IBM System Storage N series

Diagnostics Guide

GC26-7789-03

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IBM® N series

Diagnostics Guide

The sections in this guide provide the following information:

- Overview of the Diagnostics Guide gives a high-level overview of what diagnostics are available for your storage systems and gives some examples of when to run them.
- Running Diagnostics describes the Diagnostic Monitor and how to run diagnostics on your system.
- Diagnostics Menus lists and defines the menu options of the Diagnostic Monitor's individual diagnostic tests.
- Error Messages defines the coding conventions used, lists and defines the error messages generated by the diagnostic tests, and recommends the corrective action to address errors you encounter.
- Environmental Error Messages lists and defines the environmental error messages generated when you run the environmental status test in the miscellaneous motherboard test menu. This section also recommends the corrective action to address errors you encounter.

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Microsoft has not established a commitment to support SnapManager for Exchange and storage systems used in an Exchange configuration. There can be no assurance that Microsoft will provide support for this usage. IBM supports SnapManager for Exchange and IBM N series Family of Products used in an Exchange environment and has invested resources in third-party programs to provide the highest quality support possible to our customers.

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- Modify this equipment only in the ways specified by IBM.
- Use shielded cables with metallic RFI/EMI connector hoods to maintain compliance with applicable emissions standards.
- If the system has nine or more Fibre Channel disk shelves, install the system in two or three IBM N series System Cabinets to maintain performance within Part 15 of CFR 47 regulations.

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Contact Information

For N series product information, go to http://www.ibm.com/storage/nas/.

For N series support information, go to http://www.ibm.com/storage/support/nas/.

Preface

About this guide

This document describes how to boot and operate the diagnostics available for IBM N series family of products.

Audience

This guide is for qualified system administrators and service personnel who are familiar with IBM N series Family of Products. The procedures in this guide describe replacement, upgrade, and maintenance tasks for personnel with the following skills and experience:

- Working familiarity with small computer system hardware and operation
- Basic understanding of common networking concepts and practices
- Working familiarity with accepted tools and procedures for installing and operating sensitive electronic equipment

Command conventions

You can enter storage system commands on the system console or from any client that can obtain access to the storage system using Telnet. This guide uses the command syntax and output of SunOS 4.1x in examples of commands run on a UNIX workstation. If you use a different version of UNIX, the command syntax and output might be different.

Formatting conventions

The following table lists different character formats used in this guide to offset special information.

Formatting convention	Type of information
Italic type	• Words or characters that require special attention. • Placeholders for information you must supply. For example, if the guide requires you to enter the **fctest** *adaptername* command, you enter the characters "fctest" followed by the actual name of the adapter. • Man page names. • Book titles in cross-references.

`Monospaced` font	• Command and daemon names. • Information displayed on the system console or other computer monitors. • Contents of files.
Bold monospaced font	Words or characters you type. What you type is always shown in lowercase letters, unless your program is case-sensitive and uppercase letters are necessary for it to work properly.

Keyboard conventions

This guide uses capitalization and some abbreviations to refer to the keys on the keyboard. The keys on your keyboard might not be labeled exactly as they are in this guide.

What is in this guide...	What it means...
hyphen (-)	Used to separate individual keys. **For example** Ctrl-D means holding down the Ctrl key while pressing the D key.
Enter	Used to refer to the key that generates a carriage return, although the key is named Return on some keyboards.
type	Used to mean pressing one or more keys on the keyboard.
enter	Used to mean pressing one or more keys and then pressing the *Enter* key.

Special messages

This guide contains special messages that are described as follows:

Note
A note contains important information that helps you install or operate the system efficiently.

Attention

An attention contains instructions that you must follow to avoid damage to the equipment, a system crash, or loss of data.

Caution
A caution contains instructions that you must follow to avoid personal injury.

Safety Information (Sicherheitshinweise)

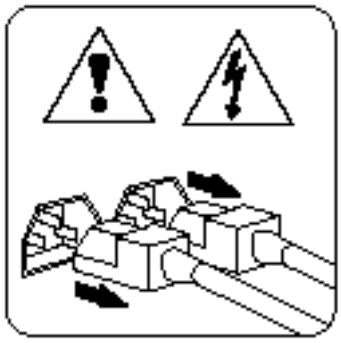
Safety Rules

All products are Class 1 laser devices. You must follow these safety rules when working with this equipment:

Caution: Failure to follow these directions could result in bodily harm or loss of life.

- When installing disk shelves and a storage system into a movable cabinet or rack, install from the bottom up for best stability.
- DC-based systems must be installed in a restricted access location and the two input power terminals for the DC power supply must be connected to separate isolated branch circuits.
- To reduce the risk of personal injury or equipment damage, allow internal components time to cool before touching them and ensure that the equipment is properly supported or braced when installing options.
- This equipment is designed for connection to a grounded outlet. The grounding type plug is an important safety feature. To avoid the risk of electrical shock or damage to the equipment, do not disable this feature.
- This equipment has one or more replaceable batteries. There is danger of explosion if the battery is incorrectly replaced. Replace the battery only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer’s instructions.

Caution for units with two power supplies



If your storage system or disk shelf has multiple power cords and you need to turn the unit off, heed the following caution:

Caution: This unit has more than one power supply cord. To reduce the risk of electrical shock, disconnect all power supply cords before servicing.

Overview of the Diagnostics Guide

About this section

This section gives a high-level overview of what diagnostics are and gives some examples of when to run them.

Topics in this section

This section discusses the following topics:

About diagnostics

The Diagnostic Monitor

The Diagnostic Monitor is a set of diagnostics tools and tests that is used to search for and determine hardware problems. It is used as part of system troubleshooting to help isolate and identify a faulty component or to confirm that a specific component is operating properly.

When to run diagnostics

Typically, you run diagnostics after one of the following events happens on your system:

- System panic is caused by an unidentified hardware failure
- Access to a specific device becomes intermittent or the device becomes unavailable
- System response time becomes sluggish

The following scenarios are examples of when you might run diagnostics:

After the initial hardware installation

When you install your system for the first time, before you boot it, you can check the hardware components by running the `all` diagnostic. If any problems exist at the hardware level, you can learn about them before you boot the system and connect it to the network.

When the system fails

When the system fails, test the system by first running the `all` diagnostic and then running individual diagnostics to isolate the cause of the failure.

When adding or replacing hardware

When you add new hardware, such as disk shelves, or change hardware components, before you boot the system, run individual diagnostics, such as `fcal`, to make sure that the disk shelf connections are sound.

When you replace a suspect component, run an individual diagnostic on the new component to check it before you boot the system. If the problem persists, it is not caused by the suspect component, but lies somewhere else.

If you suspect a problem in a specific hardware area

For example, you observed a lot of error messages of a specific type that point to a problem with the FC-AL connection. This should lead you to run the `fcal` comprehensive diagnostic while the system is running. If the system passes all tests except for the two tests that require a loopback plug, you might disconnect the system at an appropriate time and run the Loop integrity and Read-only bus tests in extended mode.

Another example is a CPU fan error causing Data ONTAP™ software to panic and shut down the system. When you examine the fan and see that it is spinning, a specific test of the fan might show that the fan is not spinning at the right speed. Replacing the CPU fan should solve the problem.

Optional materials

Optional tools and equipment

You might need the following tools and equipment to run diagnostics, if you plan on correcting any system or component problems you might find.

Tools and equipment	Where needed
#1 and #2 Phillips screwdriver	Opening the storage system, removing cabinet components, and replacing cards and adapters in the system.
Loopback plugs	Needed by some diagnostic tests that run in extended mode. The plugs close data transmission loops of some system cards, such as Ethernet cards. Make sure that you have the appropriate loopback plugs for the specific card or adapter.
Antistatic wrist strap and grounding leash	Used for grounding yourself during equipment replacement.

Reference guides

You might need the following supporting guides to assist you in replacing system components.

Manuals	Reasons
Appropriate hardware, hardware service guide, or field service guide for your storage system.	These guides contain information for installing or replacing components in your storage system.

Booting the diagnostics program

To boot the diagnostics program, complete the following steps.

Step	Action
1	Turn off power to the system if it is on. The switch for each power supply is located on the back. You should be in one of the following situations: • The system failed due to a hardware or software error. • The system is down briefly for hardware maintenance, such as replacing a component or adding a disk shelf. • You installed the system for the first time and are ready to turn on the power source and automatically boot the system.
2	Turn on power to the system. As the system boots, interrupt the process during the memory test by pressing the Delete key. **Result** For the N3700, N5200, and N5500, the CFE prompt appears after the memory test is completed. For the N5300, N5600, and the N7000 series, the Loader prompt appears after the memory test is completed.
3	Enter the following command at the prompt: **boot_diags** **Result** The diagnostics program starts to boot. When booting is complete, the top-level user interface and the Diagnostic Monitor appear, listing all available features.

Where to go next

After the Diagnostic Monitor loads, you can begin running either all diagnostic tests or specific tests. See Running Diagnostics for more information about the specific tests you can perform with the Diagnostic Monitor.

Running Diagnostics

About this section

This section describes the Diagnostic Monitor and how to run diagnostics on your system.

Topics in this section

This section discusses the following topics:

Diagnostic Monitor user interface

About the Diagnostic Monitor

The Diagnostic Monitor is a menu-driven ASCII interface. It contains three sections:

- Diagnostics
- Commands
- Options

Diagnostic Monitor menu

Typically, you test all components at once by selecting the `all` option from this menu. You can also run individual diagnostic tests by selecting the test grouping, such as the mem test, from this menu. You can also select individual commands from the Commands section, to perform specific tasks, such as setting options. The Diagnostic Monitor also enables you to control the way certain diagnostics work, such as whether a test stops when encountering an error.

The complete Diagnostic Monitor options are as follows:

Diagnostics

`all`	`All system diagnostics`
`mb`	`Motherboard diagnostic`
`mem`	`Main memory diagnostic`
`nvram`	`NVRAM diagnostic`
`scsi`	`SCSI controller diagnostic`
`fcal`	`FCAL controller diagnostic`
`gbe`	`GbE controller diagnostic`
`iscsi`	`iSCSI target HBA diagnostic`

agent Agent and rlm diagnostic

cf-card CompactFlash card diagnostic

stress System wide stress diagnostic

toe TCP controller diagnostic

Commands

Config (print a list of configured PCI devices)

Default (restore all options to default settings)

Exit (exit diagnostics and return to firmware OK prompt)

Help (print this commands list)

Options (print current option settings)

Run <diag...diag> (run selected diagnostics)

Options

Count <number> (loop selected diagnostic<s> <number> of passes>

Loop <yes | no> (loop selected diagnostic(s)>

Status <yes | no> (print status messages)

Stop <yes | no> (stop-on-error / keep running)

Xtnd <yes | no> (extended tests / regular tests)

Mchk <auto | off | on | halt> (machine check control)

CPU <0 | 1> (run diagnostic with CPU0 | run diagnostic with CPU1)

```
Seed <number>        (random seed (0:use machine generated number))


Enter Diag, Command or Option:
```

For detailed information

The following sections describe the individual sections of the Diagnostic Monitor:

- Diagnostics menu options
- Commands menu options
- Options menu options

Diagnostic Monitor user interface

Diagnostics menu options

About the Diagnostics menu

The individual Diagnostics menu options are for the individual diagnostic tests, such as `nvram`, `mb`, and so on. Typically, these tests enable you to focus your testing on a specific process or component of a card.

Sample Diagnostics menu

The following is an example of a second-level menu for the Onboard Ethernet diagnostic tests:

```
Select test or feature by number [0]: 4

GBE devices present:

GBE dev e0a

GBE dev e0b

GBE dev e0c



(Testing all GBE devices)



1:  Comprehensive GBE test              40: Port-port 10B test (Xtnd)

2:  Reset test                          41: Port-port 100B test (Xtnd)

4:  Link test                           42: Port-port 1 G test (Xtnd)

5:  Internal Mac lp test 10B            43: Cluster diag-diag test
```

6: Internal Mac lp test 100B	70: Display MAC address
7: Internal Mac lp test 1G	71: Display all registers
8: Internal Tcvr lp test 10B	72: Display Counters
9: Internal Tcvr lp test 100B	73: Set MAC address [Factory]
10: Internal Tcvr lp test 1G	90: GBE card selection
11: External lp test 10B (Xtnd)	91: Enable/disable looping
12: External lp test 100B (Xtnd)	92: Stop/continue looping on error
13: External lp test 1G (Xtnd)	93: Extended/normal test mode
14: Interrupt test	99: Exit

Select feature by number [ ]

Diagnostic Monitor user interface

Commands menu options

About the Commands menu

The following six commands are available in the Commands section of the Diagnostic Monitor.

```
Commands

Config     (print a list of configured PCI devices)

Default    (restore all options to default settings)

Exit       (exit diagnostics and return to firmware OK prompt)

Help       (print this commands list)

Options    (print current option settings)

Run <diag...diag> (run selected diagnostic)
```

Config command

The config command enables you to learn what Peripheral Component Interconnect (PCI) devices you have on your system.

Default and options commands

The default and options commands are closely related. They are compared in the following table.

Command	Enables you to...

`default`	Return all test option settings to default values, which are • `loop no` • `status yes` • `stop yes` • `xtnd no` • `mchk auto`

`options`	Display the current test option settings.
	
	When test options are set to default values, the system displays the following output after the default command:
	
	`--Tests will stop on error`
	`--Diagnostic looping disabled`
	`--Status messages enabled`
	`--Normal testing enabled`
	`--Automatically select action on machine checks`
	`(Halt on most machine checks)`
	
	For example, when you modify the option to the setting you want at the `Enter Diag, Command, or Option` prompt:
	
	loop yes
	
	The system response in this example shows all settings but one are set to default:
	
	`--Tests will stop on error`
	`**Diagnostic looping enabled`
	`--Status messages enabled`
	`--Normal testing enabled`
	`--Automatically select action on machine checks`
	`(Halt on most machine checks)`
	
	Note
	The asterisks before the option setting indicate a non-default value. The count option is not listed because it does not have a default setting.

Exit command

The `exit` command exits the Diagnostics program and returns you to the firmware prompt. Following this, you can reboot the system without power-cycling the machine.

If you need to stop a diagnostic session while it is running, you can use the `Ctrl-C` command.

Help command

Online help is available for the Diagnostic Monitor through the `help` command. The `help` command lists what is available through the `diagnostics`, `commands`, and `options` menus. It also identifies the version of Diagnostics that is being run.

Run command

The `run` command enables you to run several diagnostic sessions in sequence, using the `run` command followed by the diagnostic names you want to run. Each session runs without interactive test selection menus.

In the following example, you are running the `mb` (motherboard) diagnostic and the `memory` diagnostic:

```
run mb mem
```

Diagnostic Monitor user interface

Options menu options

About the Options menu

The six test options in the Diagnostic Monitor are as follows:

```
Options

 Count <number>      (loop selected diagnostic<s> <number> of passes)

 Loop <yes | no>     (loop selected diagnostic(s))

 Status <yes | no> (print status messages)

 Stop <yes | no>     (stop-on-error / keep running)

 Xtnd <yes | no>     (extended tests / regular tests)

 Mchk <auto | off | on | halt>  (machine check control)

 Seed <number> <random seed <0:use machine generated number>>
```

Count and loop options

The following table describes the count and loop options.

Count and loop options	Description

`count` <number>	You can control how many loop passes are executed. The count option works only when looping is enabled. **Example** To limit an internal or external loopback test to six loop passes, you would enter: **count 6**
`loop no` (default)	Looping is disabled. Terminates session at the end of a pass. Does not continue to loop continuously.
`loop yes`	Looping is enabled. The test run loops continuously or for the specified number of loop passes, if you set the count option. Enabled looping applies to the `all` and `run` commands. When you enable looping with `loop yes`, you can also specify the number of loop passes with `count` <*number*>. **Example** To enable looping, you would enter the following command: **loop yes** `**Diagnostic looping enabled` The system response tells you looping is enabled.

Example count and loop options

The following example enables looping and sets the number of loop passes to six:

```
loop yes
**Diagnostic looping enabled
count 6
```

Status option

The following table lists the status option settings.

Status option	Description
`status yes` (default)	Displays the diagnostic status in detail.
`status no`	Displays the diagnostic status in a brief sentence.

`Stop` option

The following table lists the stop option settings.

Stop option	Description
`stop yes` (default)	When diagnostics discovers an error, it stops at the end of a complete loop pass. The error is logged to the console terminal. If the `stop` option is enabled, the diagnostic stops execution at the end of a complete test pass.
`stop no`	When diagnostics discovers an error, it continues running. You can run additional tests and continue to encounter additional errors.

`Xtnd` option

Extended mode applies only to tests that are marked with the `Xtnd` label. There are two possible settings, described in the following table.

Xtnd option	Description
`xtnd no` (default)	In this test mode, called *normal test mode*, you are testing the system component within the inner boundaries of the unit.
`xtnd yes`	In this test mode, called *extended test mode*, you are testing the physical media outside the unit. With NICs, you are required to disconnect the unit and put special loopback connectors or plugs on the card. **Note** Loopback plugs are required to run some FC-AL diagnostic tests. They are not required when the Fibre Channel loop has its own terminator.

Example of xtnd yes

This example shows `xtnd yes` and the system reminding you that you might need loopback plugs.

```
xtnd yes
**Extended testing enabled
NOTE:  Some diagnostics require loopback plugs for complete test
operation and will indicate failures without these plugs.
```

Example of a test failure

This example shows a test failure when you have done the following:

- Failed to prepare the FC-AL adapter with loopback plugs
- Failed to set the `xtnd yes` test option
- Selected 11--Loop integrity LRC test [Xtnd] in the FCAL test menu

```
ERROR DLH0020: FCAL loop is open. Check cables and associated hardware
FCAL loop test.....................................FAILED
```

See Error Messages, for a description of individual error messages.

Preparing to run a test in extended mode

To prepare for a test in extended mode that requires loopback plugs, complete the following steps.

Step	Action
1	Disconnect the system from the network and if applicable from a cluster.
2	Connect the loopback plugs to the card.
3	Enable extended mode from the Diagnostic test menu by entering its number: **93**
4	Run the comprehensive test or the specific loop test.
5	Remove the loopback plugs after the test is completed.

Mchk option

The `mchk` (machine check) option enables you to control system behavior when the hardware detects a machine check error.

The four `mchk` settings are as follows.

Mchk option	When a machine check is detected, the system...

`mchk auto` (default)	Automatically chooses the best machine check control for the diagnostic. Usually it halts the diagnostic session. You can use non-default machine check settings in certain memory testing circumstances to aid in diagnosing hardware problems.
`mchk halt`	Halts the system immediately, going into a panic state. Reboot the system to continue running diagnostics.
`mchk no`	Silently ignores the error, unless it is fatal.
`mchk yes`	Does not halt diagnostic execution if memory parity/ECC errors or similar errors are detected. The system reports the machine check and resumes the diagnostic execution. The diagnostic can continue testing and analyzing all errors in the test pass, possibly providing a more accurate callout of memory DIMM failures.

Example

In the following example, you enable machine check with the `mchk yes` option.

```
mchk yes
**Machine checks enabled
 (Display memory machine checks and continue)
```

Options you can set at test menu level

You can set the `loop`, `stop`, and `xtnd` options not only at the Diagnostic Monitor menu level, but also at the individual test menu level.

For example, when you enter `gbe` to run diagnostics on the GbE card, the GbE Diagnostic test menu appears, offering the following test options:

```
91:       Enable/disable looping

92:       Stop/continue on error

93:       Extended/Normal test mode
```

You can also enable looping on the card by entering the number for the option:

```
91
```

Seed option

The following table lists the seed option settings.

Seed option	Description
`seed <number>`	Enables the user to feed the Memory, NVRAM, and Cache diagnostics tests with a user-defined seed. Even if the test is random, this option recreates a test scenario and the value of the seed is displayed at the beginning of the test.
`seed 0` (default)	The diagnostics tests will use a machine generated seed number.

See Diagnostics Menus for more information about individual diagnostic test menus.

Running diagnostic tests

About the tests

The Diagnostic Monitor enables you to run tests of all components in the system or to select individual components for testing.

Tests that are labeled `[Xtnd]` often require you to install a set of appropriate loopback plugs on the tested component before you start the test and will indicate failures without these plugs.

Caution: Do not run `[Xtnd]` mode diagnostics on network adapter cards with live network connections. Disconnect all network connections prior to running network diagnostics in `[Xtnd]` mode. Running with attached networks can adversely affect other attached devices. Type **`xtnd n`** to cancel Extended test mode.

Items that are labeled `[Factory]`, `[Mfg]`, or the like, are accessible only to manufacturing personnel with special password privileges.

Running diagnostics on a N3700 (model number 2863-A20) series

A N3700 (model number 2863-A20) is a N3700 with two system modules. If you are running diagnostics on system module B for example, you will see the following system message and question if you select specific tests or options that test the FC-AL interface or the disks:

```
Diagnostics is currently running on Module B.

If Module A, the partner system, is running Data
ONTAP or Diagnostics, then FCAL external loopback
and disk tests may report nonexistent failures.

To run all FCAL tests on this system, you must
power cycle the shelf and leave Module A at the
CFE prompt.

NOTE: FCAL external loopback and disk tests will
automatically be skipped if you answer "yes" to
the following question.

Is Module A currently running Data ONTAP or
Diagnostics (yes/no)?
```

This question is only asked once per diagnostic session and the system will recognize the response for all tests and options run during that session. If the answer is yes, then only a limited set of FC-AL tests or options are available for running. If the answer is no, then all tests and options are available for running.

For detailed information

The following sections describe how to run and interpret either type of test:

Running diagnostic tests

Running all diagnostic tests

When to run the all test

To identify a hardware problem as quickly as possible, you run diagnostics on all components using the `all` diagnostic. You should select this option only after a normal system shutdown, a new card is installed, or there is no chance to preserve customer data after a system crash.

N3700 (model number 2863-A20) only: If you are running diagnostics on system module B and you responded that system module A is running Data ONTAP or Diagnostics, then only a limited set of FC-AL tests or options are available for running.

Do not use the `all` option for the following circumstances:

- Immediately after a system crash
- If log data is stored

Using the all option

To run diagnostics on all components, complete the following step.

Step	Action
1	In the Diagnostic Monitor, after the `Enter Diag, Command, or Option` prompt, enter the following command: **all** **Results** As each test starts, its name and the test result appears on the console. By default, diagnostic testing stops when an error is encountered. The error is displayed on the screen, so you can identify the problem. See Error Messages, for more information about error messages. **Note** You can set the `all` option to run diagnostic testing without stopping when an error is detected. Use the `stop no` option from the Diagnostic Monitor. See Stop option for more information about setting this option.

Running diagnostic tests

Running individual diagnostic tests

Individual test menu structure

The hardware component that you are testing determines what appears in its test menu. However, all individual test menus share some common features:

- 1 -- You always use 1 to run a comprehensive test or all tests in the menu. This is the quickest way to learn whether you have a problem on the component.
- 99 -- You always use 99 to exit the menu.

See Diagnostics Menus, for a detailed description of the individual test menus.

The following table describes the basic organization of test menus by numbers and shared functions.

Menu number	Function
1	Runs all the tests in the main test group (2-19)
2-39	This is the main test group. Each test tests a specific part of the component.
40s	Runs additional tests, which are used to debug and narrow down the problem after you run the main test group.
70s through 80s	Displays specific information about the system component. Also lets you set specific conditions for testing. These tests are also used for initialization functions.
90s	Lets you set the `loop`, `stop`, and `xtnd` options at the test menu level and exit.

Running individual diagnostics

To run diagnostics on an individual component, complete the following steps.

Step	Action

1	In the Diagnostic Monitor, after the `Enter Diag, Command, or Option` prompt, enter the name of the diagnostic. **Example** **gbe** **Result** The Gigabit diagnostic test menu appears.
2	Enter the number of the test you want to run or enter 1 to run a comprehensive test.

Running diagnostic tests

Test results

Test output

When you run a test, its name, results, and error messages, if any, appear on the screen and you are returned to the test menu.

Error message output

A diagnostic can log up to 12 errors. If the test encounters too many errors, it stops execution. If the `stop` option is enabled, the diagnostic stops execution at the end of a complete test pass. After the test finishes, you can run additional tests and continue logging additional errors.

Example

The following example shows an error message you might see during a test:

```
DZH0112 Battery dead. RTC not functional!
```

Where to go next

After the Diagnostic Monitor is loaded, you can run diagnostics on all system components or individual components. See Diagnostics Menus, for a list and description of the tests you can run. See Error Messages, for a list and description of all diagnostic error messages, along with the suggested corrective action. See Environmental Error Messages, for a list and description of all environmental error messages, along with the suggested corrective action.

Diagnostics Menus

About this section

This section lists and defines the menu options of the Diagnostic Monitor's individual diagnostic tests.

If you receive an error message during a particular test, go to Error Messages, to determine what the message means and to determine how to correct the problem encountered by the test.

Topics in this section

This section discusses the following topics.

Motherboard diagnostics

About motherboard diagnostics

The motherboard diagnostic test the integrity of a variety of components on the motherboard or system backplane. The data you retrieve from these tests helps you determine what component is causing an error.

For example, if you want to check the PCI devices and slots on the motherboard, you select the Misc. board component menu option, then select the appropriate test from the Miscellaneous board component tests submenu.

For detailed information

For detailed information about the motherboard and backplane diagnostic menus, see the following sections:

- N3700
- N5200 and N5500
- N5300 and N5600
- N7000 series

N3700 motherboard tests

About the N3700 motherboard tests

This section addresses the Motherboard menu and the Miscellaneous board test, the Cache, the Onboard Ethernet test, and the Onboard FC-AL test submenus for the FAS3700 platform. To go to the error messages associated with the motherboard diagnostic tests, see Motherboard error messages.

For detailed information

For detailed information about the menus, see the following sections:

- Motherboard menu
- Misc. board test menu
- Cache test menu
- Onboard Ethernet test menu
- Onboard FC-AL test menu

The N3700 environmental error codes can be generated by running the miscellaneous board diagnostic tests for the N3700 motherboard.

Motherboard menu and submenus

Motherboard menu

This section describes the Motherboard menu.

N3700 (model number 2863-A20) only: If you are running diagnostics on system module B and you responded that system module A is running Data ONTAP or Diagnostics, then only a limited set of FC-AL tests or options are available for running.

Test no	Test	Description
1	Comprehensive motherboard diag	Runs all tests in this menu in current mode.
2	Misc. board test menu	Accesses the miscellaneous motherboard test menu.
3	Cache menu	Accesses the CPU Caches. For more information, see the Cache menu.
4	Onboard Ethernet test menu	Accesses the onboard Gigabit Ethernet test menu.
5	Onboard FCAL test menu	Accesses the onboard FC-AL test menu.
71	Show PCI configuration	Lists the contents of all adapters in the PCI slots on the motherboard.
72	Show detailed PCI info	Displays detailed information about the contents and settings of the cards in the PCI slots.
73	Initialize real-time clock	Initializes the onboard real-time clock to user-defined settings.
74	Show system info	Displays information about the system.
75	Serial info setup menu [Factory only]	Option not available.
76	Show all disks	Displays information about the disks.
91	Enable/disable looping	Enables or disables continuous running of a diagnostic test. The test is stopped when Ctrl-C is pressed or when an error is encountered if option 92 is active.
92	Stop/continue looping on error	Starts or stops running a diagnostic test on an error. If looping is enabled, as set by option 91, looping continues after an error is encountered.
93	Extended/normal test mode	Enables or disables extended mode on tests where extended mode is an available option.
99	Exit	Exits this diagnostics menu.

Motherboard menu and submenus

Miscellaneous board test menu

This section describes the Miscellaneous board test submenu.

Test no	Test	Description
1	Run all miscellaneous tests	Runs all tests in this menu in current mode.
2	Check PCI devices	Verifies that the onboard PCI devices are alive and responding normally.
3	Check memory interface	Verifies that accesses to main memory are operating correctly. Uses a sliding bits pattern.
4	Check boot flash access	Verifies access to system boot PROM. Reads and checks Programmable Read Only Memory (PROM) data.
5	Real-time clock test	Verifies and displays system clock and date.
6	Check Environmental Status	Checks the Environmental Status Register (ESR) for fault conditions, such as fan failure and high temperature.
7	Front panel LED exercise	Exercises the front panel LEDs by changing patterns in the displays. You need to observe the LEDs blinking to verify that they are working.
8	Test PCI slots	Tests the PCI devices.
9	Check watchdog interrupt	Checks that the watchdog interrupt is working.
71	Show PCI configuration	Shows the configuration of the Peripheral Component Interconnect (PCI), a peripheral bus.
72	Show detailed PCI info	Displays detailed information about the PCI.
73	Initialize real-time clock	Initializes the battery powered, real-time clock.

91	Enable/disable looping	Enables or disables continuous running of a diagnostic test. The test is stopped when Ctrl-C is pressed or when an error is encountered if option 92 is active.
92	Stop/continue looping on error	Starts or stops running a diagnostic test on an error. If looping is enabled, as set by option 91, looping continues after an error is encountered.
93	Extended/normal test mode	Enables or disables extended mode on tests where extended mode is an available option.
99	Return to main menu	Returns you to the main Diagnostics menu.

Motherboard menu and submenus

Cache menu

The section describes the Cache submenu.

Test no	Test	Description
1	Comprehensive cache test	Runs all tests in this menu in current mode.
2	Cache walking data bits test	Verifies the data path between the CPU and cache (on systems with cache).
3	Cache stuck-at faults test	Scans through all cache locations, checking for stuck bits (0 or 1).
4	Cache random read/write test	Tests by random reading or writing of cache locations.
5	Cache random data test	Tests by placing random data in every cache location. Provides good cell verification.
6	Cache random address test	Tests by generating random addresses for reading and writing. Stresses addressing.
7	Cache spill test	Tests the cache interface to main memory. Causes cache flush and reload. Provides excellent test of cache management logic.
8	Cache tag test	Tests the cache tags by reading random addresses.
9	Cache MP test	Tests the cache on an MP system.
91	Enable/disable looping	Enables or disables continuous running of a diagnostic test. The test is stopped when Ctrl-C is pressed or when an error is encountered if option 92 is active.
92	Stop/continue looping on error	Starts or stops running a diagnostic test on an error. If looping is enabled, as set by option 91, looping continues after an error is encountered.
99	Return to main menu	Returns you to the main Diagnostics menu.

Motherboard menu and submenus

Onboard Ethernet test menu

This section describes the onboard Ethernet test submenu. The Ethernet diagnostic tests can generate error messages associated with the hardware and software.

N3700 (model number 2863-A20) only test:
To perform test 43, complete the following steps:

1. Boot both system modules to Diagnostics.
2. Select this test option on both system modules.
3. Select tx (transmit) on system module A and rx (receive) on system module B.
4. Then select tx (transmit) on system module B and rx (receive) on system module A.

Note: Tests that are labeled `[Xtnd]` often require loopback plugs for complete test operation and indicate failures without these plugs.

Caution: Do not run `[Xtnd]` mode diagnostics on network adapters with live network connections. Disconnect all network connections prior to running network diagnostics in `[Xtnd]` mode. Running with attached networks can adversely affect other attached devices. Enter **`xtnd n`** to cancel Extended test mode.

Test no	Test	Description
1	Comprehensive GBE test	Runs all tests in this menu in current mode.
2	Reset test	Runs a test that resets the Intel GbE card to its original state.
4	Link test	Verifies the external link condition. Requires loopback plug or Ethernet connection.
5	Internal Mac lp test 10B	Tests movement of data through the MAC.
6	Internal Mac lp test 100B	
7	Internal Mac lp test 1G	
8	Internal Tcvr lp test 10B	Tests movement of data through the transceiver.
9	Internal Tcvr lp test 100B	

10	Internal Tcvr lp test 1G	
11	External lp test 10B (Xtnd)	*Extended test mode*: Tests card functionality and data movement between memory and the Ethernet cable. Requires a loopback plug.
12	External lp test 100B (Xtnd)	
13	External lp test 1G (Xtnd)	
14	Interrupt test	Performs the internal loopback test in Interrupt mode to test and verify that the DMA/data transfers work in Interrupt mode.
40	Port-port 10B test (Xtnd)	Tests the data path from one channel to another for the dual-channel network interfaces. It requires a twisted-pair network cable to be connected between the two ports.
41	Port-port 100B test (Xtnd)	
42	Port-port 1 G test (Xtnd)	
43	Cluster diag-diag test	*N3700 (model number 2863-A20) only*: Tests the third Ethernet interface which is on the backplane and functions as the interconnect interface between the two system modules.
70	Display MAC address	Verifies and displays the MAC address of the interface.
71	Display all registers	Displays all the memory registers.
72	Display Counters	Displays the date counters.
73	Set MAC address [Factory]	Option not available.
90	GBE card selection	Enables the selection of a specific GbE interface in the system.
91	Enable/disable looping	Enables or disables continuous running of a diagnostic test. The test is stopped when Ctrl-C is pressed or when an error is encountered if option 92 is active.
92	Stop/continue looping on error	Starts or stops running a diagnostic test on an error. If looping is enabled, as set by option 91, looping continues after an error is encountered.
93	Extended/normal test mode	Enables or disables extended mode on tests where extended mode is an available option.
99	Exit	Exits this diagnostics menu.

Motherboard menu and submenus

Onboard FC-AL diagnostics

This section describes the onboard FC-AL (Fibre Channel Arbitrated Loop) group of diagnostic tests. The tests range from EEPROM data verification through data transfer integrity testing. The FC-AL diagnostic tests can generate error messages associated with the interface and disk shelf.

N3700 (model number 2863-A20) only: If you are running diagnostics on system module B and you responded that system module A is running Data ONTAP or Diagnostics, then only tests 2, 3, and 4 are available for running.

Note
To perform disk or shelf diagnostics, select test 90 and identify the channel. This returns you to the main FC-AL menu. Then select test 80 or 81.

FC-AL diagnostic test menu

The following table describes the available tests in the FC-AL diagnostic menu.

Note: Tests that are labeled `[Xtnd]` often require loopback plugs for complete test operation and indicate failures without these plugs.

Caution: Do not run `[Xtnd]` mode diagnostics on network adapters with live network connections. Disconnect all network connections prior to running network diagnostics in `[Xtnd]` mode. Running with attached networks can adversely affect other attached devices. Enter **`xtnd n`** to cancel Extended test mode.

Test no	Test	Description
1	Comprehensive FCAL test	Runs all tests in this menu in current mode.
2	Self test	Verifies and tests the FC-AL chip configuration, firmware commands, mailboxes, status, error information, the serial EEPROM data, the ISP power-on self-test (POST), the on-chip SSRAM with fixed and random patterns, the SSRAM/ DMA of fixed and random patterns between SSRAM and most locations of main memory, and ISP firmware in SSRAM.
3	ISP interrupt test	Tests the ISP interrupt mechanism.
4	Int loop test	Tests data movement between main memory and the FC-AL chip, using on-chip loopback capability for 10 bit and 1 bit.

5	Bus reset test [Xtnd]	*Extended test mode*: Tests the FC-AL loop integrity and LRC functionality by resetting the bus.
6	Ext loop test [Xtnd]	*Extended test mode:* Tests the functionality and data movement between memory and FC-AL cable. Requires loopback plug.
7	Read-only bus test	Tests the FC-AL loop integrity by reading from each disk attached to the FC-AL interface.
8	Read/write bus test [Mfg]	Option not available.
9	Disk read test (FCTEST)	Tests the FC-AL adapter loop integrity by reading from each disk attached to the FC-AL onboard interface. This test has optional parameters. Requires disks attached to the FC host adapter.
10	Disk read/write test [Mfg]	Option not available.
41	Scan all disks on all FC-AL adapters	Lists the status of all the disks on all FC-AL adapters on the storage system. Requires disks attached to the FC host adapter.
42	Scan and show disks on selected FC-AL adapters	Lists the status of all the disks on the specified FC-AL adapters. Requires disks attached to the FC host adapter.
43	FC-AL adapter LED test	Tests the external LEDs on the FC-AL card.
71	Show ISP FC chip info	Displays information about the ISP Fibre Channel chip.
72	Show attached FC-AL devices	Displays all devices attached to a specific FC-AL adapter.
73	Show all disks (probe-scsi-all)	Lists disk information for all disks attached to the system.
74	Reset FC-AL adapter	Resets the selected FC-AL adapter to its original state.
75	Show serial EEPROM data	Displays the serial EEPROM data.
76	Program serial EEPROM data [Factory]	Option not available.
77	Display fcstat link_status	Displays the link statistics maintained for all drives on a Fibre Channel loop.
80	Go to disk diagnostic menu	Accesses the disk bus pattern diagnostics submenu.
81	Go to shelf diagnostics menu	Accesses the disk shelf diagnostics submenu.
90	FC-AL channel selection	Enables you to select a specific FC-AL interface for testing.
91	Enable/disable looping	Enables or disables continuous running of a diagnostic test. The test is stopped when Ctrl-C is pressed or when an error is encountered if option 92 is active.

92	Stop/continue looping on error	Starts or stops running a diagnostic test on an error. If looping is enabled, as set by option 91, looping continues after an error is encountered.
93	Extended/normal test mode	Enables or disables extended mode on tests where extended mode is an available option.
99	Exit	Exits this diagnostics menu.

Card diagnostics

Disk diagnostics submenu

The following table describes the FC-AL disk diagnostics submenu.

Test no	Test	Description
1	Perform drive self diagnostic test	The drive seeks a reserved non user-accessible cylinder and writes, reads, and verifies data for each data surface.
2	Low frequency pattern [Mfg]	Option not available.
3	Low transition density pattern [Mfg]	Option not available.
4	Half-rate square pattern [Mfg]	Option not available.
5	Quarter-rate square pattern [Mfg]	Option not available.
6	Contiguous '3' pattern [Mfg]	Option not available.
7	Composite pattern [Mfg]	Option not available.
40	Read drive defect list	Displays primary and grown defect list. This test has optional parameters. Requires disks attached to the FC host adapter.
99	Exit this menu	Returns the user to the main FC-AL menu.

Disk shelf diagnostics submenu

The following table describes the disk shelf diagnostics submenu for the FC-AL interface.

Note: Tests that are labeled `[Xtnd]` often require loopback plugs for complete test operation and indicate failures without these plugs.

Caution: Do not run `[Xtnd]` mode diagnostics on network adapters with live network connections. Disconnect all network connections prior to running network diagnostics in `[Xtnd]` mode. Running with attached networks can adversely affect other attached devices. Enter **`xtnd n`** to cancel Extended test mode.

Test no	Test	Description
1	Turn shelf LED on	Turns on the drive LEDs.
2	Turn shelf LED off	Turns off the drive LEDs.
3	Get trunk information	Option not available.
4	Get shelf drive map	Displays the list of drives on target FC-AL interface.
5	Get shelf environment information	Displays the environmental parameters on the target FC-AL interface.
6	Check SES temperature sensors	Checks SES temperature sensors against threshold value.
7	Check SES Fans	Checks SES fan status.
8	Check SES power supply	Checks SES power supply status.
9	Check SES ESH (HUB)	Option not available.
10	Check all SES elements	Checks status of all SES elements in the shelf.
11	Loop integrity/LRC test [Xtnd]	*Extended test mode*: Tests the FC-AL loop integrity and LRC functionality.
12	Show HUB status	Option not available.
70	Display sector size for FC-AL devices	Displays the sector size for the drives on the disk shelves.
93	Extended/normal test mode	Enables or disables extended mode on tests where extended mode is an available option.
99	Exit this menu	Returns the user to the main FC-AL menu.

N5200 and N5500 motherboard tests

About the N5200 and N5500 motherboard tests

This section addresses the Motherboard menu and the Miscellaneous board test, the Cache, the Onboard Ethernet test, and the Onboard FC-AL test submenus for the N5200 and N5500 platforms. To go to the error messages associated with the motherboard diagnostic tests, see Motherboard error messages.

For detailed information

For detailed information about the menus, see the following sections:

- Motherboard menu
- Misc. board test menu
- Cache menu
- Onboard Gigabit Ethernet test menu
- Onboard FC-AL test menu
- Onboard SCSI test menu

The following table identifies the environmental error messages that you can generate by running the miscellaneous board diagnostic tests for the motherboards in the N5200 and N5500 appliances.

Miscellaneous Board Tests run on...	See...
N5200 motherboard	N5200 environmental error codes
N5500 motherboard	N5500 environmental error codes

Motherboard menu and submenus

Motherboard menu

This section describes the Motherboard menu.

Test no	Test	Description
1	Comprehensive motherboard diag	Runs all tests in this menu in current mode.
2	Misc. board test menu	Accesses the miscellaneous motherboard test menu.
3	Cache menu	Accesses the CPU Caches. For more information, see the Cache menu.
4	Onboard Gigabit Ethernet test menu	Accesses the onboard Gigabit Ethernet test menu.
5	Onboard FCAL test menu	Accesses the onboard FC-AL test menu.
6	Onboard SCSI test menu	Accesses the onboard SCSI test menu.
71	Show PCI configuration	Lists the contents of all adapters in the PCI slots on the motherboard.
72	Show detailed PCI info	Displays detailed information about the contents and settings of the cards in the PCI slots.
73	Initialize real-time clock	Initializes the onboard real-time clock to user-defined settings.
74	Show system info	Displays information about the system.
75	Serial info setup menu [Factory only]	Option not available.
76	Show Adapter card info [Mfg only]	Option not available.
91	Enable/disable looping	Enables or disables continuous running of a diagnostic test. The test is stopped when Ctrl-C is pressed or when an error is encountered if option 92 is active.
92	Stop/continue looping on error	Starts or stops running a diagnostic test on an error. If looping is enabled, as set by option 91, looping continues after an error is encountered.
93	Extended/normal test mode	Enables or disables extended mode on tests where extended mode is an available option.
99	Exit	Exits this diagnostics menu.

Motherboard menu and submenus

Miscellaneous board test menu

This section describes the Miscellaneous board test submenu.

Note: Tests that are labeled `[Xtnd]` often require loopback plugs for complete test operation and will indicate failures without these plugs.

Caution: Do not run `[Xtnd]` mode diagnostics on network adapter cards with live network connections. Disconnect all network connections prior to running network diagnostics in `[Xtnd]` mode. Running with attached networks can adversely affect other attached devices. Type **`xtnd n`** to cancel Extended test mode.

Test no	Test	Description
1	Run all miscellaneous tests	Runs all tests in this menu in current mode.
2	Check CPU/host bridge status	Tests the CPU host bridge chipset.
3	Check South Bridge status	Verifies that the South Bridge System I/O chipset is alive and responding normally.
4	Check PCI devices and slots	Verifies that the onboard PCI devices and slots are alive and responding normally.
5	Check memory interface	Verifies that accesses to main memory are operating correctly. Uses a sliding bits pattern.
6	Check boot flash access	Verifies access to system boot PROM. Reads and checks Programmable Read Only Memory (PROM) data.
7	Real-time clock test	Verifies and displays system clock and date.
8	Check environmental status	Checks the Environmental Status Register (ESR) for fault conditions, such as fan failure and high temperature.
9	Check Super I/O status	Verifies that the Super I/O chip is alive and responding normally.
11	Front panel LED exercise	Exercises the front panel LEDs by changing patterns in the displays. You need to observe the LEDs blinking to verify that they are working.
12	Front panel LCD exercise	Exercises the front panel LCD by changing patterns in the display. You need to observe the LCDs to verify that they are working.
13	Test PCI devices [Factory only]	Option is unavailable.
14	Check on-board 8K nvsram	Verifies that the onboard 8K NVSRAM is working correctly.
41	Check watchdog interrupt	Checks that the watchdog interrupt is working.
71	Show PCI configuration	Shows the configuration of the Peripheral Component Interconnect (PCI), a peripheral bus.
72	Show detailed PCI info	Displays detailed information about the PCI.
73	Initialize real-time clock	Initializes the battery powered, real-time clock.

74	Toggle front panel LEDs	Verifies that the front panel activity and status LEDs are working by turning them ON/OFF or changing colors.
91	Enable/disable looping	Enables or disables continuous running of a diagnostic test. The test is stopped when Ctrl-C is pressed or when an error is encountered if option 92 is active.
92	Stop/continue looping on error	Starts or stops running a diagnostic test on an error. If looping is enabled, as set by option 91, looping continues after an error is encountered.
93	Extended/normal test mode	Enables or disables extended mode on tests where extended mode is an available option.
99	Return to main menu	Returns you to the main Diagnostics menu.

Motherboard menu and submenus

Cache menu

The section describes the Cache submenu.

Test no	Test	Description
1	Comprehensive cache test	Runs all tests in this menu in current mode.
2	Cache walking data bits test	Verifies the data path between the CPU and cache (on systems with cache).
3	Cache stuck-at faults test	Scans through all cache locations, checking for stuck bits (0 or 1).
4	Cache random read/write test	Tests by random reading or writing of cache locations.
5	Cache random data test	Tests by placing random data in every cache location. Provides good cell verification.
6	Cache random address test	Tests by generating random addresses for reading and writing. Stresses addressing.
7	Cache spill test	Tests the cache interface to main memory. Causes cache flush and reload. Provides excellent test of cache management logic.
8	Cache tag test	Tests the cache tags by reading random addresses.
9	Cache MP test	Tests the cache on an MP system.
91	Enable/disable looping	Enables or disables continuous running of a diagnostic test. The test is stopped when Ctrl-C is pressed or when an error is encountered if option 92 is active.
92	Stop/continue looping on error	Starts or stops running a diagnostic test on an error. If looping is enabled, as set by option 91, looping continues after an error is encountered.
99	Return to main menu	Returns you to the main Diagnostics menu.

Motherboard menu and submenus

Gigabit diagnostics

About the Gigabit diagnostic tests

This section describes the onboard Gigabit Ethernet (GbE) test submenu. The GbE diagnostic tests can generate error messages associated with the hardware and software.

Note: Tests that are labeled `[Xtnd]` often require loopback plugs for complete test operation and will indicate failures without these plugs.

Caution: Do not run `[Xtnd]` mode diagnostics on network adapter cards with live network connections. Disconnect all network connections prior to running network diagnostics in `[Xtnd]` mode. Running with attached networks can adversely affect other attached devices. Type **`xtnd n`** to cancel Extended test mode.

GbE diagnostic test menu

The following table describes the GbE diagnostic tests.

Test no	Test	Description
1	Comprehensive GBE test	Runs all tests in this menu in current mode.
2	Reset test	Runs a test that resets the Intel GbE card to its original state.
3	EEPROM test	Runs a series of tests that reads and verifies EEPROM data on the GbE card.
4	Internal lp test 1G	Tests data movement between main memory and the GbE card, using onboard loopback capability. **Note** If your system is running an Copper GbE card, this test is not supported.
5	External lp test 1G (Xtnd)	*Extended test mode*: Tests card functionality and data movement between memory and the Ethernet cable. Requires loopback plug.
6	Internal lp test 10B	Tests data movement between main memory and the GbE card, using onboard loopback capability.
7	Internal lp test 100B	
8	External lp test 10B (Xtnd)	*Extended test mode*: Tests card functionality and data movement between memory and the Ethernet cable. Requires loopback plug.
9	External lp test 100B (Xtnd)	
10	Interrupt test	Performs the internal loopback test in Interrupt mode to tests and verify that the DMA/data transfers work in Interrupt mode.

11	Quick Interrupt test	Tests and verifies that all the device interrupts are working. Data is not transfered during this test.
40	MAC loop test	Tests movement of data through the MAC on the Intel GbE card. **Note** If your system is running an Intel Copper GbE card, it requires a loopback plug.
41	Port-port 10B test (Xtnd)	This test tests the data path from one channel to another for the dual channel NICS, requires a twisted pair network cable to be connected between the 2 ports.
42	Port-port 100B test (Xtnd)	
43	Port-port 1 G test (Xtnd)	
70	Display MAC address	Verifies and displays the MAC address of the card.
71	Display all registers	Displays all the card memory registers.
72	Display EEPROM	Displays the EEPROM data on the GbE card.
73	Set MAC address [Factory]	This is test is unavailable.
90	GbE card selection	Enables the selection of a specific GbE card in the system.
91	Enable/disable looping	Enables or disables continuous running of a diagnostic test. The test is stopped when Ctrl-C is pressed or when an error is encountered if option 92 is active.
92	Stop/continue looping on error	Starts or stops running a diagnostic test on an error. If looping is enabled, as set by option 91, looping continues after an error is encountered.
93	Extended/normal test mode	Enables or disables extended mode on tests where extended mode is an available option.
99	Exit	Exits this diagnostics menu.

Motherboard menu and submenus

Onboard FC-AL diagnostics

This section describes the onboard FC-AL (Fibre Channel Arbitrated Loop) group of diagnostic tests. The tests range from EEPROM data verification through data transfer integrity testing. The FC-AL diagnostic tests can generate error messages associated with the interface and disk shelf.

Note
To perform disk or shelf diagnostics, select test 90 and identify the channel. This returns you to the main FC-AL menu. Then select test 80 or 81.

FC-AL diagnostic test menu

The following table describes the available tests in the FC-AL diagnostic menu.

Note: Tests that are labeled `[Xtnd]` often require loopback plugs for complete test operation and indicate failures without these plugs.

Caution: Do not run `[Xtnd]` mode diagnostics on network adapters with live network connections. Disconnect all network connections prior to running network diagnostics in `[Xtnd]` mode. Running with attached networks can adversely affect other attached devices. Enter **`xtnd n`** to cancel Extended test mode.

Test no	Test	Description
1	Comprehensive FCAL test	Runs all tests in this menu in current mode.
2	Self test	Verifies and tests the FC-AL chip configuration, firmware commands, mailboxes, status, error information, the serial EEPROM data, the ISP power-on self-test (POST), the on-chip SSRAM with fixed and random patterns, the SSRAM/ DMA of fixed and random patterns between SSRAM and most locations of main memory, and ISP firmware in SSRAM.
3	ISP interrupt test	Tests the ISP interrupt mechanism.
4	Int loop test	Tests data movement between main memory and the FC-AL chip, using on-chip loopback capability for 10 bit and 1 bit.
5	Bus reset test [Xtnd]	*Extended test mode*: Tests the FC-AL loop integrity and LRC functionality by resetting the bus.

6	Ext loop test [Xtnd]	*Extended test mode:* Tests the functionality and data movement between memory and FC-AL cable. Requires loopback plug.
7	Read-only bus test	Tests the FC-AL loop integrity by reading from each disk attached to the FC-AL interface.
8	Read/write bus test [Mfg]	Option not available.
9	Disk read test (FCTEST)	Tests the FC-AL adapter loop integrity by reading from each disk attached to the FC-AL onboard interface. This test has optional parameters. Requires disks attached to the FC host adapter.
10	Disk read/write test [Mfg]	Option not available.
41	Scan all disks on all FC-AL adapters	Lists the status of all the disks on all FC-AL adapters on the storage system. Requires disks attached to the FC host adapter.
42	Scan and show disks on selected FC-AL adapters	Lists the status of all the disks on the specified FC-AL adapters. Requires disks attached to the FC host adapter.
43	FC-AL adapter LED test	Tests the external LEDs on the FC-AL card.
71	Show ISP FC chip info	Displays information about the ISP Fibre Channel chip.
72	Show attached FC-AL devices	Displays all devices attached to a specific FC-AL adapter.
73	Show all disks (probe-scsi-all)	Lists disk information for all disks attached to the system.
74	Reset FC-AL adapter	Resets the selected FC-AL adapter to its original state.
75	Show serial EEPROM data	Displays the serial EEPROM data.
76	Program serial EEPROM data [Factory]	Option not available.
77	Display fcstat link_status	Displays the link statistics maintained for all drives on a Fibre Channel loop.
80	Go to disk diagnostic menu	Accesses the disk bus pattern diagnostics submenu.
81	Go to shelf diagnostics menu	Accesses the disk shelf diagnostics submenu.
90	FC-AL channel selection	Enables you to select a specific FC-AL interface for testing.
91	Enable/disable looping	Enables or disables continuous running of a diagnostic test. The test is stopped when Ctrl-C is pressed or when an error is encountered if option 92 is active.
92	Stop/continue looping on error	Starts or stops running a diagnostic test on an error. If looping is enabled, as set by option 91, looping continues after an error is encountered.

93	Extended/normal test mode	Enables or disables extended mode on tests where extended mode is an available option.
99	Exit	Exits this diagnostics menu.

Card diagnostics

Disk diagnostics submenu

The following table describes the FC-AL disk diagnostics submenu.

Test no	Test	Description
1	Perform drive self diagnostic test	The drive seeks a reserved non user-accessible cylinder and writes, reads, and verifies data for each data surface.
2	Low frequency pattern [Mfg]	Option not available.
3	Low transition density pattern [Mfg]	Option not available.
4	Half-rate square pattern [Mfg]	Option not available.
5	Quarter-rate square pattern [Mfg]	Option not available.
6	Contiguous '3' pattern [Mfg]	Option not available.
7	Composite pattern [Mfg]	Option not available.
40	Read drive defect list	Displays primary and grown defect list. This test has optional parameters. Requires disks attached to the FC host adapter.
99	Exit this menu	Returns the user to the main FC-AL menu.

Disk shelf diagnostics submenu

The following table describes the disk shelf diagnostics submenu for the FC-AL interface.

Note: Tests that are labeled `[Xtnd]` often require loopback plugs for complete test operation and indicate failures without these plugs.

Caution: Do not run `[Xtnd]` mode diagnostics on network adapters with live network connections. Disconnect all network connections prior to running network diagnostics in `[Xtnd]` mode. Running with attached networks can adversely affect other attached devices. Enter **`xtnd n`** to cancel Extended test mode.

Test no	Test	Description
1	Turn shelf LED on	Turns on the drive LEDs.
2	Turn shelf LED off	Turns off the drive LEDs.
3	Get trunk information	Option not available.
4	Get shelf drive map	Displays the list of drives on target FC-AL interface.
5	Get shelf environment information	Displays the environmental parameters on the target FC-AL interface.
6	Check SES temperature sensors	Checks SES temperature sensors against threshold value.
7	Check SES Fans	Checks SES fan status.
8	Check SES power supply	Checks SES power supply status.
9	Check SES ESH (HUB)	Option not available.
10	Check all SES elements	Checks status of all SES elements in the shelf.
11	Loop integrity/LRC test [Xtnd]	*Extended test mode*: Tests the FC-AL loop integrity and LRC functionality.
12	Show HUB status	Option not available.
70	Display sector size for FC-AL devices	Displays the sector size for the drives on the disk shelves.
93	Extended/normal test mode	Enables or disables extended mode on tests where extended mode is an available option.
99	Exit this menu	Returns the user to the main FC-AL menu.

Motherboard menu and submenus

Onboard SCSI test menu

This section describes the Onboard SCSI test submenu. The SCSI diagnostic tests can generate error messages associated with the controller.

Note: Tests that are labeled `[Xtnd]` often require loopback plugs for complete test operation and will indicate failures without these plugs.

Caution: Do not run `[Xtnd]` mode diagnostics on network adapter cards with live network connections. Disconnect all network connections prior to running network diagnostics in `[Xtnd]` mode. Running with attached networks can adversely affect other attached devices. Type **`xtnd n`** to cancel Extended test mode.

Test no	Test	Description
1	Comprehensive SCSI test	Runs all tests in this menu in current mode.
2	ISP chip test	Verifies the onboard ISP SCSI chip configuration, firmware commands, mailboxes, and status and error information.
3	SSRAM pattern test (Qlogic)	Tests the on-chip SSRAM with fixed data patterns.
4	SSRAM random test (Qlogic)	Tests the on-chip RAM with random data patterns.
5	SSRAM/DMA pattern test (Qlogic)	Tests the DMA of fixed data patterns between SSRAM and most locations of main memory.
6	SSRAM/DMA random test (Qlogic)	Tests the DMA of random data patterns between SSRAM and most locations of main memory.
7	ISP firmware test	Tests the ISP firmware (reads and verifies ISP firmware in SSRAM).
8	SCSI interrupt test	Tests the ISP SCSI adapter interrupt.
9	Read-only bus test [Xtnd]	*Extended test mode*: Tests SCSI adapter loop integrity by reading from each disk attached to the SCSI port.
10	Read/write bus test [Mfg]	Option not available.
11	Disk read test	Tests the SCSI adapter connection by reading from each disk attached to the SCSI interface.
12	Disk read/write test	Option not available.
71	Show ISP chip info	Displays information about the ISP chip.
72	Show attached SCSI devices	Displays the SCSI devices attached to the system.
73	Show all disks (probe-scsi-all)	Displays all SCSI disks.
74	Reset SCSI adapter	Resets the SCSI adapter.
91	Enable/disable looping	Enables or disables continuous running of a diagnostic test. The test is stopped when Ctrl-C is pressed or when an error is encountered if option 92 is active.

92	Stop/continue looping on error	Starts or stops running a diagnostic test on an error. If looping is enabled, as set by option 91, looping continues after an error is encountered.
93	Extended/normal test mode	Enables or disables extended mode on tests where extended mode is an available option.
99	Exit	Exits this diagnostics menu.

N5300 and N5600 motherboard tests

About the N5300 and N5600 motherboard tests

This section addresses the Motherboard menu and the Miscellaneous board test, the Cache test, the Onboard Ethernet test, and the Onboard FC-AL test submenus for the N5300 and N5600 only.

To go to the error messages associated with the motherboard diagnostic tests, see Motherboard error messages.

For detailed information

For detailed information about the menus, see the following sections:

- Motherboard menu
- Misc. board test menu
- Cache test menu
- Onboard Gigabit Ethernet test menu
- Onboard FC-AL test menu

The N5300/N5600 environmental error codes identify the environmental error messages that you can generate by running the miscellaneous board diagnostic tests for the motherboard.

Motherboard menu and submenus

Motherboard menu

This section describes the Motherboard menu.

Test no	Test	Description
1	Comprehensive motherboard diag	Runs all tests in this menu in current mode.
2	Misc. board test menu	Accesses the miscellaneous motherboard test menu.
3	Cache test menu	Accesses the CPU cache tests. For more information, see the Cache test menu.
4	Onboard Gigabit Ethernet test menu	Accesses the onboard Gigabit Ethernet test menu.
5	Onboard FCAL test menu	Accesses the onboard FC-AL test menu.
71	Show PCI configuration	Lists the contents of all adapters in the PCI slots on the motherboard.
72	Show detailed PCI info	Displays detailed information about the contents and settings of the cards in the PCI slots.
74	Show system info	Displays information about the system.
75	Serial info setup menu [Factory only]	Option not available.
76	Show Adapter card info [Mfg only]	Option not available.
91	Enable/disable looping	Enables or disables continuous running of a diagnostic test. The test is stopped when Ctrl-C is pressed or when an error is encountered if option 92 is active.
92	Stop/continue looping on error	Starts or stops running a diagnostic test on an error. If looping is enabled, as set by option 91, looping continues after an error is encountered.
93	Extended/normal test mode	Enables or disables extended mode on tests where extended mode is an available option.
99	Exit	Exits this diagnostics menu.

Motherboard menu and submenus

Miscellaneous board test menu

This section describes the Miscellaneous board test submenu.

Note: Tests that are labeled `[Xtnd]` often require loopback plugs for complete test operation and will indicate failures without these plugs.

Caution: Do not run `[Xtnd]` mode diagnostics on network adapter cards with live network connections. Disconnect all network connections prior to running network diagnostics in `[Xtnd]` mode. Running with attached networks can adversely affect other attached devices. Type **`xtnd n`** to cancel Extended test mode.

Test no	Test	Description
1	Run all miscellaneous tests	Runs all tests in this menu in current mode.
3	Check South Bridge status	Verifies that the South Bridge System I/O chipset is alive and responding normally.
4	Check PCI devices and slots	Verifies that the onboard PCI devices and slots are alive and responding normally.
5	Check memory interface	Verifies that accesses to main memory are operating correctly. Uses a sliding bits pattern.
7	Real-time clock test	Verifies and displays system clock and date.
8	Check environmental status	Checks the Environmental Status Register (ESR) for fault conditions, such as fan failure and high temperature.
9	Check Super I/O status	Verifies that the Super I/O chip is alive and responding normally.
11	Front panel LED exercise	Exercises the front panel LEDs by changing patterns in the displays. You need to observe the LEDs blinking to verify that they are working.
12	Front panel LCD exercise	Exercises the front panel LCD by changing patterns in the display. You need to observe the LCDs to verify that they are working.
41	Check watchdog interrupt	Checks that the watchdog interrupt is working.

42	NMI Dump Switch Test	Within two minutes of selecting this test, you must press the NMI switch below the front panel. You will then get a confirmation message.
43	Check HT link speed	Verifies if the HT link frequency and the width are the same as the factory settings.
71	Show PCI configuration	Shows the configuration of the Peripheral Component Interconnect (PCI), a peripheral bus.
72	Show detailed PCI info	Displays detailed information about the PCI.
73	Initialize real-time clock	Initializes the battery powered, real-time clock.
74	Toggle front panel LEDs	Verifies that the front panel activity and status LEDs are working by turning them ON/OFF or changing colors.
91	Enable/disable looping	Enables or disables continuous running of a diagnostic test. The test is stopped when Ctrl-C is pressed or when an error is encountered if option 92 is active.
92	Stop/continue looping on error	Starts or stops running a diagnostic test on an error. If looping is enabled, as set by option 91, looping continues after an error is encountered.
93	Extended/normal test mode	Enables or disables extended mode on tests where extended mode is an available option.
99	Exit	Exits this diagnostics menu.

Motherboard menu and submenus

Cache test menu

The section describes the Cache test submenu.

Test no	Test	Description
1	Comprehensive cache test	Runs all tests in this menu in current mode.
2	Cache walking data bits test	Verifies the data path between the CPU and cache (on systems with cache).
3	Cache stuck-at faults test	Scans through all cache locations, checking for stuck bits (0 or 1).
4	Cache random read/write test	Tests by random reading or writing of cache locations.
5	Cache random data test	Tests by placing random data in every cache location. Provides good cell verification.
6	Cache random address test	Tests by generating random addresses for reading and writing. Stresses addressing.
7	Cache spill test	Tests the cache interface to main memory. Causes cache flush and reload. Provides excellent test of cache management logic.
8	Cache tag test	Tests the cache tags by reading random addresses.
9	Cache MP test	Tests the cache on an MP system.
91	Enable/disable looping	Enables or disables continuous running of a diagnostic test. The test is stopped when Ctrl-C is pressed or when an error is encountered if option 92 is active.
92	Stop/continue looping on error	Starts or stops running a diagnostic test on an error. If looping is enabled, as set by option 91, looping continues after an error is encountered.
99	Exit	Exits this diagnostics menu.

Motherboard menu and submenus

Gigabit diagnostics

About the Gigabit diagnostic tests

This section describes the onboard Gigabit Ethernet (GbE) test submenu. The GbE diagnostic tests can generate error messages associated with the hardware and software.

Note: Tests that are labeled `[Xtnd]` often require loopback plugs for complete test operation and will indicate failures without these plugs.

Caution: Do not run `[Xtnd]` mode diagnostics on network adapter cards with live network connections. Disconnect all network connections prior to running network diagnostics in `[Xtnd]` mode. Running with attached networks can adversely affect other attached devices. Type **`xtnd n`** to cancel Extended test mode.

GbE diagnostic test menu

The following table describes the GbE diagnostic tests.

Test no	Test	Description
1	Comprehensive bge test	Runs all tests in this menu in current mode.
2	Reset test	Verifies software reset function.
3	Link test [Xtnd]	Verifies the external link condition. Requires loopback plug or Ethernet connection.
4	EEPROM test	Displays the Electrically Erasable Programmable Read Only Memory (EEPROM) contents.
5	Interrupt test [Xtnd]	Tests the interrupt mechanism. Checks transmit and receive interrupts, as well as timer interrupts. Requires loopback plug.
6	Internal Mac lp test 10B	These tests are unsupported by the controller.
7	Internal Mac lp test 100B	
8	Internal Mac lp test 1G	
9	External lp test 10Bt [Xtnd]	*Extended test mode*: Tests data transfer between memory and the Ethernet chip on the 10Base-T/100Base-TX interface, involving loopback over connected wire. Also tests overall Ethernet functionality. Requires loopback plug.
10	External lp test 100Bt [Xtnd]	
11	External lp test 1G [Xtnd]	
40	Port-port 10B test (Xtnd)	This test tests the data path from one channel to another for the dual channel NICS, requires a twisted pair network cable to be connected between the 2 ports.
41	Port-port 100B test (Xtnd)	

42	Port-port 1 G test (Xtnd)	
70	Display MAC address	Verifies and displays the MAC address of the card.
71	Display all registers	Displays all the card memory registers.
72	Display all stats counters	Displays all the card statistics.
73	Dump EEPROM	Displays the EEPROM data.
74	Set MAC address [Factory only]	Option is unavailable.
75	EEPROM firmware update [Factory only]	Option is unavailable.
90	BGE card selection	Enables you to select the onboard Ethernet port for testing.
91	Enable/disable looping	Enables or disables continuous running of a diagnostic test. The test is stopped when Ctrl-C is pressed or when an error is encountered if option 92 is active.
92	Stop/continue looping on error	Starts or stops running a diagnostic test on an error. If looping is enabled, as set by option 91, looping continues after an error is encountered.
93	Extended/normal test mode	Enables or disables extended mode on tests where extended mode is an available option.
99	Return to main menu	Returns you to the main Diagnostics menu.

Motherboard menu and submenus

Onboard FC-AL diagnostics

This section describes the onboard FC-AL (Fibre Channel Arbitrated Loop) group of diagnostic tests. The tests range from EEPROM data verification through data transfer integrity testing. The FC-AL diagnostic tests can generate error messages associated with the interface and disk shelf.

Note
To perform disk or shelf diagnostics, select test 90 and identify the channel. This returns you to the main FC-AL menu. Then select test 80 or 81.

FC-AL diagnostic test menu

The following table describes the available tests in the FC-AL diagnostic menu.

Note: Tests that are labeled `[Xtnd]` often require loopback plugs for complete test operation and indicate failures without these plugs.

Caution: Do not run `[Xtnd]` mode diagnostics on network adapters with live network connections. Disconnect all network connections prior to running network diagnostics in `[Xtnd]` mode. Running with attached networks can adversely affect other attached devices. Enter **`xtnd n`** to cancel Extended test mode.

Test no	Test	Description
1	Comprehensive FCAL test	Runs all tests in this menu in current mode.
2	Self test	Verifies and tests the FC-AL chip configuration, firmware commands, mailboxes, status, error information, the serial EEPROM data, the ISP power-on self-test (POST), the on-chip SSRAM with fixed and random patterns, the SSRAM/ DMA of fixed and random patterns between SSRAM and most locations of main memory, and ISP firmware in SSRAM.
3	ISP interrupt test	Tests the ISP interrupt mechanism.
4	Int loop test	Tests data movement between main memory and the FC-AL chip, using on-chip loopback capability for 10 bit and 1 bit.
5	Bus reset test [Xtnd]	*Extended test mode*: Tests the FC-AL loop integrity and LRC functionality by resetting the bus.

6	Ext loop test [Xtnd]	*Extended test mode:* Tests the functionality and data movement between memory and FC-AL cable. Requires loopback plug.
7	Read-only bus test	Tests the FC-AL loop integrity by reading from each disk attached to the FC-AL interface.
8	Read/write bus test [Mfg]	Option not available.
9	Disk read test (FCTEST)	Tests the FC-AL adapter loop integrity by reading from each disk attached to the FC-AL onboard interface. This test has optional parameters. Requires disks attached to the FC host adapter.
10	Disk read/write test [Mfg]	Option not available.
41	Scan all disks on all FC-AL adapters	Lists the status of all the disks on all FC-AL adapters on the storage system. Requires disks attached to the FC host adapter.
42	Scan and show disks on selected FC-AL adapters	Lists the status of all the disks on the specified FC-AL adapters. Requires disks attached to the FC host adapter.
43	FC-AL adapter LED test	Tests the external LEDs on the FC-AL card.
44	FC-AL initiator-target test	Test the mode (target or initiator) of the FC-AL.
71	Show ISP FC chip info	Displays information about the ISP Fibre Channel chip.
72	Show attached FC-AL devices	Displays all devices attached to a specific FC-AL adapter.
73	Show all disks (probe-scsi-all)	Lists disk information for all disks attached to the system.
74	Reset FC-AL adapter	Resets the selected FC-AL adapter to its original state.
75	Show serial EEPROM data	Displays the serial EEPROM data.
76	Program serial EEPROM data [Factory]	Option not available.
77	Display fcstat link_status	Displays the link statistics maintained for all drives on a Fibre Channel loop.
80	Go to disk diagnostic menu	Accesses the disk bus pattern diagnostics submenu.
81	Go to shelf diagnostics menu	Accesses the disk shelf diagnostics submenu.
85	Show onboard Fcal WWN	Display the onboard Fibre Channel port's World Wide Name.
90	FC-AL channel selection	Enables you to select a specific FC-AL interface for testing.

91	Enable/disable looping	Enables or disables continuous running of a diagnostic test. The test is stopped when Ctrl-C is pressed or when an error is encountered if option 92 is active.
92	Stop/continue looping on error	Starts or stops running a diagnostic test on an error. If looping is enabled, as set by option 91, looping continues after an error is encountered.
93	Extended/normal test mode	Enables or disables extended mode on tests where extended mode is an available option.
99	Exit	Exits this diagnostics menu.

Card diagnostics

Disk diagnostics submenu

The following table describes the FC-AL disk diagnostics submenu.

Test no	Test	Description
1	Perform drive self diagnostic test	The drive seeks a reserved non user-accessible cylinder and writes, reads, and verifies data for each data surface.
2	Low frequency pattern [Mfg]	Option not available.
3	Low transition density pattern [Mfg]	Option not available.
4	Half-rate square pattern [Mfg]	Option not available.
5	Quarter-rate square pattern [Mfg]	Option not available.
6	Contiguous '3' pattern [Mfg]	Option not available.
7	Composite pattern [Mfg]	Option not available.
40	Read drive defect list	Displays primary and grown defect list. This test has optional parameters. Requires disks attached to the FC host adapter.
99	Exit this menu	Returns the user to the main FC-AL menu.

Disk shelf diagnostics submenu

The following table describes the disk shelf diagnostics submenu for the FC-AL interface.

Note: Tests that are labeled `[Xtnd]` often require loopback plugs for complete test operation and indicate failures without these plugs.

Caution: Do not run `[Xtnd]` mode diagnostics on network adapters with live network connections. Disconnect all network connections prior to running network diagnostics in `[Xtnd]` mode. Running with attached networks can adversely affect other attached devices. Enter **`xtnd n`** to cancel Extended test mode.

Test no	Test	Description
1	Turn shelf LED on	Turns on the drive LEDs.
2	Turn shelf LED off	Turns off the drive LEDs.
3	Get trunk information	Option not available.
4	Get shelf drive map	Displays the list of drives on target FC-AL interface.
5	Get shelf environment information	Displays the environmental parameters on the target FC-AL interface.
6	Check SES temperature sensors	Checks SES temperature sensors against threshold value.
7	Check SES Fans	Checks SES fan status.
8	Check SES power supply	Checks SES power supply status.
9	Check SES ESH (HUB)	Option not available.
10	Check all SES elements	Check status of all SES elements in the shelf.
11	Loop integrity/LRC test [Xtnd]	*Extended test mode*: Tests the FC-AL loop integrity and LRC functionality.
12	Show HUB status	Option not available.
70	Display sector size for FC-AL devices	Displays the sector size for the drives on the disk shelves.
93	Extended/normal test mode	Enables or disables extended mode on tests where extended mode is an available option.
99	Exit this menu	Returns the user to the main FC-AL menu.

N7000 series motherboard tests

About the N7000 series motherboard tests

This section addresses the Motherboard menu and the Miscellaneous board test, the Cache test, the Onboard Ethernet test, and the Onboard FC-AL test submenus for the N7000 series platforms. To go to the error messages associated with the motherboard diagnostic tests, see Motherboard error messages.

For detailed information

For detailed information about the menus, see the following sections:

- Motherboard menu
- Misc. board test menu
- Cache test menu
- Onboard Gigabit Ethernet test menu
- Onboard FC-AL test menu

You can generate the N7000 series environmental error codes by running the miscellaneous board diagnostic tests.

Motherboard menu and submenus

Motherboard menu

This section describes the Motherboard menu.

Test no	Test	Description
1	Comprehensive motherboard diag	Runs all tests in this menu in current mode.
2	Misc. board test menu	Accesses the miscellaneous motherboard test menu.
3	Cache test menu	Accesses the CPU cache tests. For more information, see the Cache test menu.
4	Onboard Gigabit Ethernet test menu	Accesses the onboard Gigabit Ethernet test menu.
5	Onboard FCAL test menu	Accesses the onboard FC-AL test menu.
71	Show PCI configuration	Lists the contents of all adapters in the PCI slots on the motherboard.
72	Show detailed PCI info	Displays detailed information about the contents and settings of the cards in the PCI slots.
73	Initialize real-time clock	Initializes the onboard real-time clock to user-defined settings.
74	Show system info	Displays information about the system.
75	Serial info setup menu [Factory only]	Option not available.
76	Show Adapter card info [Mfg only]	Option not available.
91	Enable/disable looping	Enables or disables continuous running of a diagnostic test. The test is stopped when Ctrl-C is pressed or when an error is encountered if option 92 is active.
92	Stop/continue looping on error	Starts or stops running a diagnostic test on an error. If looping is enabled, as set by option 91, looping continues after an error is encountered.
93	Extended/normal test mode	Enables or disables extended mode on tests where extended mode is an available option.
99	Exit	Exits this diagnostics menu.

Motherboard menu and submenus

Miscellaneous board test menu

This section describes the Miscellaneous board test submenu.

Note: Tests that are labeled `[Xtnd]` often require loopback plugs for complete test operation and will indicate failures without these plugs.

Caution: Do not run `[Xtnd]` mode diagnostics on network adapter cards with live network connections. Disconnect all network connections prior to running network diagnostics in `[Xtnd]` mode. Running with attached networks can adversely affect other attached devices. Type **`xtnd n`** to cancel Extended test mode.

Test no	Test	Description
1	Run all miscellaneous tests	Runs all tests in this menu in current mode.
3	Check South Bridge status	Verifies that the South Bridge System I/O chipset is alive and responding normally.
4	Check PCI devices and slots	Verifies that the onboard PCI devices and slots are alive and responding normally.
5	Check memory interface	Verifies that accesses to main memory are operating correctly. Uses a sliding bits pattern.
6	Check boot flash access	Verifies access to system boot PROM. Reads and checks Programmable Read Only Memory (PROM) data.
7	Real-time clock test	Verifies and displays system clock and date.
8	Check environmental status	Checks the Environmental Status Register (ESR) for fault conditions, such as fan failure and high temperature.
9	Check Super I/O status	Verifies that the Super I/O chip is alive and responding normally.
10	Change the SYSTEM fan speeds [Factory only]	Option is unavailable.

11	Front panel LED exercise	Exercises the front panel LEDs by changing patterns in the displays. You need to observe the LEDs blinking to verify that they are working.
12	Front panel LCD exercise	Exercises the front panel LCD by changing patterns in the display. You need to observe the LCDs to verify that they are working.
13	Test PCI devices [Factory only]	Option is unavailable.
14	FRU LED exercise	Exercises the front panel LEDs by changing patterns in the displays. You need to observe the LEDs blinking to verify that they are working.
41	Check watchdog interrupt	Checks that the watchdog interrupt is working.
42	NMI Dump Switch Test	Within two minutes of selecting this test, you must press the NMI switch below the front panel. You will then get a confirmation message.
71	Show PCI configuration	Shows the configuration of the Peripheral Component Interconnect (PCI), a peripheral bus.
72	Show detailed PCI info	Displays detailed information about the PCI.
73	Initialize real-time clock	Initializes the battery powered, real-time clock.
74	Toggle front panel LEDs	Verifies that the front panel activity and status LEDs are working by turning them ON/OFF or changing colors.
75	Margins menu [Factory only]	Option is unavailable.
91	Enable/disable looping	Enables or disables continuous running of a diagnostic test. The test is stopped when Ctrl-C is pressed or when an error is encountered if option 92 is active.
92	Stop/continue looping on error	Starts or stops running a diagnostic test on an error. If looping is enabled, as set by option 91, looping continues after an error is encountered.
93	Extended/normal test mode	Enables or disables extended mode on tests where extended mode is an available option.
99	Exit	Exits this diagnostics menu.

Motherboard menu and submenus

Cache test menu

The section describes the Cache test submenu.

Test no	Test	Description
1	Comprehensive cache test	Runs all tests in this menu in current mode.
2	Cache walking data bits test	Verifies the data path between the CPU and cache (on systems with cache).
3	Cache stuck-at faults test	Scans through all cache locations, checking for stuck bits (0 or 1).
4	Cache random read/write test	Tests by random reading or writing of cache locations.
5	Cache random data test	Tests by placing random data in every cache location. Provides good cell verification.
6	Cache random address test	Tests by generating random addresses for reading and writing. Stresses addressing.
7	Cache spill test	Tests the cache interface to main memory. Causes cache flush and reload. Provides excellent test of cache management logic.
8	Cache tag test	Tests the cache tags by reading random addresses.
9	Cache MP test	Tests the cache on an MP system.
91	Enable/disable looping	Enables or disables continuous running of a diagnostic test. The test is stopped when Ctrl-C is pressed or when an error is encountered if option 92 is active.
92	Stop/continue looping on error	Starts or stops running a diagnostic test on an error. If looping is enabled, as set by option 91, looping continues after an error is encountered.
99	Exit	Exits this diagnostics menu.

Motherboard menu and submenus

Gigabit diagnostics

About the Gigabit diagnostic tests

This section describes the onboard Gigabit Ethernet (GbE) test submenu. The GbE diagnostic tests can generate error messages associated with the hardware and software.

Note: Tests that are labeled `[Xtnd]` often require loopback plugs for complete test operation and will indicate failures without these plugs.

Caution: Do not run `[Xtnd]` mode diagnostics on network adapter cards with live network connections. Disconnect all network connections prior to running network diagnostics in `[Xtnd]` mode. Running with attached networks can adversely affect other attached devices. Type **`xtnd n`** to cancel Extended test mode.

GbE diagnostic test menu

The following table describes the GbE diagnostic tests.

Test no	Test	Description
1	Comprehensive bge test	Runs all tests in this menu in current mode.
2	Reset test	Verifies software reset function.
3	Link test [Xtnd]	Verifies the external link condition. Requires loopback plug or Ethernet connection.
4	EEPROM test	Displays the Electrically Erasable Programmable Read Only Memory (EEPROM) contents.
5	Interrupt test [Xtnd]	Tests the interrupt mechanism. Checks transmit and receive interrupts, as well as timer interrupts. Requires loopback plug.
6	Internal Mac lp test 10B	These tests are unsupported by the controller.
7	Internal Mac lp test 100B	
8	Internal Mac lp test 1G	
9	External lp test 10Bt [Xtnd]	*Extended test mode*: Tests data transfer between memory and the Ethernet chip on the 10Base-T/100Base-TX interface, involving loopback over connected wire. Also tests overall Ethernet functionality. Requires loopback plug.
10	External lp test 100Bt [Xtnd]	
11	External lp test 1G [Xtnd]	
40	Port-port 10B test (Xtnd)	This test tests the data path from one channel to another for the dual channel NICS, requires a twisted pair network cable to be connected between the 2
41	Port-port 100B test (Xtnd)	

42	Port-port 1 G test (Xtnd)	ports.
70	Display MAC address	Verifies and displays the MAC address of the card.
71	Display all registers	Displays all the card memory registers.
72	Display all stats counters	Displays all the card statistics.
73	Dump EEPROM	Displays the EEPROM data.
74	Set MAC address [Factory only]	Option is unavailable.
75	EEPROM firmware update [Factory only]	Option is unavailable.
76	Set IO board FRU information [Factory only]	Option is unavailable.
77	Show IO board FRU information	Display the IO Board FRU information.
90	BGE card selection	Enables you to select the onboard Ethernet port for testing.
91	Enable/disable looping	Enables or disables continuous running of a diagnostic test. The test is stopped when Ctrl-C is pressed or when an error is encountered if option 92 is active.
92	Stop/continue looping on error	Starts or stops running a diagnostic test on an error. If looping is enabled, as set by option 91, looping continues after an error is encountered.
93	Extended/normal test mode	Enables or disables extended mode on tests where extended mode is an available option.
99	Return to main menu	Returns you to the main Diagnostics menu.

Motherboard menu and submenus

Onboard FC-AL diagnostics

This section describes the onboard FC-AL (Fibre Channel Arbitrated Loop) group of diagnostic tests. The tests range from EEPROM data verification through data transfer integrity testing. The FC-AL diagnostic tests can generate error messages associated with the interface and disk shelf.

Note
To perform disk or shelf diagnostics, select test 90 and identify the channel. This returns you to the main FC-AL menu. Then select test 80 or 81.

FC-AL diagnostic test menu

The following table describes the available tests in the FC-AL diagnostic menu.

Note: Tests that are labeled `[Xtnd]` often require loopback plugs for complete test operation and indicate failures without these plugs.

Caution: Do not run `[Xtnd]` mode diagnostics on network adapters with live network connections. Disconnect all network connections prior to running network diagnostics in `[Xtnd]` mode. Running with attached networks can adversely affect other attached devices. Enter **`xtnd n`** to cancel Extended test mode.

Test no	Test	Description
1	Comprehensive FCAL test	Runs all tests in this menu in current mode.
2	Self test	Verifies and tests the FC-AL chip configuration, firmware commands, mailboxes, status, error information, the serial EEPROM data, the ISP power-on self-test (POST), the on-chip SSRAM with fixed and random patterns, the SSRAM/ DMA of fixed and random patterns between SSRAM and most locations of main memory, and ISP firmware in SSRAM.
3	ISP interrupt test	Tests the ISP interrupt mechanism.
4	Int loop test	Tests data movement between main memory and the FC-AL chip, using on-chip loopback capability for 10 bit and 1 bit.
5	Bus reset test [Xtnd]	*Extended test mode*: Tests the FC-AL loop integrity and LRC functionality by resetting the bus.

6	Ext loop test [Xtnd]	*Extended test mode:* Tests the functionality and data movement between memory and FC-AL cable. Requires loopback plug.
7	Read-only bus test	Tests the FC-AL loop integrity by reading from each disk attached to the FC-AL interface.
8	Read/write bus test [Mfg]	Option not available.
9	Disk read test (FCTEST)	Tests the FC-AL adapter loop integrity by reading from each disk attached to the FC-AL onboard interface. This test has optional parameters. Requires disks attached to the FC host adapter.
10	Disk read/write test [Mfg]	Option not available.
41	Scan all disks on all FC-AL adapters	Lists the status of all the disks on all FC-AL adapters on the storage system. Requires disks attached to the FC host adapter.
42	Scan and show disks on selected FC-AL adapters	Lists the status of all the disks on the specified FC-AL adapters. Requires disks attached to the FC host adapter.
43	FC-AL adapter LED test	Tests the external LEDs on the FC-AL card.
44	FC-AL initiator-target test	Test the mode (target or initiator) of the FC-AL.
71	Show ISP FC chip info	Displays information about the ISP Fibre Channel chip.
72	Show attached FC-AL devices	Displays all devices attached to a specific FC-AL adapter.
73	Show all disks (probe-scsi-all)	Lists disk information for all disks attached to the system.
74	Reset FC-AL adapter	Resets the selected FC-AL adapter to its original state.
75	Show serial EEPROM data	Displays the serial EEPROM data.
76	Program serial EEPROM data [Factory]	Option not available.
77	Display fcstat link_status	Displays the link statistics maintained for all drives on a Fibre Channel loop.
80	Go to disk diagnostic menu	Accesses the disk bus pattern diagnostics submenu.
81	Go to shelf diagnostics menu	Accesses the disk shelf diagnostics submenu.
83	Set onboard Fcal FRU information [Factory only]	Option is unavailable.
84	Show onboard Fcal FRU information	Display the Onboard Fiber Channel FRU information.
85	Show onboard Fcal WWN	Display the onboard Fibre Channel port's World Wide Name.
90	FC-AL channel selection	Enables you to select a specific FC-AL interface for testing.

91	Enable/disable looping	Enables or disables continuous running of a diagnostic test. The test is stopped when Ctrl-C is pressed or when an error is encountered if option 92 is active.
92	Stop/continue looping on error	Starts or stops running a diagnostic test on an error. If looping is enabled, as set by option 91, looping continues after an error is encountered.
93	Extended/normal test mode	Enables or disables extended mode on tests where extended mode is an available option.
99	Exit	Exits this diagnostics menu.

Card diagnostics

Disk diagnostics submenu

The following table describes the FC-AL disk diagnostics submenu.

Test no	Test	Description
1	Perform drive self diagnostic test	The drive seeks a reserved non user-accessible cylinder and writes, reads, and verifies data for each data surface.
2	Low frequency pattern [Mfg]	Option not available.
3	Low transition density pattern [Mfg]	Option not available.
4	Half-rate square pattern [Mfg]	Option not available.
5	Quarter-rate square pattern [Mfg]	Option not available.
6	Contiguous '3' pattern [Mfg]	Option not available.
7	Composite pattern [Mfg]	Option not available.
40	Read drive defect list	Displays primary and grown defect list. This test has optional parameters. Requires disks attached to the FC host adapter.
99	Exit this menu	Returns the user to the main FC-AL menu.

Disk shelf diagnostics submenu

The following table describes the disk shelf diagnostics submenu for the FC-AL interface.

Note: Tests that are labeled `[Xtnd]` often require loopback plugs for complete test operation and indicate failures without these plugs.

Caution: Do not run `[Xtnd]` mode diagnostics on network adapters with live network connections. Disconnect all network connections prior to running network diagnostics in `[Xtnd]` mode. Running with attached networks can adversely affect other attached devices. Enter **`xtnd n`** to cancel Extended test mode.

Test no	Test	Description
1	Turn shelf LED on	Turns on the drive LEDs.
2	Turn shelf LED off	Turns off the drive LEDs.
3	Get trunk information	Option not available.
4	Get shelf drive map	Displays the list of drives on target FC-AL interface.
5	Get shelf environment information	Displays the environmental parameters on the target FC-AL interface.
6	Check SES temperature sensors	Checks SES temperature sensors against threshold value.
7	Check SES Fans	Checks SES fan status.
8	Check SES power supply	Checks SES power supply status.
9	Check SES ESH (HUB)	Option not available.
10	Check all SES elements	Check status of all SES elements in the shelf.
11	Loop integrity/LRC test [Xtnd]	*Extended test mode*: Tests the FC-AL loop integrity and LRC functionality.
12	Show HUB status	Option not available.
70	Display sector size for FC-AL devices	Displays the sector size for the drives on the disk shelves.
93	Extended/normal test mode	Enables or disables extended mode on tests where extended mode is an available option.
99	Exit this menu	Returns the user to the main FC-AL menu.

Motherboard diagnostics

Motherboard error messages

The following table identifies the error messages that can be generated when you run the motherboard group of diagnostic tests.

Diagnostic tests run on...	Error messages generated by...	
	Hardware	Software
Hardware bridges	DBH0301 through DBH0403	DBS0307
Memory, onboard DIMMs, and SIMMs	DMH0001 through DMH0352	DMS0060 through DMS0061
Motherboard and backplane adapters	DZH0101 through DZH2002	DZS0430

Main memory diagnostics

About the main memory diagnostic menu

The tests in the main memory diagnostic menu test main memory DIMMs, analyze errors, and attempt to identify a failing DIMM component for all platforms. All but the first 12 MB of memory can be tested. The times listed for these tests are examples and might vary, depending on the platform type and amount of memory in the system. The main memory diagnostic tests can generate error messages associated with the hardware and software.

Types of main memory tested

Type of main memory	Platforms using this type of memory
Integrated with NVRAM memory	N3700
Regular DIMMs	N5200 and N5500
Regular DIMMs	N5300, N5600, and N7000 series

[Up]

Main memory diagnostics
N3700

Rules for running main memory diagnostics with the N3700

Observe the following rules when you run the `mem` diagnostic on the N3700:

- Do not run this diagnostic immediately after a system crash.
- Be aware that `mem` diagnostics overwrite all contents of the main and NVRAM memory.
- Before you run `mem` diagnostics, reboot and shut down the system.

You are alerted to be very careful by the following caution:

Caution! `Do not run the NVMEM diagnostic immediately after a system crash or if there is a possibility that log data is stored. Run only on new boards, or after a normal system shutdown, or if there is no chance of preserving customer data.`

Main memory diagnostic menu

The following table describes the tests in the menu.

Test no	Test	Description
1	Comprehensive memory test (177 sec)	Runs all tests in this menu in current mode.
2	Walking data bits test (1 sec)	Verifies the data path between the CPU and memory. Runs a quick check of all data lines.
3	Walking address test (1 sec)	Verifies address paths in memory. Runs a quick test of all address lines, up to size of memory.
4	Stuck faults test (50 sec)	Scans memory to check for stuck bits, either 1 or 0.

5	Walking data words test (2 sec)	Runs a short test, walking a byte of ones through a field of 64 words of zeros. Test is repeated with complemented data.
6	Walking data bytes test (12 sec)	Runs a short test, walking a byte of ones through a field of 64 words of zeros. Test is repeated with complemented data.
7	Partial words test (2 sec)	Tests intermixed words, half-words, and bytes to verify ability of memory/CPU to merge data.
8	Byte patterns test (1 sec)	Spins through all 256 possible data patterns within each byte of a long word, one byte at a time.
9	RAS/CAS corners test (3 sec)	Runs a quick test between several locations that cause maximum change in the Row Address, Column Address, and RAS/CAS line.
10	Random read/write test (22 sec)	Randomly reads or writes memory locations and tests memory controller sequencing.
11	Alternating address test (23 sec)	Tests even and odd addresses, stressing PC byte marks.
12	Random data test (34 sec)	Runs a longer test, placing random data in every location. Tests DRAM cell verification.
13	Random address test (13 sec)	Runs a longer test, generating random addresses for reading and writing. Stresses DRAM addressing. Longer option also available for a test that quietly reads all memory locations.
14	MP memory test (14 sec)	Option not available
42	Fill memory with data pattern	Enables you to input data pattern and memory range.
43	Check memory with data	Verifies the data pattern and memory range specified in Test 42.
44	Log2 patterns test (28 sec)	Runs a longer test of a set of log2-based (binary) data patterns.

45	Parity/ECC bits test (90 sec)	Runs a longer test to verify that each bit of a byte can propagate into the parity/ECC term.
71	Read all locations	Reads through all memory locations, looking for errors. Gives a checksum at the end. You can run this test twice to compare the checksums.
72	Dump from specified address	Enables you to set hexadecimal base addresses for the memory tests. You can repeat this test to confirm whether checksums for both tests are the same.
73	Set test address range	Enables you to set the memory range for testing. The default range is the entire testable address space.
74	Show memory size and test range	Displays memory size and test range.
91	Enable/disable looping	Enables or disables continuous running of a diagnostic test. The test is stopped when Ctrl-C is pressed or when an error is encountered if option 92 is active.
92	Stop/continue on error	Starts or stops running a diagnostic test on an error. If looping is enabled, as set by option 91, looping continues after an error is encountered.
93	Extended/normal test mode	Enables or disables extended mode on tests where extended mode is an available option.
95	Enable/disable cache3700	Enables or disables caching on the system.
99	Exit	Exits this diagnostics menu.

[Up]

Main memory diagnostics

For N5200 and N5500

Main memory diagnostic menu

The following table describes the tests in the menu.

Test no	Test	Description
1	Comprehensive memory test (350 sec)	Runs all tests in this menu in current mode.
2	Walking data bits test (1 sec)	Verifies the data path between the CPU and memory. Runs a quick check of all data lines.
3	Walking address test (1 sec)	Verifies address paths in memory. Runs a quick test of all address lines, up to size of memory.
4	Stuck faults test (64 sec)	Scans memory to check for stuck bits, either 1 or 0.
5	Walking data words test (1 sec)	Runs a short test, walking a byte of ones through a field of 64 words of zeros. Test is repeated with complemented data.
6	Walking data bytes test (8 sec)	Runs a short test, walking a byte of ones through a field of 64 words of zeros. Test is repeated with complemented data.
7	Partial words test	Tests intermixed words, half-words, and bytes to verify ability of memory/CPU to merge data.
8	Byte patterns test (1 sec)	Spins through all 256 possible data patterns within each byte of a long word, one byte at a time.
9	RAS/CAS corners test (1 sec)	Runs a quick test between several locations that cause maximum change in the Row Address, Column Address, and RAS/CAS line.

10	Random read/write test (72 sec)	Randomly reads or writes memory locations and tests memory controller sequencing.
11	Alternating address test (48 sec)	Tests even and odd addresses, stressing PC byte marks.
12	Random data test (80 sec)	Runs a longer test, placing random data in every location. Tests DRAM cell verification.
13	Random address test (72 sec)	Runs a longer test, generating random addresses for reading and writing. Stresses DRAM addressing. Longer option also available for a test that quietly reads all memory locations.
14	MP memory test (71 sec)	Multiprocessor memory test.
15	Large memory VM test (xx sec)	A fixed pattern test that is performed and verified on platforms with memory equal to or greater than 4 GB.
42	Fill memory with data pattern	Enables you to input data pattern and memory range.
43	Check memory with data	Verifies the data pattern and memory range specified in Test 42.
44	Log2 patterns test (223 sec)	Runs a longer test of a set of log2-based (binary) data patterns.
45	Parity/ECC bits test (716 sec)	Runs a longer test to verify that each bit of a byte can propagate into the parity/ECC term.
71	Read all locations	Reads through all memory locations, looking for errors. Gives a checksum at the end. You can run this test twice to compare the checksums.
72	Dump from specified address	Enables you to set hexadecimal base addresses for the memory tests. You can repeat this test to confirm whether checksums for both tests are the same.
73	Set test address range	Enables you to set the memory range for testing. The default range is the entire testable address space.

74	Show memory size and test range	Displays memory size and test range.
91	Enable/disable looping	Enables or disables continuous running of a diagnostic test. The test is stopped when Ctrl-C is pressed or when an error is encountered if option 92 is active.
92	Stop/continue on error	Starts or stops running a diagnostic test on an error. If looping is enabled, as set by option 91, looping continues after an error is encountered.
93	Extended/normal test mode	Enables or disables extended mode on tests where extended mode is an available option.
95	Enable/disable cache3700	Enables or disables caching on the system.
99	Exit	Exits this diagnostics menu.

[Up]

Main memory diagnostics

For N5300, N5600, and N7000 series

Main memory diagnostic menu

The following table describes the tests in the menu.

Test no	Test	Description
1	Comprehensive memory test (*3328 sec*)	Runs all tests in this menu in current mode.
2	Walking data bits test (*0 sec*)	Verifies the data path between the CPU and memory. Runs a quick check of all data lines.
3	Walking address test (*0 sec*)	Verifies address paths in memory. Runs a quick test of all address lines, up to size of memory.
4	Stuck faults test (*0 sec*)	Scans memory to check for stuck bits, either 1 or 0.
5	Walking data words test (*0 sec*)	Runs a short test, walking a byte of ones through a field of 64 words of zeros. Test is repeated with complemented data.
6	Walking data bytes test (*0 sec*)	Runs a short test, walking a byte of ones through a field of 64 words of zeros. Test is repeated with complemented data.
7	Partial words test	Tests intermixed words, half-words, and bytes to verify ability of memory/CPU to merge data.
8	Byte patterns test (*0 sec*)	Spins through all 256 possible data patterns within each byte of a long word, one byte at a time.
9	RAS/CAS corners test (*0 sec*)	Runs a quick test between several locations that cause maximum change in the Row Address, Column Address, and RAS/CAS line.
10	Random read/write test (*128 sec*)	Randomly reads or writes memory locations and tests memory controller sequencing.
11	Alternating address test (*256 sec*)	Tests even and odd addresses, stressing PC byte marks.
12	Random data test (*0 sec*)	Runs a longer test, placing random data in every location. Tests DRAM cell verification.
13	Random address test (*768 sec*)	Runs a longer test, generating random addresses for reading and writing. Stresses DRAM addressing. Longer option also available for a test that quietly reads all memory locations.
14	MP memory test (*2176 sec*)	Multiprocessor memory test.
15	Large memory VM test (*0 sec*)	A fixed pattern test that is performed and verified on platforms with memory equal to or greater than 4 GB.

42	Fill memory with data pattern	Enables you to input data pattern and memory range.
43	Check memory with data pattern	Verifies the data pattern and memory range specified in Test 42.
44	Log2 patterns test (*640 sec*)	Runs a longer test of a set of log2-based (binary) data patterns.
45	Parity/ECC bits test (*3200 sec*)	Runs a longer test to verify that each bit of a byte can propagate into the parity/ECC term.
49	Qualification scope loop	Initializes a memory region with a data pattern
71	Read all locations	Reads through all memory locations, looking for errors. Gives a checksum at the end. You can run this test twice to compare the checksums.
72	Dump from specified address	Enables you to set hexadecimal base addresses for the memory tests. You can repeat this test to confirm whether checksums for both tests are the same.
73	Set test address range	Enables you to set the memory range for testing. The default range is the entire testable address space.
74	Show memory size and test range	Displays memory size and test range.
91	Enable/disable looping	Enables or disables continuous running of a diagnostic test. The test is stopped when Ctrl-C is pressed or when an error is encountered if option 92 is active.
92	Stop/continue on error	Starts or stops running a diagnostic test on an error. If looping is enabled, as set by option 91, looping continues after an error is encountered.
93	Extended/normal test mode	Enables or disables extended mode on tests where extended mode is an available option.
95	Enable/disable cache	Enables or disables caching on the system.
99	Exit	Exits this diagnostics menu.

Card diagnostics

About card diagnostics

The card diagnostics are a collection of tests of the different cards that you can install in your storage system.

For detailed information

To run diagnostic tests on the cards and adapters in the system, see the following sections:

- Agent/RLM diagnostics
- FC-AL diagnostics
- Gigabit diagnostics
- IPSec diagnostics
- iSCSI diagnostics
- NVRAM diagnostics
- SCSI diagnostics
- TOE diagnostics

Card diagnostics

Agent/Remote LAN Management (RLM) diagnostics

About the Agent/RLM diagnostic tests

The Agent/RLM diagnostic tests the interface of the remote LAN management card that is in your system. The Agent/RLM diagnostic tests can generate error messages associated with the hardware.

Note: Tests that are labeled `[Xtnd]` often require loopback plugs for complete test operation and will indicate failures without these plugs.

Caution: Do not run `[Xtnd]` mode diagnostics on network adapter cards with live network connections. Disconnect all network connections prior to running network diagnostics in `[Xtnd]` mode. Running with attached networks can adversely affect other attached devices. Type **`xtnd n`** to cancel Extended test mode.

RMC diagnostic test menu

The following table describes the tests in the RMC diagnostic test menu.

Test no	Test	Description
1	Comprehensive test	Runs tests 2 through 8 of this menu in current mode.
2	Appl-Agent interface test	Tests the interface between the appliance and the agent.
3	Appl PS On-Off test	Tests the agent functionality to turn the power supply on or off from the appliance. **Note:** This test will only run when both power supplies are installed and turned on.
4	RLM memory test	Causes the RLM to run a memory test to test all the available memory on it, and return the test status.
5	RLM Sensor test	Tests the temperature on the RLM and sensor interrupt.
6	RLM-Agent interface test	The agent interface performs a read from the agent and compares the result with the agent read from the appliance.
7	RLM IRQ test	Generates an IRQ.
8	RLM NMI test	The RLM sends the agent a command to generate an NMI.
9	RLM primary reset [Mfg]	Option is unavailable.
10	RLM secondary reset [Mfg]	Option is unavailable.
11	RLM PS On-Off test	Turns the power supply on and off, and checks the power supply status.
12	RLM Watchdog reset [Mfg]	Option is unavailable.
13	RLM internal enet lpbk [Mfg]	Option is unavailable.
14	RLM external enet lpbk [Mfg]	Option is unavailable.
70	Show Agent ring buffer info	Displays all the SEL records in a user-readable format.

71	Show RLM info	Displays the RLM serial number, revision, part number, and MAC address.
72	Show Restart reason	Displays the reason the system was rebooted.
73	Delete SEL [Mfg]	Option not available.
75	Show Agent info	Displays information about the RLM agent ID, the firmware revision, the FIFO depth, the ring depth, and the maximum number of power supplies supported.
91	Enable/disable looping	Enables or disables continuous running of a diagnostic test. The test is stopped when Ctrl-C is pressed or when an error is encountered if option 92 is active.
92	Continue/stop looping on error	Starts or stops running a diagnostic test on an error. If looping is enabled, as set by option 91, looping continues after an error is encountered.
93	Extended/normal test mode	Enables or disables extended mode on tests where extended mode is an available option.
99	Exit	Exits this diagnostics menu.

Card diagnostics

FC-AL diagnostics

About the FC-AL diagnostic tests

The FC-AL (Fibre Channel Arbitrated Loop) group of diagnostic tests the functioning of the Fibre Channel arbitrated loop adapters that are in your system. The tests range from EEPROM data verification through data transfer integrity testing. The FC-AL diagnostic tests can generate error messages associated with the interface and disk shelf.

To perform disk or shelf diagnostics, select test 90 and identify the channel. This returns you to the main FC-AL menu. Then select test 80 or 81.

Note
Altering disks or cabling in a loop adapter requires you to perform either Test 41 or Test 42 before running any FC-AL test. If you change a multiple loop adapter, run Test 41. If you change a single loop adapter, run Test 42.

FC-AL diagnostic test menu

The following table describes the available tests in the FC-AL diagnostic menu.

Note: Tests that are labeled `[Xtnd]` often require loopback plugs for complete test operation and will indicate failures without these plugs.

Caution: Do not run `[Xtnd]` mode diagnostics on network adapter cards with live network connections. Disconnect all network connections prior to running network diagnostics in `[Xtnd]` mode. Running with attached networks can adversely affect other attached devices. Type **`xtnd n`** to cancel Extended test mode.

Test no	Test	Description
1	Comprehensive FCAL test	Runs all tests in this menu in current mode.
2	Self test	Verifies and tests the FC-AL chip configuration, firmware commands, mailboxes, status, error information, the serial EEPROM data, the ISP power-on self-test (POST), the on-chip SSRAM with fixed and random patterns, the SSRAM/ DMA of fixed and random patterns between SSRAM and most locations of main memory, and ISP firmware in SSRAM.
3	ISP interrupt test	Tests the ISP interrupt mechanism.
4	Int loop test	Tests data movement between main memory and the FC-AL chip, using on-chip loopback capability for 10 bit and 1 bit.

5	Bus reset test [Xtnd]	*Extended test mode*: Tests the FC-AL loop integrity and LRC functionality by resetting the bus.
6	Ext loop test [Xtnd]	*Extended test mode:* Tests the functionality and data movement between memory and FC-AL cable. Requires loopback plug.
7	Read-only bus test	Tests the FC-AL loop integrity by reading from each disk attached to the FC-AL interface.
8	Read/write bus test [Mfg]	Option not available.
9	Disk read test (FCTEST)	Tests the FC-AL adapter loop integrity by reading from each disk attached to the FC-AL onboard interface. This test has optional parameters. Requires disks attached to the FC host adapter.
10	Disk read/write test [Mfg]	Option not available.
41	Scan all disks on all FC-AL adapters	Lists the status of all the disks on all FC-AL adapters on the storage system. Requires disks attached to the FC host adapter.
42	Scan and show disks on selected FC-AL adapters	Lists the status of all the disks on the specified FC-AL adapters. Requires disks attached to the FC host adapter.
43	FC-AL adapter LED test	Tests the external LEDs on the FC-AL card.
71	Show ISP FC chip info	Displays information about the ISP Fibre Channel chip.
72	Show attached FC-AL devices	Displays all devices attached to a specific FC-AL adapter.
73	Show all disks (probe-scsi-all)	Lists disk information for all disks attached to the system.
74	Reset FC-AL adapter	Resets the selected FC-AL adapter to its original state.
75	Show serial EEPROM data	Displays the serial EEPROM data.
76	Program serial EEPROM data [Factory]	Option not available.
77	Display fcstat link_status	Displays the link statistics maintained for all drives on a Fibre Channel loop.
80	Go to disk diagnostic menu	Accesses the disk bus pattern diagnostics submenu.
81	Go to shelf diagnostics menu	Accesses the disk shelf diagnostics submenu.
90	FC-AL channel selection	Enables you to select a specific FC-AL card for testing.
91	Enable/disable looping	Enables or disables continuous running of a diagnostic test. The test is stopped when Ctrl-C is pressed or when an error is encountered if option 92 is active.

92	Stop/continue looping on error	Starts or stops running a diagnostic test on an error. If looping is enabled, as set by option 91, looping continues after an error is encountered.
93	Extended/normal test mode	Enables or disables extended mode on tests where extended mode is an available option.
99	Exit	Exits this diagnostics menu.

Card diagnostics

Disk diagnostics submenu

The following table describes the FC-AL disk diagnostics submenu.

Test no	Test	Description
1	Perform drive self diagnostic test	The drive seeks a reserved non user-accessible cylinder and writes, reads, and verifies data for each data surface.
2	Low frequency pattern [Mfg]	Option not available.
3	Low transition density pattern [Mfg]	Option not available.
4	Half-rate square pattern [Mfg]	Option not available.
5	Quarter-rate square pattern [Mfg]	Option not available.
6	Contiguous '3' pattern [Mfg]	Option not available.
7	Composite pattern [Mfg]	Option not available.
40	Read drive defect list	Displays primary and grown defect list. This test has optional parameters. Requires disks attached to the FC host adapter.
99	Exit this menu	Returns the user to the main FC-AL menu.

Card diagnostics

Disk shelf diagnostics submenu

The following table describes the disk shelf diagnostics submenu for the FC-AL interface.

Note: Tests that are labeled `[Xtnd]` often require loopback plugs for complete test operation and will indicate failures without these plugs.

Caution: Do not run `[Xtnd]` mode diagnostics on network adapter cards with live network connections. Disconnect all network connections prior to running network diagnostics in `[Xtnd]` mode. Running with attached networks can adversely affect other attached devices. Type **`xtnd n`** to cancel Extended test mode.

Test no	Test	Description
1	Turn shelf LED on	Turns on the drive LEDs on the target disk shelf.
2	Turn shelf LED off	Turns off the drive LEDs on the target disk shelf.
3	Get trunk information	Displays the list of disk shelves and their firmware revisions on the target FC-AL card.
4	Get shelf drive map	Displays the list of drives on the disk shelves of the target FC-AL card.
5	Get shelf environment information	Displays the environmental parameters for the disk shelves on the target FC-AL card.
6	Check SES temperature sensors	Check SES temperature sensors against threshold value.
7	Check SES FANs	Check SES fan status.
8	Check SES Power Supply	Check SES Power Supply status.
9	Check SES ESH (HUB)	Check SES HUB status on the ESH.
10	Check all SES elements	Check status of all SES elements in the shelf.
11	Loop integrity test [Xtnd]	*Extended test mode*: Tests the FC-AL loop integrity.
12	Show HUB status	Display status of each port in the HUB for each ESH module.
70	Display sector size for FC-AL devices	Displays the sector size for the drives on the disk shelves.
93	Extended/normal test mode	Enables or disables extended mode on tests where extended mode is an available option.
99	Exit this menu	Returns the user to the main FC-AL menu.

Card diagnostics

Gigabit diagnostics

About the Gigabit diagnostic tests

The Gigabit group of diagnostic tests the functioning of the Gigabit Ethernet (GbE) cards that are in your system. The tests range from a status check of the card to the testing of data movement through the system while the GbE card is being used. The GbE diagnostic tests can generate error messages associated with the hardware and software.

GbE diagnostic test menu

The following table describes the GbE diagnostic tests.

Test no	Test	Description
1	Comprehensive GBE test	Runs all tests in this menu in current mode.
2	Reset test	Runs a test that resets the Intel GbE card to its original state.
3	EEPROM test	Runs a series of tests that reads and verifies EEPROM data on the GbE card.
4	Internal lp test 1G	Tests data movement between main memory and the GbE card, using onboard loopback capability. **Note** If your system is running an Copper GbE card, this test is not supported.
5	External lp test 1G (Xtnd)	*Extended test mode*: Tests card functionality and data movement between memory and the Ethernet cable. Requires loopback plug.
6	Internal lp test 10B	Tests data movement between main memory and the GbE card, using onboard loopback capability.
7	Internal lp test 100B	
8	External lp test 10B (Xtnd)	*Extended test mode*: Tests card functionality and data movement between memory and the Ethernet cable. Requires loopback plug.
9	External lp test 100B (Xtnd)	
10	Interrupt test	Performs the internal loopback test in Interrupt mode to tests and verify that the DMA/data transfers work in Interrupt mode.
11	Quick Interrupt test	Tests and verifies that all the device interrupts are working. Data is not transfered during this test.
40	MAC loop test	Tests movement of data through the MAC on the Intel GbE card. **Note** If your system is running an Intel Copper GbE card, it requires a loopback plug.

41	Port-port 10B test (Xtnd)	This test tests the data path from one channel to another for the dual channel NICS, requires a twisted pair network cable to be connected between the 2 ports.
42	Port-port 100B test (Xtnd)	
43	Port-port 1 G test (Xtnd)	
70	Display MAC address	Verifies and displays the MAC address of the card.
71	Display all registers	Displays all the card memory registers.
72	Display EEPROM	Displays the EEPROM data on the GbE card.
73	Set MAC address [Factory]	This is test is unavailable.
90	GbE card selection	Enables the selection of a specific GbE card in the system.
91	Enable/disable looping	Enables or disables continuous running of a diagnostic test. The test is stopped when Ctrl-C is pressed or when an error is encountered if option 92 is active.
92	Stop/continue looping on error	Starts or stops running a diagnostic test on an error. If looping is enabled, as set by option 91, looping continues after an error is encountered.
93	Extended/normal test mode	Enables or disables extended mode on tests where extended mode is an available option.
99	Exit	Exits this diagnostics menu.

Card diagnostics

IPSec diagnostics

About the IPSec diagnostic tests

The IPSec group of diagnostic tests the functioning of the Internet Protocol Security (IPSec) card that is in your system. The IPSec diagnostic tests can generate error messages associated with the hardware.

IPSec diagnostic test menu

The following table describes the tests in the IPSec diagnostic menu.

Test no	Test	Description
1	Comprehensive Ipsec test	Runs all tests in this menu in current mode.
2	DES_SHA1 self test	Self test with the DES SHA1 algorithm.
3	3DES_SHA1 self test	Self test with the 3DES SHA1 algorithm.
4	DES_MD5 self test	Self test with the DES MD5 algorithm.
5	3DES_MD5 self test	Self test with the 3DES MD5 algorithm.
70	Dump card info	Displays information about the card.
91	Enable/disable looping	Enables or disables continuous running of a diagnostic test. The test is stopped when Ctrl-C is pressed or when an error is encountered if option 92 is active.
92	Stop/continue on error	Starts or stops running a diagnostic test on an error. If looping is enabled, as set by option 91, looping continues after an error is encountered.
93	Extended/normal test mode	Enables or disables extended mode on tests where extended mode is an available option.
99	Exit	Exits this diagnostics menu.

Card diagnostics

iSCSI diagnostics

About the iSCSI diagnostic tests

The iSCSI group of diagnostic tests the functioning of the iSCSI card that are in your system. The tests range from a status check of the card to the testing of data movement through the system while the iSCSI card is being used. The iSCSI diagnostic tests can generate error messages associated with the hardware.

Note: Tests that are labeled `[Xtnd]` often require loopback plugs for complete test operation and will indicate failures without these plugs.

Caution: Do not run `[Xtnd]` mode diagnostics on network adapter cards with live network connections. Disconnect all network connections prior to running network diagnostics in `[Xtnd]` mode. Running with attached networks can adversely affect other attached devices. Type **`xtnd n`** to cancel Extended test mode.

iSCSI diagnostic test menu

The following table describes the iSCSI diagnostic tests.

Test no	Test	Description
1	Comprehensive iSCSI HBA test	Runs all tests in this menu in current mode.
2	Self test	Run the ISCSI adapter built in self test (BIST).
3	Memory test	Tests the onboard memory.
4	iSCSI interrupt test	Tests the interrupt mechanism. Checks transmit and receive interrupts, as well as timer interrupts.
5	Internal lp test (1G)	Tests data movement between main memory and the iSCSI card, using onboard loopback capability.
6	Internal lp test (100)	
7	Internal lp test (10)	
8	External lp test (1G) [Xtnd]	*Extended test mode*: Tests card functionality and data movement between memory and the Ethernet cable. Requires loopback plug.
9	External lp test (100) [Xtnd]	
10	External lp test (10) [Xtnd]	
70	Display iSCSI chip information	Displays information about the iSCSI chip.
71	Reset iSCSI target HBA	Resets the selected iSCSI adapter to its original state
90	iSCSI Target HBA selection	Enables the selection of a specific iSCSI card in the system.
91	Enable/disable looping	Enables or disables continuous running of a diagnostic test. The test is stopped when Ctrl-C is pressed or when an error is encountered if option 92 is active.
92	Stop/continue looping on error	Starts or stops running a diagnostic test on an error. If looping is enabled, as set by option 91, looping continues after an error is encountered.

93	Extended/normal test mode	Enables or disables extended mode on tests where extended mode is an available option.
99	Exit	Exits this diagnostics menu.

Card diagnostics

NVRAM diagnostics

About the NVRAM diagnostic test menu

The NVRAM group of diagnostics test the functioning of the NVRAM cards in the system, including PCI connectivity, data transfer, and data registers. In addition, the NVRAM diagnostics, together with other tests, run a set of memory tests on the NVRAM board. These memory tests focus on the memory module strips plugged into the cards. The NVRAM diagnostic tests can generate error messages associated with the hardware and user input.

Types of NVRAM cards tested

Type of NVRAM card	Platforms using the card	Description
NVRAM6	N7000 series	Provides a total of 512 MB of battery backed-up SDRAM for a N7030 and 2 GB of battery backed-up SDRAM for a N7070.
	N5600	Provides a total of 512 MB of battery backed-up SDRAM for a N5600.
	N5300	Provides a total of 512 MB of battery backed-up SDRAM for a N5300.
NVRAM5	N5200 and N5500	Provides a total of 512 MB of battery backed-up SDRAM in one bank.
NVMEM	N3700	Provides a total of 1 GB of battery backed-up SDRAM in one bank (128 MB for non-volatile memory).

NVRAM6 diagnostics

The following table describes the NVRAM6 test menu.

Test no	Test	Description
1	Comprehensive NVRAM test	Runs all tests in current mode.
2	NVRAM memory menu	Accesses the NVRAM memory menu.
3	NVRAM IB menu	Accesses the IB menu which tests the part of the adapter associated with clustering.
4	NVRAM ECC menu [Xtnd]	Accesses the error correction code menu.
5	NVRAM environmental test	Accesses the environmental test menu.
6	NVRAM EEPROM test	Tests the NVRAM EEPROM subcomponent.
7	NVRAM FLASH test	Tests the NVRAM FLASH subcomponent.
8	NVRAM i2c test	Tests the NVRAM i2c bus.
70	Set NVRAM properties [Mfg only]	Option not available.
71	Display NVRAM properties	Displays information about the NVRAM6 adapter.
72	Display NVRAM EEPROM	Displays information about the NVRAM6 Electrically Erasable Programmable Read Only Memory (EEPROM) contents.
73	Display NVRAM status	Displays information about the NVRAM6 status.
74	Display NVRAM config space	Displays information about the NVRAM6 configuration space.
76	Upgrade NVRAM firmware [Xtnd]	*Extended test mode*: Updates the firmware on the NVRAM6.
77	Clear NVRAM properties [Mfg only]	Option not available.
90	NVRAM card selection	Enables the selection of a specific NVRAM card for testing.
91	Enable/disable looping	Enables or disables continuous running of a diagnostic test. The test is stopped when Ctrl-C is pressed or when an error is encountered if option 92 is active.
92	Stop/continue on error	Starts or stops running a diagnostic test on an error. If looping is enabled, as set by option 91, looping continues after an error is encountered.
93	Extended/normal test mode	Enables or disables extended mode on tests where extended mode is an available option.
99	Exit	Exits this diagnostics menu.

NVRAM6 diagnostics

Memory diagnostics

The following table describes the NVRAM6 memory test menu.

Test no	Test	Description
1	Comprehensive NVRAM memory test	Runs all tests in current mode.
2	NVRAM memory walking data test	Runs quick test of data lines.
3	NVRAM memory walking address test	Runs quick test of all address lines to verify address paths in NVRAM memory.
4	NVRAM memory partial word test	Tests intermixed data sizes.
5	NVRAM memory random data test	Runs longer test by writing and reading random data to all NVRAM locations.
6	NVRAM memory random address test	Runs longer test using random addresses.
10	NVRAM DIMM SPD test	Compares NVRAM DIMM properties (SPD) against supported values.
11	Display NVRAM DIMM SPD	Displays NVRAM DIMM properties (SPD) as field-value pairs.
12	Dump NVRAM DIMM SPD	Displays NVRAM DIMM properties (SPD) as a hexadecimal dump.
20	Inject ECC errors [Xtnd only]	*Extended test mode*: Injects ECC errors into the NVRAM DIMM, without triggering detection.
21	Inject/read ECC errors [Xtnd only]	*Extended test mode*: Injects ECC errors into the NVRAM DIMM, and then triggers detection.
50	NVRAM DMA Write-Read-Verify	Fills system memory with a random data pattern, and then DMA transfers this pattern back-and-forth from NVRAM memory.
51	NVRAM DMA Write-only	Fills system memory with a random data pattern, and then DMA transfers this pattern to NVRAM memroy.
52	NVRAM DMA Read-only	Fills NVRAM memory with a random data pattern, and then DMA transfers this pattern to system memory.
70	NVRAM memory dump	Allows the user to dump a region of memory.
71	NVRAM memory poke	Allows the user to write to a region of memory.
72	NVRAM memory custom pattern	Fills NVRAM memory with a user-specified data pattern.
74	Memory fill power cycle test	Fills NVRAM memory with data patterns for power cycle test.
75	Memory write power cycle test	Fills NVRAM memory with data patterns for power cycle test, which does burst writes.
76	Memory read power cycle test	Fills NVRAM memory with data patterns for power cycle test, which does burst reads.

77	Memory DMA write power cycle test	Fills NVRAM memory with data patterns for power cycle test, which does DMA writes.
78	Verify data retention	Checks the retention of data in NVRAM after a power cycle. Data comes from data patterns entered in Test 75.
80	Memory class change [Mfg only]	Option not available.
90	NVRAM card selection	Enables the selection of a specific NVRAM card for testing.
91	Enable/disable looping	Enables or disables continuous running of a diagnostic test. The test is stopped when Ctrl-C is pressed or when an error is encountered if option 92 is active.
92	Stop/continue on error	Starts or stops running a diagnostic test on an error. If looping is enabled, as set by option 91, looping continues after an error is encountered.
93	Extended/normal test mode	Enables or disables extended mode on tests where extended mode is an available option.
99	Exit	Exits this diagnostics menu.

NVRAM6 IB diagnostics

The following table describes the tests in the NVRAM6 IB diagnostic test.

Test no	Test	Description
1	Comprehensive NVRAM cluster test	Runs all tests in current mode.
2	Internal loopback RDMAW test	Test remote direct memory access write (RDMAW) between host memory and NVRAM6 card, using onchip loopback.
3	Internal loopback send test	Test data transfer between host memory and NVRAM6 card, using onchip loopback.
4	Link test [Xtnd]	*Extended test mode*: Verify external link status. Point to point cable needed.
5	External loopback RDMAW test [Xtnd]	*Extended test mode*: Test remote direct memory access write (RDMAW) between host memory and NVRAM6 card, using external loopback. Point to point cable needed.
6	External loopback send test [Xtnd]	*Extended test mode*: Test data transfer between host memory and NVRAM6 card, using external loopback. Point to point cable needed.
70	Reset port performance counter	Resets the counter on the performance of the cluster ports.
71	Display port performance counter	Displays information about the performance of the cluster ports.
90	NVRAM card selection	Enables the selection of a specific NVRAM card for testing.
91	Enable/disable looping	Enables or disables continuous running of a diagnostic test. The test is stopped when Ctrl-C is pressed or when an error is encountered if option 92 is active.
92	Stop/continue on error	Starts or stops running a diagnostic test on an error. If looping is enabled, as set by option 91, looping continues after an error is encountered.
93	Extended/normal test mode	Enables or disables extended mode on tests where extended mode is an available option.
99	Exit	Exits this diagnostics menu.

Error Correction Code (ECC) diagnostics

The following table describes the NVRAM6 ECC test menu.

Test no	Test	Description
1	Comprehensive NVRAM ECC test	Runs all tests in current mode.
2	NVRAM ECC FIFO test	Tests the ECC FIFO that acts as a buffer.
3	NVRAM ECC memory sweep	Tests that all of memory can be corrected.
70	Plant ECC error	Inserts an ECC error into memory.
71	Plant and read ECC error	Inserts an ECC error into memory and then reads memory, thereby causing a correction.
72	Wait for and print ECC errors	Waits for ECC errors without causing them to occur.
73	System disable command	Issues a command to disable the InfiniBand interface. This happens by default when entering the ECC menu.
74	System enable command	ssues a command to enable the InfiniBand interface.
90	NVRAM card selection	Enables the selection of a specific NVRAM card for testing.
91	Enable/disable looping	Enables or disables continuous running of a diagnostic test. The test is stopped when Ctrl-C is pressed or when an error is encountered if option 92 is active.
92	Stop/continue on error	Starts or stops running a diagnostic test on an error. If looping is enabled, as set by option 91, looping continues after an error is encountered.
93	Extended/normal test mode	Enables or disables extended mode on tests where extended mode is an available option.
99	Exit	Exits this diagnostics menu.

NVRAM6 diagnostics

Environmental diagnostics

The following table describes the NVRAM6 environmental test menu. The NVRAM6 environmental test can generate environmental error messages associated with the battery or the temperature sensors. The corrective action for this error message grouping is below the error message description.

Test no	Test	Description
1	Comprehensive NVRAM env test	Runs all tests in current mode.
2	NVRAM env subsytem test	Tests the interrupt conditions for each sensor.
3	NVRAM battery test	Tests the battery.
4	NVRAM charger test	Tests the battery charger.
70	GPIO bit control	Allows the user to toggle the general purpose IO lines.
71	GPIO dump	Dumps the settings of the general purpose IO lines.
72	Turn battery on	Turns on the battery.
73	Turn charger on	Turns on the battery charger.
74	LM81 I2C dump	Allows the user to read the devices on the NVRAM board.
75	LM81 I2C write	Allows the user to write to the devices on the NVRAM board.
76	Force GPIO interrupt	Force an interrupt from the NVRAM board through the general purpose IO line.
77	Charge Battery	Charges the NVRAM battery to a user-specified voltage.
78	Discharge Battery	Discharges the NVRAM battery to a user-specified voltage.
90	NVRAM card selection	Enables the selection of a specific NVRAM card for testing.
91	Enable/disable looping	Enables or disables continuous running of a diagnostic test. The test is stopped when Ctrl-C is pressed or when an error is encountered if option 92 is active.
92	Stop/continue on error	Starts or stops running a diagnostic test on an error. If looping is enabled, as set by option 91, looping continues after an error is encountered.
93	Extended/normal test mode	Enables or disables extended mode on tests where extended mode is an available option.
99	Exit	Exits this diagnostics menu.

Environmental error message range and affected item

The following table lists the error code range and part of the error strings identifying the affected item. The full error string depends on your system configuration.

Error code range	Partial error string
ENV01500x	NVRAM6-battery-1
ENV01501x	NVRAM6-battery2-1
ENV01502x	NVRAM6-temperature-1
ENV01503x	NVRAM6-battery-2
ENV01504x	NVRAM6-battery2-2
ENV01505x	NVRAM6-temperature-2
ENV01506x	NVRAM6-battery-5
ENV01507x	NVRAM6-battery2-5
ENV01508x	NVRAM6-temperature-5
ENV01509x	NVRAM6-battery-6
ENV01510x	NVRAM6-battery2-6
ENV01511x	NVRAM6-temperature-6
ENV01512x	NVRAM6-battery-7
ENV01513x	NVRAM6-battery2-7
ENV01514x	NVRAM6-temperature-7
ENV01515x	NVRAM6-battery-8
ENV01516x	NVRAM6-battery2-8
ENV01517x	NVRAM6-temperature-8

Corrective action

The following table lists the error message groupings and corrective action that can be taken for the error code range.

Error code range	Corrective action
ENV01500x - ENV01501x, ENV01503x - ENV01504x, ENV01506x - ENV01507x, ENV01509x - ENV01510x, ENV01512x - ENV01513x, ENV01515x - ENV01516x	1. Verify that the NVRAM6 battery is connected. 2. Call technical support if the error is not corrected.
ENV01502x, ENV01505x, ENV01508x, ENV01511x, ENV01514x, ENV01517x	Call technical support if the error is not corrected.

NVRAM5 diagnostics

The following table describes the NVRAM5 test menu.

Test no	Test	Description
1	Comprehensive NVRAM test	Runs all tests in current mode.
2	NVRAM memory menu	Accesses the NVRAM memory menu.
3	NVRAM IB menu	Accesses the IB menu which tests the part of the adapter associated with clustering.
4	NVRAM ECC menu [Xtnd]	Accesses the error correction code menu.
5	NVRAM environmental test	Accesses the environmental test menu.
6	NVRAM EEPROM test	Tests the contents of the NVRAM5 EEPROM.
70	Set NVRAM properties [Mfg only]	Menu not available.
71	Display NVRAM properties	Displays information about the NVRAM5 adapter.
72	Display NVRAM EEPROM	Displays information about the NVRAM5 Electrically Erasable Programmable Read Only Memory (EEPROM) contents.
73	Display NVRAM status	Displays information about the NVRAM5 status.
74	Display NVRAM config space	Displays information about the NVRAM5 configuration space.
76	Upgrade NVRAM firmware [Xtnd]	*Extended test mode*: Updates the firmware on the NVRAM5.
90	NVRAM card selection	Enables the selection of a specific NVRAM card for testing.
91	Enable/disable looping	Enables or disables continuous running of a diagnostic test. The test is stopped when Ctrl-C is pressed or when an error is encountered if option 92 is active.
92	Stop/continue on error	Starts or stops running a diagnostic test on an error. If looping is enabled, as set by option 91, looping continues after an error is encountered.
93	Extended/normal test mode	Enables or disables extended mode on tests where extended mode is an available option.
99	Exit	Exits this diagnostics menu.

NVRAM5 diagnostics

Memory diagnostics

The following table describes the NVRAM5 memory test menu.

Test no	Test	Description
1	Comprehensive NVRAM memory test	Runs all tests in current mode.
2	NVRAM memory walking data test	Runs quick test of data lines.
3	NVRAM memory walking address test	Runs quick test of all address lines to verify address paths in NVRAM memory.
4	NVRAM memory partial word test	Tests intermixed data sizes.
5	NVRAM memory random data test	Runs longer test by writing and reading random data to all NVRAM locations.
6	NVRAM memory random address test	Runs longer test using random addresses.
70	NVRAM memory dump	Allows the user to dump a region of memory.
71	NVRAM memory poke	Allows the user to write to a region of memory.
74	Memory fill power cycle test	Fills NVRAM memory with data patterns for power cycle test.
75	Memory write power cycle test	Fills NVRAM memory with data patterns for power cycle test, which does burst writes.
76	Memory read power cycle test	Fills NVRAM memory with data patterns for power cycle test, which does burst reads.
77	Memory DMA write power cycle test	Fills NVRAM memory with data patterns for power cycle test, which does DMA writes.
78	Verify data retention	Checks the retention of data in NVRAM after a power cycle. Data comes from data patterns entered in Test 75.
90	NVRAM card selection	Enables the selection of a specific NVRAM card for testing.
91	Enable/disable looping	Enables or disables continuous running of a diagnostic test. The test is stopped when Ctrl-C is pressed or when an error is encountered if option 92 is active.
92	Stop/continue on error	Starts or stops running a diagnostic test on an error. If looping is enabled, as set by option 91, looping continues after an error is encountered.
93	Extended/normal test mode	Enables or disables extended mode on tests where extended mode is an available option.
99	Exit	Exits this diagnostics menu.

NVRAM5 IB diagnostics

The following table describes the tests in the NVRAM5 IB diagnostic test.

Test no	Test	Description
1	Comprehensive NVRAM cluster test	Runs all tests in current mode.
2	Internal loopback RDMAW test	Test remote direct memory access write (RDMAW) between host memory and NVRAM5 card, using onchip loopback.
3	Internal loopback send test	Test data transfer between host memory and NVRAM5 card, using onchip loopback.
4	Link test [Xtnd]	*Extended test mode*: Verify external link status. Point to point cable needed.
5	External loopback RDMAW test [Xtnd]	*Extended test mode*: Test remote direct memory access write (RDMAW) between host memory and NVRAM5 card, using external loopback. Point to point cable needed.
6	External loopback send test [Xtnd]	*Extended test mode*: Test data transfer between host memory and NVRAM5 card, using external loopback. Point to point cable needed.
70	Reset port performance counter	Resets the counter on the performance of the cluster ports.
71	Display port performance counter	Displays information about the performance of the cluster ports.
90	NVRAM card selection	Enables the selection of a specific NVRAM card for testing.
91	Enable/disable looping	Enables or disables continuous running of a diagnostic test. The test is stopped when Ctrl-C is pressed or when an error is encountered if option 92 is active.
92	Stop/continue on error	Starts or stops running a diagnostic test on an error. If looping is enabled, as set by option 91, looping continues after an error is encountered.
93	Extended/normal test mode	Enables or disables extended mode on tests where extended mode is an available option.
99	Exit	Exits this diagnostics menu.

NVRAM5 diagnostics

Error Correction Code (ECC) diagnostics

The following table describes the NVRAM5 ECC test menu.

Test no	Test	Description
1	Comprehensive NVRAM ECC test	Runs all tests in current mode.
2	NVRAM ECC FIFO test	Tests the ECC FIFO that acts as a buffer.
3	NVRAM ECC memory sweep	Tests that all of memory can be corrected.
70	Plant ECC error	Inserts an ECC error into memory.
71	Plant and read ECC error	Inserts an ECC error into memory and then reads memory, thereby causing a correction.
72	Wait for and print ECC errors	Waits for ECC errors without causing them to occur.
73	System disable command	Issues a command to disable the InfiniBand interface. This happens by default when entering the ECC menu.
74	System enable command	ssues a command to enable the InfiniBand interface.
90	NVRAM card selection	Enables the selection of a specific NVRAM card for testing.
91	Enable/disable looping	Enables or disables continuous running of a diagnostic test. The test is stopped when Ctrl-C is pressed or when an error is encountered if option 92 is active.
92	Stop/continue on error	Starts or stops running a diagnostic test on an error. If looping is enabled, as set by option 91, looping continues after an error is encountered.
93	Extended/normal test mode	Enables or disables extended mode on tests where extended mode is an available option.
99	Exit	Exits this diagnostics menu.

NVRAM5 diagnostics

Environmental diagnostics

The following table describes the NVRAM5 environmental test menu. The NVRAM5 environmental test can generate environmental error messages associated with the battery or the temperature sensors. The corrective action for this error message grouping is below the error message description.

Test no	Test	Description
1	Comprehensive NVRAM env test	Runs all tests in current mode.
2	NVRAM env subsytem test	Tests the interrupt conditions for each sensor.
3	NVRAM battery test	Tests the battery.
4	NVRAM charger test	Tests the battery charger.
70	GPIO bit control	Allows the user to toggle the general purpose IO lines.
71	GPIO dump	Dumps the settings of the general purpose IO lines.
72	Turn battery on	Turns on the battery.
73	Turn charger on	Turns on the battery charger.
74	LM81 I2C dump	Allows the user to read the devices on the NVRAM board.
75	LM81 I2C write	Allows the user to write to the devices on the NVRAM board.
76	Force GPIO interrupt	Force an interrupt from the NVRAM board through the general purpose IO line.
90	NVRAM card selection	Enables the selection of a specific NVRAM card for testing.
91	Enable/disable looping	Enables or disables continuous running of a diagnostic test. The test is stopped when Ctrl-C is pressed or when an error is encountered if option 92 is active.
92	Stop/continue on error	Starts or stops running a diagnostic test on an error. If looping is enabled, as set by option 91, looping continues after an error is encountered.
93	Extended/normal test mode	Enables or disables extended mode on tests where extended mode is an available option.
99	Exit	Exits this diagnostics menu.

Environmental error message range and affected item

The following table lists the error code range and part of the error strings identifying the affected item. The full error string depends on your system configuration.

Error code range	Partial error string
ENV011080 through ENV011089	NVRAM5-battery-10

ENV011100 through ENV011109	NVRAM5-battery-11
ENV011090 through ENV011099	NVRAM5-temperature-10
ENV011110 to ENV011119	NVRAM5-temperature-11

Corrective action

The following table lists the error message groupings and corrective action that can be taken for the error code range.

Error code range	Corrective action
ENV011080 through ENV011089, ENV011100 through ENV011109	1. Verify that the NVRAM5 battery is connected. 2. Call technical support if the error is not corrected.
ENV011090 through ENV011099, ENV011090 through ENV011099	Call technical support if the error is not corrected.

NVRAM diagnostics

NVMEM diagnostics

The following table describes the NVMEM test menu.

Test no	Test	Description
1	Comprehensive NVMEM test	Runs all tests in current mode.
2	Battery test	Tests the battery.
71	Turn battery off	Turns off the battery.
72	Turn charger on	Turns on the battery charger.
75	Fill for power cycle test, burst write	Fills NVRAM memory with data patterns for power cycle test, which does burst writes.
76	Fill for power cycle test, burst read	Fills NVRAM memory with data patterns for power cycle test, which does burst reads.
77	Fill for power cycle test	Fills NVRAM memory with data patterns for power cycle test.
78	Verify data retention	Checks the retention of data in NVRAM after a power cycle. Data comes from data patterns entered in Test 75.
82	Display from given address	Displays the contents of a memory address location.
91	Enable/disable looping	Enables or disables continuous running of a diagnostic test. The test is stopped when Ctrl-C is pressed or when an error is encountered if option 92 is active.
92	Stop/continue on error	Starts or stops running a diagnostic test on an error. If looping is enabled, as set by option 91, looping continues after an error is encountered.
93	Extended/normal test mode	Enables or disables extended mode on tests where extended mode is an available option.
99	Exit	Exits this diagnostics menu.

Card diagnostics

SCSI diagnostics

About the SCSI diagnostic tests

The Small Computer System Interface (SCSI) group of diagnostic tests the functioning of the SCSI adapters that are in your system. The tests range from checking firmware versions and disk access through Static Read Random Access Memory (SSRAM) and data transfer integrity. The SCSI diagnostic tests can generate error messages associated with the adapter.

SCSI Controller diagnostic test menu

The following table describes the tests in the SCSI Controller diagnostic test.

Test no	Test	Description
1	Comprehensive SCSI test	Runs all tests in this menu in current mode.
2	PCI-PCI bridge test (Netapp)	Verifies the PCI configuration registers.
3	PLX 9060 test (Netapp)	Tests the configuration, self-test, and error status of the PLX9060 bridge.
4	ISP chip test	Verifies the onboard ISP SCSI chip configuration, firmware commands, mailboxes, and status and error information.
5	EEPROM data check (Netapp)	Reads and verifies the serial EEPROM data.
6	SSRAM pattern test (Qlogic)	Tests the on-chip SSRAM with fixed data patterns.
7	SSRAM random test (Qlogic)	Tests the on-chip RAM with random data patterns.
8	SSRAM/DMA pattern test (Qlogic)	Tests the DMA of fixed data patterns between SSRAM and most locations of main memory.
9	SSRAM/DMA random test (Qlogic)	Tests the DMA of random data patterns between SSRAM and most locations of main memory.
10	ISP firmware test (Qlogic)	Tests the ISP firmware (reads and verifies ISP firmware in SSRAM).
11	SCSI interrupt test	Tests the ISP SCSI adapter interrupt.
12	Read-only bus test [Xtnd]	*Extended test mode*: Tests SCSI adapter loop integrity by reading from each disk attached to the SCSI adapter.
13	Read/write bus test [Mfg]	Option not available.
14	Disk read test	Tests the SCSI adapter connection by reading from each disk attached to the SCSI interface.
15	Disk read/write test	Option not available.
42	Scan and show disks (R100)	Lists the status of all the disks on the specified SCSI adapters. Requires disks attached to the SCSI host adapter on the R100.

71	Show ISP chip info	Displays information about the ISP chip.
72	Show attached SCSI devices	Displays the SCSI devices attached to the system.
73	Show all disks (probe-scsi-all)	Displays all SCSI disks.
74	Reset SCSI adapter	Resets the SCSI adapter.
75	Show serial EEPROM data	Displays the serial EEPROM data.
76	Program serial EEPROM data [Factory]	Option not available.
78	Set serial # and revision [Factory]	Option not available.
90	SCSI card selection	Enables you to select a specific SCSI card for testing.
91	Enable/disable looping	Enables or disables continuous running of a diagnostic test. The test is stopped when Ctrl-C is pressed or when an error is encountered if option 92 is active.
92	Stop/continue looping on error	Starts or stops running a diagnostic test on an error. If looping is enabled, as set by option 91, looping continues after an error is encountered.
93	Extended/normal test mode	Enables or disables extended mode on tests where extended mode is an available option.
99	Exit	Exits this diagnostics menu.

Card diagnostics

TCP Offload Engine diagnostics

About the TCP Offload Engine diagnostic tests

The TCP Offload Engine group of diagnostic tests the functioning of the TCP Offload Engine (TOE) cards that are in your system. The tests range from a status check of the card to the testing of data movement through the system while the TOE card is being used. The TOE diagnostic tests can generate error messages associated with the hardware.

TOE diagnostic test menu

The following table describes the TOE diagnostic tests.

Test no	Test	Description
1	Comprehensive TOE test	Runs all tests in this menu in current mode.
2	EEPROM test	Runs a series of tests that reads and verifies EEPROM data on the card.
3	MC3 BIST	Runs a series of internal functional tests on the payload memory region of the card which holds the TCP data.
4	MC4 BIST	Runs a series of internal functional tests on the CAM memory region of the card which holds the TCP connection information.
5	Interrupt test	Tests the interrupt mechanism. Checks transmit and receive interrupts, as well as timer interrupts.
6	Internal lp test	Tests data movement between main memory and the TOE card, using onboard loopback capability. **Note** This test will only run on a T204 copper card.
7	Internal lp test (Xtnd)	*Extended test mode*: Tests functionality and data movement within the card. Requires loopback plug. **Note** This test will only run on a T210 optical card.
8	External lp test (Xtnd)	*Extended test mode*: Tests card functionality and data movement between memory and the cable. Requires loopback plug.
70	Dump Registers	Allows the user to dump an extensive list of registers located in the controller.
90	TOE card selection	Enables the selection of a specific TOE card in the system.
91	Enable/disable looping	Enables or disables continuous running of a diagnostic test. The test is stopped when Ctrl-C is pressed or when an error is encountered if option 92 is active.

92	Stop/continue looping on error	Starts or stops running a diagnostic test on an error. If looping is enabled, as set by option 91, looping continues after an error is encountered.
93	Extended/normal test mode	Enables or disables extended mode on tests where extended mode is an available option.
99	Exit	Exits this diagnostics menu.

CF card diagnostics

About the CF card diagnostic tests

The CF (CompactFlash) card group of diagnostic tests the functionality of CompactFlash card that is in your system. Use these diagnostics for testing and verifying card data. The CF card diagnostic tests can generate error messages associated with the hardware.

CF card diagnostic test menu

The following table describes the tests in the CF card diagnostic test menu.

Test no	Test	Description
1	Comprehensive test	Runs all tests in this menu in current mode.
2	Reset test	Verifies the reset functionality of the CF card.
3	Self test	Runs the internal self- test supported by the CF card.
4	Read test	Verifies data read transfers from the CF card.
5	Sector read	Verifies the read from a specific sector that the user selects.
70	Display drive info	Displays CF card information.
71	Display registers	Displays the contents of specific registers.
72	Display sector	Displays the contents of individual sectors that the user selects.
73	Display checksum	Displays the value of checksum info.
91	Enable/disable looping	Enables or disables continuous running of a diagnostic test. The test is stopped when Ctrl-C is pressed or when an error is encountered if option 92 is active.
92	Stop/continue looping on error	Starts or stops running a diagnostic test on an error. If looping is enabled, as set by option 91, looping continues after an error is encountered.
99	Exit	Exits this diagnostics menu.

Stress diagnostics

About the stress diagnostics

This section describes the stress diagnostic tests. They simulate heavy traffic on the storage system to identify malfunctioning components or those that might malfunction in the near future. The stressable devices displayed depend on the cards in the system.

N3700 (model number 2863-A20) only: If you are running diagnostics on system module B and you responded that system module A is running Data ONTAP or Diagnostics, then only tests 1 and 3 are available for running.

System stress diagnostic menu

The following table describes the menu numbers and tests in the system stress diagnostic test menu.

Test no	Test	Description
1	Stress all devices	Runs all tests in this menu in current mode.
2	Stress selected devices	Runs stress diagnostics on the selected devices.
3	Interrupt stress all devices	Interrupts all tests in this menu in current mode.
4	Interrupt stress selected devices	Interrupts stress diagnostics on the selected devices.
71	Show all devices	Displays all testable system devices.
72	Show selected devices	Displays the devices selected for testing.
90	Select devices	Enables you to select a system device for the stress test.
91	Enable/disable looping	Enables or disables continuous running of a diagnostic test. The test is stopped when Ctrl-C is pressed or when an error is encountered if option 92 is active.
92	Stop/continue on error	Starts or stops running a diagnostic test on an error. If looping is enabled, as set by option 91, looping continues after an error is encountered.

93	Extended/normal test mode	Enables or disables extended mode on tests where extended mode is an available option.
99	Exit	Exits this diagnostics menu.

Error Messages

About this section

This section defines the coding conventions used, lists and defines the error messages generated by the diagnostic tests, and recommends the corrective action to address errors you encounter.

Topics in this section

The error messages are documented alphabetically and are described in the following sections.

Error message coding conventions

How to determine error message type

When a diagnostic test encounters an error, the diagnostic tool generates an error message. The type of message that is generated and displayed on your console helps you determine what failed during the diagnostic test.

Error messages are composed of four components. The alphabetic portion of the error message code helps you identify the system generating the error, the module generating the error, and the type of error encountered.

The numeric portion of the error code uniquely identifies the error for the module reporting the error. The numeric identifier is followed by a colon and the error message text. The following is an example of error message syntax.

Example:

"SMTnnnn: The XYZ card failed to reset"

System code

The system code identifies the kernel for which the error is generated.

The types of system codes are shown in the following table.

System code letter	System generating the error
C	Data ONTAP kernel critical problem
D	Diagnostic kernel error
E	Data ONTAP kernel error
F	Firmware error
W	Data ONTAP kernel caution message

> **Note**
> Error codes of the type "ENVxxxxxx" indicate that an environmental error code was generated. These codes, along with the corrective action, are listed in Environmental Error Messages.

Module code

The module code identifies the software driver, hardware adapter, or firmware for which the error is generated. Typically, the hardware error messages generated by the diagnostic tool are associated with the diagnostic kernel system code.

Also generated by the diagnostics are Data ONTAP kernel and firmware error messages. Only the diagnostic kernel messages are documented in this section.

The types of diagnostic kernel module codes are shown in the following table.

Module code letter	Module generating the error
B	Hardware bridges
G	GbE adapters
H	Disk shelf
L	FC-AL adapters
M	Memory and onboard SIMMs
N	NVRAM
P	CompactFlash unit
R	Agent/RLM unit
S	SCSI adapter
Z	Motherboard and backplane adapters

Type code

The last letter of the error message code identifies the probable error type; what caused the error to be generated.

The types of probable type codes are shown in the following table.

Type code letter	Type generating the error
H	Hardware card or adapter
S	Software error
U	User error

Message variable conventions

In the online message text, you see values displayed for conditions found on the system. These values change as conditions in the system change.

In error messages in this guide, these values are displayed in italics. The following table illustrates this convention.

Convention	Definition
ASCII_value	This denotes that an ASCII code is displayed.

dec_value	This denotes that a decimal value is displayed.
hex_value	This denotes that a hexadecimal value is displayed.

DBH0301 through DBH0501

Message type

This error message grouping covers errors associated with the bridge cards that are in the storage system. These errors are generated when you run the Option 2: Check CPU/Hostbridge CNB20HE status option and Option 3: Check SIO (OSb4) status option from the Motherboard Diagnostics menu. The corrective action for this error message grouping is below the error message description.

Error message description

The following messages can be generated for this message group.

Error code	Sample message	Description
DBH0301	Vendor ID incorrect	This error message can appear with a variety of cards. Check the test that yielded this error message to determine which bridge is faulty.
DBH0302	Device ID incorrect	Incorrect bridge chip device ID found during testing.
DBH0303	Base class incorrect	Incorrect bridge chip base class detected during testing.
DBH0304	Subclass incorrect	Incorrect bridge chip subclass detected during testing.
DBH0305	Incorrect revision number	Incorrect bridge chip revision number detected during testing.
DBH0306	Bridge at bus *hex_value*, slot *hex_value* has error	Might indicate an error in the bridge chip, or more likely, a problem with a device on the bus managed by the bridge.
DBH0308	The following bridge error bits could not be located	Internal bridging software error detected during testing.
DBH0501	No CIOB found on motherboard.	The motherboard does not have the CIOB.

Corrective action

To correct the displayed error, replace the card or contact technical support.

DBS0307

Message type

This error message grouping covers software errors associated with the bridge cards that are in the storage system. These errors are generated when you run the Option 2: Check CPU/Hostbridge CNB20HE status option and Option 3: Check SIO (OSb4) status option from the Motherboard menu.

Error message description

The following message can be generated for this message group.

Error code	Sample message	Description
DBS0307	No error bits selected to clear	Card memory was not cleared before the diagnostic was run.

Corrective action

Report this error to technical support for analysis.

DGH0140 through DGH0827

Message type

This error message grouping covers hardware errors associated with GbE cards that are in the storage system. The following GbE cards are tested:

Type of GbE card	Error code range
Intel® cards	DGH0140 through DGH0149
N3700 GbE interface	DGH0400 through DGH0417
IPSec card	DGH0500 through DGH0504
TOE card	DGH0600 through DGH0609
iSCSI card	DGH0800 through DGH0827

DGH0400 through DGH0417

Error message description

The following messages can be generated for this message group. The corrective action for this error message grouping is below the error message description.

Error code	Sample message	Description
DGH0400	Invalid slot	Invalid slot selected to run the test.
DGH0401	CFE command did not work status *dec_value*	The command issued to the common firmware environment (CFE) did not respond; the command status is returned.
DGH0402	Slot *dec_value* receive error send(*hex_value*) 0x%x recv(*hex_value*) 0x%x buf *dec_value* offset *dec_value*	Did not receive any data; displays the sent and the received data and offset at which the data mismatch occurred.
DGH0403	Receive failed dsc *dec_value*	Failed the receive operation and shows the descriptor at which the receive failed.
DGH0404	Transmit failed *dec_value*	Failed the transmit operation and shows the descriptor at which the receive failed.
DGH0405	Ring is full	The buffer ring is full trying to allocate more buffers than available.
DGH0406	Receive ring to allocate is full dsc *hex_value*\n", dsc);	The receive buffer is full trying to allocate more buffers than available.
DGH0407	No 10B link	Did not detect a 10 Bt link.
DGH0408	No 100B link	Did not detect a 100 Bt link.
DGH0409	No 1G link	Did not detect a 1G link.
DGH0410	status 0x%llx loop *dec_value*\n"	Displays the transmit and receive status in case of an error.
DGH0411		
DGH0412	Did not get an interrupt-status *hex_value*	Did not get the expected interrupt. The status of the expected interrupt is also shown.
DGH0413	Did not reset sbm_macenable val	Did not reset the mac enable register.
DGH0414	No on-board ethernet detected\n"	Failed to detect an onboard Ethernet interface.
DGH0415		
DGH0416		
DGH0417	status 0x%llx\n"	Displays the transmit and receive status in case of an error.

Corrective action

The following table lists the error message groupings and corrective action that can be taken for the error message group.

Error message group	Corrective action
DGH0400-DGH0406 DGH0410-DGH0417	Contact technical support.
DGH0407-DGH0409	1. Check that the external loopback plug is connected. 2. If it is connected and the GbE card still fails, call technical support.

DGH0140 through DGH0827

DGH0140 through DGH0159

Error message description

The following messages can be generated for this message group. The corrective action for this error message grouping is below the error message description.

Error code	Sample message	Description
DGH0140	GbE revision *dec_value* not supported	Listed card firmware revision is not supported. Only revision 3 is supported.
DGH0141	Bad EEPROM node address	EEPROM has an incorrect node address.
DGH0142	Could not initialize the registers	Failed to initialize the device registers.
DGH0143	Could not allocate the memory	Failed to allocate memory for the card.
DGH0144	Register *ASCII_value*, expected *hex_value*, actual *hex_value*	Registers do not contain the expected default values. Existing and expected values are displayed.
DGH0145	Did not receive	Failed to receive packets.
DGH0146	Sent *hex_value* received *hex_value* offset *dec_value*	Data sent does not match the data received. Sent and received data is displayed.
DGH0147	Did not transmit	Failed to transmit packets.
DGH0148	Could not get the interrupts	Failed to get interrupts.
DGH0149	Checksum read *hex_value* expected *hex_value*\n, checksum, EEPROM_SUM	Read and expected (default) checksums do not match.
DGH0152	Receive data error descriptor *dec_value*	An error was received with the given value.
DGH0153	Receive carrier extension error descriptor *dec_value*	
DGH0154	Receive sequence error descriptor *dec_value*	
DGH0155	Receive symbol error descriptor *dec_value*	
DGH0156	Receive CRC or alignment error descriptor *dec_value*	
DGH0157	Transmit error underrun	Transmit error.
DGH0158	Transmit error late collision	
DGH0159	Transmit error excess collisions	

Corrective action

The following table lists the error message groupings and corrective action that can be taken for the error message group.

Error message group	Corrective action
DGH0140-DGH0146 DGH0148-DGH0149	Replace the GbE card or contact technical support.
DGH0147	1. Check that the external loopback plug is connected. 2. If it is connected and the GbE card still fails, call technical support.

DGH0500 through DGH0504

Error message description

The following messages can be generated for this message group. The corrective action for this error message grouping is below the error message description.

Error code	Sample message	Description
DGH0500	Startup failed.	Failed to initialize the card.
DGH0501	DES_SHA1 self test error status *hex_value*	Failed the self test for the DES SHA1.
DGH0502	3DES_SHA1 self test error status *dec_value*	Failed the self test for the 3DES SHA1.
DGH0503	DES_MD5 self test error status *hex_value*	Failed the self test for the DES MD5.
DGH0504	3DES_MD5 self test error status *dec_value*	Failed the self test for the 3DES MD5.

Corrective action

Replace the card or contact technical support.

DGH0800 through DGH0827

The following messages can be generated for this message group. The corrective action for this error message grouping is below the error message description.

Error code	Sample message	Description
DGH0800	Failed control sram pattern	Card has bad SRAM.
DGH0801	Failed dram pattern test 1	Card has bad DRAM.
DGH0802	Failed dram pattern test 2	Card has bad DRAM.
DGH0803	Failed dram pattern test 3	Card has bad DRAM.
DGH0804	Failed dram pattern test 4	Card has bad DRAM.
DGH0805	Failed control sram address lines walking test	Card has bad SRAM.
DGH0806	Failed dram address lines walking test	Card has bad DRAM.
DGH0807	Failed control sram data lines walking test	Card has bad SRAM.
DGH0808	Failed dram data lines walking test	Card has bad DRAM.
DGH0809	Failed to enter eboot	Card failed to execute boot firmware.
DGH0810	Can't allocate response buffer	Unable to allocate memory.
DGH0811	iSCSI interrupt not set	Card fail to set an interrupt.
DGH0812	iSCSI interrupt not reset	Card fail to reset interrupt.
DGH0813	Can't get sysconfig information	Unable to get card system configuration information.

DGH0814	Can't get revision information	Unable to get card revision.
DGH0815	Device not ready	Card is not ready.
DGH0816	Fail init ports	Card failed to initialize the ports.
DGH0817	Can't allocate mbuf	Unable to allocate memory.
DGH0818	Fail set promiscous mode	Unable to set the card to promiscuous mode.
DGH0819	Fail activate port	Unable to activate the port.
DGH0820	Fail config port	Unable to configure the port.
DGH0821	Fail get link up	Failed to get the link up.
DGH0822	Fail xmt request	Unable to send a transmit request.
DGH0823	Fail send	Unable to send data.
DGH0824	Fail receive	Unable to receive data.
DGH0825	Frame drop	A frame was dropped.
DGH0826	Uncorrect receive length	The received data length is incorrect.
DGH0827	Data compare error	The received data is incorrect.

Corrective action

The following table lists the error message groupings and corrective action that can be taken for the error message group.

Error message group	Corrective action
DGH0800-DGH0820	Replace iSCSI card or contact technical support.
DGH0821DGH0827	1. Check that the external loopback plug is connected. 2. If it is connected and the iSCSI card still fails, call technical support.

DGH0001 through DGH0827

DGH0600 through DGH0609

Error message description

The following messages can be generated for this message group. The corrective action for this error message grouping is below the error message description.

Error code	Sample message	Description
DGH0600	Failed in MAC training slot *dec_value*	Failed in the setup process of the card, loss of syncronization.
DGH0601	Failed in start up slot *dec_value*	Failed in the setup process of the card.
DGH0602	Training Did Not Finish slot *dec_value*	Failed in the setup process of the card. Did not finish the syncronization process.
DGH0603	DIP4 Errors Encountered slot *dec_value*	DIP4 type errors encountered in setup.
DGH0604	Did not transmit slot *dec_value*	Failed to send any data out.
DGH0605	Did not receive slot *dec_value*	Did not receive back any data.
DGH0606	offset *dec_value* Data miscompare sent *hex_value* received *hex_value*	Received data with a miscompare.
DGH0607	loop *dec_value* mr *hex_value* ms *hex_value*	Failed on the specified loop with errors during the loopback test.
DGH0608	Failed to get card format information	Failed to get any information from the card EEPROM.
DGH0609	Failed to get card microcode information	Failed to read the card microcode.

Corrective action

The following table lists the error message groupings and corrective action that can be taken for the error message group.

Error message group	Corrective action
DGH0600-DGH0603 DGH0608-DGH0609	Replace the TOE card or contact technical support.
DGH0604-DGH0607	1. Check that the external loopback plug is connected. 2. If it is connected and the TOE card still fails, call technical support.

DGS0006

Message type

This error message grouping covers software errors associated with GbE cards that are in the storage system.

Error message description

The following message can be generated for this message group.

Error code	Sample message	Description
DGS0006	Couldn't fill recv ring	Failed to initialize the receive rings.

Corrective action

Replace the card or contact technical support.

DHH0001

Message type

This error message grouping covers hardware errors associated with the disk shelves that are connected to the storage system or with the Fibre Channel cards that are in the storage system.

Error message description

The following message can be generated for this message group.

Error code	Sample message	Description
DHH0001	SES Admin failed to obtain SES structure; aborting operation	System is aborting the operation because the SCSI enclosure services (SES) administrator failed to access the correct target disk shelf ID.

Corrective action

To correct this error, complete the following steps.

Step	Action
1	Make sure that the drive bays for SES monitoring on the target disk shelf have disk drives.
2	Check the FC-AL connection.
3	If the connection is good, replace the FC-AL adapter.
4	Contact technical support.

DLH0001 through DLH1003

Message type

This error message grouping covers hardware errors associated with Fibre Channel cards that are in the storage system. The corrective action for this error message grouping is below the error message description.

Error message description

The following messages can be generated for this message group.

Error code	Sample message	Description
DLH0001	Could not reset ISP on adapter *ASCII_value*	Card failed to reset the chip.
DLH0003	Mailbox timeout	Card failed to finish the given mailbox command.
DLH0004	Mailbox command returned with a failure note	During execution of the mailbox command, the value put on the incoming mailbox does not match the value that was received in the outgoing mailbox.
DLH0005	ISP VID is *hex_value* but should be *hex_value*	Card has an unrecognized vendor ID (not ISP2100 or ISP2200).
DLH0006	ISP DID is *hex_value* but should be either *hex_value* or *hex_value*	Card has an unrecognized device ID (not ISP2100 or ISP2200).
DLH0007	RISC status was *hex_value*, but should be *hex_value*	After reset, the card does not come back alive.
DLH0009	ISP firmware simple command	Card failed to execute a simple command (NOP operation).
DLH0010	ISP firmware bad command test	Card failed to execute an invalid command.
DLH0011	ISP firmware wraparound failed	Card failed to execute a wraparound mailbox command.
DLH0012	ISP firmware wraparound	The data transmitted to and received by the mailbox does not match.
DLH0013	Expected *dec_value* ISP2100 controllers, but only found 1	Card received an unexpected number of ISP chips.
DLH0014	Copy to SSRAM on channel *dec_value* failed	Card failed to write to Synchronous Static Random Access Memory (SSRAM).
DLH0015	Read from SSRAM on channel *dec_value* failed	Card failed to read from SSRAM.

DLH0016	Data mismatch at SSRAM word *dec_value*, channel *dec_value*, read *hex_value*, expected *hex_value*, dest *hex_value*, source *hex_value*	Read and written data do not match. **Note** The word is the address offset from the starting address in the word.
DLH0019	RISC checksum failed	Card failed when verifying the checksum of the downloaded firmware code.
DLH0020	FCAL loop is open, channel *dec_value*	Card failed to reconnect to the loop. Check the cable, disk, and terminator plug.
DLH0021	Could not save new ISP 2100 settings to EEPROM; giving up after 2 retries	Card failed to download the EEPROM.
DLH0023	Unable to execute firmware: error code 0004	Card failed to execute the downloaded firmware.
DLH0025	FCAL loop is open, channel *dec_value*	Card failed to reconnect to the loop. Check the cable, disk, and terminator plug.
DLH0026	No FCAL in slot *dec_value*	No card was found in designated slot.
DLH0030	isp2100_diag_reset_isp: while resetting ISP, ISP never came ready on adapter *dec_value*	Card failed to come back after reset.
DLH0032	FCAL ISP POST test failed: error code *dec_value*, count *dec_value* failing FIFO: *hex_value*, FIFO addr: *hex_value*	Card failed to execute the POST code given by the FC-AL vendor.
DLH0033	NOP command failed execution	Card failed to execute the NOP command.
DLH0034	Unexpected number of ISP 2100s; found *dec_value*	Chip number is incorrect.
DLH0035	The HCCR_INTR bit was not reset	Test failed to flush the previous command.
DLH0036	FCAL interrupt test failed, the interrupt test never got set	Card/test failed to set the interrupt bit to the main CPU.
DLH0037	FCAL interrupt bit either never got reset or it regenerated an interrupt	Test either failed to flush the previous command or the interrupt bit was reset.
DLH0038	There is a link failure or loss of sync or invalid CRC	System failed to receive the link status from the Fibre Channel chip.

DLH0039	FCTEST confidence factor is < 95	The fctest has a confidence factor of < 95%.
DLH0040	ISP internal loop test 10 bit failed during mail, channel *dec_value*	*Applies to ISP2200 card only:* Card failed to execute the internal loop test (before the serial transceiver).
DLH0041	ISP internal loop test 1 bit failed during mail, channel *dec_value*	
DLH0042	ISP external loop test failed during mail, channel *dec_value*	*Applies to ISP2200 card only:* Card failed to execute the external loop test.
DLH0043	Data mismatch doing *dec_value* at word *dec_value*, channel *dec_value*, received *hex_value*, send *hex_value*	Card has a data mismatch when executing an internal or external loop test.
DLH0044	ISP failed to get device link status at channel *dec_value*, device # *dec_value*	Card failed to get device link status before the fctest.
DLH0045	ISP failed to get adapter link status at channel *dec_value*	Card failed to get adapter link status before the fctest.
DLH0046	ISP failed to execute fctest at channel *dec_value*	Card failed to execute the fctest.
DLH0047	ISP failed to get device link status at channel *dec_value*, device # *dec_value*	Card failed to get device link status after the fctest.
DLH0070	Unrecognized signature	The save EEPROM data has an invalid signature.
DLH0071	Invalid NVRAM minimum version	The save EEPROM data has an invalid NVRAM version.
DLH0072	EEPROM data checksum error	The save EEPROM data has an invalid checksum.
DLH0073	Serial number in EEPROM is not equal to the one in FLASH	Serial numbers saved in EEPROM and in FLASH do not match.
DLH0074	Never saw LIP occur after executing internal loopback test	Card never saw the loop initialization process (LIP) back up after executing the internal loopback test.
DLH0100	LED test failed	LED test failed.
DLH1000	Self test failed with error of class *dec_value*, subclass *dec_value*, info *dec_value*	Card self test failed.
DLH1001	Interrupt test failed with error of class *dec_value*, subclass *dec_value*, info *dec_value*	Failed to get interrupt from the card.
DLH1002	External loopback test failed with error of class *dec_value*, subclass *dec_value*, info *dec_value*	The card failed to execute external loopback test.
DLH1003	Failed to relip with error of class *dec_value*, subclass *dec_value*, info *dec_value*	The card failed to generate a lip or close the loop.

Corrective action

The following table lists the error message groupings and corrective action that can be taken for the error message group.

Error message group	Corrective action
DLH0001-DLH0007 DLH0009-DLH0016 DLH0019, DLH0021 DLH0023 DLH0026-DLH0030 DLH0032-DLH0041 DLH0070-DLH0074 DLH0100 DLH1000-DLH1003	Replace the FC-AL card or contact technical support.
DLH0020, DLH0025 DLH0042-DLH0043	1. Check the external connection. 2. If the FC-AL card still fails, replace the card or contact technical support.
DLH0044-DLH0047	1. Check the external connection, disk, and disk shelf. 2. If the FC-AL card still fails, replace the card or contact technical support.

DMH0001 through DMH0352

Message type

This error message grouping covers hardware errors associated with the storage system onboard memory.

When the memory diagnostics encounter errors, or if recoverable ECC errors occur, the diagnostics attempt to analyze the error and identify the failing SIMMs.

The following table lists the bank part number for the SIMMs by platform.

Platform	Bank part number
F700/C700 series	J27:J30
F800 series/C3100/C6100/D140/R100	J40:J45

Bank part numbers are silk-screened on the motherboard, adjacent to the SIMM sockets.

cache3700 SRAM chips might also be called out. The following table lists the labeling for the cache3700 components by platform.

Platform	Bank part number
F700/C700 series	U30:U37

Example

When an error is encountered, the diagnostics display an error message similar to the following:

```
ERROR: Addr=04b1329e: Exp=55aa55aa, Act=55af55aa, Diff=00050000
** DIMM banks indicating errors: U101
** cache3700 SRAMs indicating errors: E44
```

Error message description

The following messages can be generated for this message group.

Error code	Sample message	Description

DMH0001-DMH0059	Addr=*hex_value*: Exp=*hex_value*, Act=*hex_value*, Diff=*hex_value* ** SIMM banks indicating errors: *hex_value*	Data might be corrupted and a specific DIMM is bad. Read/write error.
DMH0101-DMH0106 DMH0301-DMH0352	Addr=*hex_value* Exp=*hex_value*, Act=*hex_value*, Diff=*hex_value*	An error in cache3700 memory is found and identified. cache3700 errors require replacement of the motherboard.

Corrective action for DMH0001 through DMH0352

The following table lists the error message groupings and corrective action that can be taken for the error message group.

Error message group	Corrective action
DMH0001-DMH0059	Replace the DIMM/SIMM for DIMM/SIMM errors. Call technical support for cache3700 errors.
DMH0101-DMH0352	1. Replace the motherboard 2. Call technical support if the error is not corrected.

DMS0060 through DMS0061

Message type

This error message grouping covers software errors associated with the onboard memory in the storage system.

Error message description

The following messages can be generated for this message group.

Error code	Sample message	Description
DMS0060	Unknown platform type = *dec_value*!	The storage system type cannot be determined by the test.
DMS0061	Invalid memory configuration, dimmMap = *hex_value*	The test encountered an invalid memory configuration for the storage system. One or more DIMMs might be malfunctioning, inaccessible, or missing.

Corrective action

Contact technical support.

DNH0101 through DNH0602

Message type

This error message grouping covers hardware errors associated with the NVRAM in the storage system. The corrective action for this error message grouping is below the error message description.

Error message description

The following messages can be generated for this message group.

Error code	Sample message	Description
DNH0101	No NVRAM card found	No NVRAM found in the system.
DNH0102	NVRAM3 card not initialized by firmware	Configuration data for the card is not as expected by the test.
DNH0103	No NVRAM in slot *dec_value*	NVRAM card was not found in the correct slot.
DNH0104	Data mismatch at *hex_value* on slot *dec_value*, *dec_value* bytes from cardbase at *hex_value* pass *dec_value* read *hex_value*, expected *hex_value*	A read/write error occurred.
DNH0110	No NVRAM memory found	No memory was found on the NVRAM card.
DNH0143	Addr=*hex_value*, Exp=*hex_value*, Act=*hex_value*, Diff=*hex_value*	Test shows unexpected data.
DNH0145	Majority vote for address not reached (*hex_value*, *hex_value*, *hex_value*)	Indicates that the address of the location being written to when power was lost could not be obtained.
DNH0106-DNH0109 DNH0112-DNH0143 DNH0301-DNH0302 DNH0311-DNH0312	Addr=*hex_value* Exp=*hex_value*, Act=*hex_value*, Diff=*hex_value*	A read/write error was encountered.
DNH0321	Soft error register value is not correct: Exp=*dec_value*, Act=*dec_value*	Test forced an ECC error. Status register is not correct.
DNH0322	Soft error count not generated	The status register did not count the errors.
DNH0323-DNH0324	No ACK received	I2C write failed.
DNH0325	EEPROM byte=*dec_value*, val=*hex_value*, exp=*hex_value*	An EEPROM read/write error occurred.
DNH0326	Soft error register value shows error = *hex_value*	Status register shows an unexpected error.

DNH0327	Cannot clear soft error register = *hex_value*	Test could not clear the status register bit.
DNH0328	Hard error register value shows error = *hex_value*	Status register shows an unexpected error.
DNH0329	Cannot clear hard error register = *hex_value*	Test could not clear the status register bit.
DNH0330	NVRAM battery needs to be charged	NVRAM battery voltage is low and needs charging or replacing.
DNH0331	NVRAM battery voltage too high	NVRAM adapter is bad, incorrect voltage read.
DNH0332	NVRAM battery in the chassis is *missing or dead*	NVRAM battery is missing or discharged.
DNH0333	Low NVRAM battery charger voltage	Battery charger is broken on the NVRAM III adapter.
DNH0334	NVRAM battery is connected	Bad NVRAM III card (manufacturing-only diagnostic).
DNH0335	Low NVRAM battery charger voltage (*dec_value* mVolts)	NVRAM III card is not functioning because the charger is not working.
DNH0402	Command status reads as busy	Previous command was not completed.
DNH0416	Expected interrupt *hex_value* did not occur	Missing interrupt.
DNH0417	Unexpected interrupt *hex_value*	Unexpected interrupt occurred.
DNH0423	Clear command did not clear memory	Memory was supposed to be cleared, but was not.
DNH0424	Incorrect number of unlogged ECC corrections *dec_value*	Log data shows memory errors, or expected errors not logged.
DNH0425	ECC log 0 incorrect mask=*hex_value*, addr=*hex_value*	
DNH0426	ECC log 1 incorrect mask=*hex_value*, addr=*hex_value*	
DNH0435	Unable to read the flash ID	Flash that stores NVRAM microcode is not responding properly.
DNH0436	Flash write error address = *hex_value*	A sector of flash memory that stores NVRAM microcode could not be written to.
DNH0440	Invalid nvram serial number *dec_value*	Test encountered an invalid serial number for the storage system type or NetCache appliance.
DNH0441	Invalid nvram revision number *hex_value*	The test encountered an invalid revision number for the storage system type or NetCache appliance.

DNH0442	Board part number (*hex_value*) does not match DIMM size	The test encountered an invalid memory size for the storage system type or NetCache appliance.
DNH0443	ECC PCI correction	Memory errors read from the NVRAM card have not been corrected.
DNH0444	ECC silent correction Loc=*hex_value,* Exp=*hex_value*, Act=*hex_value*	Single-bit ECC error not corrected.
DNH0445	Wrong size DIMM (*dec_value* MB) for this platform	NVRAM installed with wrong memory size.
DNH0446	A front panel is *hex_value* detected on this system	Unable to communicate with the NVRAM flash.
DNH0447	Unrecognized part number (string-value)	NVRAM programmed with a bad part number, or unable to read part number.
DNH0448	ECC unlogged correction Adr=*hex_value,* Exp=*hex_value*, Act=*hex_value*	Unlogged ECC correction is incorrect.
DNH0449	ECC odd cacheline correction Addr=*hex_value,* Exp=*hex_value*, Act=*hex_value*	Odd ECC cacheline correction is incorrect.
DNH0461	DMA failed: Engine=*dec_value*, Ctrl=*hex_value* Addr=*hex_value*, Exp=*hex_value*, Act=*hex_value*, Diff=*hex_value*	DMA memory transfer shows unexpected data.
DNH0462	DMA ECC: Engine=*dec_value*, Exp=*hex_value*, *hex_value*, *hex_value*, *hex_value* Act=*hex_value*, *hex_value*, *hex_value*, *hex_value*	
DNH0463	DMA time out: Engine=*dec_value*, Desc Exp=*hex_value*, Desc Act=*hex_value*	
DNH0471	Vendor ID incorrect - Expected *hex_value*, Actual *hex_value*	This card has a different vendor than what testing reads.
DNH0472	Device ID incorrect - Expected *hex_value*, Actual *hex_value*	This card is of a different type than what testing reads.
DNH0473	Class incorrect - Expected *hex_value*, Actual *hex_value*	This card is of a different class than what testing reads.
DNH0474	Completion buffer timeout	Command issued to NVRAM, but NVRAM did not reply.
DNH0490	NVRAM front panel EEPROM wrote *hex_value*, read *hex_value*	EEPROM read and/or write failed.
DNH0500	NVRAM5 IB fail create CQ	NVRAM5 IB failed to create the completion queue.
DNH0501	NVRAM5 IB fail QP prep	NVRAM5 IB failed the queue pair preparation.
DNH0502	NVRAM5 IB fail create QP	NVRAM5 IB failed to create the queue pair.

DNH0503	NVRAM5 IB fail transit QP from reset to init	NVRAM5 IB failed to transition the queue pair from reset to initialized state.
DNH0504	NVRAM5 IB fail transit QP from init to rtr	NVRAM5 IB failed to transition the queue pair from initialized state to ready-to- receive.
DNH0505	NVRAM5 IB fail transit QP from rtr to rts	NVRAM5 IB failed to transition the queue pair from ready-to- receive to ready-to- send.
DNH0506	NVRAM5 IB fail memory registration	NVRAM5 IB failed memory region registration.
DNH0507	NVRAM5 IB fail post send request	NVRAM5 IB failed post send request.
DNH0508	NVRAM5 IB fail post rcv request	NVRAM5 IB failed post receive request.
DNH0509	NVRAM5 IB fail completion poll	NVRAM5 IB failed completion poll.
DNH0510	NVRAM5 IB error verify data	NVRAM5 IB error in verifying data.
DNH0511	NVRAM5 IB fail link up on port (*dec_value*)	NVRAM5 IB failed to get the link up on the identified port.
DNH0512	NVRAM5 IB slot (*dec_value*) failed initialization	The identified slot for NVRAM5 IB failed to initialize.
DNH0550	Timeout waiting for ECC correction	ECC errors not corrected or not recorded in logs.
DNH0551	NVRAM5 did not receive expected ECC error	NVRAM5 failed to receive the expected error correction code.
DNH0552	NVRAM5 EEPROM write failed: exp *hex_value* got *hex_value*	NVRAM5 read and expected EEPROM write do not match.
DNH0553	NVRAM5 received wrong ECC error: *dec_value*	NVRAM5 received the wrong error correction code.
DNH0554	NVRAM5 received too many ECC errors	NVRAM5 received too many error correction codes.
DNH0555	NVRAM5 ECC did not correct data: exp *hex_value* got *hex_value*	NVRAM5 error correction code did not correct the data.
DNH0556	NVRAM5 battery is too low or disconnected at 4590 mV	NVRAM5 battery power is below normal.
DNH0600	NVRAM DMA mismatch: Addr1: *hex_value* Data1: *hex_value* Addr2: *hex_value* Data2: *hex_value*	DMA memory transfer shows unexpected data
DNH0601	NVRAM SPD byte *dec_value* unsupported: *dec_value*	The DIMM in the NVRAM adapter shows unsupported properties (SPD).
DNH0602	NVRAM battery *dec_value* is too low or disconnected at *dec_value* mV	NVRAM battery power is below normal.

Corrective action

The following table lists the error message groupings and corrective action that can be taken for the error message group.

Error message group	Corrective action
DNH0101-DNH0330 DNH0471-DNH0473	1. Replace the NVRAM adapter for platforms with an NVRAM adapter or Replace the SDRAM DIMM in the N3700. 2. Call technical support if the error is not corrected.
DNH0331-DNH0332 DNH0430, DNH0432, DNH0556, DNH0602	Replace the NVRAM battery.
DNH0333, DNH0335 DNH0402-DNH0426 DNH0435-DNH0436 DNH0442 DNH0445-DNH0446 DNH0473, DNH0550 DNH0601	Replace the NVRAM adapter.
DNH0334	Need to disconnect the battery to test the charger.
DNH0440-DNH0441 DNH0447	Replace the storage system head.
DNH0443 DNH0461-DNH0463 DNH0600	1. Replace the NVRAM adapter. 2. Replace the storage system head.
DNH0490	Replace the NVRAM adapter and the attached front panel.
DNH0500- DNH0512	1. Reseat the cables. 2. Reseat the adapter. 3. Replace the adapter.
DNH0551- DNH0555	1. Reseat the DIMM. 2. Reseat the adapter. 3. Replace the adapter.

DNU0002 through DNU0106

Message type

This error message grouping covers user errors associated with the NVRAM in the storage system.

Error message description

The following messages can be generated for this message group.

Error code	Sample message	Description
DNU0002	Might be missing last bank of SIMMs	Test cannot verify the existence of the last bank of SIMMs.
DNU0106	Might be missing last bank of SIMMs	Test cannot find the last bank of SIMMs.

Corrective action

Check the storage system for the last bank of SIMMs. If it is there, verify that it is seated properly, then rerun the diagnostic test. If the same error occurs, call technical support.

DPH0001 through DPH0029

Message type

This error message grouping covers user errors associated with the CompactFlash unit. The corrective action for this error message grouping is below the error message description.

Error message description

The following messages can be generated for this message group.

Error code	Sample message	Description
DPH0001	Incorrect status *hex_value*	Status value shows error.
DPH0002	Invalid model	Model number not supported.
DPH0003	Incorrect size *dec_value*, current cylinders *dec_value*, current heads *dec_value*, current sectors per track *dec_value*	Card shows size not supported or incorrectly programmed.
DPH0004	BSY status bit not cleared	Busy bit is not cleared.
DPH0005	DRQ status bit not cleared	Data request is not cleared.
DPH0006	Command error	Command is not executed.
DPH0009	Drive not ready	Drive is not ready to respond.
DPH0010	Write complete error	Did not complete write command.
DPH0013	First read failed for sector *hex_value*	Could not read on first try.
DPH0014	Second read failed for sector *hex_value*	Could not read on second try.
DPH0015	Sector *dec_value* conflicting CRCs CRC1=*dec_value*, CRC2=*dec_value*	CRC error on read.
DPH0016, DPH0017	Invalid sector selected	Sector selected is not correct.
DPH0018	Read failed for sector *hex_value*	Failed on read command.
DPH0019	Mismatch; wrote *hex_value*, read *hex_value*	Read data does not match what was written.
DPH0020	Invalid sector selected	Sector selected is not correct.
DPH0021	Reset failed	Failed to reset card.
DPH0023	Formatter device error	Formatter device is incorrect.
DPH0024	Sector buffer error	Buffer type error is detected.
DPH0025	ECC circuitry error	ECC circuitry type error is detected.
DPH0026	Controlling MP error	Multiprocessor type error is detected.

DPH0029	Slave failed status *hex_value*	Failed to read slave device.
DPH0028	Read failed for sector *hex_value*	Failed on read command.

Corrective action

Error message group	Corrective action
DPH0001-DPH0028	Replace CompactFlash card. Call technical support.

DRH0001 through DRH0034

Message type

This error message grouping covers errors associated with the remote management card that is in the storage system. The corrective action for this error message grouping is below the error message description.

Error message description

The following messages can be generated for this message group.

Error code	Sample message	Description
DRH0001	Failed to Reset the RMC Card	The remote management card could not be reset.
DRH0002	RMC Self Test Error	The remote management card failed its self-test.
DRH0003	No External Power Source detected for the RMC Card	The remote management card did not detect any external power sources.
DRH0004	RMC I2C Cable connection not detected	The remote management card did not detect the cable connecting it to the motherboard.
DRH0005	RMC card failed to access the BMC SEL	The remote management card failed to read the baseboard management controller System Event Log.
DRH0006	Failed to access the BMC SEL. This is a BMC error	The baseboard management controller failed to read its System Event Log.
DRH0007	Incorrect or corrupt SEL data retrieved by the RMC	The remote management card did not retrieve correct System Event Log data.
DRH0008	No LAN cable connection detected for the RMC card	The remote management card did not detect a LAN cable connection.
DRH0011	Failed to get the RMC Firmware revision	The remote management card failed to read its firmware version.
DRH0012	Failed to update the RMC Firmware	The remote management card failed to update its firmware.
DRH0021	Expected temperature interrupt didn't happen	The temperature interrupt test failed.
DRH0022	Expected critical interrupt didn't happen	The interrupt request test failed.
DRH0023	Temperature out of range	The temperature is above the expected range.
DRH0024	Fail access agent	The test to gain access to the agent failed.
DRH0025	Fail get correct agent information	The test failed to get the correct agent information.
DRH0026	Fail access sensor	The test failed to gain access to the sensor failed.

DRH0027	Not all power supply present	The platform does not have all its power supplies.
DRH0028	Not all power supply on	Not all the platform power supplies are on.
DRH0029	Fail turn off power supply	The test failed in the attempt to turn off the power supply.
DRH0030	Fail turn on power supply	The test failed in the attempt to turn on the power supply.
DRH0031	Expected Appliance IRQ didn't happen	The appliance IRQ test failed.
DRH0033	NMI didn't happen	The agent failed to generate an NMI.
DRH0034	Wrong reboot reason from CPLD	An invalid reason was given for the reboot.

Corrective action

The following table lists the error message groupings and corrective action that can be taken for the error message group.

Error message group	Corrective action
DRH0001-DRH0002 DRH0005 DRH0007 DRH0011-DRH0012	Replace the remote management card.
DRH0003	1. Check the external power source. 2. Replace the remote management card.
DRH0004	1. Check the cable connecting the remote management card to the motherboard. 2. Replace the remote management card.
DRH0006	Replace the motherboard.
DRH0008	1. Check the LAN cable. 2. Replace the remote management card.
DRH0021-DRH0022 DRH0026 DRH0034	1. Replace the RLM card. 2. Call technical support.
DRH0023	1. Verify that the actual temperature in the enviroment is not too high or too low. 2. Replace the RLM card.

DRH0027	1. Verify that all the power supplies are present before rerunning the test. 2. If the error continues to occur, check the agent on the motherboard. 3. If the error continues to occur, check the power supply.
DRH0028	1. Verify that all the power supplies are on before rerunning the test. 2. If the error continues to occur, check the agent on the motherboard. 3. If the error continues to occur, check the power supply.
DRH0029-DRH0030	1. Check the agent on the motherboard. 2. If the error continues to occur, check the power supply.
DRH0024-DRH0025 DRH0031-DRH0033	1. Reseat the RLM card. 2. If the error continues to occur, replace the RLM card. 3. If the error continues to occur, check the agent on the motherboard. 4. Call technical support.

DSH0001 through DSH1015

Message type

This error message grouping covers hardware errors associated with the SCSI cards in the storage system. The corrective action for this error message grouping is below the error message description.

Error message description

The following messages can be generated for this message group.

Error code	Sample message	Description
DSH0001	Not a NetApp Dual SCSI card; bridge test skipped	SCSI card found is not a NetApp Dual SCSI card.
DSH0002	PLX VID is *hex_value* but should be *hex_value* or *hex_value*	Test found the wrong PLX VID.
DSH0003	PLX DID is *hex_value* but should be *hex_value*, *hex_value*, *hex_value*	Test found an unexpected PLX DID.
DSH0004	PLX revision is *hex_value*; illegal *dec_value*	Revision found is illegal.
DSH0005	Base class is *hex_value* but should be *hex_value*	Test found an incorrect SCSI base class.
DSH0006	SubClass is *hex_value* but should be *hex_value*	Test found an incorrect subclass.
DSH0007	Interrupt pin is *hex_value* but should be *hex_value*	Test found an incorrect interrupt pin on the SCSI cable.
DSH0008	PLX selftest failed	Test failed to run the PLX self test.
DSH0009	EEPROM data error	Test found an invalid EEPROM value in one of the bits.
DSH0010	Could not reset ISP	SCSI adapter cannot reset itself.
DSH0011	ISP VID is *hex_value* but should be *hex_value*	Test found the wrong SCSI VID.
DSH0012	ISP DID is *hex_value* but should be *hex_value* or *hex_value*	Test found the wrong SCSI DID.
DSH0013	ISP revision is *hex_value*; illegal *dec_value*	Test found the wrong SCSI revision.
DSH0014	RISC status was *hex_value* but should be *hex_value*	SCSI adapter never came back alive.
DSH0015	MBOX register 1 was *hex_value* but should be *hex_value*	SCSI adapter returned a different product ID word.
DSH0016	ISP firmware simple command test failed	SCSI adapter failed to execute NOP operation.
DSH0017	ISP firmware bad command test failed	Invalid command entered; the SCSI adapter responds with invalid return status.

DSH0018	ISP firmware wraparound failed	SCSI adapter failed to execute the wraparound mailbox command.
DSH0019	ISP firmware wraparound mailbox # *dec_value*: read *hex_value*, expected *hex_value*	During execution of the wraparound mailbox command, the value put on the incoming mailbox does not match the value that was received in the outgoing mailbox.
DSH0020	Expected *dec_value* ISP controllers, but found *dec_value*	Number of ISP chips found does not match the number recorded.
DSH0021	Copy to SSRAM on slot *dec_value* failed	SCSI adapter failed to copy DMA data to the SSRAM.
DSH0022	Read from SSRAM on slot *dec_value* failed	SCSI failed to read DMA data to the host.
DSH0023	Data mismatch at SSRAM word # *dec_value*, slot *dec_value*, read *hex_value*, expected *hex_value*, dest *hex_value*, source *hex_value*	Value read from SSRAM does not match the value written to SSRAM.
DSH0024	Read of firmware from SSRAM failed	SCSI adapter failed to dump the firmware value written to the host.
DSH0025	Firmware data mismatch at word # *dec_value*, read *hex_value*, expected *hex_value*	Firmware data written to SSRAM does not match the firmware data that was read from SSRAM.
DSH0026	Firmware checksum failed	SCSI adapter failed the firmware checksum.
DSH0027	The HCCR_INTR bit was not reset	HCCR interrupt bit has not cleared existing data.
DSH0028	SCSI interrupt test failed, the interrupt test never got set	SCSI adapter interrupt is not set.
DSH0029	SCSI interrupt bit either never got reset or it regenerated	SCSI adapter interrupt is not set or the interrupt was set again.
DSH0030	Unable to execute firmware: error code *hex_value*	SCSI adapter failed to execute the loaded firmware.
DSH0031	Expected vendor *hex_value*, device *dec_value* saw vendor *hex_value*, device *dec_value*	Vendor ID numbers on the device and in the device database do not match.
DSH0032	No SCSI in slot *dec_value*	Cannot find SCSI adapter in the specified slot.
DSH0033	Copy of firmware to SSRAM failed	SCSI adapter failed to copy the firmware to SSRAM.
DSH0034	Copy of stress Qlogic code to SSRAM failed	SCSI adapter failed to copy the Qlogic stress code to SSRAM.
DSH0035	Qlogic stress code checksum failed	SCSI adapter failed when doing a checksum for a given Qlogic stress code.
DSH0036	Unable to execute Qlogic stress code	Cannot execute Qlogic stress code.
DSH0037	Read from SSRAM on slot *dec_value* failed	SCSI device failed to read the SSRAM in the identified slot.
DSH0038	Read from firmware from SSRAM in slot *dec_value* failed	SCSI device failed to read the SSRAM in the identified slot during the firmware test.

DSH0039	Failed to reset adapter card	Failed to reset SCSI adapter card.
DSH0040	Failed to reset ISP	Failed to reset SCSI chip.
DSH0041	Data mismatch at SSRAM word *hex_value*, slot *dec_value*, read *hex_value*, expected *hex_value*	Value read from SSRAM does not match the value written to SSRAM.
DSH0042	Firmware data mismatch at word *dec_value*, read *hex_value*, expected *hex_value*	Firmware data written to SSRAM does not match the firmware data that was read from SSRAM.
DSH0050	Failed to flush previous pending mailbox command	SCSI adapter failed to flush the previous pending mailbox command.
DSH0051	Mailbox command failed to finish	SCSI adapter found a timeout when executing a mailbox command.
DSH1000	SCSI adapter in slot *dec_value*, port *dec_value* is dead	Adapter is marked dead.
DSH1001	SCSI adapter in slot *dec_value*, port *dec_value* is currently in OSM event mode	Adapter is busy executing the OSM event and cannot be disturbed.
DSH1002	Failed to initialize SCSI adapter in slot *dec_value*, port *dec_value*	Adapter failed to do hardware initialization.
DSH1003	Timeout when initializing SCSI adapter in slot *dec_value*, port *dec_value*	A timeout occurred during the hardware initialization.
DSH1004	Failed to reset SCSI adapter in slot *dec_value*, port *dec_value*	Resetting of the SCSI adapter failed.
DSH1005	Timeout when resetting SCSI adapter in slot *dec_value*, port *dec_value*	A timeout occurred while the SCSI adapter was being reset.
DSH1006	Failed to reset SCSI adapter bus in slot *dec_value*, port *dec_value*	Adapter failed to do a bus reset.
DSH1007	Timeout when resetting SCSI adapter bus in slot *dec_value*, port *dec_value*	A timeout occurred while the adapter bus was being reset.
DSH1008	Failed to reset target in slot *dec_value*, port *dec_value*	Adapter failed to do specific disk reset.
DSH1009	Timeout when resetting target in slot *dec_value*, port *dec_value*	A timeout occurred while a specific disk was being reset.
DSH1010	Failed to rescan SCSI adapter in slot *dec_value*, port *dec_value*	Adapter failed to do a rescan.
DSH1011	Timeout when rescanning SCSI adapter in slot *dec_value*, port *dec_value*	A timeout occurred during rescanning.
DSH1012	Timeout from SCSI during disk init in slot *dec_value*, port *dec_value*	A timeout occurred during disk initialization through this adapter.
DSH1013	OSM event happened for SCSI card in slot *dec_value*, port *dec_value* and failed to handle it	An OSM event happened during the task and the adapter failed to handle it.
DSH1014	ISP VID is 0x%x but should be 0x%x	Wrong vendor ID.
DSH1015	ISP DID is 0x%x but should be 0x%x	Wrong device ID.

Corrective action

The following table lists the error message groupings and corrective action that can be taken for the error message group.

Error message group	Corrective action
DSH0001-DSH0038 DSH0040-DSH0051 DSH1000-DSH1007 DSH1013-DSH1015	Replace the SCSI card or contact technical support.
DSH0039	1. Check that the external loopback plug is connected. 2. If it is connected, and the SCSI card still fails, call technical support.
DSH1008	Replace the bad disk. Call technical support.
DSH1009-DSH1012	1. Replace the bad disk. 2. Replace the SCSI card. 3. Call technical support.

DZH0104 through DZH3002

Message type

This error message grouping covers hardware errors associated with the motherboard or backplane of the storage system. The corrective action for this error message grouping is below the error message description.

Error message description

The following messages can be generated for this message group.

Error code	Sample message	Description
DZH0104	Conflicting CRCs; CRC1 = *hex_value*, CRC2 = *hex_value*	Bad boot ROM/FLASH encountered.
DZH0138	Can't program motherboard SEEPROM, error code = *dec_value*	Failed to program the motherboard SEEPROM.
DZH0150	Super I/O config error; config = *hex_value*, expected *hex_value*	An invalid device ID was read from the Super I/O.
DZH0154	Unable to read backplane SEEPROM, error code = *dec_value*	Failed to read the backplane SEEPROM.
DZH0155		
DZH0161		
DZH0163		
DZH0164		
DZH0158	Unable to read backplane SEEPROM SEEPROM, error code = *dec_value*	Failed to program the backplane SEEPROM.
DZH0136	Unable to read motherboard SEEPROM, error code = *dec_value*	Failed to read the motherboard SEEPROM.
DZH0165		
DZH0166		
DZH0167		
DZH0169	Can't program backplane SEEPROM SEEPROM, error code = *dec_value*	Failed to program the backplane SEEPROM.
DZH0170	Unrecognized device (ID = *hex_value*, *hex_value*) in slot *dec_value*	Unrecognized PCI device.
DZH0171	No card detected in slot *dec_value*	No PCI device found in indicated slot.
DZH0172	Card detected in (nonexistent) slot *dec_value*	Invalid PCI card found in indicated slot.

DZH0175	Unable to read backplane SEEPROM, error code = *dec_value*	Failed to read backplane SEEPROM.
DZH0194	Unable to read Front Panel SEEPROM, error code = *dec_value*	Failed to read the front fanel SEEPROM.
DZH0191 DZH0197	Unable to read IO Board SEEPROM, error code = *dec_value*	Failed to read the I/Oboard SEEPROM.
DZH0192	Can't program onboard FC-AL SEEPROM SEEPROM, error code = *dec_value*	Failed to program the onboard FC-AL SEEPROM.
DZH0193	Can't program Front Panel SEEPROM SEEPROM, error code = *dec_value*	Failed to program the Front Panel SEEPROM.
DZH0198	Can't program IO Board SEEPROM SEEPROM, error code = *dec_value*	Failed to program the I/O Board SEEPROM.
DZH0199	Unable to read onboard FC-AL SEEPROM, error code = *dec_value*	Failed to read the onboard FC-AL SEEPROM.
DZH0362	Battery dead; RTC not functional	RTC battery is not working.
DZH0363	Update-busy signal never cleared	Signal refresh did not take place.
DZH0364	Seconds not counting properly	RTC seconds value is incorrect.
DZH0365	Day-of-week not in proper range	RTC day of week is incorrect.
DZH0366	Tiny NVRAM; address = *hex_value* expected = *hex_value*	Onboard NVRAM test failed on data mismatch.
DZH0367	Tiny NVRAM; address = *hex_value* expected = *hex_value*	NVRAM failed the data compare check.
DZH0375	Noisy com port # *dec_value*	Comm port signal error detected.
DZH0376	Com Port # *dec_value* hung	Comm port stuck.
DZH0377	Com Port # *dec_value* data received does not match	Comm port failed on data mismatch.
DZH0378	Burst data transfer hung	Comm port failed on data transfer.
DZH0379	Com Port # *dec_value* burst data received does not match	Comm port failed on data comparison.
DZH0428	Unrecognized device (ID = *hex_value*, *hex_value*) in slot *dec_value*	Incorrect device is detected.
DZH0431	No card detected in slot *dec_value*	No card is in the selected slot.
DZH0432	Card detected in (nonexistent) slot *dec_value*	A card is found in a slot that does not exist.
DZH0452	Conflicting CRCs; CRC1 = *hex_value*, CRC2 = *hex_value*	Incorrect CRC.
DZH0507 DZH0508	MP table checksum bad	Cache data error.
DZH0601	Data error in cache tag test	Unexpected data read.

DZH2001	Watchdog did not bite	The expected watchdog interrupt did not occur.
DZH3000	PCI Express Correctable Error from HT2000 (*%d*): EXB(*%d, %d, %d*): RootErr(*hex_value*(s)); Br[*%d*](*%d, %d, %d*): DevStatus(*hex_value*(s)); Br[*%d*](*%d, %d, %d*): DevStatus(*hex_value*(s)).	The chipset detected an error on a PCI Express bus, but the hardware has already corrected it.
DZH3001	Unexpected watchdog	The watchdog hardware is faulty.
DZH3002	Unexpected NMI: <Message string will identify either the Front Panel or the RLM.>	If the front panel is identified, then the error could be due to a faulty front panel or a faulty front panel-to-motherboard connection. If the RLM is identified, then the error could be due to a faulty RLM or a faulty front panel-to-RLM connection.

Corrective action

The following table lists the error message groupings and corrective action that can be taken for the error message group.

Error message group	Corrective action
DZH0104 DZH0136-DZH0138 DZH0150 DZH0154-DZH0167 DZH0175-DZH0194 DZH0196 DZH0197-DZH0198 DZH0354-DZH0355 DZH0366-DZH0379	Motherboard error, call technical support.
DZH0362-DZH0365 DZH0452	Call technical support.
DZH0170-DZH0172	1. Check that the correct PCI device is in the correct slot. 2. Replace the PCI device. 3. Replace the motherboard if the PCI device is not working. 4. Call technical support if the error is not corrected.
DZH0442-DZH0445	1. Check the battery connections. 2. Replace the battery if connections are good. 3. Call technical support for instructions if the error is not corrected.
DZH0507-DZH0508 DZH0601, DZH2001	1. Replace the motherboard. 2. Call technical support if the error is not corrected.

DZH0428 DZH0431-DZH0432	1. Check the device at the indicated slot and replace it with the correct device. 2. If the device is correct, replace the motherboard. 3. Call technical support if the error is not corrected.
DZH3000	1. Ignore this message if it only appears once, because the hardware has already corrected it. 2. Call technical support if the message is persistent.
DZH3001	1. Ignore this message if it only appears once, because the hardware has already corrected it. 2. If the message is persists, replace the motherboard.
DZH3002	1. Ignore this message if it only appears once, because the hardware has already corrected it. 2. If the message is persists, replace the identified HW component. 3. If the message is still persists, replace the motherboard.

DZS0430

Message type

This error message grouping covers software errors associated with the motherboard and backplane.

Error message description

The following message can be generated for this message group.

Error code	Sample message	Description
DZS0430	Unexpected platform type = *dec_value*	Platform type is not correct.

Corrective action

Call technical support.

Environmental Error Messages

About this section

This section lists and defines the environmental error messages generated by running the environmental status test in the miscellaneous motherboard test menu. It also lists the Corrective action for each error message grouping that you can take to address errors you encounter.

Topics in this section

The error messages are listed according to the platform in which the motherboard and any related daughterboard resides are described in the following sections according to the type of sensor which is reporting the error condition:

N3700 environmental error codes

Message type

The N3700 environmental error messages are tabulated according to the sensors that generate them:

- Temperature sensors
- Voltage power sensors
- Chassis and CPU fan sensors
- Power supply sensors

N3700 environmental error codes

Temperature sensors

Temperature sensor error message description

Error messages can be generated by the following temperature sensors.

Note: The "x" in the code represents the actual error condition.

Platform and sensor code	Sensor description
ENV01060x	Motherboard temperature (motherboard temp).
ENV01061x	Front panel temperature (Front panel temp).

The following table lists the error messages that can be generated by the temperature sensors on the motherboard. The corrective action for this error message grouping is below the error message description.

Note: "[d]" in the sample error message represents one of the four temperature sensors.

If "x" is...	Sample error message	Description
1	[d] does not read	Cannot read [d].
2	[d] is in critical high state	[d] exceeds the critical high threshold.
3	[d] is in warning high state	[d] exceeds the warning high threshold.
4	[d] is in warning low state	[d] falls below the warning low threshold.
5	[d] is in critical low state	[d] falls below the critical low threshold.
6	[d] expected high interrupt did not occur	Missing interrupt when [d] exceeds the warning high threshold.
7	[d] expected low interrupt did not occur	Missing interrupt when [d] falls below the warning low threshold.

Corrective action

1. Check to see whether the PSU fans are working properly (from the Diagnostics menu, as well as by physically looking at them).
2. If the fans are bad, replace the PSUs.
3. If the fans are good, replace the motherboard.

N3700 environmental error codes

Voltage power sensors

Voltage power sensor error message description

Error messages can be generated by the voltage power sensors on the motherboard, the memory board, and the power supplies.

Note: The "x" in the code represents the actual error condition.

Platform and sensor code	Sensor description
ENV01062x	3.3 Volt
ENV01063x	5.0 Volt
ENV01064x	12 Volt
ENV01065x	2.5 Volt
ENV01066x	1.2 Volt
ENV01067x	Battery voltage (VBatt)

The following table lists the error messages that can be generated by the voltage power sensors. The corrective action for these error messages is below the error message description.

Note: "[d]" in the sample error message represents one of the seven voltage power sensors.

If "x" is...	Sample error message	Description
1	[d] does not read	Cannot read the [d] power sensor.
2	[d] is in critical high state	[d] power sensor exceeds the critical high threshold.
3	[d] is in warning high state	[d] power sensor exceeds the warning high threshold.
4	[d] is in warning low state	[d] power sensor falls below the warning low threshold.
5	[d] is in critical low state	[d] power sensor falls below the critical low threshold.
6	[d] expected high interrupt did not occur	Missing interrupt when [d] power sensor exceeds the warning high threshold.
7	[d] expected low interrupt did not occur	Missing interrupt when [d] power sensor falls below the warning low threshold.

Corrective action

- Replace the power supply.

- If the problem remains, replace the motherboard.

N3700 environmental error codes

Fan sensors

Fan sensor error message description

Error messages can be generated by the fan sensors for existence and status. The corrective action for all fan sensor error messages is below all the error message descriptions.

Fan sensors

Status error messages can be generated by the following power supply fans within each power supply module.

Note: The "x" in the code represents the actual error condition.

Platform and sensor code	Sensor description
ENV01068x	PSU 1 Fan 1 (Power supply unit 1 fan 1).
ENV01069x	PSU 1 Fan 2 (Power supply unit 1 fan 2).
ENV01070x	PSU 2 Fan 1 (Power supply unit 2 fan 1).
ENV01071x	PSU 2 Fan 2 (Power supply unit 2 fan 2).

The following table lists the error messages that can be generated by the baseboard and power supply fan sensors.

Note: "[d]" in the sample error message represents one of the six baseboard fan sensors or one of the four power supply fan sensors.

If "x" is...	Sample error message	Description
1	[d] does not read	Cannot read [d] sensor.
2	[d] is in critical high state	[d] speed read exceeds the critical high threshold.
3	[d] is in warning high state	[d] speed read exceeds the warning high threshold.
4	[d] is in warning low state	[d] speed read exceeds the warning low threshold.
5	[d] is in critical low state	[d] speed read exceeds the critical low threshold.
6	[d] expected high interrupt did not occur	Missing interrupt when the [d] speed exceeds the warning high threshold.
7	[d] expected low interrupt did not occur	Missing interrupt when the [d] speed exceeds the warning low threshold.
8	[d] can’t be speeded up	[d] cannot be speeded up by the system.

9	[d] can’t be slowed down	[d] cannot be slowed down by the system.

Corrective action

Replace the power supply unit.

N3700 environmental error codes

Power supply sensors

Power supply sensor error message description

Error messages can be generated by the power supply sensors for existence and status. The corrective action for all power supply sensor error messages is below all the error message descriptions.

Power supply sensors for existence

Error messages can be generated by the power supply sensors for existence.

Note: The "x" in the code represents the actual error condition.

Platform and sensor code	Sensor description for existence
ENV01072x	PSU1
ENV01073x	PSU2

The following table lists the error messages that can be generated for the power supply existence sensors.

Note: "[d]" in the sample error message represents one of the two sensors indicating the existence of the power supplies.

If "x" is...	Sample error message	Description
2	[d] is not installed	[d] is missing.
3	[d] is installed, but powered off	[d] is off.
4	[d] is installed and powered on, but not functioning	[d] is not functioning.

Corrective action

1. Install the power supply.
2. Turn the power supply on.
3. Replace the power supply.

N5200 environmental error codes

Message type

The N5200 environmental error messages are tabulated according to the sensors that generate them:

- Temperature sensors
- Voltage power sensors
- Chassis and CPU fan sensors
- Power supply sensors

N5200 environmental error codes

Temperature sensors

Temperature sensor error message description

Error messages can be generated by the following temperature sensors.

Note: The "x" in the code represents the actual error condition.

Platform and sensor code	Sensor description
ENV01240x	CPU 1 temperature (computer processing unit 1 temp).
ENV01241x	CPU 2 temperature (computer processing unit 2 temp).
ENV01247x	PSU 1 temperature (power supply 1 temp).
ENV01248x	PSU 2 temperature (power supply 2 temp).
ENV01251x	Backplane MB temperature (backplane motherboard temp).
ENV01252x	Backplane HDD temperature (backplane hard disk drive temp).
ENV01253x	Front panel temperature (Front panel temp).

The following table lists the error messages that can be generated by the temperature sensors on the motherboard. The corrective action for this error message grouping is below the error message description.

Note: "[d]" in the sample error message represents one of the four temperature sensors.

If "x" is...	Sample error message	Description
1	[d] does not read	Cannot read [d].
2	[d] is in critical high state	[d] exceeds the critical high threshold.
3	[d] is in warning high state	[d] exceeds the warning high threshold.
4	[d] is in warning low state	[d] falls below the warning low threshold.
5	[d] is in critical low state	[d] falls below the critical low threshold.
6	[d] expected high interrupt did not occur	Missing interrupt when [d] exceeds the warning high threshold.
7	[d] expected low interrupt did not occur	Missing interrupt when [d] falls below the warning low threshold.

Corrective action

1. Check to see whether the PSU fans are working properly (from the Diagnostics menu, as well as by

physically looking at them).
2. If the fans are bad, replace the PSUs.
3. If the fans are good, replace the motherboard.

N5200 environmental error codes

Voltage power sensors

Voltage power sensor error message description

Error messages can be generated by the voltage power sensors on the motherboard, the memory board, and the power supplies.

Note: The "x" in the code represents the actual error condition.

Platform and sensor code	Sensor description
ENV01242x	CPU Core Volt (computer processing unit core voltage)
ENV01243x	12 Volt
ENV01244x	3.3 Volt
ENV01245x	1.8 Volt
ENV01246x	1.2 Volt

The following table lists the error messages that can be generated by the voltage power sensors. The corrective action for these error messages is below the error message description.

Note: "[d]" in the sample error message represents one of the seven voltage power sensors.

If "x" is...	Sample error message	Description
1	[d] does not read	Cannot read the [d] power sensor.
2	[d] is in critical high state	[d] power sensor exceeds the critical high threshold.
3	[d] is in warning high state	[d] power sensor exceeds the warning high threshold.
4	[d] is in warning low state	[d] power sensor falls below the warning low threshold.
5	[d] is in critical low state	[d] power sensor falls below the critical low threshold.
6	[d] expected high interrupt did not occur	Missing interrupt when [d] power sensor exceeds the warning high threshold.
7	[d] expected low interrupt did not occur	Missing interrupt when [d] power sensor falls below the warning low threshold.

Corrective action

- Replace the power supply.
- If the problem remains, replace the motherboard.

N5200 environmental error codes

Fan sensors

Fan sensor error message description

Error messages can be generated by the fan sensors for existence and status. The corrective action for all fan sensor error messages is below all the error message descriptions.

Fan sensors

Status error messages can be generated by the following power supply fans within each power supply module.

Note: The "x" in the code represents the actual error condition.

Platform and sensor code	Sensor description
ENV01254x	Sys 1 Fan 1 (Chassis fan 1 unit 1).
ENV01255x	Sys 1 Fan 2 (Chassis fan 1 unit 2).
ENV01256x	Sys 2 Fan 1 (Chassis fan 2 unit 1).
ENV01257x	Sys 2 Fan 2 (Chassis fan 2 unit 2).
ENV01258x	PSU 1 Fan 1 (Power supply unit 1 fan 1).
ENV01259x	PSU 1 Fan 2 (Power supply unit 1 fan 2).
ENV01260x	PSU 2 Fan 1 (Power supply unit 2 fan 1).
ENV01261x	PSU 2 Fan 2 (Power supply unit 2 fan 2).

The following table lists the error messages that can be generated by the baseboard and power supply fan sensors.

Note: "[d]" in the sample error message represents one of the six baseboard fan sensors or one of the four power supply fan sensors.

If "x" is...	Sample error message	Description
1	[d] does not read	Cannot read [d] sensor.
2	[d] is in critical high state	[d] speed read exceeds the critical high threshold.
3	[d] is in warning high state	[d] speed read exceeds the warning high threshold.
4	[d] is in warning low state	[d] speed read exceeds the warning low threshold.
5	[d] is in critical low state	[d] speed read exceeds the critical low threshold.

6	[d] expected high interrupt did not occur	Missing interrupt when the [d] speed exceeds the warning high threshold.
7	[d] expected low interrupt did not occur	Missing interrupt when the [d] speed exceeds the warning low threshold.
8	[d] can’t be speeded up	[d] cannot be speeded up by the system.
9	[d] can’t be slowed down	[d] cannot be slowed down by the system.

Corrective action

Replace the power supply unit.

N5200 environmental error codes

Power supply sensors

Power supply sensor error message description

Error messages can be generated by the power supply sensors for existence and status. The corrective action for all power supply sensor error messages is below all the error message descriptions.

Power supply sensors for existence

Error messages can be generated by the power supply sensors for existence.

Note: The "x" in the code represents the actual error condition.

Platform and sensor code	Sensor description for existence
ENV01249x	PSU1
ENV01250x	PSU2

The following table lists the error messages that can be generated for the power supply existence sensors.

Note: "[d]" in the sample error message represents one of the two sensors indicating the existence of the power supplies.

If "x" is...	Sample error message	Description
2	[d] is not installed	[d] is missing.
3	[d] is installed, but powered off	[d] is off.
4	[d] is installed and powered on, but not functioning	[d] is not functioning.

Corrective action

1. Install the power supply.
2. Turn the power supply on.
3. Replace the power supply.

N5500 environmental error codes

Message type

The N5500 environmental error messages are tabulated according to the sensors that generate them:

- Temperature sensors
- Voltage power sensors
- Chassis and CPU fan sensors
- Power supply sensors

N5500 environmental error codes

Temperature sensors

Temperature sensor error message description

Error messages can be generated by the following temperature sensors.

Note: The "x" in the code represents the actual error condition.

Platform and sensor code	Sensor description
ENV01270x	CPU 1 temperature (computer processing unit 1 temp).
ENV01271x	CPU 2 temperature (computer processing unit 2 temp).
ENV01277x	PSU 1 temperature (power supply 1 temp).
ENV01278x	PSU 2 temperature (power supply 2 temp).
ENV01281x	Backplane MB temperature (backplane motherboard temp).
ENV01282x	Backplane HDD temperature (backplane hard disk drive temp).
ENV01283x	Front panel temperature (Front panel temp).

The following table lists the error messages that can be generated by the temperature sensors on the motherboard. The corrective action for this error message grouping is below the error message description.

Note: "[d]" in the sample error message represents one of the four temperature sensors.

If "x" is...	Sample error message	Description
1	[d] does not read	Cannot read [d].
2	[d] is in critical high state	[d] exceeds the critical high threshold.
3	[d] is in warning high state	[d] exceeds the warning high threshold.
4	[d] is in warning low state	[d] falls below the warning low threshold.
5	[d] is in critical low state	[d] falls below the critical low threshold.
6	[d] expected high interrupt did not occur	Missing interrupt when [d] exceeds the warning high threshold.
7	[d] expected low interrupt did not occur	Missing interrupt when [d] falls below the warning low threshold.

Corrective action

1. Check to see whether the PSU fans are working properly (from the Diagnostics menu, as well as by

physically looking at them).
2. If the fans are bad, replace the PSUs.
3. If the fans are good, replace the motherboard.

N5500 environmental error codes

Voltage power sensors

Voltage power sensor error message description

Error messages can be generated by the voltage power sensors on the motherboard, the memory board, and the power supplies.

Note: The "x" in the code represents the actual error condition.

Platform and sensor code	Sensor description
ENV01272x	CPU Core Volt (computer processing unit core voltage)
ENV01273x	12 Volt
ENV01274x	3.3 Volt
ENV01275x	1.8 Volt
ENV01276x	1.2 Volt

The following table lists the error messages that can be generated by the voltage power sensors. The corrective action for these error messages is below the error message description.

Note: "[d]" in the sample error message represents one of the seven voltage power sensors.

If "x" is...	Sample error message	Description
1	[d] does not read	Cannot read the [d] power sensor.
2	[d] is in critical high state	[d] power sensor exceeds the critical high threshold.
3	[d] is in warning high state	[d] power sensor exceeds the warning high threshold.
4	[d] is in warning low state	[d] power sensor falls below the warning low threshold.
5	[d] is in critical low state	[d] power sensor falls below the critical low threshold.
6	[d] expected high interrupt did not occur	Missing interrupt when [d] power sensor exceeds the warning high threshold.
7	[d] expected low interrupt did not occur	Missing interrupt when [d] power sensor falls below the warning low threshold.

Corrective action

- Replace the power supply.
- If the problem remains, replace the motherboard.

N5500 environmental error codes

Fan sensors

Fan sensor error message description

Error messages can be generated by the fan sensors for existence and status. The corrective action for all fan sensor error messages is below all the error message descriptions.

Fan sensors

Status error messages can be generated by the following power supply fans within each power supply module.

Note: The "x" in the code represents the actual error condition.

Platform and sensor code	Sensor description
ENV01284x	Sys 1 Fan 1 (Chassis fan 1 unit 1).
ENV01285x	Sys 1 Fan 2 (Chassis fan 1 unit 2).
ENV01286x	Sys 2 Fan 1 (Chassis fan 2 unit 1).
ENV01287x	Sys 2 Fan 2 (Chassis fan 2 unit 2).
ENV01288x	PSU 1 Fan 1 (Power supply unit 1 fan 1).
ENV01289x	PSU 1 Fan 2 (Power supply unit 1 fan 2).
ENV01290x	PSU 2 Fan 1 (Power supply unit 2 fan 1).
ENV01291x	PSU 2 Fan 2 (Power supply unit 2 fan 2).

The following table lists the error messages that can be generated by the baseboard and power supply fan sensors.

Note: "[d]" in the sample error message represents one of the six baseboard fan sensors or one of the four power supply fan sensors.

If "x" is...	Sample error message	Description
1	[d] does not read	Cannot read [d] sensor.
2	[d] is in critical high state	[d] speed read exceeds the critical high threshold.
3	[d] is in warning high state	[d] speed read exceeds the warning high threshold.
4	[d] is in warning low state	[d] speed read exceeds the warning low threshold.
5	[d] is in critical low state	[d] speed read exceeds the critical low threshold.

6	[d] expected high interrupt did not occur	Missing interrupt when the [d] speed exceeds the warning high threshold.
7	[d] expected low interrupt did not occur	Missing interrupt when the [d] speed exceeds the warning low threshold.
8	[d] can’t be speeded up	[d] cannot be speeded up by the system.
9	[d] can’t be slowed down	[d] cannot be slowed down by the system.

Corrective action

Replace the power supply unit.

N5500 environmental error codes

Power supply sensors

Power supply sensor error message description

Error messages can be generated by the power supply sensors for existence and status. The corrective action for all power supply sensor error messages is below all the error message descriptions.

Power supply sensors for existence

Error messages can be generated by the power supply sensors for existence.

Note: The "x" in the code represents the actual error condition.

Platform and sensor code	Sensor description for existence
ENV01279x	PSU1
ENV01280x	PSU2

The following table lists the error messages that can be generated for the power supply existence sensors.

Note: "[d]" in the sample error message represents one of the two sensors indicating the existence of the power supplies.

If "x" is...	Sample error message	Description
2	[d] is not installed	[d] is missing.
3	[d] is installed, but powered off	[d] is off.
4	[d] is installed and powered on, but not functioning	[d] is not functioning.

Corrective action

1. Install the power supply.
2. Turn the power supply on.
3. Replace the power supply.

N5300 and N5600 environmental error codes

Message type

The N5300 and N5600 environmental error messages are tabulated according to the sensors that generate them:

- Temperature sensors
- Voltage power sensors
- Chassis and CPU fan sensors
- Power supply sensors

N5300 and N5600 environmental error codes

Temperature sensors

Temperature sensor error message description

Error messages can be generated by the following temperature sensors.

Note: The "x" in the code represents the actual error condition.

Platform and sensor code	Sensor description
ENV01612x	CPU 1 temperature (computer processing unit 1 temp).
ENV01613x	CPU 2 temperature (computer processing unit 2 temp).
ENV01614x	PSU 1 temperature (power supply 1 temp).
ENV01615x	PSU 2 temperature (power supply 2 temp).
ENV01616x	LCD board temperature (platform's LCD board temp).
ENV01281x	MB front zone temperature (motherboard temp in the front).
ENV01282x	MB rear zone temperature (motherboard temp in the rear).

The following table lists the error messages that can be generated by the temperature sensors on the motherboard. The corrective action for this error message grouping is below the error message description.

Note: "[d]" in the sample error message represents one of the four temperature sensors.

If "x" is...	Sample error message	Description
1	[d] does not read	Cannot read [d].
2	[d] is in critical high state	[d] exceeds the critical high threshold.
3	[d] is in warning high state	[d] exceeds the warning high threshold.
4	[d] is in warning low state	[d] falls below the warning low threshold.
5	[d] is in critical low state	[d] falls below the critical low threshold.
6	[d] expected high interrupt did not occur	Missing interrupt when [d] exceeds the warning high threshold.
7	[d] expected low interrupt did not occur	Missing interrupt when [d] falls below the warning low threshold.

Corrective action

1. Check to see whether the PSU fans are working properly (from the Diagnostics menu, as well as by

physically looking at them).
2. If the fans are bad, replace the PSUs.
3. If the fans are good, replace the motherboard.

N5300 and N5600 environmental error codes

Voltage power sensors

Voltage power sensor error message description

Error messages can be generated by the voltage power sensors on the motherboard, the memory board, and the power supplies.

Note: The "x" in the code represents the actual error condition.

Platform and sensor code	Sensor description
ENV01608x	CPU3.3 Volt active
ENV01609x	CPU3.3 Volt standby
ENV01610x	CPU5 Volt
ENV01611x	CPU12 Volt
ENV01619x	PSU1 AC IN
ENV01620x	PSU1 12 Volt
ENV01621x	PSU1 5 Volt
ENV01622x	PSU2 AC IN
ENV01623x	PSU2 12 Volt
ENV01624x	PSU2 5 Volt

The following table lists the error messages that can be generated by the voltage power sensors. The corrective action for these error messages is below the error message description.

Note: "[d]" in the sample error message represents one of the seven voltage power sensors.

If "x" is...	Sample error message	Description
1	[d] does not read	Cannot read the [d] power sensor.
2	[d] is in critical high state	[d] power sensor exceeds the critical high threshold.
3	[d] is in warning high state	[d] power sensor exceeds the warning high threshold.
4	[d] is in warning low state	[d] power sensor falls below the warning low threshold.
5	[d] is in critical low state	[d] power sensor falls below the critical low threshold.
6	[d] expected high interrupt did not occur	Missing interrupt when [d] power sensor exceeds the warning high threshold.

7	[d] expected low interrupt did not occur	Missing interrupt when [d] power sensor falls below the warning low threshold.

Corrective action

- Replace the power supply.
- If the problem remains, replace the motherboard.

N5300 and N5600 environmental error codes

Fan sensors

Fan sensor error message description

Error messages can be generated by the fan sensors for existence and status. The corrective action for all fan sensor error messages is below all the error message descriptions.

Fan sensors

Status error messages can be generated by the following power supply fans within each power supply module.

Note: The "x" in the code represents the actual error condition.

Platform and sensor code	Sensor description
ENV01600x	Sys 1 Fan 1 (Chassis fan 1 unit 1).
ENV01601x	Sys 1 Fan 2 (Chassis fan 1 unit 2).
ENV01602x	Sys 2 Fan 1 (Chassis fan 2 unit 1).
ENV01603x	Sys 2 Fan 2 (Chassis fan 2 unit 2).
ENV01604x	PSU 1 Fan 1 (Power supply unit 1 fan 1).
ENV01605x	PSU 1 Fan 2 (Power supply unit 1 fan 2).
ENV01606x	PSU 2 Fan 1 (Power supply unit 2 fan 1).
ENV01607x	PSU 2 Fan 2 (Power supply unit 2 fan 2).
ENV01627x	System Fan FRU 1.
ENV01628x	System Fan FRU 2.
ENV01640x	SYS_FAN_1 present.
ENV01641x	SYS_FAN_2 present.

The following table lists the error messages that can be generated by the baseboard and power supply fan sensors.

Note: "[d]" in the sample error message represents one of the six baseboard fan sensors or one of the four power supply fan sensors.

If "x" is...	Sample error message	Description
1	[d] does not read	Cannot read [d] sensor.
2	[d] is in critical high state	[d] speed read exceeds the critical high threshold.

3	[d] is in warning high state	[d] speed read exceeds the warning high threshold.
4	[d] is in warning low state	[d] speed read exceeds the warning low threshold.
5	[d] is in critical low state	[d] speed read exceeds the critical low threshold.
6	[d] expected high interrupt did not occur	Missing interrupt when the [d] speed exceeds the warning high threshold.
7	[d] expected low interrupt did not occur	Missing interrupt when the [d] speed exceeds the warning low threshold.
8	[d] can’t be speeded up	[d] cannot be speeded up by the system.
9	[d] can’t be slowed down	[d] cannot be slowed down by the system.

Corrective action

Replace the power supply unit.

N5300 and N5600 environmental error codes

Power supply sensors

Power supply sensor error message description

Error messages can be generated by the power supply sensors for existence and status. The corrective action for all power supply sensor error messages is below all the error message descriptions.

Power supply sensors for existence

Error messages can be generated by the power supply sensors for existence.

Note: The "x" in the code represents the actual error condition.

Platform and sensor code	Sensor description for existence
ENV01625x	PSU1
ENV01626x	PSU2
ENV01638x	PSU2 present.
ENV01639x	PSU1 present.

The following table lists the error messages that can be generated for the power supply existence sensors.

Note: "[d]" in the sample error message represents one of the two sensors indicating the existence of the power supplies.

If "x" is...	Sample error message	Description
2	[d] is not installed	[d] is missing.
3	[d] is installed, but powered off	[d] is off.
4	[d] is installed and powered on, but not functioning	[d] is not functioning.

Corrective action

1. Install the power supply.
2. Turn the power supply on.
3. Replace the power supply.

N7000 series environmental error codes

Message type

The N7000 series environmental error messages are tabulated according to the sensors that generate them:

- Temperature sensors
- Voltage power sensors
- Chassis and CPU fan sensors
- Power supply sensors

N7000 series environmental error codes

Temperature sensors

Temperature sensor error message description

Error messages can be generated by the following temperature sensors.

Note: The "x" in the code represents the actual error condition.

Platform and sensor code	Sensor description
ENV01393x	I/O board temperature.
ENV01394x	Front panel temperature.
ENV01411x	CPU 0 temperature (computer processing unit 1 temp).
ENV01412x	CPU 1 temperature (computer processing unit 1 temp).
ENV01413x	CPU 2 temperature (computer processing unit 2 temp).
ENV01414x	CPU 3 temperature (computer processing unit 1 temp).
ENV01415x	MB Zone 1 temperature.
ENV01416x	MB Zone 2 temperature.
ENV01425x	PSU 1 temperature.
ENV01426x	PSU 2 temperature.

The following table lists the error messages that can be generated by the temperature sensors on the motherboard. The corrective action for this error message grouping is below the error message description.

Note: "[d]" in the sample error message represents one of the four temperature sensors.

If "x" is...	Sample error message	Description
1	[d] does not read	Cannot read [d].
2	[d] is in critical high state	[d] exceeds the critical high threshold.
3	[d] is in warning high state	[d] exceeds the warning high threshold.
4	[d] is in warning low state	[d] falls below the warning low threshold.
5	[d] is in critical low state	[d] falls below the critical low threshold.
6	[d] expected high interrupt did not occur	Missing interrupt when [d] exceeds the warning high threshold.
7	[d] expected low interrupt did not occur	Missing interrupt when [d] falls below the warning low threshold.

Corrective action

1. Check to see whether the PSU fans are working properly (from the Diagnostics menu, as well as by physically looking at them).
2. If the fans are bad, replace the PSUs.
3. If the fans are good, replace the motherboard.

N7000 series environmental error codes

Voltage power sensors

Voltage power sensor error message description

Error messages can be generated by the voltage power sensors on the motherboard, the memory board, and the power supplies.

Note: The "x" in the code represents the actual error condition.

Platform and sensor code	Sensor description
ENV01380x	CPU3.3 Volt active
ENV01381x	CPU5.0 Volt active
ENV01382x	CPU12 Volt
ENV01383x	CPU3.3 Volt standby
ENV01384x	CPU5.0 Volt standby
ENV01385x	Real time clock battery (RTC_batt).
ENV01386x	IOB HTLE core 1.2 Volt
ENV01387x	IOB VLDT 1.2 Volt
ENV01388x	IOB HTLE PCI-EX 1.2 Volt
ENV01389x	IOB3.3 Volt active
ENV01390x	IOB5.0 Volt
ENV01391x	IOB12 Volt
ENV01392x	IOB3.3 Volt standby
ENV01395x	CPU0 core voltage
ENV01396x	CPU1 core voltage
ENV01397x	CPU0 & 1 VDD25 2.5 Volt
ENV01398x	CPU0 & 1 VTT 1.2 Volt
ENV01399x	CPU2 core voltage
ENV01400x	CPU3 core voltage
ENV01401x	CPU2 & 3 VDD25 2.5 Volt
ENV01402x	CPU2 & 3 VTT 1.2 Volt
ENV01403x	HTLE SB1 core voltage
ENV01404x	HTLE VLDT voltage
ENV01405x	HTLE PCI-EX voltage

ENV01406x	FC core voltage
ENV01407x	FC bridge core voltage
ENV01408x	FC bridge ref voltage
ENV01409x	FC 3.3 voltage
ENV01410x	RLM standby voltage
ENV01423x	PSU 1 AC voltage
ENV01424x	PSU 2 AC voltage
ENV01427x	PSU 1 12 Volt
ENV01428x	PSU 2 12 Volt
ENV01429x	PSU 1 5 Volt
ENV01430x	PSU 2 5 Volt

The following table lists the error messages that can be generated by the voltage power sensors. The corrective action for these error messages is below the error message description.

Note: "[d]" in the sample error message represents one of the seven voltage power sensors.

If "x" is...	Sample error message	Description
1	[d] does not read	Cannot read the [d] power sensor.
2	[d] is in critical high state	[d] power sensor exceeds the critical high threshold.
3	[d] is in warning high state	[d] power sensor exceeds the warning high threshold.
4	[d] is in warning low state	[d] power sensor falls below the warning low threshold.
5	[d] is in critical low state	[d] power sensor falls below the critical low threshold.
6	[d] expected high interrupt did not occur	Missing interrupt when [d] power sensor exceeds the warning high threshold.
7	[d] expected low interrupt did not occur	Missing interrupt when [d] power sensor falls below the warning low threshold.

Corrective action

- Replace the power supply.
- If the problem remains, replace the motherboard.

N7000 series environmental error codes

Fan sensors

Fan sensor error message description

Error messages can be generated by the fan sensors for existence and status. The corrective action for all fan sensor error messages is below all the error message descriptions.

Fan sensors

Status error messages can be generated by the following power supply fans within each power supply module.

Note: The "x" in the code represents the actual error condition.

Platform and sensor code	Sensor description
ENV01419x	PSU 1 Fan 1 (Power supply unit 1 fan 1).
ENV01420x	PSU 1 Fan 2 (Power supply unit 1 fan 2).
ENV01421x	PSU 2 Fan 1 (Power supply unit 2 fan 1).
ENV01422x	PSU 2 Fan 2 (Power supply unit 2 fan 2).
ENV01431x	Sys Fan 0 (Chassis fan 0).
ENV01432x	Sys Fan 1 (Chassis fan 1).
ENV01433x	Sys Fan 2 (Chassis fan 2).
ENV01434x	Sys Fan 3 (Chassis fan 3).
ENV01435x	Sys Fan 4 (Chassis fan 4).
ENV01436x	Sys Fan 5 (Chassis fan 5).
ENV01437x	Sys Fan 6 (Chassis fan 6).
ENV01438x	Sys Fan 7 (Chassis fan 7).
ENV01439x	Sys Fan 8 (Chassis fan 8).
ENV01440x	Sys Fan 9 (Chassis fan 9).
ENV01443x	Fan FRU 1 present (Define this ?????).
ENV01444x	Fan FRU 2 present (?????).
ENV01445x	Fan FRU 3 present (?????).
ENV01446x	Fan FRU 4 present (?????).
ENV01447x	Fan FRU 5 present (?????).

The following table lists the error messages that can be generated by the baseboard and power supply fan

sensors.

Note: "[d]" in the sample error message represents one of the six baseboard fan sensors or one of the four power supply fan sensors.

If "x" is...	Sample error message	Description
1	[d] does not read	Cannot read [d] sensor.
2	[d] is in critical high state	[d] speed read exceeds the critical high threshold.
3	[d] is in warning high state	[d] speed read exceeds the warning high threshold.
4	[d] is in warning low state	[d] speed read exceeds the warning low threshold.
5	[d] is in critical low state	[d] speed read exceeds the critical low threshold.
6	[d] expected high interrupt did not occur	Missing interrupt when the [d] speed exceeds the warning high threshold.
7	[d] expected low interrupt did not occur	Missing interrupt when the [d] speed exceeds the warning low threshold.
8	[d] can’t be speeded up	[d] cannot be speeded up by the system.
9	[d] can’t be slowed down	[d] cannot be slowed down by the system.

Corrective action

Replace the power supply unit.

N7000 series environmental error codes

Power supply sensors

Power supply sensor error message description

Error messages can be generated by the power supply sensors for existence and status. The corrective action for all power supply sensor error messages is below all the error message descriptions.

Power supply sensors for existence

Error messages can be generated by the power supply sensors for existence.

Note: The "x" in the code represents the actual error condition.

Platform and sensor code	Sensor description for existence
ENV01417x	PSU1
ENV01418x	PSU2
ENV01441x	PSU1 hard status
ENV01442x	PSU2 hard status
ENV01448x	PSU1 soft on
ENV01449x	PSU1 AC status
ENV01450x	PSU1 DC status
ENV01452x	PSU2 soft on
ENV01453x	PSU2 AC status
ENV01454x	PSU2 DC status
ENV01455x	PSU2 present

The following table lists the error messages that can be generated for the power supply existence sensors.

Note: "[d]" in the sample error message represents one of the two sensors indicating the existence of the power supplies.

If "x" is...	Sample error message	Description
2	[d] is not installed	[d] is missing.
3	[d] is installed, but powered off	[d] is off.

4	[d] is installed and powered on, but not functioning	[d] is not functioning.

Corrective action

1. Install the power supply.
2. Turn the power supply on.
3. Replace the power supply.

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IBM System Storage N series
Diagnostics Guide

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