M7. See the following illustration.



Number	Description	Location code
M1	Memory slot 1 (J2A)	U0.1-P1-C1-M1
M2	Memory slot 2 (J2B)	U0.1-P1-C1-M2
M3	Memory slot 3 (J3A)	U0.1-P1-C1-M3
M4	Memory slot 4 (J3B)	U0.1-P1-C1-M4
M5	Memory slot 5 (J1B)	U0.1-P1-C1-M5
M6	Memory slot 6 (J1A)	U0.1-P1-C1-M6
M7	Memory slot 7 (J0B)	U0.1-P1-C1-M7
M8	Memory slot 8 (J0A)	U0.1-P1-C1-M8
Note: The location code column indicates the location codes for processor card 1. If your system is configured for processor card 2, substitute C2 in place of C1.		

5. A single DIMM may be replaced if and only if you are replacing it with a DIMM of the exact same part number.

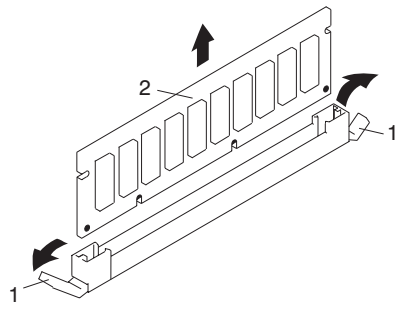
DIMM removal

To remove the DIMMs, do the following:

1. To access the DIMMs, remove the appropriate processor book as described in “Processor book removal” on page 343.
2. Locate the DIMMs, and determine the DIMM that you want to remove.

   Attention: To prevent damage to the DIMM and the DIMM connectors, open or close the retention latches at the same time.
3. Remove the DIMM by pushing the tabs out and then down. The tabs’ camming action forces the DIMM out of the connector.

4. Pull the DIMM out of the connector as shown in the following illustration.

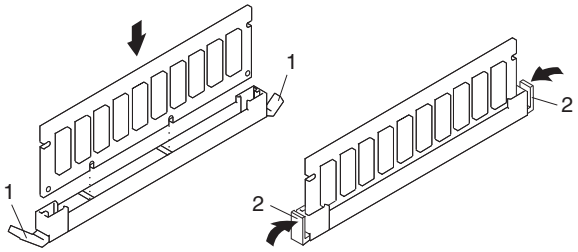


1 Connector tabs (unlocked position)
2 DIMM

DIMM insertion

To insert a DIMM, perform the following steps:

1. Before handling any card, board, or DIMM, touch any metal surface of the chassis with one hand to minimize static-electricity discharge. Refer to “Handling static-sensitive devices” on page 310.
2. If necessary, remove the DIMM from its antistatic package.
3. Ensure that the connector locking tabs are pushed out in the unlocked position before installing a new DIMM, as shown in the following illustration.
4. Carefully grasp the DIMM along two edges and align the connector.
5. Insert the memory card firmly into the connector.
6. Secure the DIMM with the locking tabs located at each end of the DIMM connector, as shown in the following illustration.



1 Locking tabs (unlocked position)
2 Locking tabs (locked position)

7. Complete the procedure by re-installing the processor books as described in “Processor book insertion” on page 344.

Battery

Before performing the following procedure, read “Safety notices” on page xv.

CAUTION:
A lithium battery can cause fire, explosion, or a severe burn. Do not recharge, disassemble, heat above 100 degrees C (212 degrees F), solder directly to the cell, incinerate, or expose cell contents to water. Keep away from children. Replace only with the part number specified for your system. Use of another battery may represent a risk of fire or explosion. (C08)

The battery connector is polarized; do not attempt to reverse the polarity.

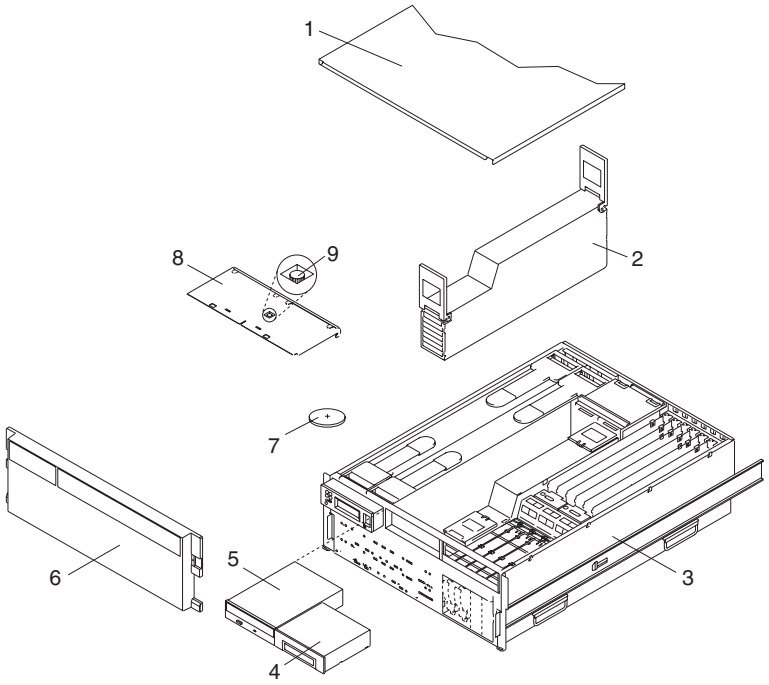
Dispose of the battery according to local regulations.

To replace the system’s battery, do the following:

1. Open the front and back rack doors and put the system into the service position as described in “Placing the NAS Gateway 500 into the service position” on page 312.
2. Shut down the system as described in “Stopping the system” on page 310.
3. Remove the service access cover as described in “Service access cover removal” on page 314.
4. Remove the front bezel as described in “Front bezel removal” on page 315.
5. Disconnect and label all power and signal cables from the media drives, located in media bay 1 and media bay 2. Then remove the media drives as described in “Media drive removal” on page 337. Note the location of each media drive removed.
6. Remove the media device support shelf by loosening the thumbscrew and grasping the back edge of the shelf, sliding it back, then lifting it up and out of the system chassis.

   Note: The support leg located on the bottom of the support shelf is used to deactivate a microswitch. The microswitch is located on the CEC backplane and when deactivated, cuts off power to many of the components and connectors located on the CEC backplane. This support shelf must be correctly seated and secured in position after any new FRU is added to the system and you perform a system boot.
7. Remove processor book 1 as described in “Processor book removal” on page 343.

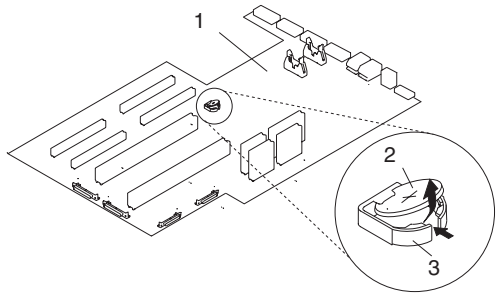
Note: Processor book 1 is the processor book that is closest to the power supplies. See the following illustration.



1 Service access cover
2 Processor book 1
3 NAS Gateway 500
4 Diskette drive
5 IDE CD-ROM drive
6 Front bezel
7 Battery (positive (+) side facing up)
8 Media device support shelf
9 Captive thumbscrew

8. Locate the battery on the CEC backplane as shown in the following illustration.
9. Use your finger to push the battery against the side springs (inside the plastic mount) and then, using your fingernail, pry the battery out of its plastic mount away from the CEC backplane.

   Note: The battery's plastic mount connections are soldered to the CEC backplane. If the battery mount is damaged or removed, permanent damage can result to the CEC backplane.



1 CEC backplane
2 Battery
3 Battery plastic mount

10. Replace the battery with (FRU) part number 00P3903 or equivalent.
11. When installing the new battery, ensure that the battery polarity is correct. For this system, the positive (+) side of the battery should be facing up in its plastic mount.

12. Gently insert the new battery into its plastic mount.
13. Replace processor book 1 as described in “Processor book insertion” on page 344.
14. Replace the media device support shelf. Tighten the thumbscrew located on the support shelf.

    Note: When replacing the support shelf, ensure that the lower support leg activates the microswitch located on the CEC backplane. Failure to do so results in the system not being able to power on.
15. Replace all media drives, ensuring that the media drives removed are returned to the same media bay from which they were removed as described in “Media drive replacement” on page 338.
16. Reconnect all power and signal cables to their respective media drives.
17. Replace the front bezel as described in “Front bezel replacement” on page 315.
18. Replace the service access cover, as described in “Service access cover replacement” on page 314.
19. Push the system drawer back into the operating position as described in “Returning the NAS Gateway 500 to the operating position” on page 313.
20. Turn on the system power.
21. The **bootlist** command might need to be run while logged in as root user. This action rebuilds the customized boot list. Internet protocol (IP) parameters might also need to be reentered.

Power supplies

DANGER

Do not attempt to open the covers of the power supply. Power supplies are not serviceable and are to be replaced as a unit. (D08)

This system drawer has power supplies that have hot-swap capabilities. To use this feature, you *must* have two power supplies in place.

Before performing any of the following procedures, read and understand all of the safety notices beginning with “Safety notices” on page xv.

Power supply removal

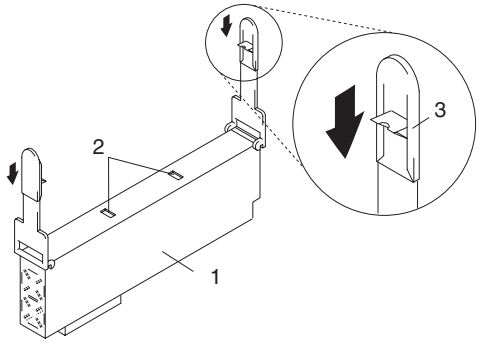
Before performing this procedure, read the following “Safety notices” on page xv.

Because the system has two power supplies, you can replace each power supply (one at a time) without shutting down the system.

To remove a power supply, do the following:

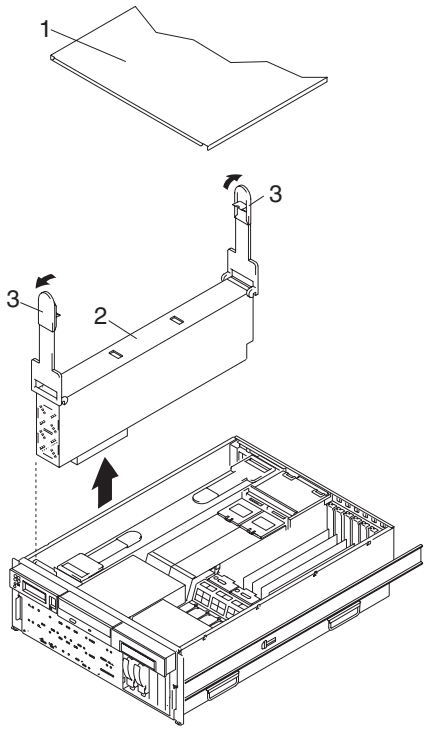
Note: You do not need to turn off the power to the system to install power supplies.

1. Open the front and back rack doors and place the system into the service position as described in “Placing the NAS Gateway 500 into the service position” on page 312.
2. Visually check the power supply LEDs. If the amber LED is lit, suspect that power supply to be faulty.
3. Remove the service access cover as described in “Service access cover removal” on page 314.
4. Remove the power cable from the back of the faulty power supply.
5. Wait at least 10 seconds before performing the next step.
6. Grasp the ends of both power supply handles, and slide the retractable spring-activated portion of each handle toward its hinged base. This action releases the locking tab located on the bottom side of each release handle. See the following illustration.



1 Power supply
2 Locking tab receiver hole
3 Retractable spring-activated portion of the handle

7. Lift the handle until it is perpendicular (90 degrees) to the top of the power supply. By placing the handle perpendicular to the top of the power supply, the base or hinged portion of each handle acts as a cam and will gently pry the power supply from its connector located on the CEC backplane.
8. After the power supply is released from its connector, pull the power supply out of the system.
9. Go to “Power supply replacement”.



1 Service access cover
2 Power supply #1
3 Power supply release handle
4 Power supply #2
5 NAS Gateway 500

Note: Do not leave a processor bay empty during normal operation or the system will not cool properly.

Power supply replacement

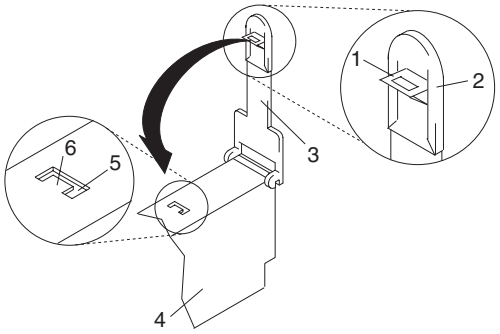
Note: If a power supply is being replaced for a redundant failure, after the service repair action is completed, ask the customer to check the **crontab** file for any power/cooling warning messages. When a power or cooling error is encountered, the system software adds an entry to the **crontab** file to “wall” a warning message every 12 hours, to alert or remind the customer of the problem. Replacing the faulty part does not clear this **crontab** entry, so unless the **crontab** file is edited to remove this entry, the customer continues to be reminded of the failure despite its having been repaired. Use the **crontab -l** command to read the **crontab** file to determine if an entry exists. Use the **crontab -e** command to edit the file.

To replace a power supply, do the following:

1. Grasp the handle located on top of the new power supply. Pivot the handle upward to 90 degrees. This action puts the handle cams into the correct position to help seat the power supply into its connector.
2. Carefully insert the power supply into the same power supply bay from which the faulty power supply was just removed.

3. Lower the power supply handles, carefully pressing the power supply into the connector. The spring latch located on the underside of each handle will snap into place, indicating that the power supply is seated correctly and locked into position.

   Note: Improper operation of the spring-activated portion of the power supply handles can result in the following:
   - The retractable spring remains compressed. This situation keeps the handle from locking the power supply in its seated position. To eliminate this problem, lower the handle into the locked position, and push the spring activated handle end toward the locking tab. This action forces the spring latch to match with the locking tab in the spring-latch receiver hole.
   - The locking tab receiver is bent. Before lowering the handle to lock the power supply into the seated position, ensure that the locking tab located on top of the power supply in the receiver hole is not bent. Before the spring latch will seat onto the locking tab, the locking tab, if bent, must be straightened.



1 Spring latch
2 Spring-activated handle end
3 Power supply release handle
4 Power supply
5 Spring-latch receiver hole
6 Locking tab

4. Plug the power cable for the added power supply into the power cable connector located on the back of the power supply.
5. Reconnect the power source to the system. The green AC Good LED located on the power supply should come on solid.
6. Verify that the green DC Good LED on the power supply is lit. The green LED indicates that the power supply is operating correctly.
7. Replace the service access cover as described in “Service access cover removal” on page 314.
8. Push the system drawer back into the operating position as described in “Returning the NAS Gateway 500 to the operating position” on page 313.
9. Close the rack doors.

PCI riser card

Attention: The PCI riser card is a FRU and should be replaced only by trained experienced service personnel.

Note: Performing this procedure requires a considerable amount of force when removing or installing the riser card from its docking connectors. It is strongly recommended that the system drawer be removed from the rack.

Before performing the following procedure, read “Safety notices” on page xv.

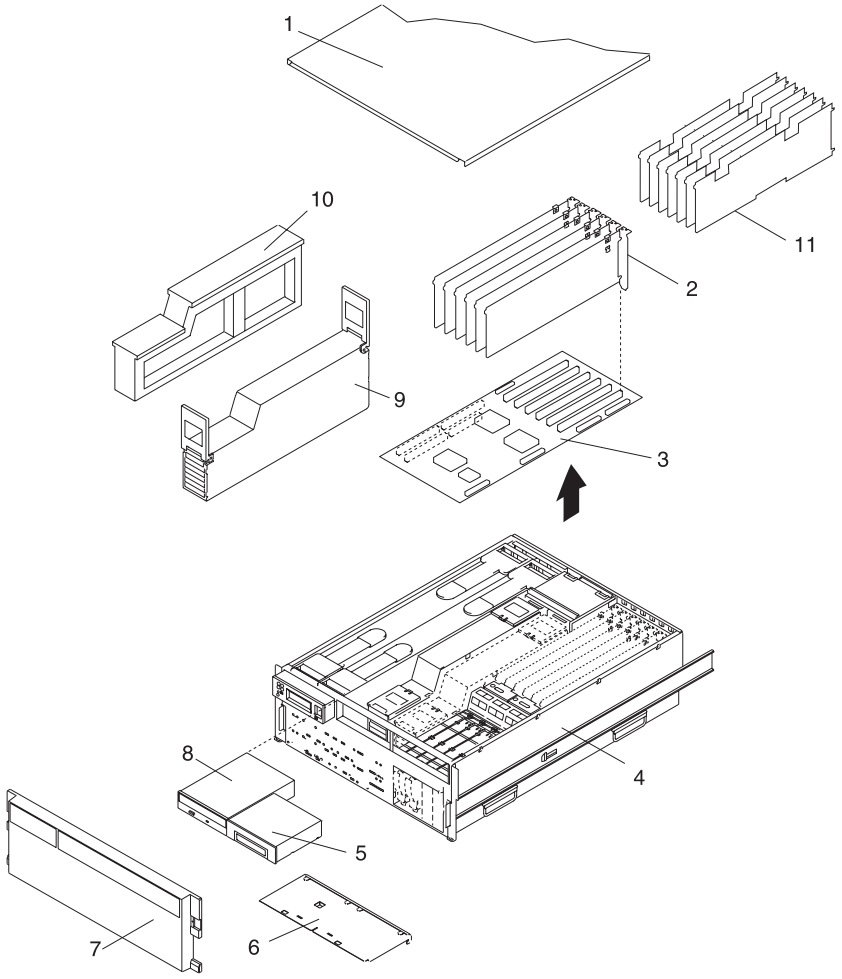
PCI riser card removal

To remove the PCI riser card, do the following:

1. Open the front and back rack doors.
2. Shut down the system as described in “Stopping the system” on page 310.
3. Disconnect the power source from the system.

   Note: This system is equipped with a second power supply. Before continuing with this procedure, ensure that the power source to the system has been completely disconnected.
4. Label and disconnect all adapter cables, located at the back of the system unit.
5. Place the system drawer into the service position as described in “Placing the NAS Gateway 500 into the service position” on page 312.
6. Remove the service access cover as described in “Service access cover removal” on page 314.
7. Remove the front bezel as described in “Front bezel removal” on page 315.
8. Before handling any card, board, or DIMM, be sure to use your electrostatic discharge strap to minimize static-electric discharge. Refer to “Handling static-sensitive devices” on page 310.
9. Remove the media drives as described in “Media drive removal” on page 337.

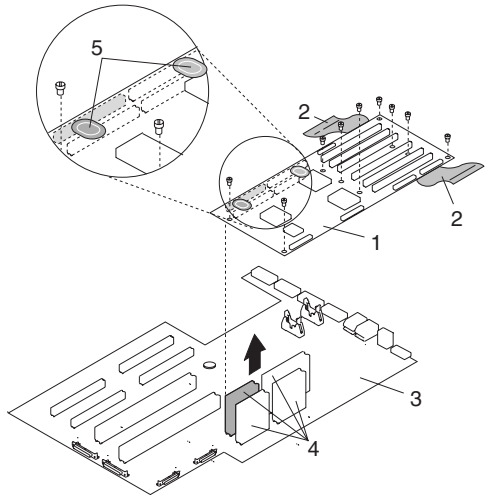
10. Record the slot number and location of each adapter.



1 Service access cover
2 PCI-X adapters
3 PCI riser card
4 NAS Gateway 500
5 Media device
6 Media-support tray
7 Front bezel
8 IDE CD-ROM
9 Processor card assembly #2
10 Processor filler panel
11 Card separators

11. Remove the processor card assembly #2 as described in “Processor book removal” on page 343. If your system is equipped with a processor filler panel instead of a second processor card assembly, remove the processor filler panel.
12. Remove the PCI-X adapters as described in “PCI-X adapter removal” on page 328.
13. Remove the PCI-X hot plug separators.
14. Remove all power, signal, and SCSI cables from the PCI riser card.
15. Remove the plastic protector from the top of the riser card.

16. Remove all seven hex-head screws and the two 5.5-mm nuts that secure the PCI riser card to the CEC backplane and chassis.



1 PCI riser card
2 Removal sling
3 CEC backplane
4 CEC backplane connectors to PCI riser card connectors
5 “Push” labels

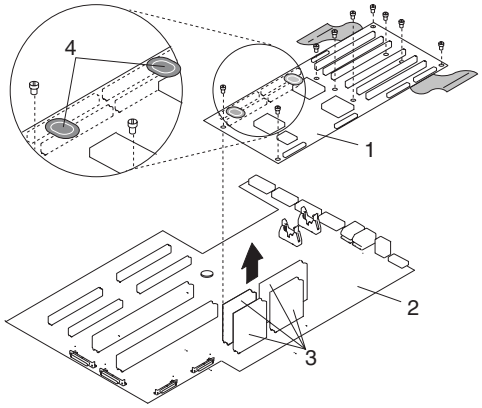
17. Grasp each end of the removal sling located toward the back of the system chassis. Slowly lift up the back end of the PCI riser card. You might need to rock the sling back and forth several times to aid in the removal of the PCI riser card connectors from their docking connectors located on the CEC backplane. As the connectors begin to separate, grasp the front end of the PCI riser card and pull it up and out of the system. Put the PCI riser card in a safe place.

    Note: The PCI riser card might require up to 60 pounds of pulling force to free it from the docking connectors. Depending on the system drawer’s location in the rack, it is strongly recommended that the system drawer be removed from the rack to perform the PCI-riser-card removal and replacement procedures.

PCI riser card replacement

To replace the PCI riser card, do the following:

1. Before handling any card, board, or DIMM, be sure to use your electrostatic discharge strap to minimize static-electric discharge. Refer to “Handling static-sensitive devices” on page 310.
2. If necessary, remove the PCI riser card from the antistatic package.
3. Carefully grasp the PCI riser card along two edges, and align the four connectors located on the bottom side of the PCI riser card with the four standoff connectors located on the CEC backplane.
4. Ensure that you have proper alignment of the PCI-riser-card connectors. Seat the PCI riser card into the CEC backplane connectors.
   a. To perform this procedure requires a considerable amount of force when removing or installing the PCI riser card from its docking connectors. It is strongly recommended that the system drawer be removed from the rack.



1 PCI riser card
2 CEC backplane
3 CEC backplane connectors to PCI-riser-card connectors
4 “Push” labels

   b. To ensure the PCI-riser-card docking connectors are fully seated, using your thumbs, alternately push down on the two “push” labels that are mounted on the PCI riser card. Push until no more movement is felt and then push down hard again on both “push” labels. This alternate pushing technique is allowed only for this card.

      Note: Mounted below the CEC backplane is an aluminum plate. The plate aids in stiffening the CEC backplane and keeps it from flexing or cracking when the PCI riser card is inserted.

   c. If you experience any problem when you boot the system, repeat substep 4, but the second time, you must push harder.
5. Replace the seven hex-head screws and the two 5.5-mm nuts that secure the PCI riser card to the CEC backplane and chassis.

   Note: For proper alignment, insert all screws before tightening.
6. Replace the plastic protector on top of the riser card.
7. Reconnect the power, signal, and SCSI cables.
8. Replace the PCI-X hot plug separators
9. Replace all adapters to their proper locations as described in “PCI-X adapter replacement” on page 325.
10. Reconnect all of the labeled PCI-X adapter cables to their respective PCI-X adapters.
11. Replace the processor card assembly #2 as described in “Processor book insertion” on page 344. If you removed a processor filler panel, replace the processor filler panel now.

12. Replace all removed media drives, ensuring that the media drives removed are returned to the same media bay locations from which they were removed. Refer to “Media drive replacement” on page 338.
13. Reconnect all power and signal cables to their respective media drives.
14. Replace the front bezel as described in “Front bezel replacement” on page 315.
15. Replace the service access cover as described in “Service access cover replacement” on page 314.
16. Reconnect the power cables.
17. Push the system drawer back into the operating position as described in “Returning the NAS Gateway 500 to the operating position” on page 313.
18. Power on the system as described in “Starting the system” on page 311.

    Note: If you experience any problem when you boot the system, repeat substep 4, but the second time, you must push harder.
19. Close the rack doors.

Disk drive backplane

Attention: The disk drive backplane is a FRU and should be replaced only by trained experienced service personnel.

These procedures require you to remove and install the PCI riser card. Removing or Installing a PCI riser card from its docking connectors requires a considerable amount of force. It is strongly recommended that the system drawer be removed from the rack.

Before performing the following procedure, read “Safety notices” on page xv.

Disk drive backplane removal

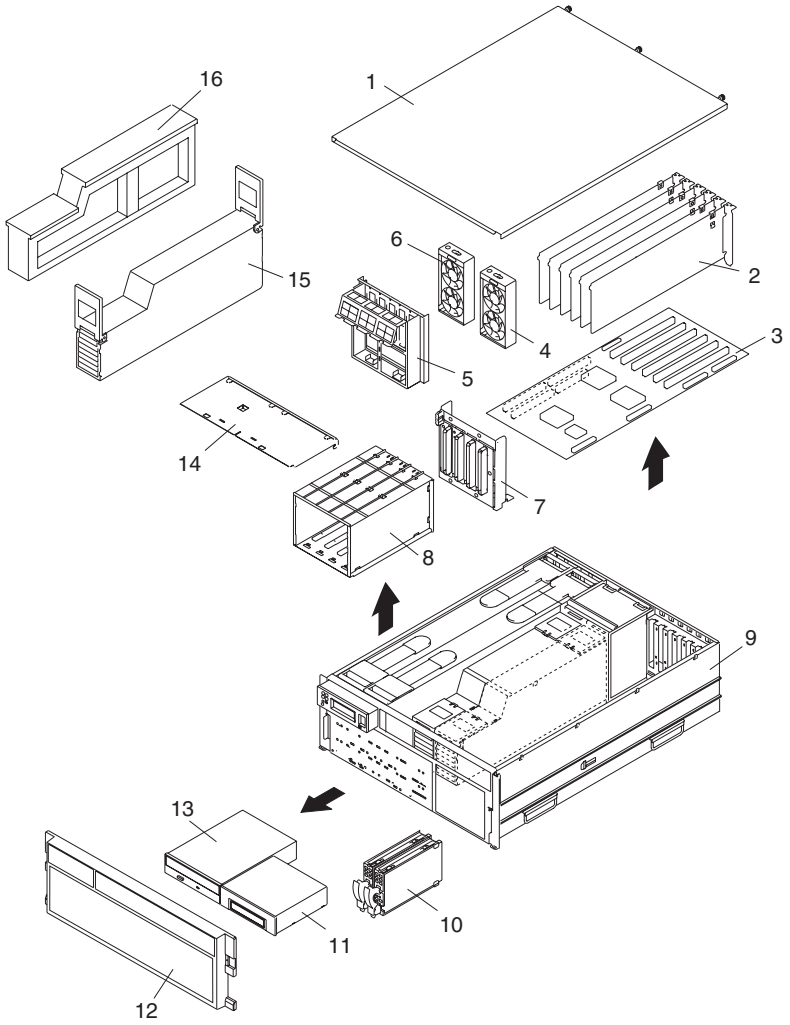
To remove the disk drive backplane, do the following:

1. Open the front and back rack doors.
2. Shut down the system as described in “Stopping the system” on page 310.
3. Disconnect the power source from the system.

   Note: This system is equipped with a second power supply. Before continuing with this procedure, ensure that the power source to the system has been completely disconnected.
4. Label and disconnect all adapter cables, located at the back of the system unit.
5. Place the system drawer into the service position as described in “Placing the NAS Gateway 500 into the service position” on page 312.
6. Remove the service access cover as described in “Service access cover removal” on page 314.
7. Remove the front bezel as described in “Front bezel removal” on page 315.
8. Before handling any card, board, or DIMM, be sure to use your electrostatic discharge strap to minimize static-electric discharge. Refer to “Handling static-sensitive devices” on page 310.
9. Remove the media drives as described in “Media drive removal” on page 337. Note the location of each removed media drive.
10. Remove the processor card assembly #2 as described in “Processor book removal” on page 343. If your system is equipped with a processor filler panel instead of a second processor card assembly, remove the processor filler panel.
11. Record the slot number and location of each adapter.
12. Remove the PCI-X adapters as described in “PCI-X adapter removal” on page 328.
13. Remove the PCI riser card as described in “PCI riser card removal” on page 354.
14. Remove all hot-plug disk drives as described in “Disk drive removal” on page 340.
15. Remove the PCI-adapter-cooling fans as described in “Fan assembly removal” on page 334.
16. Remove cables from the clamps attached to the cable management bracket.
17. Remove the PCI-adapter-cooling fan stabilizing cage by loosening the four retaining screws located along the bottom back edge of the stabilizing cage.

18. Disconnect all power and signal cables connected to the disk drive backplane.
19. Remove the four retaining screws that secure the disk drive cage to the front of the system chassis.
20. Remove the two screws, located by the backplane card, that secure the disk drive cage to the chassis bottom.
21. Remove the two screws on the outside of the chassis that secure the disk drive cage to the chassis. These are on the right side towards the front.
22. Slide the disk drive cage back until it clears the upper chassis ledge.
23. Pull the disk-drive-cage assembly out of the system.
24. Remove the six retaining thread-lock screws attached to the disk drive backplane.

Note: These six screws have thread-lock on them. Keep them separate from the chassis screws.



1 Service access cover (drawer)
2 PCI-X adapters
3 PCI riser card
4 PCI cooling fan
5 Stabilizing cage
6 PCI cooling fan
7 Disk drive backplane
8 Disk drive cage
9 NAS Gateway 500 Chassis
10 Disk drive (2 out of 4 pack)
11 Media device
12 Front bezel
13 IDE CD-ROM media
14 Media-device-support shelf
15 Processor assembly #2
16 Processor filler

Disk drive backplane replacement

To replace the disk drive backplane, do the following:

1. Using the six thread-lock retaining screws removed earlier, secure the backplane to the disk drive cage.
2. Carefully place the disk-drive-cage assembly into the system.
3. Slide the disk-drive-cage assembly toward the front of the system.
4. Ensure that the eight screw holes located on the cage assembly correctly align with the mating screw holes located on the system chassis.
5. Insert and finger-tighten the eight retaining screws. After all screws have been started, tighten the four on the front of the chassis first, then finish tightening the remaining four.
6. Reconnect all power and signal cables to the disk drive backplane.
7. Replace the PCI-adapter-cooling fan stabilizing cage by installing the two tabs located on the bottom edge of the cage into their mating slots located on the chassis. Secure the cage to the chassis with the four previously removed screws.
8. Replace the PCI-X adapter cooling fans as described in “Fan assembly replacement” on page 335.
9. Replace all hot-plug disk drives as described in “Disk drive replacement” on page 341.
10. Replace the media-device-support shelf.
11. Replace all previously removed media drives, ensuring that the media drives are returned to the same media bay from which they were removed. Refer to “Media drive replacement” on page 338, if necessary.
12. Before handling any card, board, or DIMM, be sure to use your electrostatic discharge strap to minimize static-electric discharge. Refer to “Handling static-sensitive devices” on page 310.
13. Replace the PCI riser card as described in “PCI riser card replacement” on page 357.
14. Replace the PCI-X adapters as described in “PCI-X adapter replacement” on page 325.
15. Reconnect all adapter cables, located at the back of the system unit.
16. Reconnect the power source to the system.
17. Replace the front bezel as described in “Front bezel replacement” on page 315.
18. Power on the system as described in “Starting the system” on page 311.
19. Replace the service access cover as described in “Service cover” on page 314.
20. Place the system drawer into the operating position as described in “Returning the NAS Gateway 500 to the operating position” on page 313.
21. Close the front and back rack doors.

Operator panel

Attention: The operator panel is a FRU and should be replaced only by trained experienced service personnel.

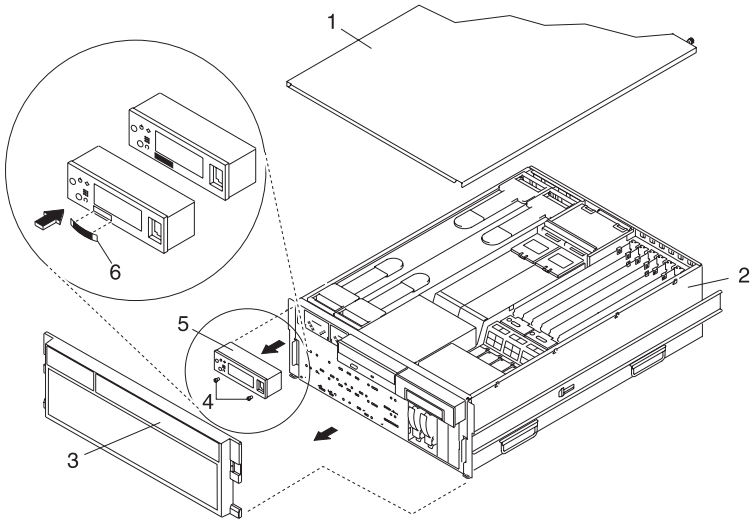
Before performing the following procedure, read “Safety notices” on page xv.

Operator panel removal

To remove the operator panel, do the following:

1. Open the front and back rack doors and place the system into the service position as described in “Placing the NAS Gateway 500 into the service position” on page 312.
2. Shut down the system as described in “Stopping the system” on page 310.
3. Disconnect the power source from the system.

   Note: This system is equipped with a second power supply. Before continuing with this procedure, ensure that the power source to the system has been completely disconnected.
4. Remove the front bezel as described in “Front bezel removal” on page 315.
5. Remove the service access cover as described in “Service access cover removal” on page 314.
6. Locate the operator panel, as shown in the following illustrations.
7. Remove the two retaining screws, located along the bottom edge of the operator panel.
8. Disconnect the power/signal cable from the back of the operator panel.
9. Remove the operator panel by grasping the edges of the panel and pulling it out of its bay.
10. You must take the MTM/SN label from the operator panel that you just removed and install it into the new operator panel. The label is not a stick-on type. It is attached to a plastic backing that has tabs extending from each side. To remove, insert the corner of a stiff piece of paper under the bottom of the label and gently pry it up until you can get your fingers in a position to pop it out.



1 Service access cover (drawer)
2 System unit
3 Front bezel
4 Operator-panel retaining screws
5 Operator panel
6 MTM/SN label

Operator panel replacement

Attention: If you are replacing the operator panel with a new FRU, you must write the system VPD information (machine type, model number, and serial number) into the VPD module. You must contact the support center to obtain instructions and the necessary password to enter the information into the VPD module.

Note: Refer to “System vital product data (VPD) update procedure” on page 364 for the correct procedure.

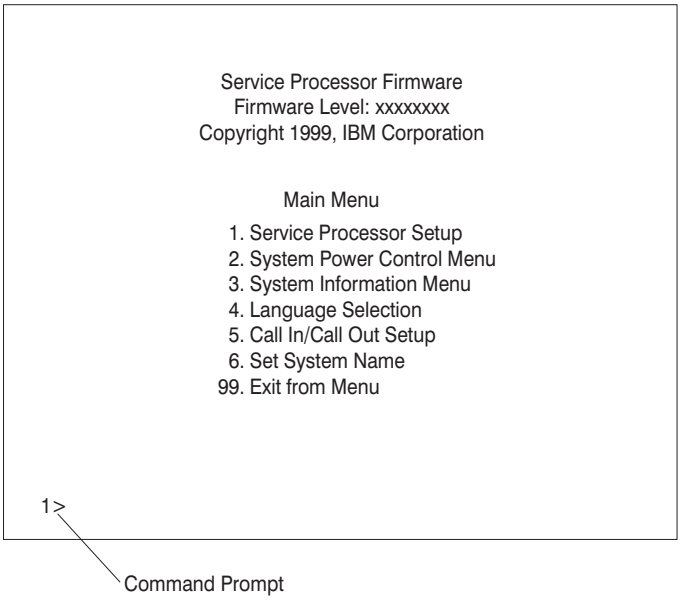
To replace the operator panel, do the following:

1. Insert the previously removed MTM/SN label into the new operator panel by gently bowing the label, inserting the left tab and then the right tab. It should snap down flat into the space.
2. Carefully slide the operator panel back into the system bay.
3. Connect the power/signal cable to the connector on the new operator panel.
4. Secure the operator panel with the two retaining screws previously removed.
5. Replace the service access cover, as described in “Service access cover replacement” on page 314.
6. Push the system drawer back into the operating position as described in “Returning the NAS Gateway 500 to the operating position” on page 313.
7. Reconnect all system power cables.
8. Replace the front bezel as described in “Front bezel replacement” on page 315.
9. Power on the system as described in “Starting the system” on page 311.
10. If the NAS Gateway 500 has successfully powered on, close the rack doors.

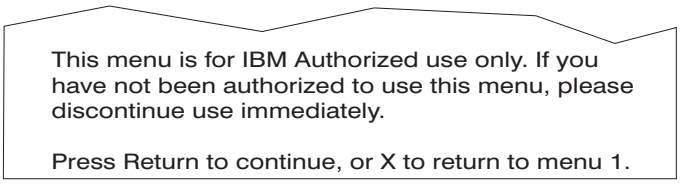
System vital product data (VPD) update procedure

If you replaced the operator panel with a new FRU, perform the following procedure to ensure that the VPD is correct.

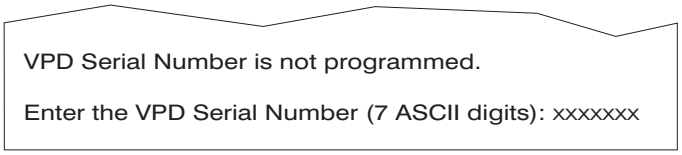
1. After you install the new operator panel, wait for the operator panel to display the 0K message.
2. Start the Service Processor Firmware menu.



3. At the command prompt, type the code that accesses the hidden menus. If necessary, call your local support center to obtain the code.

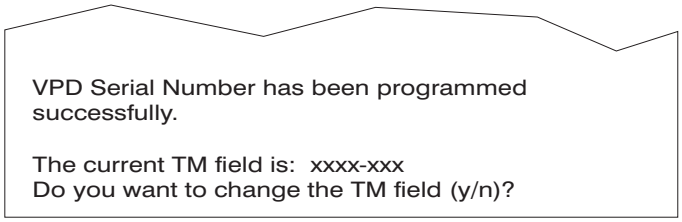


4. Press Return to continue.

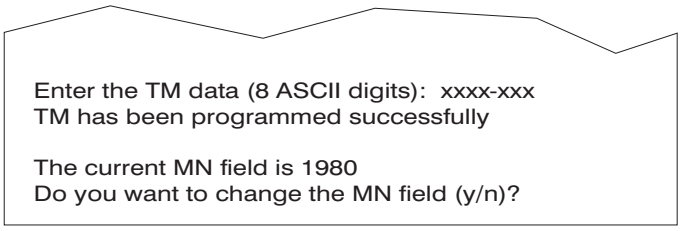


5. Type the VPD serial number.

   Attention: The serial number *must* be entered correctly. Enter the last seven digits only. Do not include the dash (-) in the serial number as a digit. If the serial number is not entered correctly, a new operator panel must be ordered and installed.



6. Type y(yes) if the system unit's type/model (TM) that you are working on is different from the one listed on the screen.
7. Type the machine type and model number of the system unit.



8. The **MN** field is for manufacturing use only. Type n (no) in this field.
9. Enter 99 at the command line of the Main Menu to exit.

Central electronics complex (CEC) backplane

The PCI riser card is a FRU and should be replaced only by trained experienced service personnel.

Before performing the following procedure, read the “Safety notices” on page xv.

Note: To perform this procedure, you must remove and install the PCI riser card. Removing or installing the PCI riser card from its docking connectors requires a considerable amount of force. If you are servicing a NAS Gateway 500, it is strongly recommended that the system drawer be removed from the rack.

CEC backplane removal

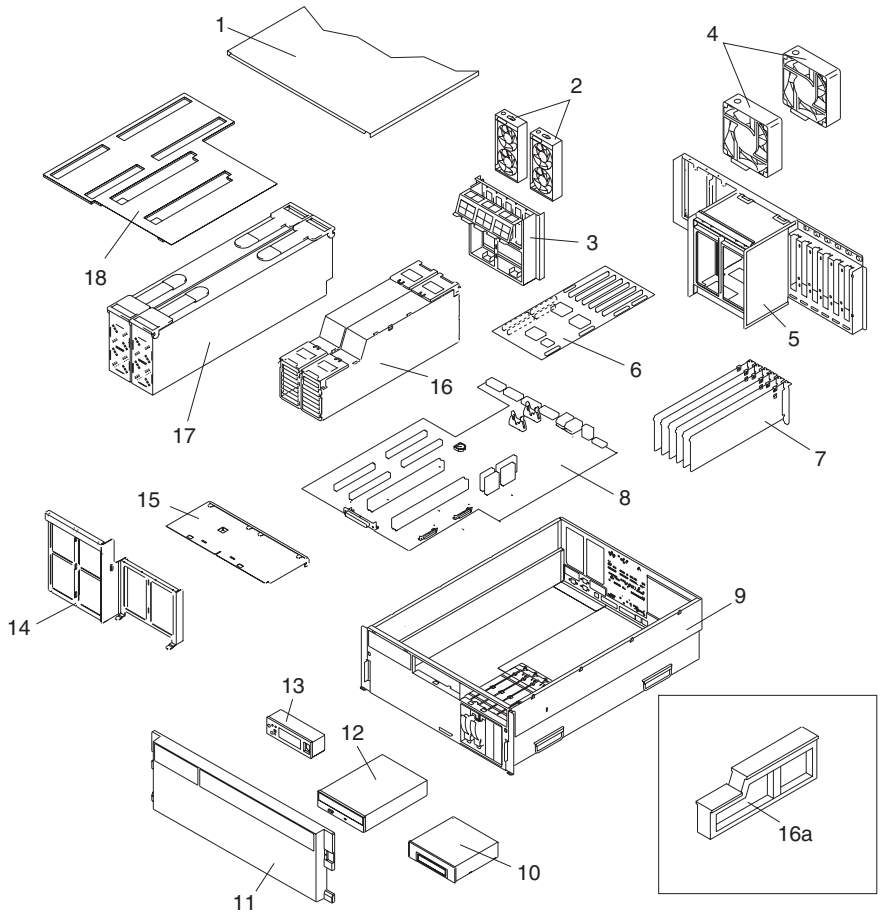
Attention: Before you remove or disconnect any components, record their location. Before removing the CEC backplane from the system for servicing or replacement, record the settings of any jumpers located on the CEC backplane.

To remove the CEC backplane (system board), do the following:

1. Open the front and back rack doors.
2. Shut down the system as described in “Stopping the system” on page 310.
3. Disconnect the power source from the system.

   Note: This system is equipped with a second power supply. Before continuing with this procedure, ensure that the power source to the system has been completely disconnected.
4. Label and disconnect all other cables located at the back of the system unit.
5. Place the system into the service position as described in “Placing the NAS Gateway 500 into the service position” on page 312.
6. Remove the front bezel as described in “Front bezel removal” on page 315.
7. Remove the service access cover as described in “Service access cover removal” on page 314.
8. Because each adapter must be returned to its original slot, you must record the slot number and location of each adapter being removed.
9. Before handling any card, board, or DIMM, be sure to use your electrostatic discharge strap to minimize static-electric discharge. Refer to “Handling static-sensitive devices” on page 310.

10. Remove the PCI-X adapters as described in “PCI-X adapter removal” on page 328.



1 Service access cover (drawer)
2 Primary and redundant PCI cooling fans
3 PCI cooling fan and stabilizing bracket
4 Processor cooling fans
5 Processor cooling fan cage
6 PCI riser card
7 PCI-X adapters
8 CEC backplane
9 NAS Gateway 500 chassis
10 Diskette drive
11 Front bezel
12 IDE CD-ROM drive
13 Operator panel
14 Front power supply and processor support bracket
15 Media device support shelf
16 Processor assemblies 1 and 2
16a Processor filler panel
17 Power supplies 1 and 2
18 Plastic membrane

11. Remove the media drives as described in “Media drive removal” on page 337.
12. Remove all processor books or the processor filler panel as described in “Processor book removal” on page 343.
13. Remove all power supplies as described in “Power supply removal” on page 351.
14. Remove the PCI riser card as described in “PCI riser card removal” on page 354.
15. Remove the PCI cooling fans as described in “Fan assembly removal” on page 334.
16. Remove cables from clamps attached to PCI cooling fan stabilizing bracket.
17. Remove the PCI cooling fan’s stabilizing bracket.

    Note: The bracket is secured to the CEC backplane with four hex-head screws and two alignment tabs.

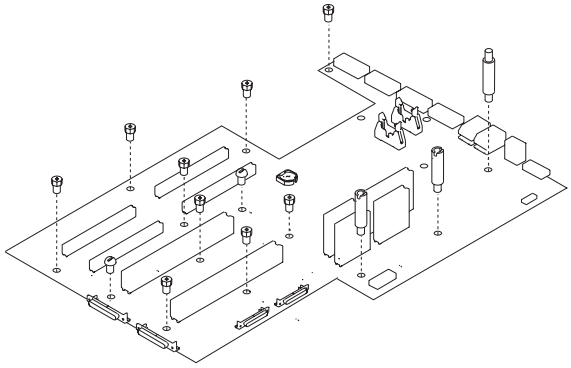
18. Remove and label all remaining power, signal, and SCSI cables.

19. Remove the processor-cooling fans as described in “Fan assembly removal” on page 334.
20. Remove the processor-cooling-fan-cage assembly by completely removing the two hex-head screws located at the base of the cage. You have to open the processor-fan-access cover to see these two screws. These two hex-head screws have thread-lock on them and should be kept separate from the other screws. Also, remove the eight hex-head screws that screw in from the back of the system chassis.
21. Remove the 16 threaded 5-mm standoffs that secure the back connectors located on the CEC backplane to the back of the system chassis.

    Note: Only the two standoffs on serial port 2 have lock washers. The four standoffs on SPCN1 and SPCN2 are not ribbed. The other 10 have a grooved rib around them.
22. Remove the power supply and processor-assembly-front-support bracket.

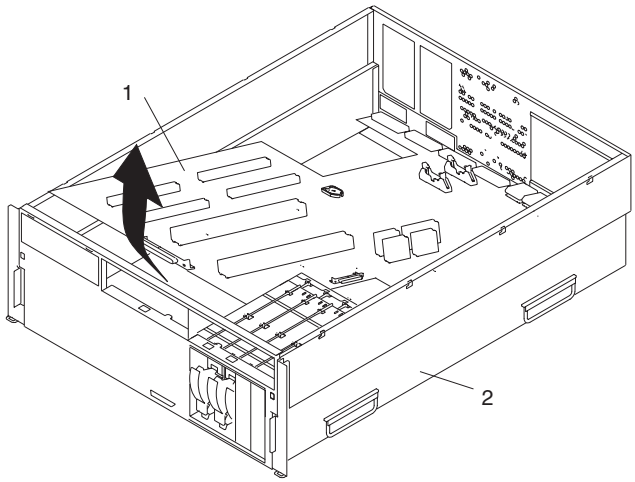
    Note: The bracket is secured to the system chassis with 13 hex-head screws: five screws on the power supply support section, three screws on the processor support section, and five on the front of the chassis in the area of the processor support.
23. Unplug the operator panel and debug test port cables from the CEC backplane.
24. Remove the CEC backplane retaining screws. All but two screws, including standoffs, have thread-lock on them and should be keep separate. The other two screws are round-head and are used for frame ground. The pads on the CEC backplane have “FG” printed beside them.

    Note: For the locations of the retaining screws, see the following CEC backplane illustration.



    Note: Use care when removing the CEC backplane. Standoffs attached to the chassis base might damage the components attached to the bottom of the CEC backplane.
25. Slide the CEC backplane toward the front of the system (about 7 mm). A strip of sponge rubber attached to the back (bottom) of the CEC backplane will compress against an aluminum plate that is secured to the system chassis, preventing the CEC backplane from traveling forward any farther. This action allows the connectors located on the back of the CEC backplane to have enough room to clear

the back chassis bulkhead.



1 CEC backplane
2 NAS Gateway 500

26. To remove the CEC from the chassis, lift the front edge of the CEC backplane and pull it out and away from the system chassis.
27. Put the CEC backplane in a safe place.

CEC backplane replacement

To replace the CEC backplane (system board), do the following:

1. Before handling any card, board, or DIMM, be sure to use your electrostatic discharge strap to minimize static-electric discharge. Refer to “Handling static-sensitive devices” on page 310.
2. If necessary, remove the CEC backplane from the antistatic package.
3. Carefully grasp the CEC backplane along two edges and align the retaining screw holes with its mating screw holes located on the system chassis.

   Note: Use care when replacing the CEC backplane. Standoffs attached to the chassis base might damage the components attached to the bottom of the CEC backplane.
4. Replace the CEC backplane and slide it toward the back of the system. Ensure that all of the back connectors located on the CEC backplane are positioned correctly through the back chassis bulkhead.
5. Replace the retaining screws and standoffs that secure the CEC backplane to the system chassis. Pay attention to the locations from which you removed the screws and standoffs, returning the correct type to each location.

   Note: For proper alignment, insert all screws and finger-tighten only. Ensure that the CEC backplane is not binding.
6. Tighten all CEC backplane retaining screws, starting with the 16 threaded standoffs that secure each connector to the back of the system chassis.
7. Reconnect all power, signal, and SCSI cables that attach to the CEC backplane.
8. Replace the front power supply and processor support bracket. Replace the 13 screws that you removed.

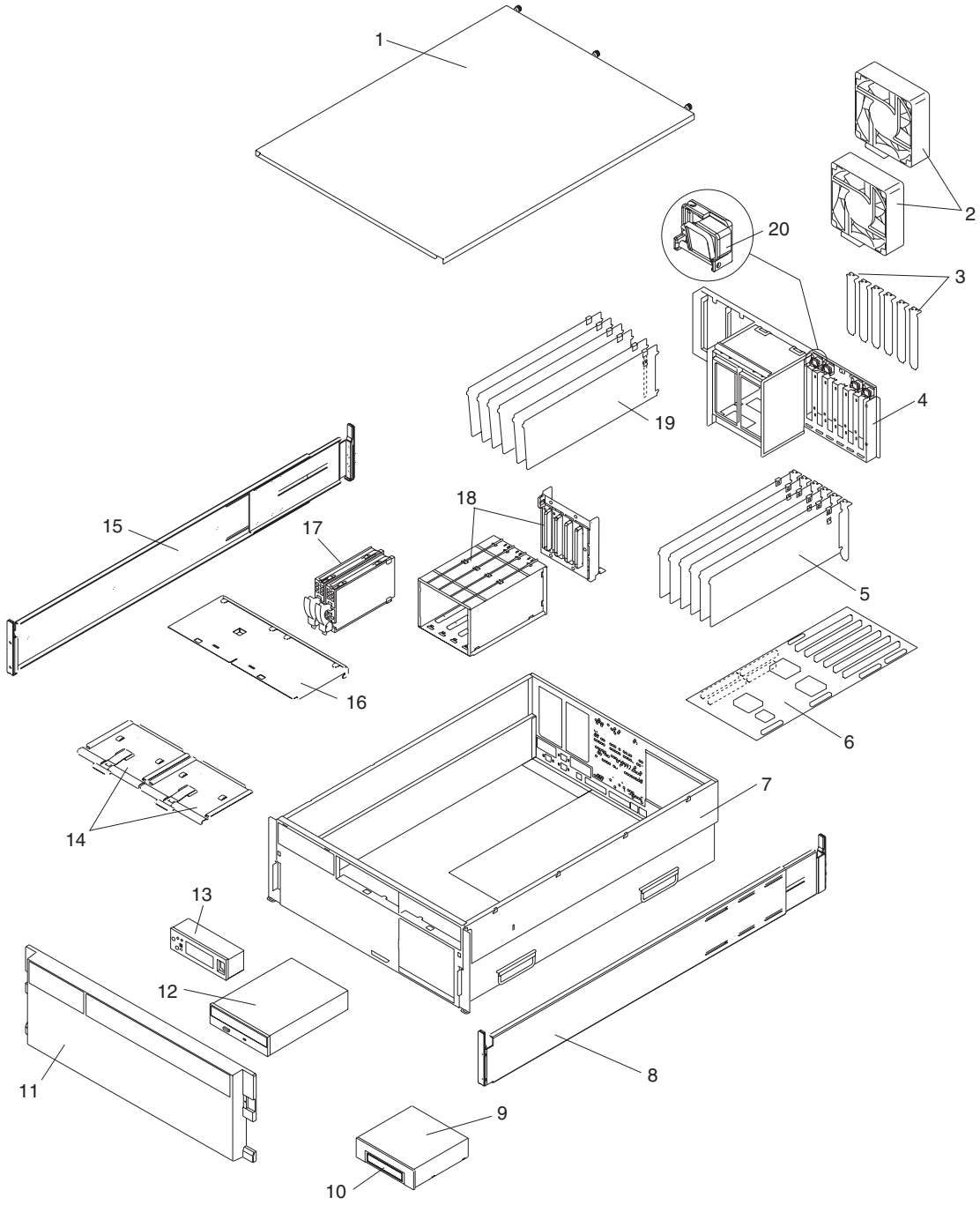
   Note: Make sure that the operator panel cable is under the standoffs at the bottom of the chassis to keep it from being pinched.
9. Replace the processor-cooling-fan-cage assembly.
10. Replace the eight screws that secure the processor-cooling-fan-cage assembly to the back chassis, and then replace the two screws at the base of the cage. You will have to lift the processor-fan-access cover.
11. Replace the processor cooling fans as described in “Fan assembly replacement” on page 335.
12. Replace the PCI-X adapter cooling-fan-stabilizing cage by installing the two tabs located on the bottom edge of the cage into their mating slots located on the chassis. Secure the cage to the chassis with the four screws.
13. Replace the PCI cooling fans as described in “Fan assembly replacement” on page 335.
14. Replace the PCI riser card as described in “PCI riser card replacement” on page 357.
15. Replace all PCI-X adapters as described in “PCI-X adapter replacement” on page 325, making sure that each adapter is returned to its original slot.
16. Replace the processor books and, if applicable, the processor-assembly filler panel.
17. Replace all removed media drives, ensuring that the media drives removed are returned to the same media bay from which they were removed. Refer to “Media drive replacement” on page 338, if necessary.
18. Replace the power supplies as described in “Power supply replacement” on page 352.

19. Replace the front bezel as described in “Front bezel replacement” on page 315.
20. Replace the service access cover, as described in “Service access cover replacement” on page 314.
21. Push the system drawer back into the operating position as described in “Returning the NAS Gateway 500 to the operating position” on page 313.
22. Reconnect all system power cables.
23. The service processor settings should have been set to their default values. If the service processor settings have not been set to their default values, the default values must be restored. To restore the default values settings, do one of the following:
    - Manually reset all settings.
    - If the service processor settings had previously been saved, the settings might be restored using the procedure in the *NAS Gateway 500 Administrator's Guide*.
24. Check the firmware level that is on the new CEC backplane. Look at the top of the service processor main menu. If the firmware is not at the correct level, refer to *NAS Gateway 500 Administrator's Guide*.
25. Power on the system as described in “Starting the system” on page 311.
26. Reset the time and date.
27. The **bootlist** command might need to be run while logged in as root user. This rebuilds the customized boot list. Internet Protocol (IP) parameters might also need to be reentered.
28. If the system has successfully powered on, close the rack doors.
29. Check the firmware level on the new backplane; refer to the *NAS Gateway 500 Administrator's Guide*. If the firmware is back-level, download the latest firmware from CORE or the Web. (Refer to the *NAS Gateway 500 Administrator's Guide*.)

Chapter 12. Parts information

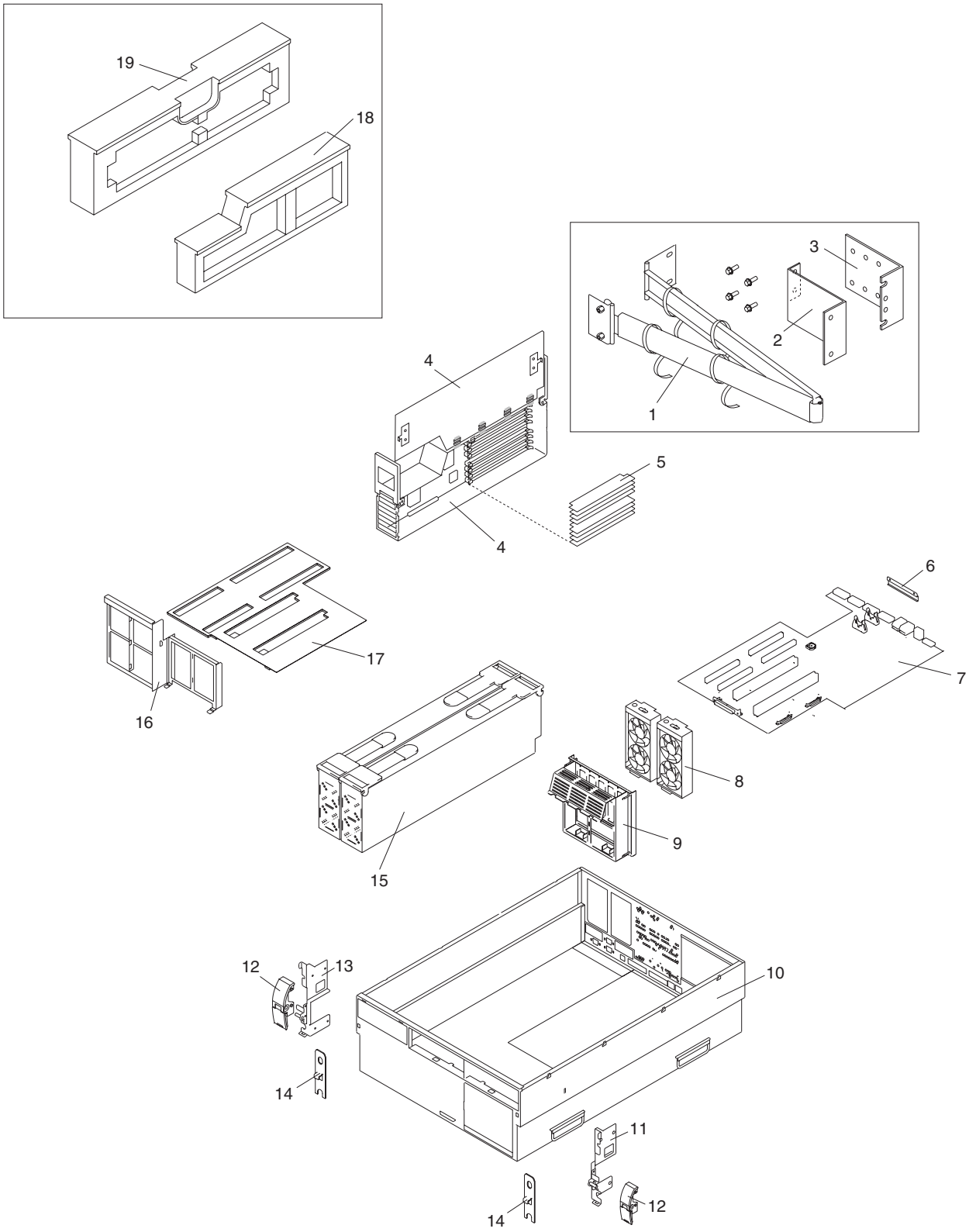
This chapter contains parts information for the NAS Gateway 500, identifying field replacement units (FRUs) and customer replacement units (CRUs). A CRU can be exchanged by a customer; however, a FRU can only be replaced by a trained service representative.

System parts



Index number	FRU part number	CRU Yes/No	Units per assembly	Description
1	N/A	–	1	Service access cover (drawer)
2	09P5865	Yes	2	Processor cooling fans
3	80P2341	Yes	Up to 6	PCI-slot filler
4	N/A	–	–	Processor cooling fan cage and rear bulk head assembly
5	00P3055	Yes	1	1-port Ethernet SX PCI adapter
	00P4289	Yes	1	2-port Ethernet TX PCI adapter
	00P4290	Yes	1	2-port Ethernet SX PCI adapter
	00P4297	Yes	1	1-port fibre-channel adapter
	00P4501	Yes	1	1-port Ethernet TX PCI adapter
	18P8863	Yes	1	2-port fibre-channel adapter
6	00P6402	No	1	Six-slotted PCI riser card
7	N/A	–	–	Chassis
8	00P4988	Yes	1	Right rack extension rail
9	80P2349	Yes	1	Diskette drive cage
10	76H4091	Yes	1	Diskette drive
	02K3488	Yes	1	Diskette drive
11	18P8796	Yes	1	Cover, rack front
12	80P2951	Yes	1	IDE CD-ROM
13	00P3210	No	1	Operator panel
14	00P2797	Yes	2	Media carrier trays
15	00P4989	Yes	1	Left rack extension rail
16	00P4133	Yes	1	Media device support shelf
17	09P3915	Yes	2	Disk drives (2 pack)
18	00P4132	No	1	Disk drive cage/backplane assembly
19	00P2799	Yes	6	PCI plastic light pipe and air flow separators
20	00P2800	Yes	6	PCI card lock assemblies

System parts, continued

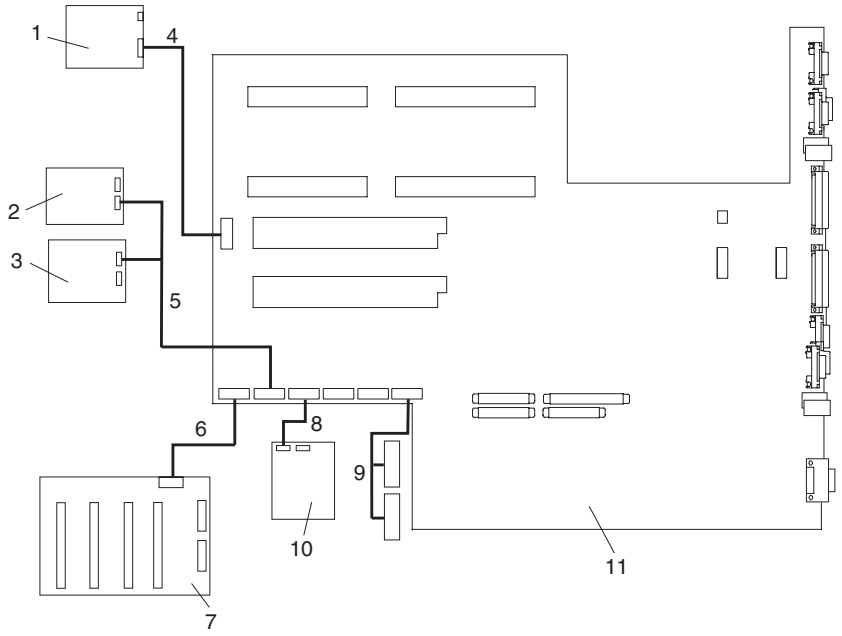


Index number	FRU part number	CRU Yes/No	Units per assembly	Description
1	21P4312	Yes	1	Cable management arm assembly
2	00P2806	Yes	1	Cable carrier support bracket
3	00P2807	Yes	1	Rack flange mounting bracket
4	00P2736	Yes	Up to 2	Processor assembly, 1.45 GHz, 2-way
5	53P3226	Yes	Up to 16	512-MB DIMMs
	53P3230	Yes	Up to 16	1-GB DIMMs
	53P3232	Yes	Up to 16	2-GB DIMMs
6	00P3203	Yes	1 per RIO connector	RIO connector cover
7	00P5830	No	1	CEC backplane
8	00P5866	Yes	2 units	PCI cooling fans (2 fans per unit)
9	N/A	–	1	Internal cable management bracket
10	N/A	–	1	Chassis
11	00P4134	Yes	1	Right release latch bracket
12	09P5907	Yes	2	Release latch
13	00P4135	Yes	1	Left release latch bracket
14	00P2805	Yes	2	Latch mounting bracket
15	00P5692	Yes	Up to 2	Power supply
16	N/A	–	–	Front power supply and processor assembly support bracket
17	N/A	–	–	Plastic separator
18	09P5893	Yes	1	Processor filler
19	09P5892	Yes	1	Power supply filler

System internal cables

The following diagrams show the system cable connections. The first diagram illustrates the routing of the internal power cables. The second diagram illustrates the routing of the signal cables.

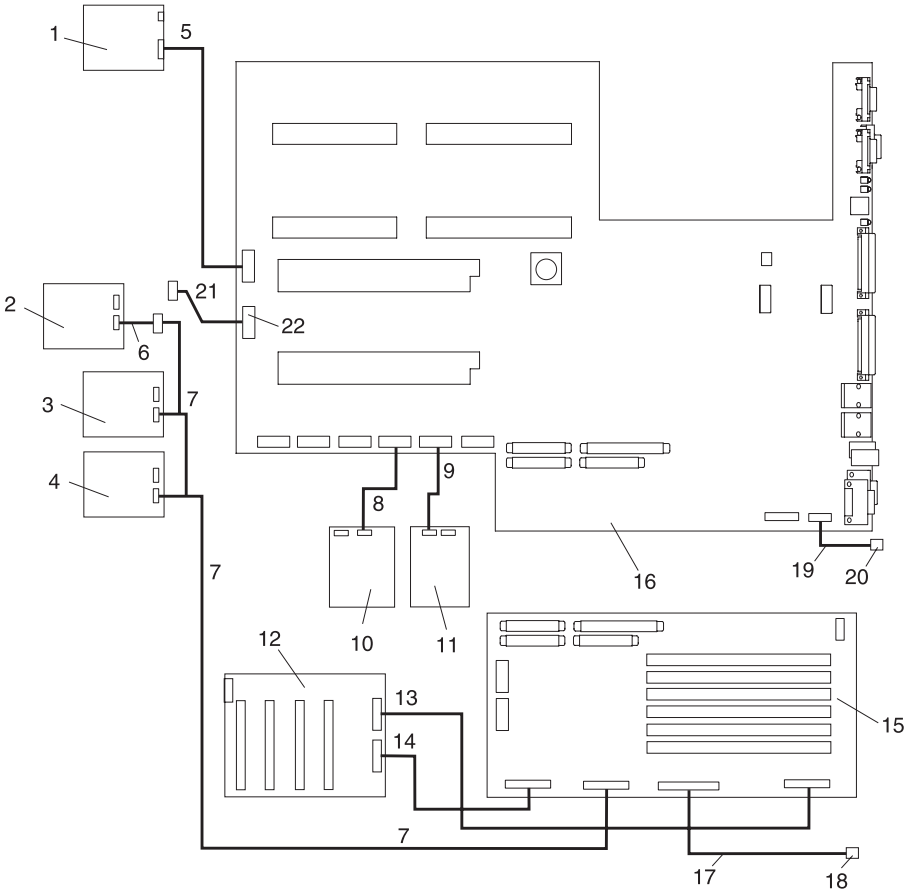
Internal power cable routing diagram



Index number	FRU part number	CRU Yes/No	Units per assembly	Description
1	00P3210	No	1	Operator panel
2	80P2951	Yes	1	IDE CD-ROM
3	N/A	–	–	SCSI media device
4	09P5870	No	1	CEC backplane to operator panel signal and power cable
5	09P5867	Yes	1	2-drop media power cable from CEC backplane to IDE CD-ROM and other SCSI media devices
6	09P5888	Yes	1	CEC backplane to DASD backplane power cable
7	00P4132	Yes	1	Disk drive backplane
8	09P5864	Yes	1	Diskette drive to CEC backplane power cable
9	09P5900	Yes	1	PCI cooling fans #3 and #4 power cable
10	76H4091	Yes	1	Diskette drive
	02K3488	Yes	1	Diskette drive
11	00P5830	No	1	CEC backplane

Note: For more information on power cables, go to “External AC power cables” on page 30.

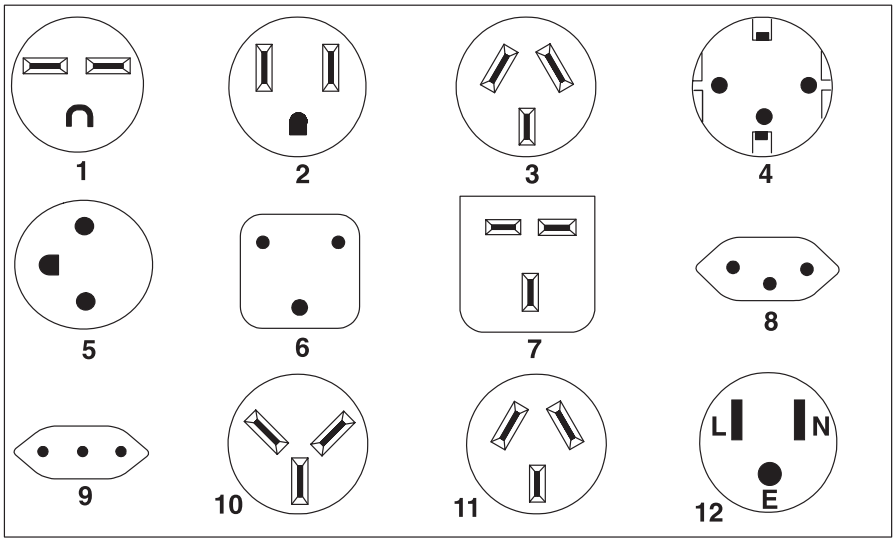
Internal signal cable routing diagram



Index number	FRU part number	CRU Yes/No	Units per assembly	Description
1	00P3210	No	1	Operator panel
2	N/A	–	–	SCSI media device (50-pin)
3	N/A	–	–	SCSI media device (68-pin)
4	N/A	–	–	SCSI media device (68-pin)
5	09P5870	No	1	CEC backplane to operator panel signal and power cable
6	N/A	–	–	SCSI media 50-pin to 68-pin converter cable
7	N/A	–	–	Integrated SCSI media device cable
8	09P5863	Yes	1	CEC backplane connector to diskette drive signal cable
9	09P5868	Yes	1	CEC backplane to IDE CD-ROM signal cable
10	76H4091	Yes	1	Diskette drive
	02K3488	Yes	1	Diskette drive
11	80P2951	Yes	1	IDE CD-ROM
12	00P4132	Yes	1	Card FRU, DASD CCIN 28CE
13	09P5895	Yes	1	PCI riser card to disk drive backplane signal cable (50-pin)
14	09P5889	Yes	1	PCI riser card to disk drive backplane signal cable (68-pin)
15	00P6402	No	1	6-slotted PCI riser card
16	00P5830	No	1	CEC backplane
17	09P5869	Yes	1	PCI riser card to external SCSI signal cable

Index number	FRU part number	CRU Yes/No	Units per assembly	Description
18	N/A	-	-	External SCSI port
19	09P5899	No	1	CEC backplane to rack indicator signal cable
20	N/A	–	–	Rack indicator port
21	N/A	–	–	CEC backplane to debug port signal cable
22	N/A	–	1	Debug parallel port

Power cable



Index	Wall plug power Cord part number	PDU Power Cord P/N	Country or region
1	1838574	1838573	Bahamas, Barbados, Bolivia, Brazil, Canada, Costa Rica, Dominican Republic, El Salvador, Ecuador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Japan, Netherlands Antilles, Panama, Peru, Philippines, Taiwan, Thailand, Trinidad, Tobago, U.S.A., and Venezuela
2	86G7648	87G3880	Bahamas, Barbados, Bermuda, Bolivia, Brazil, Canada, Cayman Islands, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Japan, Korea (South), Mexico, Netherlands Antilles, Nicaragua, Panama, Peru, Philippines, Puerto Rico, Saudi Arabia, Suriname, Trinidad, Taiwan, U.S.A., and Venezuela
3	13F9940	13F9941	Argentina, Australia, and New Zealand
4	13F9979	13F9980	Abu Dhabi, Austria, Belgium, Bulgaria, Botswana, China (Macao S.A.R), Egypt, Finland, France, Germany, Greece, Iceland, Indonesia, Korea (South), Lebanon, Luxembourg, Netherlands, Norway, Portugal, Saudi Arabia, Spain, Sudan, Sweden, Turkey, and Yugoslavia
5	13F9997	13F9998	Denmark
6	14F0015	14F0016	Bangladesh, Burma, Pakistan, South Africa, and Sri Lanka
7	14F0033	14F0034	Bahrain, Bermuda, Brunei, Channel Islands, China (Hong Kong S.A.R), Cyprus, Ghana, India, Iraq, Ireland, Jordan, Kenya, Kuwait, Malawi, Malaysia, Nigeria, Oman, People's Republic of China, Qatar, Sierra Leone, Singapore, Tanzania, Uganda, United Arab Emirates (Dubai), United Kingdom, and Zambia
8	14F0051	14F0052	Liechtenstein and Switzerland
9	14F0069	14F0070	Chile, Ethiopia, and Italy
10	14F0087	14F0088	Israel
11	6952291	–	Paraguay, Colombia, and Uruguay
12	49P2110	–	Brazil
–	–	36L8861	AC power cable, (power distribution bus to AC power supply)

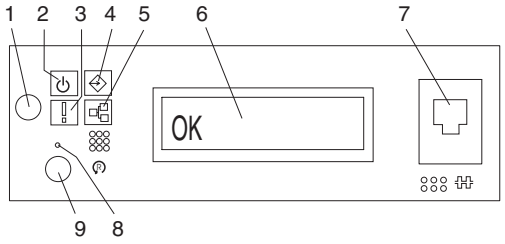
Chapter 13. Using the system

Reading the operator panel display

The operator panel display is used to:

- Track the progress of the system unit self-tests and configuration program
- Display codes when the operating system comes to an abnormal end
- Display system messages

Operator panel



1 Power-on button
2 Power-on LED
3 Attention LED
4 SCSI port activity
5 Ethernet port activity
6 Operator panel display
7 (FS1) Front serial connector (RJ-48 connector)
8 Service processor reset switch (pinhole)
9 System reset button

Number	Component name	Component description
1	Power-on button	Turns the system power on and off.
2	Power-on LED	Blinking - When connected to the power source (system is in standby mode). Solid - When power button has been pressed. **Note:** There is approximately a 40-second transition period from the time the power button is pressed until the power LED goes from blinking to on solid. During the transition period, you might observe the blinking intervals accelerate.
3	Attention LED	Normal state - LED is off.
4	SCSI port activity	Normal state - LED is on when there is SCSI activity.
5	Ethernet port activity	Normal state - LED is on when there is Ethernet activity.
6	Operator panel display	Displays current status of system startup, or diagnostic information in the event of a hardware problem.
7	Front serial connector (FS1)	Serial port uses RJ-48 connector. Use to plug in the console at the front of the system unit.
8	Service processor reset switch (pinhole)	Service personnel use
9	System reset button	Resets the system

System attention LED

The system attention LED on the operator panel is turned on when an entry is made in the service processor error log that gets transmitted to the system-level error logs. When the attention light comes on, examine these error logs to see if user intervention is required.

If a hardware problem is indicated, call service support. If no intervention is required, the system attention LED can be turned off by one of the following methods:

Resetting the system attention LED

As a user with root authority, type `diag` on the command line, and do the following:

1. Select **Task Selection**.
2. On the Task Selection Menu, select **Identify and Attention Indicators**.
3. When the list of LEDs is displayed, use the cursor to highlight **Set System Attention Indicator to Normal**.
4. Press Enter, and then press F7 to commit. This action turns off the LED.

If the system is powered off, access the service processor menus. From the service processor main menu, do the following:

1. Select **System Information Menu**.
2. Select **LED Control Menu**.
3. Select **Clear System Attention Indicator**. This action turns off the LED.

Component LEDs

Individual LEDs are located on or near the failing components. The LEDs are located either on the component itself or on the carrier of the component (for example, memory card, fan, memory module, CPU). LEDs are either green or amber.

Green LEDs indicate either of the following:

- Electrical power is present.
- Activity is occurring on a link. (The system could be sending or receiving information.)

Amber LEDs indicate a fault or identify condition. If your system or one of the components on your system has an amber LED turned on or blinking, identify the problem and take the appropriate action to restore the system to normal.

The following sections identify the location, color and status of your system component LEDs.

LEDs visible from the front of the NAS Gateway 500

Table 20. LEDs visible from the front of the NAS Gateway 500

Location	Name	Color	Notes
Operator panel	Power indicator	Green	When flashing, the unit is in standby. Pressing the power-on button causes the unit to begin powering up. This LED turns to solid green in approximately 40 seconds.
	Attention indicator	Amber	The service processor has recorded an entry in the error log.
	Activity indicator	Green	Flashed when activity on any SCSI device (HDD in the drive bay or a device on the external SCSI connector on back of unit).
	Ethernet indicator	Green	Flashed when activity on either of the two 10/100 ports on the back of the unit.
CD-ROM drive	Activity	Green	Flashes during activity, including power on and disk seek.
Floppy drive	Activity	Green	Solid during activity, including power on and disk seek.
Power supply (behind the vent holes in the front bezel)	AC indicator	Green	If the AC power switch is turned on, the LED comes on solid green.
	DC indicator	Green	When flashing, the unit is in standby mode. Pressing the power-on button causes the unit to begin powering up. This LED turns to solid green in approximately 10 seconds.
	Fault indicator	Amber	If on, replace the power supply. The power supply can be removed with the power on.
Hard disk drive (behind the vent holes in the front bezel)	Activity	Green	If on, it indicates normal disk activity.
	Identify	Amber	If on, it identifies which disk has a problem or needs to be replaced.

LEDs visible from the back of the NAS Gateway 500

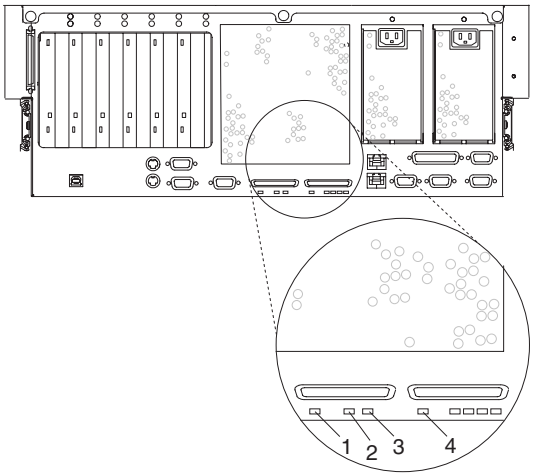
Table 21. LEDs visible from the back of the NAS Gateway 500

Location	Name	Color	Notes
First LED from the left below RIO connector 0	RIO-G 0 identify indicator	Amber	Not supported
Second LED from the left below RIO connector 0	System drawer back power indicator	Green	When flashing, the unit is in standby. Pressing the power-on button causes the unit to begin powering up. This LED turns to solid green in approximately 40 seconds.
Third LED from the left below RIO connector 0	System drawer back attention indicator	Amber	The service processor has recorded an entry in the error log.
First LED from the left below RIO connector 1	RIO-G 1 identify indicator	Amber	Not supported
First LED from the right below RIO connector 1	Ethernet 1 connector mode indicator	Green	10 Mbps – Off 100 Mbps – On
Second LED from the right below RIO connector 1	Ethernet 1 connector activity indicator	Green	On – Receiving information Off – Not receiving information

Table 21. LEDs visible from the back of the NAS Gateway 500 (continued)

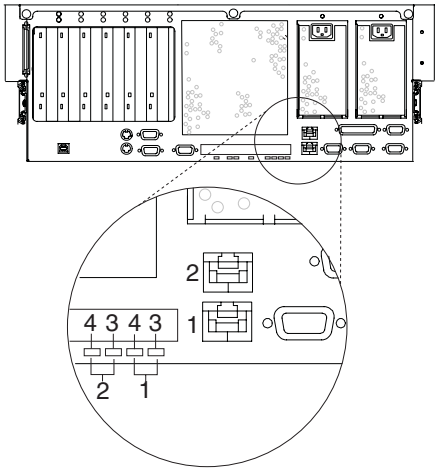
Location	Name	Color	Notes
Third LED from the right below RIO connector 1	Ethernet 2 connector mode indicator	Green	10 Mbps – Off 100 Mbps – On
Fourth LED from the right below RIO connector 1	Ethernet 2 connector activity indicator	Green	On – Receiving information Off – Not receiving information

See the following illustration for RIO connector LED location details.



1 RIO-G 0 identify LED
2 System drawer back power LED
3 System drawer back attention LED
4 RIO-G 1 identify LED

See the following illustration for Ethernet LED location details.



1 Ethernet 1 connector and LED
2 Ethernet 2 connector and LED
3 Mode
4 Activity

LEDs visible from the top of the NAS Gateway 500 with the top cover removed

Table 22. LEDs visible from the top of the NAS Gateway 500 with the top cover removed

Location	Name	Color	Notes
Power supply	AC indicator	Green	If the AC power-on button is pressed, the LED comes on solid.
	DC indicator	Green	When flashing, the unit is in standby. Pressing the power-on button causes the unit to begin powering up. This LED turns to solid green in approximately 40 seconds.
	Fault indicator	Amber	If on, replace the power supply. The power supply can be removed with the power on.
Fan 1	Fault indicator	Amber	If on, replace fan. This can be done with the power on.
Fan 2	Fault indicator	Amber	If on, replace fan. This can be done with the power on.
Fan 3	Fault indicator	Amber	If on, replace fan. This can be done with the power on.
Fan 4	Fault indicator	Amber	If on, replace fan. This can be done with the power on.
Processor board	M8	Amber	If on, power down the system and remove the processor board. After you have removed the processor board, you can replace the DIMM.
	M7	Amber	
	M6	Amber	
	M5	Amber	
	M4	Amber	
	M3	Amber	
	M2	Amber	
	M1	Amber	
	! processor board	Amber	If on, power down the system and replace the processor board.
CEC backplane (between the two processor books toward the front of the backplane)	CEC backplane	Amber	It identifies the location of the CEC backplane.
PCI riser card	PCI riser card	Amber	It identifies the location of the PCI riser card.
PCI-X adapter slot dividers (next to the PCI-X adapter slots; also visible from the back of the NAS Gateway 500)	PCI-X divider	Green	If on, a card is plugged into the slot. If off and the amber LED is blinking, it identifies which card requires repair.
		Amber	If blinking and the green LED is on, it identifies the card location. If blinking and the green LED is off, it identifies which card requires repair.

LEDs visible on the back of the PCI-X adapter cards

Table 23. LEDs visible on the back of the PCI-X adapter cards

Location	Name	Color	Notes
FC 5706 FC 5701	Activity	Green	Link is active.
		Green blinking	Data activity
	Link speed	Off	10 Mbps
		Green	100 Mbps
		Orange	1000 Mbps
FC 5707 FC 5700	Unlabeled	Off	No link, no activity
		Green on	Link, no activity
		Green flashing	Link, activity
FC 6240 FC 6239 **Note:** FC 6239 is labelled 5704 on the back PCI bracket.	Two LEDs, one yellow and one green, are encoded to indicate various adapter states. The slow blink rate is one blink per second. The fast blink rate is four blinks per second. Flashing reflects program activity and might appear to be irregular.	Green off Yellow off	The adapter is dead.
		Green off Yellow on	The adapter is dead (POST error).
		Green off Yellow slow blink	Wake-up failure monitor
		Green off Yellow fast blink	POST failure
		Green off Yellow flashing	POST in progress
		Green on Yellow off	Failed while functioning
		Green off Yellow on	Failed while functioning
		Green on Yellow slow blink	1-Gbps link rate Normal – link up
		Green on Yellow fast blink	2-Gbps link rate Normal – link up
		Green slow blink Yellow off	Normal – link down
		Green slow blink Yellow slow blink	Offline from download
		Green slow blink Yellow fast blink	Restricted offline mode, waiting for restart
		Green slow blink Yellow flashing	Restricted offline mode, test active
		Green slow blink Yellow off	Debug monitor in restricted mode
		Green fast blink Yellow slow blink	Debug monitor in test fixture mode
		Green fast blink Yellow fast blink	Debug monitor in remote debug mode

Appendix A. Getting help, service, and information

If you need help, service, technical assistance, or just want more information about IBM products, you will find a wide variety of sources available from IBM to assist you.

IBM maintains pages on the World Wide Web where you can get information about IBM products and services and find the latest technical information.

Table 24 lists some of these pages.

Table 24. IBM Web sites for help, services, and information

www.ibm.com	Main IBM home page
www.ibm.com/servers/storage	IBM Storage home page
www.ibm.com/servers/storage/support/	IBM Support home page
publib.boulder.ibm.com/tividd/td/tdprodlist.html#S	IBM Tivoli documentation page

Services available and telephone numbers listed are subject to change without notice.

Service support

With the original purchase of the NAS Gateway 500 system, you have access to extensive support coverage.

Hardware support

Expert technical-support representatives are available to assist you with questions you might have on the following:

- Arranging for service
- Arranging for overnight shipment of customer-replaceable parts

The following services are available during the warranty period:

- Problem determination: Trained personnel are available to assist you with determining if you have a problem and deciding what action is necessary to fix the problem.
- IBM hardware repair or replacement: If the problem is determined to be caused by IBM hardware covered by warranty labor, trained service personnel are available to provide the applicable level of service. If the problem is determined to be caused by IBM hardware covered by warranty parts only, IBM service parts are available.
- Engineering change management: Occasionally, there might be changes that are required after a product has been sold. IBM or your reseller, if authorized by IBM, will make Engineering Changes (ECs) available that apply to your hardware.

Be sure to retain your proof of purchase to obtain warranty service.

A console is required for many service activities. The NAS Gateway 500 is “headless”. Before you have the NAS Gateway 500 serviced, be sure a console is available.

The following items are not covered:

- Replacement or use of non-IBM parts or nonwarranted IBM parts

  Note: All warranted parts contain a 7-character identification in the format IBM FRU XXXXXXX.
- Identification of software problem sources
- Configuration of BIOS as part of an installation or upgrade

- Changes, modifications, or upgrades to device drivers
- Installation and maintenance of network operating systems (NOSs)
- Installation and maintenance of application programs

Refer to your IBM hardware warranty for a full explanation of IBM's warranty terms.

Software support

The software license for the NAS Gateway 500 Product includes one year of Software Maintenance in the price of the license. At the end of the existing Software Maintenance, you must renew your Software maintenance agreement or you are no longer be entitled to software support. There are 1 year and 3 year renewal options available.

The following technical support is received with Software Maintenance Warranty:

- Telephone access or electronic access by the Web (where available) to an IBM Support Center
- Support for routine, short duration installation and usage (*how-to*) questions
- Code-related problems
- Access to hints, tips, and frequently asked questions
- Access to escalation management 24 hours per day, seven days a week
- Ability to authorize any number of knowledgeable IS technical staff who can submit problems to IBM Support Centers on your behalf

Refer to your IBM software maintenance agreement for a full explanation of IBM's warranty terms.

Before you call for service

Some problems can be solved without outside assistance, by using the online help, by looking in the online or printed documentation that comes with your NAS Gateway 500, or by consulting the support Web page noted in Table 24 on page 389. Also, be sure to read the information in any README files that come with your software.

Your NAS Gateway 500 comes with documentation that contains troubleshooting procedures and explanations of error messages. The *IBM TotalStorage NAS Gateway 500 Service Guide* also contains information about the diagnostic tests you can perform.

A directly-attached, customer-supplied modem or a console are required to perform initial problem determination and problem source identification.

If you suspect a software problem, consult the support Web page noted in Table 24 on page 389.

Getting customer support and service

Purchasing a NAS Gateway 500 entitles you to standard help and support during the warranty period. If you need additional support and services, a wide variety of extended services are available for purchase.

Getting help online: www.ibm.com/storage/support

Be sure to visit the support page that is specific to your hardware, complete with FAQs, parts information, technical hints and tips, technical publications, and downloadable files, if applicable. This page is at:

www.ibm.com/servers/storage/support

Getting help by telephone

During the IBM product hardware or software warranty period, you may call the IBM Support Center (1 800 426-7378 in the U.S.) for product assistance covered under the terms of the IBM hardware or software warranty.

If possible, be at your NAS Gateway 500 when you call. Have the following information ready when you call:

- Machine type and model
- Serial number of your IBM hardware products, or your proof of purchase
- Description of the problem
- Exact wording of any error messages
- Hardware and software configuration information

Note: The more information you can provide, the better. Appendix D, “PD data collection worksheets”, on page 421 has blank worksheets which you are free to copy and complete to enable you to gather all pertinent information.

In the U.S. and Canada, these services are available 24 hours a day, 7 days a week. In the U.K., these services are available Monday through Friday, from 9:00 a.m. to 6:00 p.m. In all other countries, contact your IBM reseller or IBM marketing representative.[1]

1. Response time will vary depending on the number and complexity of incoming calls.

Appendix B. Modem configurations

Attention: This appendix applies only to modems attached to serial port S2 located on the CEC backplane (location U0.1-P1).

The service processor and Electronic Service Agent are designed to place little demand on an attached modem, thereby increasing the setup and connection success rates.

Modem setup

This section describes how to configure the IBM modems recommended for use with the Electronic Service Agent and the service processor.

The recommended modems are:

- 7852 Model 400
- 7857-017 or 7858-336

Note: You can use a non-recommended modem. The Electronic Service Agent configuration has an extensive selection of modems from which you can choose, while the service processor allows you to customize a configuration modem file if your modem is not listed in its directory. If the Electronic Service Agent and the service processor are to use the same modem, and you are not using one of the recommended modems, you must choose a modem from the Electronic Service Agent modem list. Then you must customize a configuration modem file in service processor that best fits the modem you are using for the Electronic Service Agent and service processor.

This appendix contains sample modem configuration files that either work directly with your modem or provide a starting point for a custom setup. The sample modem configuration files are located in your service processor firmware in the **/usr/share/modems** subdirectory with the following names. A listing of each file is included in this appendix.

Specific modem configuration files

AIX file name	Service processor firmware file name
modem_m0.cfg	modem_m0_sp
modem_m1.cfg	modem_m1_sp

Generic modem configuration files

AIX file name	Service processor firmware file name
modem_z.cfg	modem_z_sp
modem_z0.cfg	modem_z0_sp
modem_f.cfg	modem_f_sp
modem_f0.cfg	modem_f0_sp
modem_f1.cfg	modem_f1_sp

Use the following selection procedures and your modem manual to determine which of the configuration files is suitable for your use.

Configuration file selection

Use the following steps to select a configuration file:

1. Is your modem an IBM 7852-400?

   If Yes, use “Configuring the 7852-400 Modem” to set DIP switches on the modem and use modem configuration file modem_m0.cfg and then go to step 3.

   Note: The IBM 7852-400 modem has DIP switches on the right side of the unit. See “IBM 7852-400 DIP switch settings” on page 396 for the correct switch settings.

   If No, go to “Generic configuration file selection” on page 396.
2. Is your modem an IBM 7857-017? If Yes, use “Configuring the 7857-017 or 7858-336 Modem”, use modem configuration file **modem_m1.cfg**, and go to step 3.

   Note: The IBM 7857-017 modem has two telephone line connections on the back of the unit. One is marked **LL** (for leased line), and the other is marked **PTSN** (for Public Telephone Switched Network). The Electronic Service Agent and the service processor expect to use the modem on the public network, so the telephone line should attach to the PTSN connector.

   If No, go to “Generic configuration file selection” on page 396.
3. You have completed the modem configuration.

Configuring the 7852-400 Modem

The 7852 Model 400 is one of the recommended modem choices for the Electronic Service Agent and service processor. From the factory, there are DIP switches on the side of the modem that need to be set to make the asynchronous mode the default mode. Switch 12 needs to be set to the off (down) position for asynchronous mode. Switch 11 needs to be set to the on (up) position to enable AT Responses. If you wish to enable the auto-answer capability of the 7852-400 modem to perform remote dial-in to the NAS Gateway 500, Switch 5 needs to be set to the on (up) position to disable enable auto-answer. If your security requirements do not allow remote dial-in, switch 5 needs to be set to the on (up) position to enable auto-answer. If your security requirements do not allow remote dial-in, switch 5 needs to be set to the off (down) position to disable auto-answer. See “IBM 7852-400 DIP switch settings” on page 396 for proper setting of switches.

To set up and initialize the 7852-400 for operation:

1. Set switches 5, 11 and 12 to their appropriate position.
2. Connect the RS232 cable to the modem and to a serial port.
3. Connect the telephone cable (sent with the modem) to the modem connector labeled LINE (middle connector), and to the telephone wall jack.
4. Connect the modem power cable to the modem and the transformer to the building power.
5. Power-on the modem (switch in rear).

Configuring the 7857-017 or 7858-336 Modem

The 7857 is also a recommended modem for the Electronic Service Agent. The 7858-336 is the replacement modem for the 7857. These procedures aid in the proper configuration of the 7857-017 or 7858-336, or set a known configuration state.

To set up and initialize the 7857-017 or 7858-336 for operation:

1. Connect the RS232 cable to the modem and to a serial port.
2. Connect the telephone cable (sent with the modem) to the modem connector labeled PSTN, and to the telephone wall jack.
3. Connect the modem power cable to building power.
4. Power-on the modem.

5. Wait for the main display panel.

Use the following procedure to place the modem in a known configuration. After the modem is powered on and local tests have completed, there should be two lines of configuration information displayed on the modem LCD screen.

1. Press ↓ 12 times until the CONFIGURATIONS message is displayed.

   ```
   CONFIGURATIONS D12
   ```

2. Press → until the Select Factory message is displayed.

   ```
   CONFIGURATIONS D12

   Select Factory
   ```

3. Press **Enter** to select the Factory configuration option. Press ↑ until 0 is displayed.

   ```
   CONFIGURATIONS D12

   Select Factory 0
   ```

4. Press **Enter** to load the predefined factory configuration 0.

   ```
   IBM 7857 AT CMD aa ■
   td_ rd_ dsr_ ec ■ ll_
   ```

5. Press ↓ 7 times until the S-REGISTER message is displayed.

   ```
   S-REGISTER D7
   ```

6. Press → until the message Ring to answer on is displayed.

   ```
   S-REGISTER D7
   Ring to answ. On=2_
   ```

7. Press **Enter** to select Ring to answer on.

   ```
   S-REGISTER D7
   Ring to answ. On=_
   ```

8. Press ↑ until 0 is displayed.

   ```
   S-REGISTER D7
   Ring to answ. On=0
   ```

9. Press **Enter** to set Auto Answer to 0.

   ```
   S-REGISTER D7
   ```

10. Press ↓ key 5 times until the CONFIGURATIONS message is displayed.

    ```
    CONFIGURATIONS D12
    ```

11. Press → 3 times until the Store User Conf. message is displayed.

    ```
    CONFIGURATIONS D12
    Store User Conf._
    ```

12. Press **Enter** to select the Store User Configuration option. Press ↑ until 0 is displayed.

    ```
    CONFIGURATIONS D12
    Store User Conf. 0
    ```

13. Press **Enter** to select location 0.
14. Press **Enter** to save current configuration into User 0.

    ```
    CONFIGURATIONS D12
    ```

15. Press **Enter** to return to main display panel.

    ```
    IBM 7857 AT CMD aa_
    td_ rd_ dsr_ ec ■ ll_    ■ = Shows LCD as on.
    ```

The above set up places the 7857 or 7858 modem into the proper configuration for use with the Dialer that is used for the Electronic Service Agent and the service processor.

Note: The modem initialization strings provided are on an AS IS basis. Although they have been tested in a typical AIX environment they might have to be modified depending on the actual setup and configuration of your environment.

IBM 7852-400 DIP switch settings

If you are using a 7852-400 modem to enable Electronic Service Agent and service processor communications, for proper operation, the dual in-line package (DIP) switches must be set according to the following table:

Switch	Position	Function
1	Up	Force DTR
2	Up	Flow control &E4
3	Down	Result codes enabled
4	Down	Modem emulation disabled
5	Up	Auto answer enabled
6	Up	Maximum throughput enabled
7	Up	RTS normal functions
8	Down	Enable command mode
9	Down	Remote digital loopback test enabled
10	Up	Dial-up line enabled
11	*Up	AT responses enabled (extended responses disabled)
12	*Down	Asynchronous operation
13	Up	28.8-KB line speed
14	Up	
15	Up	CD and DSR normal functions
16	Up	2-wire leased line enabled
* Only switches 11 and 12 are changed from the factory default settings.		

Generic configuration file selection

1. Does your modem respond to the extended command set (prefixed with &)?
   - If Yes, go to step 3.
   - If No, continue with step 2.
2. Does your modem respond to:
   - ATZ reset command.

     Configuration file modem_z.cfg is recommended.
   - ATZn reset commands, where n can be 0, 1, and so on?

     Configuration file modem_z0.cfg is recommended.

   Go to step 5 on page 397.
3. Does your modem command set include a test for V.42 error correction at the remote modem (often called Auto-Reliable Mode)?
   - If Yes, disable this test. You can use sample configuration files **/usr/share/modem_m0.cfg** or **/usr/share/modem_m1.cfg** as models to help you create a file for your particular modem. Go to step 5.5 on page 397.
   - If No, go to step 4.
4. Does your modem respond to:
   - ATZ reset command.

     Configuration file modem_f.cfg is recommended.
   - ATZ*n* reset commands, where n can be 0, 1, and so on?

     Configuration file **modem_f0.cfg** or **modem_f1.cfg** is recommended, depending on which provides the hardware flow control profile.

5. You have completed selection of the configuration file. If your modem configuration selection is not available in the Service Processor Modem Configuration Menu, you must access it through the Configure Remote Maintenance Policy Service Aid. If you find it necessary to adjust any of these configuration files, use the manual provided with your modem to accomplish that task. It is recommended you select settings that enable hardware flow control and respond to DTR.

   Note: Some older modems do not respond to the **X0** or **&R1** commands. Edit the modem configuration file and delete these files if your modem does not respond to them. See the documentation that came with the modem you are using fro more information. Some modems, such as the IBM 7857-017, are not designed for the paging function. Although they can be used for paging, they return an error message when they do not get the expected response from another modem. Therefore, even though the paging was successful, the error message causes the service processor to retry, continuing to place pager calls for the number of retries specified in the Call-Out Policy Setup Menu. These retries result in redundant pages.

Examples for using the generic sample modem configuration files

The following table contains information to help you determine which modem configuration file to use with various modems.

Modem	Setup Z	Setup Z0 (rare)	Setup F	Setup F0	Setup F1
AT&T DataPort 2001 (Ring interrupt only on first ring)				X	
Bocamodem 1440E			X		
Hayes Smart Modem 300	X				
IBM 5841	X				
IBM 5843	X				
IBM 7851				X	
IBM 7852-10				X	
IBM 7855					X
USRobotics 36.6K Sportster					X
Zoom V.32			X		

Customizing the modem configuration files

You can create your own modem configuration files or modify the samples provided. After you customize your modem configuration files, you *must* access them through the Configure Remote Maintenance Policy Service Aid rather than from the service processor menus.

Note: If you have already set up your serial ports, line speeds, authorizations, and telephone numbers from the service processor menus, use the service aid to specify your customized modem configuration files.

If you have not already set up your serial ports, line speeds, authorizations, and telephone numbers from the service processor menus, use the service aids to set them while you specify your customized modem configuration files.

To disable Auto-Reliable Mode testing of the remote modem, use the sample modem configuration file **/usr/share/modems/modem_f.cfg** as a model that you can modify, as follows:

1. Find the necessary command in your modem manual.

2. Copy the **/usr/share/modems/modem_f.cfg** file to a new file with a different name (for example, **modem_fx.cfg**).
3. In the new file (**modem_fx.cfg**), change the line `Send "ATE0T\r"` to `Send "ATcccE0T\r"` where ccc is the added command as specified in your modem manual, as follows:

   Change the third line of each of the following stanzas:
   - `condout`
   - `condin`
   - `ripo`
4. Save the changes.

Xon/Xoff modems

Some early modems assume software flow control (Xon/Xoff) between the computer and the modem. Modems with this design send extra characters during and after the transmitted data. The service processor cannot accept these extra characters. If your configuration includes such a modem, your functional results might be unpredictable.

The sample modem configuration files included in this appendix do not support these modems, so custom configuration files are necessary. Anchor Automation 2400E is an example of such a modem.

If you experience unexplainable performance problems that might be due to Xon/Xoff characters, it is recommended that you upgrade your modem.

Ring detection

Most modems produce an interrupt request each time they detect a ring signal. Some modems generate an interrupt only on the first ring signal that they receive. AT&T DataPort 2001 is an example of such a modem.

The service processor uses the ring interrupt request to count the number of rings when Ring Indicate Power-On (RIPO) is enabled. If your modem produces an interrupt on only the first ring, set Ring Indicate Power-On to start on the first ring. Otherwise, you can choose to start Ring Indicate Power-On on any ring count.

Terminal emulators

The Electronic Service Agent and the service processor are compatible with simple ASCII terminals, and therefore, are compatible with most emulators. When a remote session is handed off from the service processor to the operating system, agreement between terminal emulators becomes important.

The NAS Gateway 500's operating system has some built-in terminal emulators. You might also have a commercially available terminal emulation. It is important that the local and host computers select the same or compatible terminal emulators so that the key assignments and responses match, ensuring successful communications and control.

For best formatting, choose line wrap in your terminal emulator setup.

Recovery procedures

Situations such as line noises and power surges can sometimes cause your modem to enter an undefined state. When it is being used for dial-in, dial-out or ring indicate power-on, your modem is initialized each time one of these actions is expected. If one of these environmental conditions occurs after your modem has been initialized, it might be necessary to recover your modem to a known state.

If your modem communicates correctly with remote users, it is probably in control. It might be wise to occasionally change some of the functional settings and then change them back, just for the sense of security that the modem is communicating, and to ensure that it has been initialized recently.

If your system is particularly difficult to access physically, another strategy is to protect it with an Uninterruptible Power Source (UPS) and a phone-line surge protector.

If recovery becomes necessary, shut down your system using established procedures. Disconnect the power cable and press the power button to drain capacitance while power is disconnected. Disconnect and reconnect modem power, and then reconnect system power to completely reinitialize your system.

Transfer of a modem session

Because many modem command variations exist, the sample modem configuration files located at the end of this appendix have been written to capture the largest number of workable modem settings.

The modem command **&Dn** (where *n* is a number) generally sets the modem response to the Data Terminal Ready (DTR) signal from the server's serial port. The intended response is that the modem holds a connection while DTR is enabled and drops the connection when DTR is released. Using this mechanism, the server hangs up on a connection under normal conditions.

Consult your modem manual for its specific response scheme for the **&Dn** command.

Two strategies are available for dealing with the modem's response to DTR:

- Recovery
- Prevention

Before you use one of these strategies, determine if your server's modem is set up correctly to respond to DTR.

With the remote terminal connected to serial port 2 and defined as the Primary Console Device, there are two tests that you can perform:

1. Will the modem drop the connection after the remote terminal displays the `System initialization complete` message?

   If Yes, the modem is set up correctly.

   If No, try another **&Dn** setting for your server's modem. See your modem manual for this information. The **&Dn** command appears in three places each in three of the sample modem configuration files (see "Modem configuration sample files" on page 401).
2. Does the server's modem disconnect when the power drops? You can make this observation at the remote terminal by commanding your server to shut down and power off. (Use the command **shutdown -F**.) Watch for the message `NO CARRIER` on your remote terminal.

   If Yes, this is the correct response. The modem is set up correctly.

   If No, try another **&Dn** setting for your server's modem. See your model manual for this information. The **&Dn** command appears in three places each in three of the sample modem configuration files. Only the following sample modem configuration files contain the **&Dn** command (in three places each):
   - modem_f.cfg
   - modem_f0.cfg
   - modem_f1.cfg

   If you are using modem_z.cfg or modem_z0.cfg, you cannot control DTR response. If your remote terminal does not disconnect after logging off, you must command the remote terminal emulator to hang up. This then breaks the connection.

Recovery strategy

The recovery strategy consists of making two calls to establish a remote session. This solution is the easiest to implement and allows more freedom for configuring the NAS Gateway 500's serial ports.

To set up a remote terminal session, dial into the service processor and start the NAS Gateway 500. After the operating system is loaded and initialized, the connection is dropped. At this point, call the NAS Gateway 500 and the operating system answers and offer you the login prompt.

Prevention strategy

The disconnect is caused by the operating system when it initializes the Primary Console. The tests listed in “Transfer of a modem session” on page 399 are conducted with the remote terminal selected as the primary console to manifest the modem’s response to DTR transitions. If a console is to be a permanent part of the NAS Gateway 500, then make it the primary console. Your remote terminal is no longer experiencing the connection loss.

Modem configuration sample files

Sample file modem_m0.cfg

```
#
# COMPONENT_NAME: (ESPSETUP) ENTRY SERVICE PROCESSOR SETUP: modem_m0
#
# FUNCTIONS: Modem configuration file specifically for IBM 7852-400
#  modem with Auto-Reliable feature.  This feature must be turned off
#  for Catcher calls.  This example uses the AT&F reset command to
#  choose the factory defaults.
#
# (C) COPYRIGHT International Business Machines Corp. 1996
# All Rights Reserved
# Licensed Materials - Property of IBM
#
# US Government Users Restricted Rights - Use, duplication or
# disclosure restricted by GSA ADP Schedule Contract with IBM Corp.
#
#
# The modem has configuration switches.  They should be set to the
# factory default settings, except switches 11 and 12.  These must be
# to UP ("AT" responses) and DOWN (Asynchronous operation), respectively.

ICDelay 1
DefaultTO 10
CallDelay 120
#
#  %N  Call-Out phone number    %R   Return phone number
#
#
# PROGRAMMING NOTE: No blanks between double quote marks (").

condout:    send "AT&F&E2E0T\r"                 # Reset to factory defaults
                                                # Reliable mode
                                                # Echo off
            ignore "0\r" or "OK\r\n" timeout 2  # Ignore modem response.
            send "AT&E12&E14\r"                 # Disable pacing
                                                # Disable data compression
            expect "0\r" or "OK\r\n" timeout 2  # Confirm commands successful.
            send "AT&SF1&S0S9=1\r"              # DSR independent of CD
                                                # Force DSR on.
                                                # CD respond time=100ms
            expect "0\r" or "OK\r\n" timeout 2  # Confirm commands successful.
            send "ATV0S0=0\r"                   # Numeric response code
                                                # Auto-Answer off
            expect "0\r" or "OK\r\n" timeout 2  # Confirm commands successful.
            done

connect:    send "ATDT%N\r"                     # Tone dialing command.
                                                # %N from Call Home setup.
                                                # Expect a connection response.
            expect "33\r" or "31\r" or "28\r" or "26\r" or "24\r" or "21\r" or
"19\r" or "13\r" or "12\r" or "1\r" busy "7\r"
            timeout 60
            done

retry:      send "A/"                           # Repeat the previous command.
                                                # Expect a connection response.
            expect "33\r" or "31\r" or "28\r" or "26\r" or "24\r" or "21\r" or
```

```
"19\r" or "13\r" or "12\r" or "1\r" busy "7\r"
            timeout 60
            done

 disconnect:
            delay 2                             # Separate from previous data.
            send "+++"                          # Assure command mode.
            delay 2                             # Allow mode switching delay.
            send "ATH0T\r"                      # Set modem switch-hook down
                                                #  (i.e., hang up).
            ignore "0\r" or "OK\r" timeout 2    # Ignore modem response.
            send "ATE0Q1\r"                     # Initialize modem: Echo OFF,
                                                #  Disable responses.
            ignore "0\r" timeout 1
            done

 condin:    send "AT&F&E2E0T\r"                 # Reset to factory defaults.
                                                # Reliable mode
                                                # Echo off
            ignore "0\r" or "OK\r\n" timeout 2  # Ignore modem response.
            send "AT&E12&E14\r"                 # Disable pacing
                                                # Disable data compression
            expect "0\r" or "OK\r\n" timeout 2  # Confirm commands successful
            send "AT&SF1&S0S9=1\r"              # DSR independent of CD.
                                                # Force DSR on.
                                                # CD respond time=100ms
            expect "0\r" or "OK\r\n" timeout 2  # Confirm commands successful.
            send "ATV0S0=2\r"                   # Numberic response code
                                                # Answer on 2nd ring
            expect "0\r" timeout 2              # Confirm commands successful.
            done

 waitcall:  ignore "2\r" timeout 1              # Ignore first ring.
            expect "2\r" timeout 10             # Pickup 2nd ring or timeout
                                                # Expect a connection response.
            expect "33\r" or "31\r" or "28\r" or "26\r" or "24\r" or "21\r" or
"19\r" or "13\r" or "12\r" or "1\r" busy "7\r"
            timeout 60
            done

 page:      send "ATDT%N,,,,%R;\r"              # %N = pager call center number
                                                # Add enough commas to wait for
                                                #  time to enter paging number.
                                                # %R = paging number
            expect "0\r" timeout 60             # Confirm successful command.
            delay 2                             # Wait before hanging up.
            send "ATH0\r"                       # Hang up.
            expect "0\r" timeout 2              # Confirm successful command.
            done

 ripo:      send "AT&F&E2E0T\r"                 # Reset to factory defaults.
                                                # Reliable mode
                                                # Echo off
            ignore "0\r" or "OK\r\n" timeout 2  # Ignore modem response.
            send "AT&E12&E14\r"                 # Disable pacing
                                                # Disable data compression
            expect "0\r" or "OK\r\n" timeout 2  # Confirm successful command.
            send "AT&SF1&S0S9=1\r"              # DSR independent of CD.
                                                # Force DSR on.
                                                # CD respond time=100ms
```

```
            expect "0\r" or "OK\r\n" timeout 2  # Confirm commands successful.
            send "ATV0S0=0\r"                   # Numeric response code
                                                # Auto Answer OFF
            expect "0\r" timeout 2              # Confirm commands successful.
            done                                #

error:                                          # Handle unexpected modem
                                                # responses.
            expect "8\r" or "7\r" or "6\r" or "4\r" or "3\r"
            delay 2
            done
```

Sample file modem_m1.cfg

```
#
# COMPONENT_NAME: (ESPSETUP) ENTRY SERVICE PROCESSOR SETUP modem_m1
#
# FUNCTIONS: Modem configuration file specifically for IBM 7857-017 modem with
#  Auto-Reliable feature.  This feature must be turned off for Catcher calls.
#  This example uses the AT&F reset command to choose the factory defaults.
#
#  To allow dial commands for digital pagers, it is necessary to reduce
#  the number of characters in the dial command.  Each comma (delay) has
#  been set to 6 seconds (S8=6) for that reason.
#
#
# (C) COPYRIGHT International Business Machines Corp. 1996
# All Rights Reserved
# Licensed Materials - Property of IBM
#
# US Government Users Restricted Rights - Use, duplication or
# disclosure restricted by GSA ADP Schedule Contract with IBM Corp.
#

ICDelay 1
DefaultTO 10
CallDelay 120
#
#  %N  Call-Out phone number    %R   Return phone number
#
#
# PROGRAMMING NOTE: No blanks between double quote marks (").

condout:    send "AT&F*E0E0\r"                  # Reset to factory defaults.
                                                # *E0=data compression disabled
                                                # E0=echo disabled
            ignore "0\r" or "OK\r\n" timeout 2  # Ignore modem response.
            send "AT#F0*Q2S8=6\r"               # Trellis modulation disabled
                                                # Retrain with adaptive rate
                                                # Set ,=6second
            expect "0\r" or "OK\r\n" timeout 2  # Confirm commands successful
            send "ATV0X0S0=0\r"                 # Numeric response code
                                                # AT compatible messages
                                                # Auto-Answer disabled
            expect "0\r" or "OK\r\n" timeout 2  # Confirm commands successful.
            done

connect:    send "ATDT%N\r"                     # Tone dialing command.
                                                # %N from Call Home setup.
            expect "1\r" busy "7\r" timeout 60  # Expect a connection response.
            done
```

```
retry:      send "A/"                           # Repeat the previous command.
            expect "1\r" busy "7\r" timeout 60  # Expect a connection response.
            done

disconnect:
            delay 2                             # Separate from previous data.
            send "+++"                          # Assure command mode.
            delay 2                             # Allow mode switching delay.
            send "ATH0\r"                       # Set modem switch-hook down
                                                #  (i.e., hang up).
            ignore "0\r" or "OK\r" timeout 2    # Ignore modem response.
            send "ATE0Q1\r"                     # Initialize modem: Echo OFF,
                                                #  Disable responses.
            ignore "0\r" timeout 1
            done

condin:     send "AT&F*E0E0\r"                  # Reset to factory defaults.
                                                # *E0=data compression disabled
                                                # E0=echo disabled
            ignore "0\r" or "OK\r\n" timeout 2  # Ignore modem response.
            send "AT#F0*Q2\r"                   # Trellis modulation disabled
                                                # Retrain with adaptive rate
            expect "0\r" or "OK\r\n" timeout 2  # Confirm commands successful
            send "ATV0X0S0=2\r"                 # Numeric response code
                                                # AT compatible messages
                                                # Answer on 2nd ring
            expect "0\r" timeout 2              # Confirm commands successful.
            done

waitcall:   ignore "2\r" timeout 1              # Ignore first ring.
            expect "2\r" timeout 10             # Pick up second ring
                                                #  or timeout.
                                                # Expect a connection response.
            expect "1\r" timeout 60
            done

page:       send "ATD%N,%R\r"                   # %N = pager call center number
                                                # commas=6sec wait time to
                                                #   enter paging number.
                                                # %R = return number
            expect "0\r" or "3\r" timeout 30    # Confirm successful command.
            delay 2                             # Wait before hanging up.
            send "+++"                          # Assure command mode.
            delay 2                             # Allow mode switching delay.
            send "ATH0\r"                       # Hang up.
            expect "0\r" timeout 2              # Confirm successful command.
            done

ripo:       send "AT&F*E0E0\r"                  # Reset to factory defaults.
                                                # *E0=data compression disabled
                                                # E0=echo disabled
            ignore "0\r" or "OK\r\n" timeout 2  # Ignore modem response.
            send "AT#F0*Q2\r"                   # Trellis modulation disabled
                                                # Retrain with adaptive rate
            expect "0\r" or "OK\r\n" timeout 2  # Confirm successful command.
            send "ATV0X0S0=0\r"                 # Numeric response code
                                                # AT compatible messages
                                                # Auto-Answer disabled
            expect "0\r" timeout 2              # Confirm commands successful.
```

```
            done                                    #

error:                                              # Handle unexpected modem
                                                    #  responses.
            expect "8\r" or "7\r" or "4\r" or "3\r"
            delay 2
            done
```

Sample file modem_z.cfg

```
#
# COMPONENT_NAME: (ESPSETUP) ENTRY SERVICE PROCESSOR SETUP Z
#
# FUNCTIONS: Modem configuration file for many early Hayes* compatible modems.
#  This example uses the ATZ reset command to choose the factory defaults.
#  This setup will work for many modems, but it is required for early vintage
#  modems which respond to neither the ATZ0 reset command nor the extended (&)
#  commands.  Refer to your modem manual.
#
# * Trademark of Hayes Microcomputer Products, Inc.
#
# (C) COPYRIGHT International Business Machines Corp. 1996
# All Rights Reserved
# Licensed Materials - Property of IBM
#
# US Government Users Restricted Rights - Use, duplication or
# disclosure restricted by GSA ADP Schedule Contract with IBM Corp.
#
#
# If the modem has configuration switches, they should be set to the
# factory default settings.

ICDelay 1
DefaultTO 10
CallDelay 120
#  AT  Attention Code             ,   Inserts delay in dialing commands
#  Z   Reset to factory defaults Q0   Turn on responses
#  E0  Turn echo off             Q1   Turn off responses
#  V0  Use numeric responses     S0=0 Automatic answer inhibit
# +++  Escape to command mode    S0=2 Answer on second ring
#  H0  Hang-up                   T =  Tone mode.  When used as T\r, it is a
#                                     no op to maintain program synchronization
#                                     when modem may/will echo the commands.
#
#  %N  Call-Out phone number    %P   Paging phone number
#  %S  Modem speed (available to users)
#
# Following are common responses from a wide range of modems:
# 16, 15, 12, 10, 5 and 1 are connection responses.  Add others as required.
# 7=busy; 6=no dial tone; 4=error; 3=no carrier; 2=ring; 0=OK
#
# PROGRAMMING NOTE: No blanks between double quote marks (").

condout:    send "ATZQ0T\r"                     # Reset to factory defaults.
            ignore "0\r" or "OK\r\n" timeout 2  # Ignore modem response.
            send "ATE0T\r"                      # Initialize modem: Echo OFF,
            expect "0\r" or "OK\r\n" timeout 2  #  Enable responses (Numeric),
            send "ATQ0V0T\r"                    #  Limit response codes.
            expect "0\r" timeout 2              # Confirm commands successful.
            send "ATS0=0\r"                     # Set AutoAnswer OFF
            expect "0\r" timeout 2              # Confirm command successful.
```

```
            done

connect:    send "ATDT%N\r"                     # Tone dialing command.
                                                # %N from Call Home setup.

                                                # Expect a connection response.
 expect "16\r" or "15\r" or "14\r" or "12\r" or "10\r" or "5\r" or "1\r" busy "7\r"
 timeout 60
            done

retry:      send "A/"                           # Repeat the previous command.

                                                # Expect a connection response.
 expect "16\r" or "15\r" or "14\r" or "12\r" or "10\r" or "5\r" or "1\r" busy "7\r"
 timeout 60
            done

disconnect:
            delay 2                             # Separate from previous data.
            send "+++"                          # Assure command mode.
            delay 2                             # Allow mode switching delay.
            send "ATH0T\r"                      # Set modem switch-hook down
                                                #  (i.e., hang up).
            ignore "0\r" or "OK\r" timeout 2    # Ignore modem response.
            send "ATE0Q1\r"                     # Initialize modem: Echo OFF,
                                                #  Disable responses.
            ignore "0\r" timeout 1
            done

condin:     send "ATZQ0T\r"                     # Reset to factory defaults.
            ignore "0\r" or "OK\r\n" timeout 2  # Ignore modem response.
            send "ATE0T\r"                      # Initialize modem: Echo OFF,
            expect "0\r" or "OK\r\n" timeout 2  #  Enable responses (Numeric),
            send "ATQ0V0T\r"                    #  Limit response codes.
            expect "0\r" timeout 2              # Confirm commands successful.
            send "ATS0=2\r"                     # Set AutoAnswer ON
            expect "0\r" timeout 2              # Confirm command successful.
            done

waitcall: ignore "2\r" timeout 1                # Ignore first ring.
          expect "2\r" timeout 10               # Pick up second ring
                                                #  or timeout.
                                                # Expect a connection response.
 expect "16\r" or "15\r" or "14\r" or "12\r" or "10\r" or "5\r" or "1\r"
 timeout 60
            done

page:       send "ATDT%N,,,,%R;\r"              # %N = pager call center number
                                                # Add enough commas to wait for
                                                #  time to enter paging number.
                                                # %R = paging number

                                                # Confirm successful command.
            expect "0\r" timeout 60
            delay 2                             # Wait before hanging up.
            send "ATH0T\r"                       # Hang up.
            expect "0\r" timeout 2              # Confirm successful command.
            done

ripo:       send "ATZQ0T\r"                     # Reset to factory defaults.
```

```
            ignore "0\r" or "OK\r\n" timeout 2  # Ignore modem response.
            send "ATE0T\r"                      # Initialize modem: Echo OFF,
            expect "0\r" or "OK\r\n" timeout 2  #  Enable responses (Numeric),
            send "ATQ0V0T\r"                    #  Limit response codes.
            expect "0\r" timeout 2              # Confirm commands successful.
            send "ATS0=0\r"                     # Set AutoAnswer OFF
            expect "0\r" timeout 2              # Confirm command successful.
            done                                # RI Power On enabled.

error:                                          # Handle unexpected modem
                                                #  responses.
            expect "8\r" or "7\r" or "6\r" or "4\r" or "3\r"
            delay 2
            done
```

Sample file modem_z0.cfg

```
#
# COMPONENT_NAME: (ESPSETUP) ENTRY SERVICE PROCESSOR SETUP Z0
#
# FUNCTIONS: Modem configuration file for some early Hayes* compatible modems.
#  This example uses the ATZ0 reset command to choose the factory defaults.
#  This setup is recommended for modems that will respond to the ATZ0 command
#  and which do not respond to the extended (&) commands.  Refer to your modem
#  manual.
#
# * Trademark of Hayes Microcomputer Products, Inc.
#
# (C) COPYRIGHT International Business Machines Corp. 1996
# All Rights Reserved
# Licensed Materials - Property of IBM
#
# US Government Users Restricted Rights - Use, duplication or
# disclosure restricted by GSA ADP Schedule Contract with IBM Corp.
#
#
# If the modem has configuration switches, they should be set to the
# factory default settings.

ICDelay 1
DefaultTO 10
CallDelay 120
#  AT  Attention Code            ,   Inserts delay in dialing commands
#  Z0  Reset. Restore Profile 0 Q0   Turn on responses
#  E0  Turn echo off            Q1   Turn off responses
#  V0  Use numeric responses    S0=0 Automatic answer inhibit
# +++  Escape to command mode   S0=2 Answer on second ring
#  H0  Hang-up                  X0=0 Limit modem response codes
#                               T =  Tone mode.  When used as T\r, it is a
#                                    no op to maintain program synchronization
#                                    when modem may/will echo the commands.
#
#  %N  Call-Out phone number    %P   Paging phone number
#  %S  Modem speed (available to users)
#
# Following are common responses from a wide range of modems:
# 16, 15, 12, 10, 5 and 1 are connection responses.  Add others as required.
# 7=busy; 6=no dial tone; 4=error; 3=no carrier; 2=ring; 0=OK
#
# PROGRAMMING NOTE: No blanks between double quote marks (").
```

```
condout:    send "ATZ0Q0T\r"                    # Reset modem. Select profile 0
            ignore "0\r" or "OK\r\n" timeout 2  # Ignore modem response.
            send "ATE0T\r"                      # Initialize modem: Echo OFF,
            expect "0\r" or "OK\r\n" timeout 2  #  Enable responses (Numeric),
            send "ATQ0V0X0T\r"                  #  Limit response codes.
            expect "0\r" timeout 2              # Confirm commands successful.
            send "ATS0=0\r"                     # Set AutoAnswer OFF
            expect "0\r" timeout 2              # Confirm command successful.
            done

connect:    send "ATDT%N\r"                     # Tone dialing command.
                                                # %N from Call Home setup.

                                                # Expect a connection response.
 expect "16\r" or "15\r" or "14\r" or "12\r" or "10\r" or "5\r" or "1\r" busy "7\r"
 timeout 60
            done

retry:      send "A/"                           # Repeat the previous command.

                                                # Expect a connection response.
 expect "16\r" or "15\r" or "14\r" or "12\r" or "10\r" or "5\r" or "1\r" busy "7\r"
 timeout 60
            done

disconnect:
            delay 2                             # Separate from previous data.
            send "+++"                          # Assure command mode.
            delay 2                             # Allow mode switching delay.
            send "ATH0T\r"                      # Set modem switch-hook down
                                                #  (i.e., hang up).
            ignore "0\r" or "OK\r" timeout 2    # Ignore modem response.
            send "ATE0Q1\r"                     # Initialize modem: Echo OFF,
                                                #  Disable responses.
            ignore "0\r" timeout 1
            done

condin:     send "ATZ0Q0T\r"                    # Reset modem. Select profile 0
            ignore "0\r" or "OK\r\n" timeout 2  # Ignore modem response.
            send "ATE0T\r"                      # Initialize modem: Echo OFF,
            expect "0\r" or "OK\r\n" timeout 2  #  Enable responses (Numeric),
            send "ATQ0V0X0T\r"                  #  Limit response codes.
            expect "0\r" timeout 2              # Confirm commands successful.
            send "ATS0=2\r"                     # Set AutoAnswer ON
            expect "0\r" timeout 2              # Confirm command successful.
            done

waitcall: ignore "2\r" timeout 1                # Ignore first ring.
          expect "2\r" timeout 10               # Pick up second ring
                                                #  or timeout.
                                                # Expect a connection response.
 expect "16\r" or "15\r" or "14\r" or "12\r" or "10\r" or "5\r" or "1\r"
 timeout 60
            done

page:       send "ATDT%N,,,,%R;\r"              # %N = pager call center number
                                                # Add enough commas to wait for
                                                #  time to enter paging number.
                                                # %R = paging number
```

```
                                        # Confirm successful command.
            expect "0\r" timeout 60
            delay 2                     # Wait before hanging up.
            send "ATH0T\r"               # Hang up.
            expect "0\r" timeout 2      # Confirm successful command.
            done

ripo:       send "ATZ0Q0T\r"            # Reset modem. Select profile 0
            ignore "0\r" or "OK\r\n" timeout 2  # Ignore modem response.
            send "ATE0T\r"              # Initialize modem: Echo OFF,
            expect "0\r" or "OK\r\n" timeout 2  #  Enable responses (Numeric),
            send "ATQ0V0X0T\r"          #  Limit response codes.
            expect "0\r" timeout 2      # Confirm commands successful.
            send "ATS0=0\r"             # Set AutoAnswer OFF
            expect "0\r" timeout 2      # Confirm command successful.
            done                        # RI Power On enabled.

error:                                  # Handle unexpected modem
                                        #  responses.
            expect "8\r" or "7\r" or "6\r" or "4\r" or "3\r"
            delay 2
            done
```

Sample file modem_f.cfg

```
#
# COMPONENT_NAME: (ESPSETUP) ENTRY SERVICE PROCESSOR SETUP F
#
# FUNCTIONS: Modem configuration file for many recent Hayes* compatible modems.
#  This example uses the AT&F reset command to choose the factory defaults.
#  This set up is preferred for modems with extended (&) commands.  For early
#  vintage modems, setup Z or Z0 is recommended.  If your modem responds to
#  the extended (&) commands and to factory default choices (&Fn), setup file
#  F0 or F1 is recommended.
#
# * Trademark of Hayes Microcomputer Products, Inc.
#
# (C) COPYRIGHT International Business Machines Corp. 1996
# All Rights Reserved
# Licensed Materials - Property of IBM
#
# US Government Users Restricted Rights - Use, duplication or
# disclosure restricted by GSA ADP Schedule Contract with IBM Corp.
#
#
# If the modem has configuration switches, they should be set to the
# factory default settings.

ICDelay 1
DefaultTO 10
CallDelay 120
#  AT  Attention Code            ,   Inserts delay in dialing commands
#  &F  Reset to default profile Q0   Turn on responses
#  E0  Turn echo off            Q1   Turn off responses
#  V0  Use numeric responses    S0=0 Automatic answer inhibit
# +++  Escape to command mode   S0=2 Answer on second ring
#  H0  Hang-up                  X0=0 Limit modem response codes
#                               T =  Tone mode.  When used as T\r, it is a
#                                    no op to maintain program synchronization
#                                    when modem may/will echo the commands.
#
```

```
# &C1  Detect CD                &D2  Respond to DTR (often the default)
#
#  %N  Call-Out phone number    %P   Paging phone number
#  %S  Modem speed (available to users)
#
# Following are common responses from a wide range of modems:
# 16, 15, 12, 10, 5 and 1 are connection responses.  Add others as required.
# 7=busy; 6=no dial tone; 4=error; 3=no carrier; 2=ring; 0=OK
#
# PROGRAMMING NOTE: No blanks between double quote marks (").

condout:    send "AT&FQ0T\r"                    # Reset to factory defaults.
            ignore "0\r" or "OK\r\n" timeout 2  # Ignore modem response.
            send "ATE0T\r"                      # Initialize modem: Echo OFF,
            expect "0\r" or "OK\r\n" timeout 2  #  Enable responses (Numeric),
            send "ATQ0V0X0T\r"                  #  Limit response codes.
            expect "0\r" timeout 2              # Confirm commands successful.
            send "ATS0=0\r"                     # Set AutoAnswer OFF
            expect "0\r" timeout 2              # Confirm command successful.
            send "AT&C1&D2\r"                   # Detect carrier and DTR.
            expect "0\r" timeout 2              # Confirm command successful.
            done

connect:    send "ATDT%N\r"                     # Tone dialing command.
                                                # %N from Call Home setup.

                                                # Expect a connection response.
 expect "16\r" or "15\r" or "14\r" or "12\r" or "10\r" or "5\r" or "1\r" busy "7\r"
 timeout 60
            done

retry:      send "A/"                           # Repeat the previous command.

                                                # Expect a connection response.
 expect "16\r" or "15\r" or "14\r" or "12\r" or "10\r" or "5\r" or "1\r" busy "7\r"
 timeout 60
            done

disconnect:
            delay 2                             # Separate from previous data.
            send "+++"                          # Assure command mode.
            delay 2                             # Allow mode switching delay.
            send "ATH0T\r"                      # Set modem switch-hook down
                                                #  (i.e., hang up).
            ignore "0\r" or "OK\r" timeout 2    # Ignore modem response.
            send "ATE0Q1\r"                     # Initialize modem: Echo OFF,
                                                #  Disable responses.
            ignore "0\r" timeout 1
            done

condin:     send "AT&FQ0T\r"                    # Reset to factory defaults.
            ignore "0\r" or "OK\r\n" timeout 2  # Ignore modem response.
            send "ATE0T\r"                      # Initialize modem: Echo OFF,
            expect "0\r" or "OK\r\n" timeout 2  #  Enable responses (Numeric),
            send "ATQ0V0X0T\r"                  #  Limit response codes.
            expect "0\r" timeout 2              # Confirm commands successful.
            send "ATS0=2\r"                     # Set AutoAnswer ON
            expect "0\r" timeout 2              # Confirm command successful.
            send "AT&C1&D2\r"                   # Detect carrier and DTR.
            expect "0\r" timeout 2              # Confirm command successful.
```

```
            done

waitcall: ignore "2\r" timeout 1                # Ignore first ring.
          expect "2\r" timeout 10               # Pick up second ring
                                                #  or timeout.
                                                # Expect a connection response.
 expect "16\r" or "15\r" or "14\r" or "12\r" or "10\r" or "5\r" or "1\r"
 timeout 60
            done

page:       send "ATDT%N,,,,%R;\r"              # %N = pager call center number
                                                # Add enough commas to wait for
                                                #  time to enter paging number.
                                                # %R = paging number

                                                # Confirm successful command.
            expect "0\r" timeout 60
            delay 2                             # Wait before hanging up.
            send "ATH0T\r"                       # Hang up.
            expect "0\r" timeout 2              # Confirm successful command.
            done

ripo:       send "AT&FQ0T\r"                    # Reset to factory defaults.
            ignore "0\r" or "OK\r\n" timeout 2  # Ignore modem response.
            send "ATE0T\r"                      # Initialize modem: Echo OFF,
            expect "0\r" or "OK\r\n" timeout 2  #  Enable responses (Numeric),
            send "ATQ0V0X0T\r"                  #  Limit response codes.
            expect "0\r" timeout 2              # Confirm commands successful.
            send "ATS0=0\r"                     # Set AutoAnswer OFF
            expect "0\r" timeout 2              # Confirm command successful.
            send "AT&C1&D2\r"                   # Detect carrier and DTR.
            expect "0\r" timeout 2              # Confirm command successful.
            done                                # RI Power On enabled.

error:                                          # Handle unexpected modem
                                                #  responses.
            expect "8\r" or "7\r" or "6\r" or "4\r" or "3\r"
            delay 2
            done
```

Sample file modem_f0.cfg

```
#
# COMPONENT_NAME: (ESPSETUP) ENTRY SERVICE PROCESSOR SETUP F0
#
# FUNCTIONS: Modem configuration file for many recent Hayes* compatible modems.
#  This example uses the AT&F0 reset command to choose the factory defaults.
#  This set up is preferred for modems with extended (&) commands.  For early
#  vintage modems, setup Z or Z0 is recommended.  If your modem responds to
#  the extended (&) commands and to factory default choices (&Fn), but doesn't
#  work properly with this setup file, setup F1 is recommended.
#
# * Trademark of Hayes Microcomputer Products, Inc.
#
# (C) COPYRIGHT International Business Machines Corp. 1996
# All Rights Reserved
# Licensed Materials - Property of IBM
#
# US Government Users Restricted Rights - Use, duplication or
# disclosure restricted by GSA ADP Schedule Contract with IBM Corp.
#
```

```
#
# If the modem has configuration switches, they should be set to the
# factory default settings.

ICDelay 1
DefaultTO 10
CallDelay 120
#  AT  Attention Code             ,   Inserts delay in dialing commands
# &F0  Reset. Restore profile 0 Q0   Turn on responses
#  E0  Turn echo off            Q1   Turn off responses
#  V0  Use numeric responses    S0=0 Automatic answer inhibit
# +++  Escape to command mode   S0=2 Answer on second ring
#  H0  Hang-up                  X0=0 Limit modem response codes
#                               T =  Tone mode.  When used as T\r, it is a
#                                    no op to maintain program synchronization
#                                    when modem may/will echo the commands.
#
# &C1  Detect CD                &D2  Respond to DTR (often the default)
# &R1  Ignore RTS (CTS)
#
#  %N  Call-Out phone number    %P   Paging phone number
#  %S  Modem speed (available to users)
#
# Following are common responses from a wide range of modems:
# 16, 15, 12, 10, 5 and 1 are connection responses.  Add others as required.
# 7=busy; 6=no dial tone; 4=error; 3=no carrier; 2=ring; 0=OK
#
# PROGRAMMING NOTE: No blanks between double quote marks (").

condout:    send "AT&F0Q0T\r"                   # Reset modem. Select profile 0
            ignore "0\r" or "OK\r\n" timeout 2  # Ignore modem response.
            send "ATE0T\r"                      # Initialize modem: Echo OFF,
            expect "0\r" or "OK\r\n" timeout 2  #  Enable responses (Numeric),
            send "ATQ0V0X0T\r"                  #  Limit response codes.
            expect "0\r" timeout 2              # Confirm commands successful.
            send "ATS0=0\r"                     # Set AutoAnswer OFF
            expect "0\r" timeout 2              # Confirm command successful.
            send "AT&C1&D2&R1\r"                # Detect carrier and DTR,
                                                #  Ignore RTS.
            expect "0\r" timeout 2              # Confirm command successful.
            done

connect:    send "ATDT%N\r"                     # Tone dialing command.
                                                # %N from Call Home setup.

                                                # Expect a connection response.
 expect "16\r" or "15\r" or "14\r" or "12\r" or "10\r" or "5\r" or "1\r" busy "7\r"
 timeout 60
            done

retry:      send "A/"                           # Repeat the previous command.

                                                # Expect a connection response.
 expect "16\r" or "15\r" or "14\r" or "12\r" or "10\r" or "5\r" or "1\r" busy "7\r"
 timeout 60
            done

disconnect:
            delay 2                             # Separate from previous data.
            send "+++"                          # Assure command mode.
```

```
            delay 2                             # Allow mode switching delay.
            send "ATH0T\r"                      # Set modem switch-hook down
                                                #  (i.e., hang up).
            ignore "0\r" or "OK\r" timeout 2    # Ignore modem response.
            send "ATE0Q1\r"                     # Initialize modem: Echo OFF,
                                                #  Disable responses.
            ignore "0\r" timeout 1
            done

condin:     send "AT&F0Q0T\r"                   # Reset modem. Select profile 0
            ignore "0\r" or "OK\r\n" timeout 2  # Ignore modem response.
            send "ATE0T\r"                      # Initialize modem: Echo OFF,
            expect "0\r" or "OK\r\n" timeout 2  #  Enable responses (Numeric),
            send "ATQ0V0X0T\r"                  #  Limit response codes.
            expect "0\r" timeout 2              # Confirm commands successful.
            send "ATS0=2\r"                     # Set AutoAnswer ON
            expect "0\r" timeout 2              # Confirm command successful.
            send "AT&C1&D2&R1\r"                # Detect carrier and DTR,
                                                #  Ignore RTS.
            expect "0\r" timeout 2              # Confirm command successful.
            done

waitcall: ignore "2\r" timeout 1                # Ignore first ring.
          expect "2\r" timeout 10               # Pick up second ring
                                                #  or timeout.
                                                # Expect a connection response.
 expect "16\r" or "15\r" or "14\r" or "12\r" or "10\r" or "5\r" or "1\r"
 timeout 60
            done

page:       send "ATDT%N,,,,%R;\r"              # %N = pager call center number
                                                # Add enough commas to wait for
                                                #  time to enter paging number.
                                                # %R = paging number

                                                # Confirm successful command.
            expect "0\r" timeout 60
            delay 2                             # Wait before hanging up.
            send "ATH0T\r"                       # Hang up.
            expect "0\r" timeout 2              # Confirm successful command.
            done

ripo:       send "AT&F0Q0T\r"                   # Reset modem. Select profile 0
            ignore "0\r" or "OK\r\n" timeout 2  # Ignore modem response.
            send "ATE0T\r"                      # Initialize modem: Echo OFF,
            expect "0\r" or "OK\r\n" timeout 2  #  Enable responses (Numeric),
            send "ATQ0V0X0T\r"                  #  Limit response codes.
            expect "0\r" timeout 2              # Confirm commands successful.
            send "ATS0=0\r"                     # Set AutoAnswer OFF
            expect "0\r" timeout 2              # Confirm command successful.
            send "AT&C1&D2&R1\r"                # Detect carrier and DTR,
                                                #  Ignore RTS.
            expect "0\r" timeout 2              # Confirm command successful.
            done                                # RI Power On enabled.

error:                                          # Handle unexpected modem
                                                #  responses.
            expect "8\r" or "7\r" or "6\r" or "4\r" or "3\r"
            delay 2
            done
```

Sample file modem_f1.cfg

```
#
# COMPONENT_NAME: (ESPSETUP) ENTRY SERVICE PROCESSOR SETUP F1
#
# FUNCTIONS: Modem configuration file for many recent Hayes* compatible modems.
#  This example uses the AT&F1 reset command to choose the factory defaults.
#  This set up is for modems with extended (&) commands and which do not work
#  properly with setup F0.  For early vintage modems, setup Z or Z0 is
#  recommended.
#
# * Trademark of Hayes Microcomputer Products, Inc.
#
# (C) COPYRIGHT International Business Machines Corp. 1996
# All Rights Reserved
# Licensed Materials - Property of IBM
#
# US Government Users Restricted Rights - Use, duplication or
# disclosure restricted by GSA ADP Schedule Contract with IBM Corp.
#
#
# If the modem has configuration switches, they should be set to the
# factory default settings.

ICDelay 1
DefaultTO 10
CallDelay 120
#  AT  Attention Code            ,   Inserts delay in dialing commands
# &F1  Reset. Restore profile 1 Q0   Turn on responses
#  E0  Turn echo off            Q1   Turn off responses
#  V0  Use numeric responses    S0=0 Automatic answer inhibit
# +++  Escape to command mode   S0=2 Answer on second ring
#  H0  Hang-up                  X0=0 Limit modem response codes
#                               T =  Tone mode.  When used as T\r, it is a
#                                    no op to maintain program synchronization
#                                    when modem may/will echo the commands.
#
# &C1  Detect CD                &D2  Respond to DTR (often the default)
# &R1  Ignore RTS (CTS)
#
#  %N  Call-Out phone number    %P   Paging phone number
#  %S  Modem speed (available to users)
#
# Following are common responses from a wide range of modems:
# 16, 15, 12, 10, 5 and 1 are connection responses.  Add others as required.
# 7=busy; 6=no dial tone; 4=error; 3=no carrier; 2=ring; 0=OK
#
# PROGRAMMING NOTE: No blanks between double quote marks (").

condout:    send "AT&F1Q0T\r"                   # Reset modem. Select profile 1
            ignore "0\r" or "OK\r\n" timeout 2  # Ignore modem response.
            send "ATE0T\r"                      # Initialize modem: Echo OFF,
            expect "0\r" or "OK\r\n" timeout 2  #  Enable responses (Numeric),
            send "ATQ0V0X0T\r"                  #  Limit response codes.
            expect "0\r" timeout 2              # Confirm commands successful.
            send "ATS0=0\r"                     # Set AutoAnswer OFF
            expect "0\r" timeout 2              # Confirm command successful.
            send "AT&C1&D2&R1\r"                # Detect carrier and DTR,
                                                #  Ignore RTS.
            expect "0\r" timeout 2              # Confirm command successful.
            done
```

```
connect:    send "ATDT%N\r"                     # Tone dialing command.
                                                # %N from Call Home setup.

                                                # Expect a connection response.
 expect "16\r" or "15\r" or "14\r" or "12\r" or "10\r" or "5\r" or "1\r" busy "7\r"
 timeout 60
            done

retry:      send "A/"                           # Repeat the previous command.

                                                # Expect a connection response.
 expect "16\r" or "15\r" or "14\r" or "12\r" or "10\r" or "5\r" or "1\r" busy "7\r"
 timeout 60
            done

disconnect:
            delay 2                             # Separate from previous data.
            send "+++"                          # Assure command mode.
            delay 2                             # Allow mode switching delay.
            send "ATH0T\r"                      # Set modem switch-hook down
                                                #  (i.e., hang up).
            ignore "0\r" or "OK\r" timeout 2    # Ignore modem response.
            send "ATE0Q1\r"                     # Initialize modem: Echo OFF,
                                                #  Disable responses.
            ignore "0\r" timeout 1
            done

condin:     send "AT&F1Q0T\r"                   # Reset modem. Select profile 1
            ignore "0\r" or "OK\r\n" timeout 2  # Ignore modem response.
            send "ATE0T\r"                      # Initialize modem: Echo OFF,
            expect "0\r" or "OK\r\n" timeout 2  #  Enable responses (Numeric),
            send "ATQ0V0X0T\r"                  #  Limit response codes.
            expect "0\r" timeout 2              # Confirm commands successful.
            send "ATS0=2\r"                     # Set AutoAnswer ON
            expect "0\r" timeout 2              # Confirm command successful.
            send "AT&C1&D2&R1\r"                # Detect carrier and DTR,
                                                #  Ignore RTS.
            expect "0\r" timeout 2              # Confirm command successful.
            done

waitcall: ignore "2\r" timeout 1                # Ignore first ring.
          expect "2\r" timeout 10               # Pick up second ring
                                                #  or timeout.
                                                # Expect a connection response.
 expect "16\r" or "15\r" or "14\r" or "12\r" or "10\r" or "5\r" or "1\r"
 timeout 60
            done

page:       send "ATDT%N,,,,%R;\r"              # %N = pager call center number
                                                # Add enough commas to wait for
                                                #  time to enter paging number.
                                                # %R = paging number

                                                # Confirm successful command.
            expect "0\r" timeout 60
            delay 2                             # Wait before hanging up.
            send "ATH0T\r"                       # Hang up.
            expect "0\r" timeout 2              # Confirm successful command.
            done
```

```
ripo:       send "AT&F1Q0T\r"                   # Reset modem. Select profile 1
            ignore "0\r" or "OK\r\n" timeout 2  # Ignore modem response.
            send "ATE0T\r"                      # Initialize modem: Echo OFF,
            expect "0\r" or "OK\r\n" timeout 2  #  Enable responses (Numeric),
            send "ATQ0V0X0T\r"                  #  Limit response codes.
            expect "0\r" timeout 2              # Confirm commands successful.
            send "ATS0=0\r"                     # Set AutoAnswer OFF
            expect "0\r" timeout 2              # Confirm command successful.
            send "AT&C1&D2&R1\r"                # Detect carrier and DTR,
                                                #  Ignore RTS.
            expect "0\r" timeout 2              # Confirm command successful.
            done                                # RI Power On enabled.

error:                                          # Handle unexpected modem
                                                #  responses.
            expect "8\r" or "7\r" or "6\r" or "4\r" or "3\r"
            delay 2
            done
```

Appendix C. General attributes required when using a TTY terminal

The following general attributes are the default settings for the diagnostic programs. Be sure your terminal is set to these attributes.

Note: Set these attributes before the diagnostic programs are loaded.

General setup attributes	3151 /11/31/41 settings	3151 /51/61 settings	3161 /3164 settings	Description
Machine mode	3151	3151 PC	3161 or 3164	The diagnostic programs are set to emulate use of the 3161 ASCII Display Terminal. If your terminal can emulate a 5085, 3161 or 3164 terminal, use these attribute settings. Otherwise, refer to your operator's manual, compare the attribute descriptions with those of your terminal, and set your attributes accordingly.
Generated code set		ASCII		
Screen	Normal	Normal		Uses the EIA-232 interface protocol.
Row and column	24 x 80	24 x 80		Uses the EIA-232 interface protocol.
Scroll	Jump	Jump	Jump	When the last character on the bottom line is entered, the screen moves down one line.
Auto LF	Off	Off	Off	For the "On" setting, pressing the Return key moves the cursor to the first character position of the next line. For the "Off" setting, pressing Return moves the cursor to the first character position of the current line. The CR and LF characters are generated by the New line setting.
CRT saver	Off	Off	10	The "10" setting causes the screen to go blank if there is no activity for 10 minutes. When the system unit sends data or a key is pressed, the screen contents are displayed again.
Line wrap	On	On	On	The cursor moves to the first character position of the next line in the page after it reaches the last character position of the current line in the page.
Forcing insert	Off	Off		
Tab	Field	Field	Field	The column tab stops are ignored, and the tab operation depends on the field attribute character positions.
Trace			All	Both inbound data (data to the system unit) and outbound data (data from the system unit) to and from the main port can be transferred to the auxiliary port without disturbing communications with the system unit when the Trace key is pressed.

Additional communication attributes

The following communication attributes are for the 3151, 3161, and 3164 terminals.

Communication setup attributes	3151/11 /31/41) settings	3151 /51/61, settings	3161 /3164 settings	Description
Operating mode	Echo	Echo	Echo	Data entered from the keyboard on the terminal is sent to the system unit for translation and then sent back to the screen. Sometimes called *conversational mode.*
Line speed	9600 bps	9600 bps	9600 bps	Uses the 9600 bps (bits per second) line speed to communicate with the system unit.
Word length (bits)	8	8	8	Selects eight bits as a data word length (byte).
Parity	No	No	No	Does not add a parity bit and is used together with the word length attribute to form the 8-bit data word (byte).
Stop bit	1	1	1	Places a bit after a data word (byte).
Turnaround character	CR	CR	CR	Selects the carriage return (CR) character as the line turnaround character.
Interface	EIA-232	EIA-232	EIA-232	Uses the EIA-232 interface protocol.
Line control	IPRTS	IPRTS	IPRTS	Uses the 'permanent request' to send (IPRTS) signal to communicate with system unit.
Break signal (ms)	500	500	500	The terminal sends a break signal to the system unit within 500 ms after the Break key is pressed.
Send null suppress	On	On		Trailing null characters are not sent to the system unit.
Send null			On	Trailing null characters are sent to the system unit.
Response delay (ms)	100	100	100	The terminal waits for 100 ms for the system unit to respond.

Additional keyboard attributes

The following keyboard attributes are for the keyboard attached to the 3151, 3161, and 3164 terminals.

Keyboard setup attributes	3151/11 /31/41 settings	3151 /51/61 settings	3161 /3164 settings	Description
Enter	Return	Return	Return	The Enter key functions as the Return key.
Return	New line	New line	New line	The cursor moves to the next line when the Return key is pressed.

Keyboard setup attributes	3151/11 /31/41 settings	3151 /51/61 settings	3161 /3164 settings	Description
New line	CR	CR	CR	The Return key generates the carriage return (CR) and the line feed (LF) characters. The line turnaround occurs after the CR and LF characters are generated.
Send	Page	Page	Page	The contents of the current page are sent to the system unit when the Send key is pressed.
Insert character	Space	Space	Space	A blank character is inserted when the Insert key is pressed.

Additional printer attributes

The following printer attributes are for a printer attached to the 3151, 3161, and 3164 terminals.

Printer setup attributes	3151/11 /31/41 settings	3151 /51/61 settings	3161 /3164 settings	Description
Line speed	9600	9600	9600	Uses 19200 or 9600 bps (bits per second) line speed to communicate with the system unit.
Word length (bits)	8	8	8	Selects eight bits as a data word length (byte).
Parity	Even	Even	No	
Stop bit	1	1	1	Places a bit after a data word (byte).
Characters	ALL	ALL		
Line end			CR-LF	
Print			View port	
Print EOL			Off	
Print null			Off	

Appendix D. PD data collection worksheets

PD data collection worksheet

Questions	Responses
General problem description	
1. Problem definition	
2. Time/date of failure	
3. How was the problem detected? General problem determination questions a. Does problem exist on multiple machines? b. Was the error detected by a user? (for example, a usability problem) c. Was the error detected by the NAS Gateway 500? (for example, System Admin problem) d. Which management interface exhibited the problem? (for example, CLI, WebSM, or SMIT; (if CLI or SMIT, which shell of execution, root w/ksh, or root/maintshell or NASAdmin shell))	
4. Audio/visual inspection a. Status of status LEDs b. Error code on display c. Any specific beep sequence	
5.. Any recent changes to the: a. System software b. System hardware c. System storage d. System network e. Were recent change prerequisites met?	
6. Can external storage be accessed?	
7. Can NAS Gateway 500 ping any client?	
8. Is the problem re-createable (yes/no)? If yes, what are the re-creation steps?	
9. What network file protocol (CIFS, NFS, HTTP, FTP) is being used?	

PD data collection worksheet (continued)

Data	Procedure	Results
System configuration		
1. General system information a. Host name b. System model c. Machine serial d. Processor type e. Number of processors f. Processor clock speed g. CPU type h. Total memory size i. Network information j. Filesystem information k. Paging space information l. Device information	CLI **prtconf**	
2. Version level of System Software	CLI **opt/nas/bin/naslevel**	
3. Single node or cluster?		
4. Additional software installed		
5. OS and NAS volume mirroring	CLI **lsvg -p rootvg** CLI **lsvol** *<NAS volume name>*	
6. Free space on system drive	CLI **df**	
7. Paging space allocation	CLI **prtconf**	
Hardware configuration		
Number of processor books	CLI **prtconf**	
Memory per processor book	CLI **prtconf**	
Slot 1 adapter	CLI **lsslot -c pci** (lsslot output, for example, `U0.1-P2-`**`I3`** `PCI-X capable, 64 bit, 133-MHz slot ent2 ent3` *I3* indicates the slot 3, contains a dual port Ethernet adapter, *E-net P1:_ent2–TX_* and *E-net P2:_ent3–TX_*) TX = Ethernet copper port SX = Ethernet fiber port LC = fibre channel port N/A = unused port	E-net P1: _____ P2: _____ HBA P1: _____ P2: _____
Slot 2 adapter		E-net P1: _____ P2: _____ HBA P1: _____ P2: _____
Slot 3 adapter		E-net P1: _____ P2: _____ HBA P1: _____ P2: _____
Slot 4 adapter		E-net P1: _____ P2: _____ HBA P1: _____ P2: _____
Slot 5 adapter		E-net P1: _____ P2: _____ HBA P1: _____ P2: _____
Slot 6 adapter		E-net P1: _____ P2: _____ HBA P1: _____ P2: _____
Serial port 1 device	Only console	
Serial port 2 device	Only modem	
Serial port 3 device	Only UPS or null modem cable	

Data	Procedure	Results
External SCSI device	Only tape drive	
File serving network configuration		
Ethernet device driver level ***	**lslpp -l devices.pci.* | grep thernet**	
Ethernet 1 configuration IP address Static/DHCP Auto negation on/off Link speed Frame size Network interface (for example, ent0) Slot #___ Port #____ Physical destination (for example, Cisco switch)	SMIT **chdev**: Select **Communications** Select **Ethernet** Select **Adapter** Select **Change and show characteristics.....** Select **Adapter to show properties**	
Ethernet 2 configuration IP address Static/DHCP Auto negation on/off Link speed Frame size Network interface (for example, ent0) Slot #___ Port #____ Physical destination (for example, Cisco switch)	SMIT **chdev**: Select **Communications** Select **Ethernet** Select **Adapter** Select **Change and show characteristics.....** Select **Adapter to show properties**	
Ethernet 3 configuration IP address Static/DHCP Auto negation on/off Link speed Frame size Network interface (for example, ent0) Slot #___ Port #____ Physical destination (for example, Cisco switch)	SMIT **chdev**: Select **Communications** Select **Ethernet** Select **Adapter** Select **Change and show characteristics.....** Select **Adapter to show properties**	
Ethernet 4 configuration IP address Static/DHCP Auto negation on/off Link speed Frame size Network interface (for example, ent0) Slot #___ Port #____ Physical destination (for example, Cisco switch)	SMIT **chdev**: Select **Communications** Select **Ethernet** Select **Adapter** Select **Change and show characteristics.....** Select **Adapter to show properties**	

Data	Procedure	Results
Ethernet 5 configuration IP address Static/DHCP Auto negation on/off Link speed Frame size Network interface (for example, ent0) Slot #___ Port #____ Physical destination (for example, Cisco switch)	SMIT **chdev**: Select **Communications** Select **Ethernet** Select **Adapter** Select **Change and show characteristics.....** Select **Adapter to show properties**	
Ethernet 6 configuration IP address Static/DHCP Auto negation on/off Link speed Frame size Network interface (for example, ent0) Slot #___ Port #____ Physical destination (for example, Cisco switch)	SMIT **chdev**: Select **Communications** Select **Ethernet** Select **Adapter** Select **Change and show characteristics.....** Select **Adapter to show properties**	
Ethernet 7 configuration IP address Static/DHCP Auto negation on/off Link speed Frame size Network interface (for example, ent0) Slot #___ Port #____ Physical destination (for example, Cisco switch)	SMIT **chdev**: Select **Communications** Select **Ethernet** Select **Adapter** Select **Change and show characteristics.....** Select **Adapter to show properties**	
Ethernet 8 configuration IP address Static/DHCP Auto negation on/off Link speed Frame size Network interface (for example, ent0) Slot #___ Port #____ Physical destination (for example, Cisco switch)	SMIT **chdev**: Select **Communications** Select **Ethernet** Select **Adapter** Select **Change and show characteristics.....** Select **Adapter to show properties**	
Storage network configuration		
HBA device driver level	**lslpp -l devices.pci.* | grep FC**	
HBA WWN	**lscfg -vl** *fcs#*	Port WWN _____ Node WWN _____

Data	Procedure	Results
HBA WWN	**lscfg -vl** *fcs#*	Port WWN _______ Node WWN ______
HBA WWN	**lscfg -vl** *fcs#*	Port WWN _______ Node WWN ______
HBA WWN	**lscfg -vl** *fcs#*	Port WWN _______ Node WWN ______
HBA WWN	**lscfg -vl** *fcs#*	Port WWN _______ Node WWN ______
HBA WWN	**lscfg -vl** *fcs#*	Port WWN _______ Node WWN ______
HBA WWN	**lscfg -vl** *fcs#*	Port WWN _______ Node WWN ______
HBA WWN	**lscfg -vl** *fcs#*	Port WWN _______ Node WWN ______
Error logs (software logs)		
AIX default logs	**Snap -a** on both nodes • Error report • Copy of customized Object Data Manager (ODM) database • Trace file • User environment • Amount of physical memory and paging space • Device and attribute information • Security user information	
NAS generated logs	CLI **mknasb**	
Tivoli logs	CLI **mknasb**	
File system logs	CLI **mknasb**	
System log trace	CLI **showlog**	
Error logs (service processor)	**Power off system** Attach a console to serial port 1 Server processor main menu displays Select **System Info** from main menu Select **Service Processor error log**	

Appendix E. Environmental notices

Product recycling and disposal

This unit contains materials such as circuit boards, cables, electromagnetic compatibility gaskets and connectors that might contain lead and copper/beryllium alloys that require special handling and disposal at end of life. Before this unit is disposed of, these materials must be removed and recycled or discarded according to applicable regulations. IBM offers product-return programs in several countries. For country specific instructions refer to the following Web site: http://www.ibm.com/ibm/environment/products/prp.phtml

This product might contain a sealed lead acid, nickel cadmium, nickel metal hydride, lithium, or lithium ion battery. Consult your user manual or service manual for specific battery information. The battery must be recycled or disposed of properly. Recycling facilities might not be available in your area. For information on disposal of batteries, contact your local waste disposal facility.

In the United States, IBM has established a collection process for reuse, recycling, or proper disposal of used IBM sealed lead acid, nickel cadmium, nickel metal hydride, and other battery packs from IBM Equipment. For information on proper disposal of these batteries, please contact IBM at 1-800-426-4333. Have the IBM part number listed on the battery available prior to your call.

Environmental design

The environmental efforts that have gone into the design of this system signify IBM's commitment to improve the quality of its products and processes. Some of these accomplishments include the elimination of the use of Class 1 ozone-depleting chemicals in the manufacturing process and reductions in manufacturing wastes. For more information, contact an IBM account representative.

Acoustical noise emissions

The equivalent continuous A-weighted sound pressure level at workstations (emission sound pressure level at the 1-meter bystander positions) does not exceed 70 dB(A).

Declared acoustical noise emissions

Product configuration	Declared A-weighted sound power level, *LWAd* (B)		Declared A-weighted sound pressure level, <LpAm>(dB) at 1 meter bystander position	
	Operating	Idling	Operating	Idling
NAS Gateway 500	6.1	6.0	44	43

Notes:

1. ^{LWAd} is the declared (upper limit) sound power level for a random sample of machines. (1B = 10dB)
2. ^{LpAm} is the mean value of the A-weighted sound pressure level at the 1-meter bystander positions for a random sample of machines.
3. NAS Gateway 500 levels apply to the following hardware configuration: two-way processor, two disk drives, 2 GB of RAM, redundant system (two 645-watt power supplies, two processor fans).
4. All measurements made in conformance with ISO 7779 and declared in conformance with ISO 9296.

Appendix F. Notices

This information was developed for products and services offered in the U.S.A.

IBM may not offer the products, services, or features discussed in this document in other countries. Consult your local IBM representative for information on the products and services currently available in your area. Any reference to an IBM product, program, or service is not intended to state or imply that only that IBM product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any IBM intellectual property right may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any non-IBM product, program, or service.

IBM may have patents or pending patent applications covering subject matter described in this document. The furnishing of this document does not grant you any license to these patents. You can send license inquiries, in writing, to:

IBM Director of Licensing
IBM Corporation
North Castle Drive
Armonk, NY 10504-1785
U.S.A.

The following paragraph does not apply to the United Kingdom or any other country where such provisions are inconsistent with local law: INTERNATIONAL BUSINESS MACHINES CORPORATION PROVIDES THIS PUBLICATION ″AS IS″ WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some states do not allow disclaimer of express or implied warranties in certain transactions, therefore, this statement may not apply to you.

This information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. IBM may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.

Any references in this information to non-IBM Web sites are provided for convenience only and do not in any manner serve as an endorsement of those Web sites. The materials at those Web sites are not part of the materials for this IBM product and use of those Web sites is at your own risk.

IBM may use or distribute any of the information you supply in any way it believes appropriate without incurring any obligation to you.

Information concerning non-IBM products was obtained from the suppliers of those products, their published announcements or other publicly available sources. IBM has not tested those products and cannot confirm the accuracy of performance, compatibility or any other claims related to non-IBM products. Questions on the capabilities of non-IBM products should be addressed to the suppliers of those products.

Trademarks

The following terms are trademarks of International Business Machines Corporation in the United States, other countries, or both:

- AIX
- Electronic Service Agent
- eServer
- IBM
- IBM logo
- LANstreamer

- OS/2
- POWER4
- pSeries
- RS/6000
- TotalStorage

Microsoft and Windows are trademarks of Microsoft Corporation in the United States, other countries, or both.

Other company, product, and service names may be trademarks or service marks of others.

Glossary

List of abbreviations

These abbreviations apply to this product, its environment, and associated products.

CEC Central Electronics Complex

CIFS Common Internet File System

CIM common information model

CLI command line interface

CSM Cluster System Manager

DBMS database management system

DDR Double Data Rate

DES Data Encryption Standard

DHCP Dynamic Host Configuration Protocol

DIMM dual inline memory module

DMTF Distributed Management Task Force

DNS Domain Name Service

EC EtherChannel

ESA Electronic Service Agent

ESS Enterprise Storage Server

FAStT Fibre Array Storage Technology

FAT file allocation table

FC Fibre Channel

FCAL Fibre Channel Abritrated Loop

FTP File Transfer Protocol

HACMP
high availability cluster multiprocessing

HTML
Hypertext Markup Language

HTTP Hypertext Transfer Protocol

HMC Hardware Management Console

HSM hierarchical storage management

IDE Integrated Drive Electronics

IETF Internet Engineering Task Force

IIS Internet Information Server

ITSO international technical support organization

JBOD Just a Bunch of Disks

JDBC Java Data Base Connectivity

JFS Journaled File System

JFS2 Journaled File System 2

LDAP Lightweight Directory Access Protocol

LFS Logical File System

LP logical partition

LPP licensed program product

LPAR logical partition

LTO Linear Tape Open

LV logical volume

LVM Logical Volume Manager

MMF multimode fiber

MTM Machine Type Model

NAS network-attached storage

NDMP Network Data Management Protocol

NFS Network File System

NIC network interface card

NIS Network Information Service

NLS National language support

NTFS NT File System

NTP Network Tim Protocol

NVRAM
nonvolatile random access memory

PCI Peripheral Component Interconnect

PDF Portable Document Format

PD Problem Determination

PP physical partition

PSM Persistent Storage Manager

PV physical volume

PVid physical volume identifier

RAID Redundant Array of Independent Disks

RMC Remote Management Console

SAK Server Appliance Kit

SAN storage area network

SAS Service Agent server

SCSI Small Computer System Interface

SDD Subsystem Device Driver

SDRAM
Synchronous Dynamic Random Access Memory

SFU Services for UNIX

SMB Server Message Block

SMBFS
Server Message Block File System

SMIT System Management Interface Tool

SMP symmetrical multiprocessor

SMS System Management Services

SNIA Storage Networking Industry Association

SNMP Simple Network Management Protocol

SP Service Processor

TCP Transmission Control Protocol

TCP/IP
Transmission Control Protocol/Internet Protocol

TSM Tivoli Storage Manager

TSANM
Tivoli SAN Manager

TSRM Tivoli Storage Resource Manager

UDP User Datagram Protocol

UMS Universal Manageability Services

VDS Virtual Disk Service

UPS uninterruptable power supply

UTP unshielded twisted pair

VG volume group

VGDA volume group descriptor area

VGid volume group identifier

VSS Volume Shadow Copy Service

WebSM
Web-based System Manager

XML Extensible Markup Language

Glossary of terms

This glossary defines technical terms and abbreviations that this book uses. If you do not find the term you are looking for, see the *IBM Glossary of Computing Terms* located at:

www.ibm.com/networking/nsg/nsgmain.htm

This glossary also includes terms and definitions from:

- *American National Standard Dictionary for Information Systems*, ANSI X3.172-1990, copyright 1990 by the American National Standards Institute (ANSI). You can purchase copies from the American National Standards Institute, 11 West 42nd Street, New York, New York 10036. Definitions are identified by the symbol (A) after the definition.
- *Information Technology Vocabulary* by Subcommittee 1, Joint Technical Committee 1, of the International Organization for Standardization and the International Electrotechnical Commission (ISO/IEC JTC1/SC1). Definitions are identified by the symbol (I) after the definition; definitions taken from draft international standards, committee drafts, and working papers by ISO/IEC JTC1/SC1 are identified by the symbol (T) after the definition, indicating that final agreement has not yet been reached among the participating National Bodies of SC1.
- *IBM Glossary of Computing Terms*. New York: McGraw-Hill, 1994.

This glossary uses the following cross-reference convention:

See Refers you to (a) a term that is the expanded form of an abbreviation or acronym, or (b) a synonym or more preferred term.

See also
Refers you to a related term.

Numerics

10BASE-T. The IEEE 802.3 Ethernet standard that supports a transmission rate of 10 Mbps using two twisted-pair wires (Category 3 telephone wiring).

100BASE-T. The IEEE 802.3 Ethernet standard that supports a transmission rate of 100 Mbps using two twisted-pair wires (Category 5 telephone wiring).

A

access control. In computer security, the process of ensuring that the resources of a computer system can be accessed only by authorized users in authorized ways.

access control list (ACL). (1) A collection of all access rights for one object. (2) A list associated with an object that identifies all the subjects that can access the

object and their access rights; for example, a list associated with a file might identify users who can access the file and their access rights to that file.

accessory. An IBM designation for a separately orderable part that (a) has no type number, (b) is for purchase only, and (c) does not receive normal IBM maintenance.

ACL. See *access control list*.

adapter load balancing. The ability of several adapters in a team to be active simultaneously, with the outbound-traffic load balanced across all the adapters in the team; spreading tasks among adapters improves performance by preventing uneven distribution of workload. If one adapter in the team fails, the outbound traffic is redistributed across the remaining active adapters in the team. See also *teaming*.

assigned disk. A disk that is mapped to a logical drive.

asynchronous. A class of data-transmission service whereby all requests for service contend for a pool of dynamically allocated ring bandwidth and response time.

attach. To make a device a part of a network logically. Contrast with *connect*.

attachment. A port or a pair of ports, optionally including an associated optical bypass, that are managed as a functional unit. A dual attachment includes two ports: a port A and a port B. A single attachment consists of one port: port S.

attention (ATTN). An occurrence external to an operation that could cause an interruption of the operation.

ATTN. See *attention*.

B

bandwidth. The capacity of a communications line or processor, normally expressed in bits per second (bps) or transactions per seconds (tps).

baseband LAN. A local area network in which data is encoded and transmitted without modulation of a carrier (T).

Basic Input/Output System (BIOS). The personal computer code that controls basic hardware operations, such as interactions with diskette drives, hard disk drives, and the keyboard.

BIOS. See *Basic Input/Output System*.

bits per second (bps). The rate at which bits are transmitted per second. Contrast with *baud*.

boot IP address. The IP address on which an Ethernet adapter boots prior to being assigned a service IP address.

bps. See *bits per second.*

buffer. See *buffer storage*.

buffer storage. (1) A special-purpose storage or storage area allowing, through temporary storage, the data transfer between two functional units having different transfer characteristics. A buffer storage is used between non-synchronized devices, a serial and a parallel device, or between devices having different transfer rates. (2) In word processing, a temporary storage in which text is held for processing or communication (T).

bus. See *data bus*.

C

cache. A high-speed buffer storage that contains frequently accessed instructions and data to reduce access time.

carrier sense multiple access with collision detection (CSMA/CD). A class of medium access procedures that allows multiple stations to access the medium at will, without explicit prior coordination, and avoids contention by way of carrier sense and deference. Contention is resolved by way of collision detection and transmission.

cascade. To connect in a series or in a succession of stages so that each stage derives from or acts upon the product of the preceding stage.

cascading resource group. A resource group in which takeover priority is assigned to each configured node in the cluster such that ownership preferences is given to the highest priority node. Cascading resource groups exist only on one node at a time.

CIFS. See *Common Internet File System.*

client. A computer system or process that requests access to the data, services, or resources of a server (another computer system or process). Multiple clients may share access to a common server.

client-server model. A common way to describe network services and the model user processes (programs) of those services. Need input. 1) We aren't defining *client/server*, which might have these definitions: *1) Pertaining to the model of interaction in distributed data processing in which a program at one site sends a request to a program at another site and awaits a response. The requesting program is called a client; the answering program is called a server and 2) The relationship between machines in a communications network. The client is the requesting*

machine, the server the supplying machine. 2) This is not a common term to me. 3) If we do use this term, shouldn't it be *client/server model* for consistency with *client/server*?

cluster. In high-availability cluster multiprocessing (HACMP), a set of independent systems (called nodes) that are organized into a network for the purpose of sharing resources and communicating with each other. (1) A station that consists of a control unit (a *cluster controller*) and the terminals attached to it. (2) A group of APPN nodes that have the same network ID and the same topology database. A cluster is a subset of a network identifier (NETID) subnetwork. (3) Loosely coupled collection of independent systems organized into a network for the purpose of sharing resources and communicating with each other. Can be used to create highly-available systems. See also *high-availability cluster multiprocessing (HACMP)* and *network identifier (NETID)*.

collision avoidance. In carrier sense multiple access with collision avoidance (CSMA/CA), the process of sending a jam signal and waiting for a variable time before transmitting data. The process is designed to avoid two or more simultaneous transmissions.

Common Internet File System (CIFS). A protocol that enables collaboration on the Internet by defining a remote file-access protocol that is compatible with the way applications already share data on local disks and network file servers.

communications protocol. In networking, a set of standards defining how computers are to exchange information.

connect. In a LAN, to physically join a cable from a station to an access unit or network connection point. Contrast with *attach*.

control unit. A processor electronics assembly in a storage controller that exposes logical unit numbers (LUNs) to the storage network and connects internally to the storage controller's disk drives. A storage controller can have 1 to *n* control units, but typically has one for each path group. See also *logical unit number (LUN)*.

CRC. See *cyclic redundancy check*.

CRU. See *customer-replaceable unit*.

customer-replaceable unit (CRU). An assembly or part that a customer can replace in its entirety when any of its components fail. Contrast with *field-replaceable unit*.

cyclic redundancy check (CRC). (1) A redundancy check in which the check key is generated by a cyclic algorithm (T). (2) A system of error checking performed at both the sending and receiving station after a block-check character has been accumulated.

D

DASD. See *direct access storage device*.

data bus. A bus used to communicate data internally and externally to and from a processing unit, storage, and peripheral devices (A).

device identifier (ID). An 8-bit identifier that uniquely identifies a physical I/O device.

device parity protection. A function that protects data stored on a disk-unit subsystem from being lost because of the failure of a single-disk unit in the disk-unit subsystem. When a disk-unit subsystem has device parity protection and one of the disk units in the subsystem fails, the subsystem continues to run. The disk-unit subsystem reconstructs the data after the disk unit in the subsystem is repaired or replaced. See also *RAID*.

DHCP. See *Dynamic Host Configuration Protocol*.

DIMM. See *dual inline memory module*.

direct access storage device (DASD). A mass-storage medium on which a computer stores data. Contrast with *random access memory (RAM)*.

Direct Memory Access (DMA). A technique in which an adapter bypasses a computer's CPU, and performs the transfer of data between itself and the system's memory directly.

DMA. See *Direct Memory Access*.

DNS. See *Domain Name System*.

Domain Name System (DNS). In the Internet suite of protocols, the distributed database system used to map domain names to IP addresses.

drive bay. A receptacle in the NAS Gateway 500 into which you insert a hard-disk-drive module. The bays are in storage units that can be located in a different rack from the the NAS Gateway 500.

dual inline memory module (DIMM). A small circuit board with memory-integrated circuits containing signal and power pins on both sides of the board.

Dynamic Host Configuration Protocol (DHCP). A protocol defined by the Internet Engineering Task Force (IETF) that is used for dynamically assigning IP addresses to computers in a network.

E

EIA. See *Electronic Industries Association*.

EISA. See *Extended Industry Standard Architecture*.

electromagnetic compatibility (EMC). The design and test of products to meet legal and corporate specifications dealing with the emissions and susceptibility to frequencies in the radio spectrum. Electromagnetic compatibility is the ability of various electronic equipment to operate correctly in the intended electromagnetic environment.

Electronic Industries Association (EIA). An organization of electronics manufacturers that advances the technological growth of the industry, represents the views of its members, and develops industry standards.

Electronic Industries Association (EIA) unit. A unit of measure equal to 4.45 cm (1.75 in.).

electrostatic discharge (ESD). An undesirable discharge of static electricity that can damage equipment and degrade electrical circuitry.

EMC. See *electromagnetic compatibility*.

engine. The unit that contains the processors that respond to requests for data from clients. The operating software for the NAS Gateway 500 resides in the engine.

equivalent paths. A collection of paths to the storage device. The paths have no switchover time penalty when changing from one path group to another while accessing the storage device.

error. A discrepancy between a computed, observed, or measured value or condition and the true, specified, or theoretically correct value or condition (A) (I). Contrast with *failure*.

ESD. See *electrostatic discharge*.

ESM. See *environmental service monitor*.

Ethernet. A standard protocol for a 10-Mbps baseband local area network (LAN) that allows multiple access and manages contention by using carrier sense multiple access with collision detection (CSMA/CD) as the access method.

Ethernet network. A baseband LAN with a bus topology in which messages are broadcast on a coaxial cable using a carrier sense multiple access/collision detection (CSMA/CD) transmission method.

expansion slot. In personal-computer systems, one of several receptacles in the rear panel of the system unit into which a user can install an adapter.

Extended Industry Standard Architecture (EISA). The PC bus standard that extends the AT bus (ISA bus) to 32 bits and provides support for bus master. It was announced in 1988 as a 32-bit alternative to the Micro Channel that would preserve investment in existing boards. PC and AT cards (ISA cards) can plug into an EISA bus.

F

fabric. A complex network using hubs, switches and gateways. For example, Fibre Channel uses a fabric to connect devices. A fabric can be as simple as a single cable connecting two devices.

failback. The restoration of the NAS Gateway 500 to its initial configuration after detection and repair of a failed network or component.

failover. (1) The automatic recovery of resources in the event of a network outage, or failure of the hardware or software. (2) A cluster event in which the primary database server or application server switches to a backup system due to the failure of the primary server.

failure. (1) The termination of the ability of a functional unit to perform its required function. (2) An uncorrected hardware error. Failures are either recoverable or not recoverable by the software or the operator. The operator is always notified when failures occur. Contrast with *error*.

fallover. Also called failover. The process of an active node acquiring resources previously owned by another node, in order to maintain availability of those resources.

fallback. Also called failback. Process of a joining or reintegrating node acquiring resources previously owned by another node.

Fast Etherchannel (FEC). A proprietary technology developed by Cisco that creates a team of two to four 10/100 Ethernet adapters or ports to increase transmission and reception throughput. Adapter fault tolerance is also supported by this technology.

Fast Ethernet. An Ethernet standard that provides a data rate of 100 Mbps.

feature code. A code used by IBM to process hardware and software orders.

FEC. See *Fast Etherchannel*.

Federal Communications Commission (FCC). A board of commissioners appointed by the President under the Communications Act of 1934, having the power to regulate all interstate and foreign communications by wire and radio originating in the United States.

fiber optic cable. See *optical cable*.

field-replaceable unit (FRU). An assembly that is replaced in its entirety when any one of its components fails. In some cases, a FRU may contain other FRUs. Contrast with *customer-replaceable unit*.

File Transfer Protocol (FTP). In the Internet suite of protocols, an application layer protocol that uses TCP/IP and Telnet services to transfer bulk-data files between machines or hosts.

flash memory. A type of non-volatile storage device that must be erased in fixed blocks rather than single bytes.

FRU. See *field-replaceable unit*.

FTP. See *File Transfer Protocol*.

G

gateway. A device that acts as a router to transfer packets between networks, but occurs at the transport layer. See also *router*.

GB. see *gigabyte*.

GBIC. See *Gigabit Interface Converter*.

GEC. See *Gigabit Etherchannel*.

GHz. see *gigahertz*.

gigabyte (GB). In decimal notation, 1 073 741 824 when referring to memory capacity; in all other cases, it is defined as 1 000 000 000.

Gigabit Etherchannel (GEC). A proprietary technology developed by Cisco that creates a team of two Gigabit Ethernet adapters to increase transmission and reception throughput. Adapter fault tolerance is also supported by this technology.

Gigabit Interface Converter (GBIC). An encoding/decoding device that is a Class-1 laser component assembly with transmitting and receiving receptacles that connect to fiber-optic cables.

gigahertz (GHz). A unit of measure of frequency. One gigahertz equals 1 000 000 000 hertz.

H

HACMP. see *high availability cluster management program*.

high availability cluster multiprocessing (HACMP). An AIX Licensed Program Product (LPP) that provides clustering function. An HACMP cluster can include up to 32 nodes.

heartbeat. Also called Keepalive. State-of-health message exchanged between nodes. Means of detecting failure in a cluster.

high availability. A model for maintaining computer service availability. It views service availability not as a series of replicated physical components, but rather as a set of system-wide, shared resources that cooperate to guarantee essential services.

hertz (Hz). A unit of frequency equal to one cycle per second.

Note: In the United States, line frequency is 60 Hz or a change in voltage polarity 120 times per second; in Europe, line frequency is 50 Hz or a change in voltage polarity 100 times per second.

host. (1) In TCP/IP, any system that has at least one Internet address associated with it. A host with multiple network interfaces may have multiple Internet addresses associated with it. The host can be a client, a server, or both. (2) In fibre-channel technology, any system that has at least one worldwide name associated with it. A host with multiple network interfaces may have multiple worldwide names associated with it.

host processor. See *host computer*.

I

IDE. see *integrated development environment*.

integrated development environment (IDE). A set of software development tools such as source editors, compilers, and debuggers, that are accessible from a single user interface.

IETF. See *Internet Engineering Task Force*.

iLUN. See *iSCSI client logical-unit number.*

IML. See *initial microcode load*.

integrated development environment (IDE).

IP aliasing, IP address takeover (IPAT) through IP aliasing. A networking capability that allows placing a service IP address into a network interface as an alias, and keeping the old (boot) IP and hardware address.

initial microcode load (IML). The process of loading the operational microcode.

interference. (1) The prevention of clear reception of broadcast signals. (2) The distorted portion of a received signal. (3) In optics, the interaction of two or more beams of coherent or partially coherent light.

Internet Engineering Task Force (IETF). The task force of the Internet Architecture Board (IAB) that is responsible for solving the short-term engineering needs of the Internet. The IETF consists of numerous working groups, each focused on a particular problem. Internet standards are typically developed or reviewed by individual working groups before they can become standards.

Internet Protocol (IP). A protocol that routes data through a network or interconnected networks. IP acts as an intermediary between the higher protocol layers and the physical network.

interrupt request (IRQ). An input found on a processor that causes it to suspend normal instruction execution temporarily and to start executing an interrupt handler routine.

IP. See *Internet Protocol*.

IRQ. See *interrupt request*.

iSCSI client logical-unit number (iLUN). A unique number that is assigned to each virtual logical unit number (VLUN). The iLUN for a single client starts at zero and increments sequentially.

J

JBOD. Just a bunch of disks.

JBON. Just a bunch of nodes.

jumper. A connector between two pins on a network adapter that enables or disables an adapter option, feature, or parameter value.

jumper cable. See *patch cable*.

L

LAN. See *local area network*.

LIP. See *loop initialization process*.

local area network (LAN). A network in which a set of devices is connected to one another for communication and that can be connected to a larger network.

logical drive. A unit of virtual storage that is made available to the network through virtual logical unit numbers (VLUNs) and iSCSI client logical-unit number (iLUNs). It consists of one or more physical disks that are combined using RAID 0, 1, 1E, 5, or 5E technology.

logical partition (LPAR). A fixed-size portion of a logical volume. A logical partition is the same size as the physical partitions in its volume group. Unless the logical volume of which it is a part is mirrored, each logical partition corresponds to, and its contents are stored on, a single physical partition.

logical unit. A type of network-accessible unit that enables users to gain access to network resources and communicate with each other.

logical unit number (LUN). An identifier used on a SCSI bus to distinguish among up to eight devices (logical units) with the same SCSI ID.

loop. A closed unidirectional signal path connecting input/output devices to a system.

LUN. See *logical unit number*.

M

management information base (MIB). Simple Network Management Protocol (SNMP) units of managed information that specifically describe an aspect of a system, such as the system name, hardware number, or communications configuration. A collection of related MIB objects is defined as a MIB.

MB. see *Megabyte*.

megabyte. A unit of measure for storage capacity. For main storage, 1 megabyte equals 1 048 576 bytes (1024 x 1024); for auxiliary storage (disk, diskette, and tape), 1 megabyte equals 1 000 000 bytes (1000 x 1000).

megahertz (MHz). A unit of measure of frequency. One megahertz equals 1 000 000 hertz.

MES. See *miscellaneous equipment specification*.

MHz. See *megahertz*.

MIB. See *management information base*.

miscellaneous equipment specification (MES). Any equipment that is added after the time of the initial order.

modulation. (1) The process by which a characteristic of a carrier is varied in accordance with a characteristic of an information-bearing signal (T). (2) The process by which a message signal is impressed upon a carrier signal so that the carrier is altered to represent the message signal.

multicast address. A type of IP address, which identifies a group of interfaces and permits all of the systems that are in that group to receive the same packet of information.

multimode optical fiber. (1) A graded-index or step-index optical fiber that allows more than one bound mode to propagate (E). Contrast with *single-mode optical fiber*. (2) In FDDI, an optical-fiber waveguide usually characterized by a core diameter of 50 - 100 microns that will allow a large number of modes to propagate.

multiplexing. In data transmission, a function that permits two or more data sources to share a common transmission medium so that each data source has its own channel (A) (I).

N

N. See *newton*.

NAS. See *network-attached storage*.

NetBIOS. A standard interface to networks, IBM personal computers (PCs), and other compatible PCs. It is used on LANs to provide message, print-server, and file-server functions. Application programs that use NetBIOS need not manage the details of LAN data-link-control protocols.

network-attached storage (NAS). A task-optimized storage device directly attached to a network that operates independently of the general-purpose file servers.

Network File System (NFS). A protocol, developed by Sun Microsystems, Incorporated, that allows any host in a network to mount another host's file directories. After a file directory is mounted, it appears to reside on the local host.

network information services (NIS). A set of UNIX network services (for example, a distributed service for retrieving information about the users, groups, network addresses, and gateways in a network) that resolve naming and addressing differences among computers in a network.

newton (N). The unit of force required to impart an acceleration of one meter per second per second to a mass of one kilogram (1 m/s^2).

NFS. See *Network File System*.

NIS. See *network information services*.

node. A server participating in the cluster.

O

optical cable. A fiber, multiple fibers, or a fiber bundle in a structure built to meet optical, mechanical, and environmental specifications (E).

P

parity check. (1) A redundancy check by which a recalculated parity bit is compared to the pre-given parity bit (T). (2) A check that tests whether the number of ones (or zeros) in an array of binary digits is odd or even (A).

patch cable. A length of cable with data connectors at both ends; it is normally used to interconnect two sections of building cable at a distribution panel or to connect a product to the building cable.

path. In a network, a route between two nodes.

path group. A collection of equivalent paths. Storage devices may have one - *n* path groups.

PCI. See *Peripheral Component Interconnect*.

Peripheral Component Interconnect (PCI). A local bus for PCs from Intel that provides a high-speed data path between the CPU and up to 10 peripherals (video, disk, network, and so on). The PCI bus coexists in the PC with the industry standard architecture (ISA) or extended industry standard architecture (EISA) bus. ISA and EISA boards plug into an ISA or EISA slot, while high-speed PCI controllers plug into a PCI slot.

port. See *socket*.

port number. (1) In Internet communications, the identification of an application entity to the transport service. (2) In the Internet suite of protocols, the identifier for a logical connector between an application entity and the transport service.

protocol. The meaning of, and the sequencing rules for, requests and responses used for managing a network, transferring data, and synchronizing the states of network components.

PSM. See *Persistent Storage Manager*.

R

RAID. See *redundant array of independent disks*.

RAM. See *random access memory*.

random access memory (RAM). A temporary storage location in which the central processing unit (CPU) stores and executes its processes. Contrast with *direct access storage device (DASD)*.

Redundant Array of Independent Disks (RAID). A method of protecting data loss due to disk failure based on the Redundant Array of Independent Disks specification published by the University of California in 1987. See also *device parity protection*.

resource. Cluster entity, such as a disk, file system, or network adapter, that is made highly available in the cluster.

resource group. A set of resources handled as one unit.

router. An attaching device that connects two LAN segments at the reference-model network layer. The LAN segments may use similar or different architectures.

S

SAN. See *storage area network*.

SCSI. See *small computer system interface*.

SDLC. See *synchronous data link control*.

server. (1) In a network, a node that provides facilities to other stations; for example, a file server, a printer server, a mail server.

service adapter or IP address. The adapter and IP address used for client access; a “virtual” IP that will failover to another adapter or node.

shielded twisted pair (STP). A cable medium consisting of a telephone wire wrapped in a metal sheath to eliminate external interference.

Simple Network Management Protocol (SNMP). In the Internet suite of protocols, a network management protocol that is used to monitor routers and attached networks. SNMP is an application-layer protocol. Information on devices managed is defined and stored in the application’s Management Information Base (MIB).

single-mode optical fiber. An optical fiber in which only the lowest-order bound mode (which can consist of a pair of orthogonally polarized fields) can propagate at the wavelength of interest. Contrast with *multimode optical fiber*.

small computer system interface (SCSI). A standard hardware interface that enables a variety of peripheral devices to communicate with one another.

SNMP. See *Simple Network Management Protocol*.

storage area network (SAN). A dedicated storage network tailored to a specific environment, combining servers, storage products, networking products, software, and services.

socket. In TCP/IP, the Internet address of the host computer on which the application runs, and the port number it uses. A TCP/IP application is identified by its socket.

storage client network. A classic, interconnected, fibre channel fabric with a single, fibre channel-fabric name.

storage controller. A device (such as a RAID controller) that creates and manages other storage devices. The circular arrangement between storage controllers and storage devices is due to the in-band management techniques used by the storage controllers.

storage device. A logical unit number (LUN) that terminates a collection of ports on the storage network.

storage network. An arrangement that provides shared access to a set of logical unit numbers (LUNs) across one - *n* storage client networks.

storage port. An engine’s connection point to a storage client network. A storage port is a member of a single fabric. See also *engine*.

storage unit. Hardware that contains one or more drive bays, power supplies, and a network interface. Some storage units contain RAID controllers; their storage unit is accessed by the NAS Gateway 500.

STP. See *shielded twisted pair*.

synchronize. Command that propagates the local node’s definition of the cluster to all other nodes of the cluster.

synchronous data link control (SDLC). A discipline for managing synchronous, code-transparent, serial-by-bit information transfer over a link connection. Transmission exchanges may be duplex or half-duplex over switched or nonswitched links. The configuration of the link connection may be point-to-point, multipoint, or loop.

synchronous data transfer. A physical transfer of data to or from a device that has a predictable time relationship with the execution of an I/O request.

T

tape device. A collection of tape units that share a model type and serial number (such as all the logical unit numbers (LUNs) of a tape library). See also *tape unit*.

tape unit. A tape device or a robotics controller that is visible over a storage network. A tape unit is a member of a single storage network (of 1 - *n* fabrics), but can have 1 - *n* equivalent paths.

target. A collection of logical units that are directly addressable on the network. The target corresponds to the server in a client-server model.

TB. see *Terabyte*.

TCP. See *Transmission Control Protocol*.

TCP/IP. See *Transmission Control Protocol/Internet Protocol*.

teaming. The grouping of two to four ports or adapters to increase transmission and reception throughput. Teaming creates a single, high-speed, fault-tolerant link that provides load balancing for both outbound and inbound traffic.

Telnet. In the Internet suite of protocols, a protocol that provides remote-terminal connection service. It

allows users of one host to log on to a remote host and interact as directly attached terminal users of that host.

terabyte. For processor storage, real and virtual storage, and channel volume, 2 to the power of 40 or 1 099 511 627 776 bytes.

thread. A stream of computer instructions that is in control of a process. A multithread process begins with one stream of instructions (one thread) and may later create other instruction streams to perform tasks.

timeout. A time interval that is allotted for certain operations to occur, such as a response to polling or addressing before system operation is interrupted and must be restarted.

Tivoli Storage Manager (TSM). A client/server product that provides storage management and data access services in a heterogeneous environment.

Transmission Control Protocol (TCP). In TCP/IP, a host-to-host protocol that provides transmission in an Internet environment. TCP assumes Internet Protocol (IP) is the underlying protocol.

Transmission Control Protocol/Internet Protocol (TCP/IP). The Transmission Control Protocol and the Internet Protocol, which together provide reliable end-to-end connections between applications over interconnected networks of different types.

TSM. See *Tivoli Storage Manager*.

U

UPS. see *uninterruptible power source*.

uninterruptible power source. A commercially available power source (usually a battery system) that provides temporary power to sustain the electrical operation of a device during a power failure until the normal power source can be restored.

universal serial bus (USB). A serial-interface standard for telephony and multimedia connections to personal computers.

unshielded twisted pair (UTP). A cable medium with one or more pairs of twisted insulated copper conductors bound in a single plastic sheath.

USB. See *universal serial bus*.

V

virtual local area network (VLAN). A logical association of switch ports based upon a set of rules or criteria such as MAC addresses, protocols, network address, or multicast address. This concept permits resegmentation of the LAN without requiring physical rearrangement.

virtual logical unit number (VLUN). A subset of a logical drive.

VLAN. See *virtual local area network*.

VLUN. See *virtual logical unit number*.

volume. (1) A unit of storage on disk, tape, or other data-recording media. (2) A logical disk visible to the NAS Gateway 500 over a storage network. A volume is a member of a single storage network of 1 - *n* fabrics. It can have 1 - *n* path groups of 1 - *n* equivalent paths.

W

Windows Internet Naming Service (WINS). A Microsoft program that provides a distributed database for registering and querying dynamic NetBIOS names to IP address mapping in a routed network environment.

WINS. See *Windows Internet Naming Service*.

Windows networking. A networking file-system protocol for the Windows operating system.

X

Xmodem. A public-domain asynchronous data link control (DLC) protocol that provides packet numbering and checksum error control for the transfer of binary files.

Index

Numerics

A

B

C

D

E

N

O

P

Q

R

S

T

U

V

W

Readers' Comments — We'd Like to Hear from You

IBM TotalStorage NAS Gateway 500
Service Guide

Publication No. GY27-0418-00

Overall, how satisfied are you with the information in this book?

	Very Satisfied	Satisfied	Neutral	Dissatisfied	Very Dissatisfied
Overall satisfaction	☐	☐	☐	☐	☐

How satisfied are you that the information in this book is:

	Very Satisfied	Satisfied	Neutral	Dissatisfied	Very Dissatisfied
Accurate	☐	☐	☐	☐	☐
Complete	☐	☐	☐	☐	☐
Easy to find	☐	☐	☐	☐	☐
Easy to understand	☐	☐	☐	☐	☐
Well organized	☐	☐	☐	☐	☐
Applicable to your tasks	☐	☐	☐	☐	☐

Please tell us how we can improve this book:

Thank you for your responses. May we contact you? ☐ Yes ☐ No

When you send comments to IBM, you grant IBM a nonexclusive right to use or distribute your comments in any way it believes appropriate without incurring any obligation to you.

Name _____ Address _____

Company or Organization _____

Phone No. _____

Readers' Comments — We'd Like to Hear from You
GY27-0418-00

IBM

Cut or Fold
Along Line

Fold and Tape | **Please do not staple** | Fold and Tape

NO POSTAGE
NECESSARY
IF MAILED IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST-CLASS MAIL PERMIT NO. 40 ARMONK, NEW YORK

POSTAGE WILL BE PAID BY ADDRESSEE

International Business Machines Corporation
Design & Information Development
Department CGF
P.O. Box 12195
Research Triangle Park, NC
U.S.A. 27709-9990

Fold and Tape | **Please do not staple** | Fold and Tape

GY27-0418-00

Cut or Fold
Along Line

Printed in U. S. A.

GY27-0418-00

Spine information:

IBM TotalStorage NAS Gateway 500

NAS Gateway 500 Service Guide

GY27-0418-00