IBM System Storage N series
Error Messages and Troubleshooting Guide

GC26-7984-01
NA 210-01322_A0
December 2006

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Table of Contents

Preface

About this guide

This guide describes hardware platform error messages and basic methods of troubleshooting hardware.

Audience

This guide is for both end-users and IBM Service personnel.

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 a Telnet session. In examples that illustrate commands executed on a UNIX® workstation, the command syntax and output might differ, depending on your version of UNIX.

Formatting conventions

The following table lists different character formats used in this guide to set off 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. ◆ Book titles in cross-references.
`Monospaced` font	◆ Command and daemon names. ◆ Information displayed on the system console or other computer monitors. ◆ The 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; 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:

Attention

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

Caution

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

WARNING

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

Finding Troubleshooting Information 1

About this chapter

This chapter discusses the following topics:

What this guide covers

Error messages by type

This guide only covers hardware troubleshooting issues common across all platforms.

Error message type	Where this message is displayed	Where to go for information
Boot error messages	System console	Chapter 3, "Boot error messages," on page 41
CFE or BIOS error messages	System console	Chapter 3, "POST error messages," on page 33
LEDs	LEDs on various components	Chapter 2, "Interpreting LEDs," on page 5
EMS environmental and other operational messages	LCD display or system console	Chapter 4, "Interpreting EMS and Operational Error Messages," on page 47
RLM notifications regarding the system and EMS messages about the RLM	E-mail sent to indicated e-mail address and system console	Chapter 5, "Understanding Remote LAN Module Messages," on page 55

Other sources for hardware troubleshooting information

Other sources

If you do not find the troubleshooting information you need in this guide, use the following table to determine where you can find the information you need.

Platform type	Topic	Document
N series systems	N7000 series filers and gateways N5000 series filers and gateways	This guide
	N3700	*IBM System Storage N3700 Hardware and Service Guide* Chapters 5 and 7
Expansion units	EXN2000	*IBM System Storage EXN2000 Storage Expansion Unit Hardware and Service Guide* Chapter 4
	EXN1000	*IBM System Storage EXN1000 Storage Expansion Unit Hardware and Service Guide* Chapter 4
Third-party hardware	Switches, routers, storage subsystems, and tape backup devices	Applicable third-party hardware documentation

Interpreting LEDs 2

About this chapter

This chapter describes the basic startup sequence and interpreting LEDs on your system for basic monitoring of the system.

For detailed information

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

Platform-specific LED information

Types of platform specific LEDs

Two sets of LEDs provide you with basic information about how your system is running. These sets give high-level device status at a glance, along with network activity:

- LEDs visible on the front of your storage system with the bezel in place
- LEDs visible on the back of your storage system

N7000 series-specific LED information

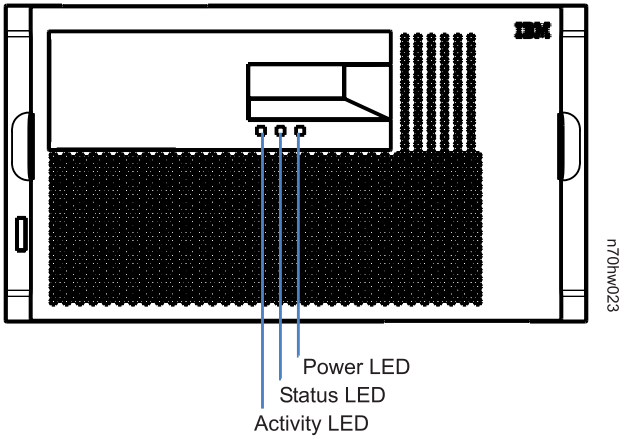
About this section

This section describes LED information specific to the following platforms:

- N7000 series filers and gateways

LEDs visible from the front

Location of the LEDs: The following illustration shows the LEDs on the front panel subassembly.



What the LEDs mean: The following table describes what the front panel subassembly LEDs mean.

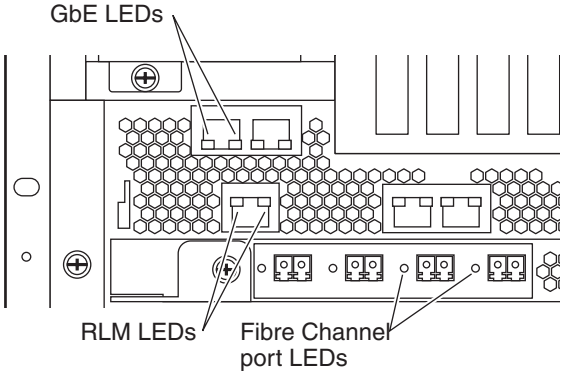
LED label	Status indicator	Description
Activity	Green	The system is operating and is active.
	Blinking	The system is actively processing data.
	Off	No activity is detected.

LED label	Status indicator	Description
Status	Green	The system is operating normally.
	Amber	The system halted or a fault occurred. The fault is displayed in the LCD. **Attention** This LED remains lit during boot, while the operating system loads.
Power	Green	The system is receiving power.
	Off	The system is not receiving power.

LEDs visible from the back

Location of LEDs: The following illustration shows the location of the following onboard port LEDs on the system backplane:

- Fibre Channel port LEDs
- GBE port LEDs
- RLM LEDs

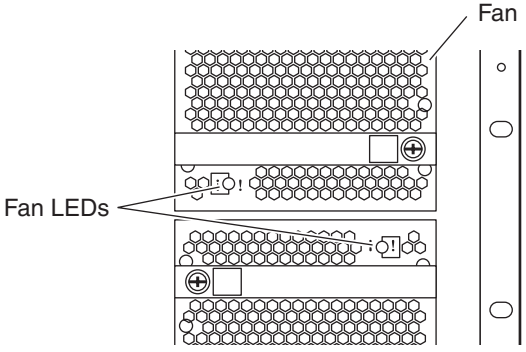


What the LEDs mean: The following table explains what the LEDs for your onboard ports mean.

Port type	LED type	Status indicator	Description
Fibre Channel	LNK	Off	No link with the Fibre Channel is established.
		Green	A link is established and communication is happening.
GbE and RLM	LNK	On	A valid network connection is established.
		Off	There is no network connection.
	ACT	On	There is data activity.
		Off	There is no network activity present.

Fan LEDs

Location of LEDs: The following illustration shows the location of the fan LEDs, which you can see when you remove the bezel.



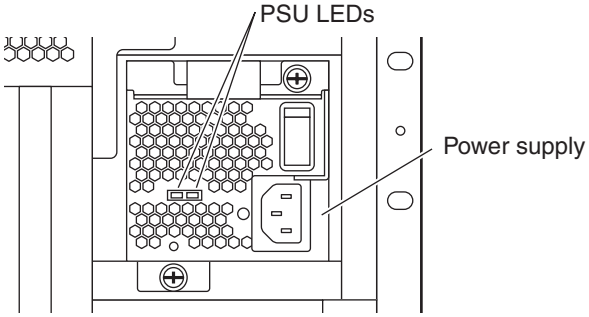
What the LEDs mean: The following table explains what the LEDs on the fans mean.

LED status	Description
Orange	The fan is operational.

LED status	Description
Orange blinking	The fan failed.
Off	There is no power to the system.

Power supply LEDs

Location of LEDs: The following illustrations shows the location of the power supply LEDs on your system backplane.



What the LEDs mean: The following table explains what the LEDs on the power supplies mean.

Amber	Green	Description
On	On	The AC power source is good and is powering the system.
On	Off	There is AC power present, but the power supply is not operational.
On	Blinking	There is AC power present but the power supply is not enabled.
Off	Off	There is insufficient power to the system.

N5000 series-specific LED information

About this section

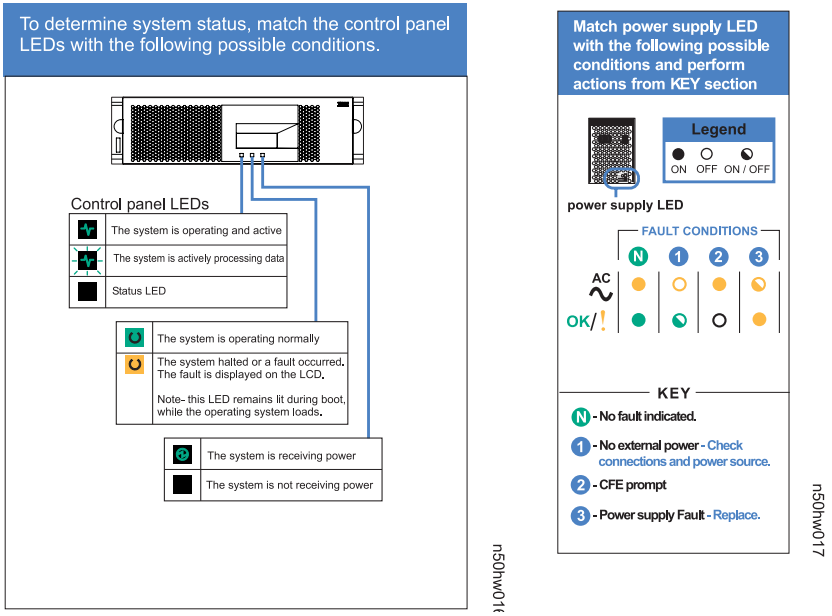
This section describes LED information specific to the following platforms:

- N5000 series filers and gateway systems

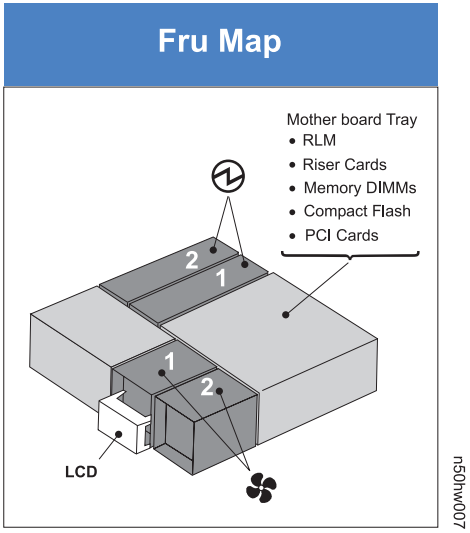
Using quick reference sheets

Your system is shipped with a quick reference sheet located at the bottom of the chassis.

Check LEDs: Check all system LEDs to determine whether any components are not functioning properly. The following illustration is a replica of the part of the quick reference sheet that shows LED locations and explanations.

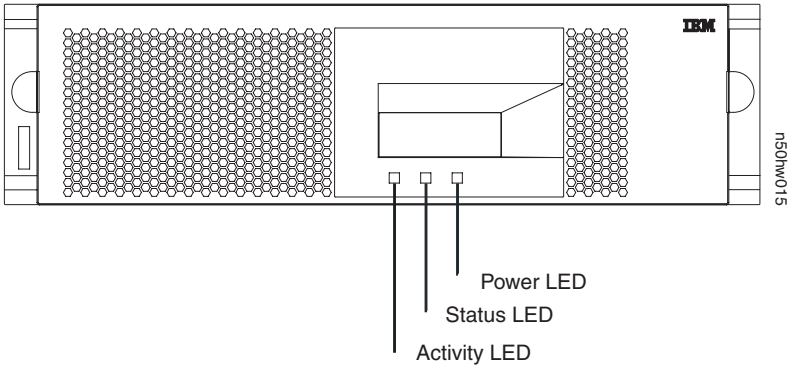


FRU Map: Use the FRU map to identify Field-Replaceable Units in your system.



LEDs visible from the front

Location of the LEDs: The following illustration shows the LEDs on the front panel subassembly.



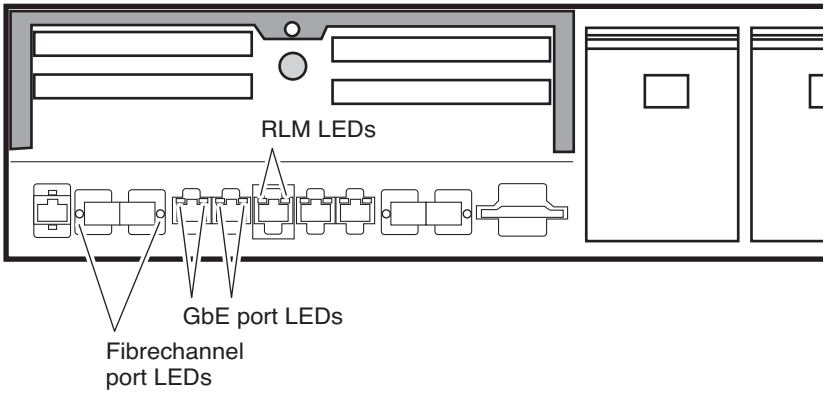
What the LEDs mean: The following table describes what the front panel subassembly LEDs mean.

LED label	Status indicator	Description
Activity	Green	The system is operating and is active.
	Blinking	The system is actively processing data.
	Off	No activity is detected.
Status	Green	The system is operating normally.
	Amber	The system halted or a fault occurred. The fault is displayed in the LCD. **Attention** This LED remains lit during boot, while the operating system loads.
Power	Green	The system is receiving power.
	Off	The system is not receiving power.

LEDs visible from the back

Location of LEDs: The following illustration shows the location of the following onboard port LEDs on the system back plane:

- Fibre Channel port LEDs
- GBE port LEDs
- RLM LEDs

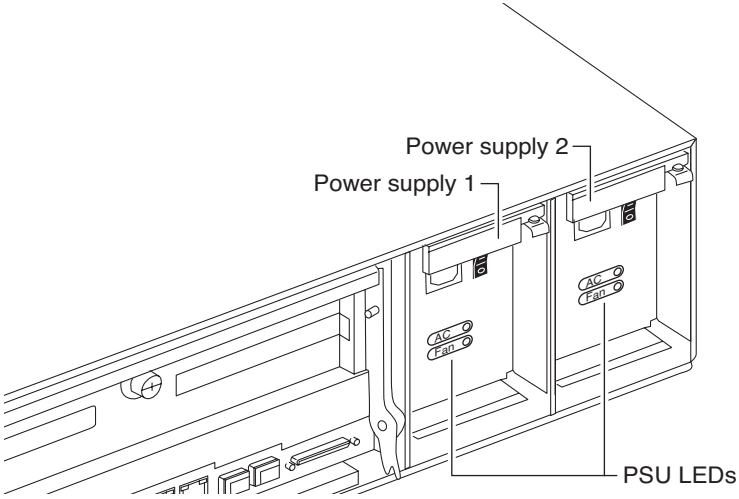


What the LEDs mean: The following table explains what the LEDs for your onboard ports mean.

Port type	LED type	Status indicator	Description
Fibre Channel	LNK	Off	No link with the Fibre Channel is established.
		Green	A link is established and communication is happening.
GbE and RLM	LNK	On	A valid network connection is established.
		Off	There is no network connection.
	ACT	On	There is data activity.
		Off	There is no network activity present.

Power supply LEDs

Location of LEDs: The following illustrations shows the location of the power supply LEDs on your system back plane.



What the LEDs on your AC power supply mean: The following table explains what the LEDs on the power supplies mean.

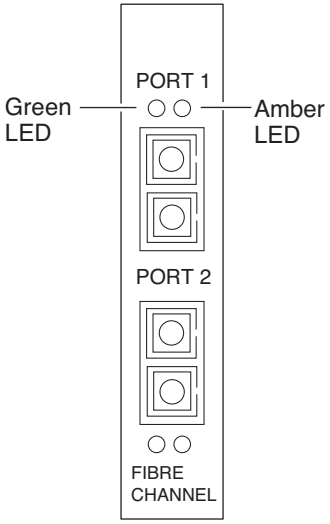
LED status	Description
Green	The AC power source is good and is powering the system.
Amber	The power supply failed.
Off	There is no power to this power supply.

Fibre Channel Host Bus Adapter LEDs

Location of the LEDs

Your system might have Fibre Channel Host Bus Adapters (HBA) installed in it. You can configure the HBAs, as well as the ports on the system, to function in one of two modes: Initiator or Target.

The following illustration shows the LED locations for a dual-port Fibre Channel HBA.



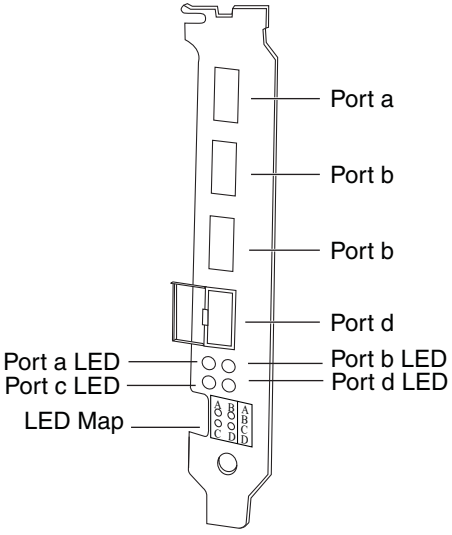
What the LEDs mean

The following table describes the LEDs on the Fibre Channel HBA.

Green	Amber	Description
On	On	Power
Off	Flashing	Loss of sync
Off	On	Signal acquired
On	Off	Ready
Flashing	Flashing	Adapter firmware error

Location of the quad-port, 4-Gb, Fibre Channel HBA

The following illustration shows the LED locations for a quad-port Fibre Channel HBA.



What the LEDs mean

The following table describes the LEDs on the Fibre Channel HBA.

LED Label	Status Indicator	Description
By port letter	White	Loss of sync or no link
	Blinking white	Fault
	Amber	1 Gbps link
	Blinking amber	1 Gbps data transfer
	Green	2 Gbps link
	Blinking green	2 Gbps data transfer
	Blue	4 Gbps link
	Blinking blue	4 Gbps data transfer

Cabling and Support Rules for the quad-port, 4-Gb, Fibre Channel HBA

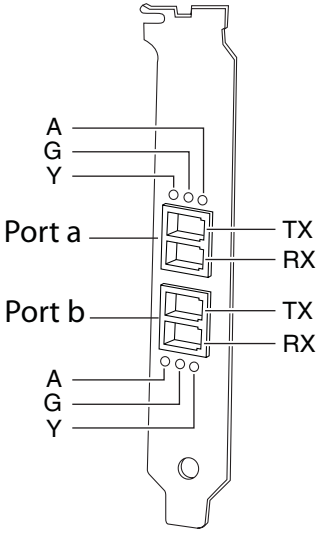
This HBA supports both Fibre Channel disk shelves and tape devices. It supports all IBM N series Fibre Channel disk devices, subject to current loop mixing restrictions, as well as third-party Fibre Channel tape devices and libraries. This HBA does not support fabric-attached MetroCluster configurations. You can mix Fibre Channel disk shelves and Fibre Channel tape devices on the same HBA. They must be cabled by port pairs of A&B and C&D.

The following table shows possible cabling combinations by port and device.

Ports A&B	Ports C&D
Disk shelves	Disk shelves
Disk shelves	Tape/library devices
Tape/library devices	Disk shelves
Tape/library devices	Tape/library devices

Location of the dual-port, 4-Gb target mode HBA LEDs

The following illustration shows the LED locations for a dual-port 4-Gb target mode Fibre Channel HBA.



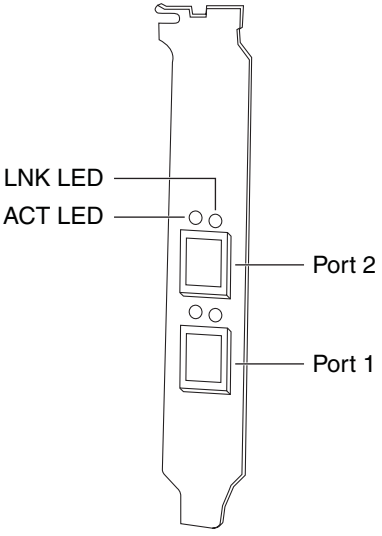
What the LEDs mean

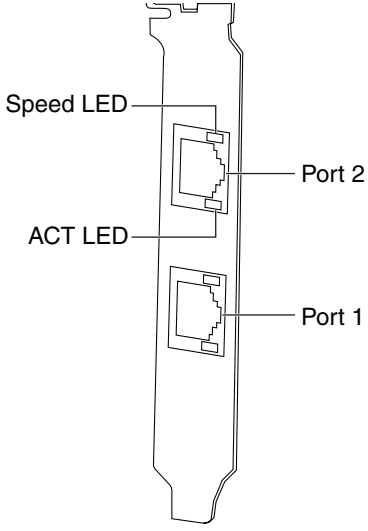
The following table describes the LEDs on the HBA.

Yellow	Green	Amber	Description
Off	Off	Off	Power off
On	On	On	Power on, before firmware initialization
Flashing	Flashing	Flashing	Power on, after firmware initialization
LEDs flashing alternately			Firmware error
Off	Off	On/ Flashing	Online, 1 Gbps link/ I/O activity
Off	On/ Flashing	Off	Online, 2 Gbps link/ I/O activity
On/Flashing	Off	Off	Online, 4 Gbps link/ I/O activity
Flashing	Off	Flashing	Beacon

Location of the iSCSI Target LEDs

The following illustrations show the LED locations for an iSCSI Target HBA.





What the LEDs Mean

The following table describes the LEDs on the iSCSI Target HBA.

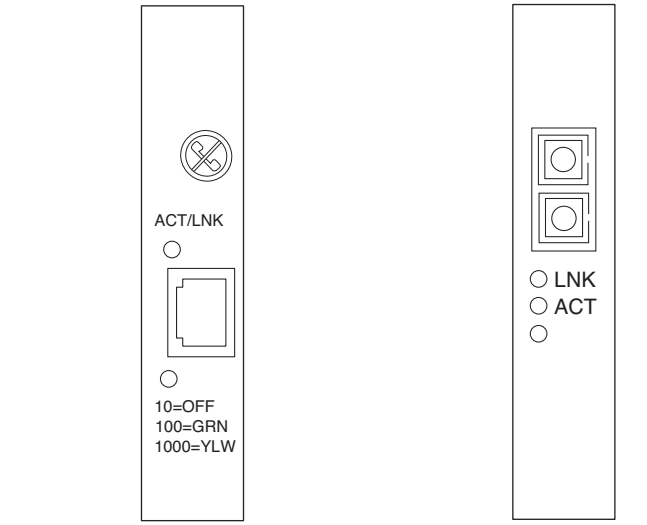
Connection Type	LED Label	Status Indicator	Description
Copper	Speed	Green	The card is running at 1 Gbps.
			The card is not running at 1 Gbps.
	ACT	Amber	A connection is established.
		Blinking amber	There is data activity.
Fiber optic	LNK	Yellow	The card is on and connected to the network.
		Off	The card is not connected to the network.
	ACT	Green	A connections is established.
		Blinking green	There is data activity.

GbE NIC LEDs

Location of the LEDs for single-port GbE NICs

Your system might have Ethernet network interface (NIC) cards in it. The LEDs on the cards are similar to the onboard Ethernet ports, in that they give the status and activity of the Ethernet connection. The NICs might also identify transfer speeds.

The following illustration shows the location of LEDs for both the copper and fiber single-port GbE NICs.

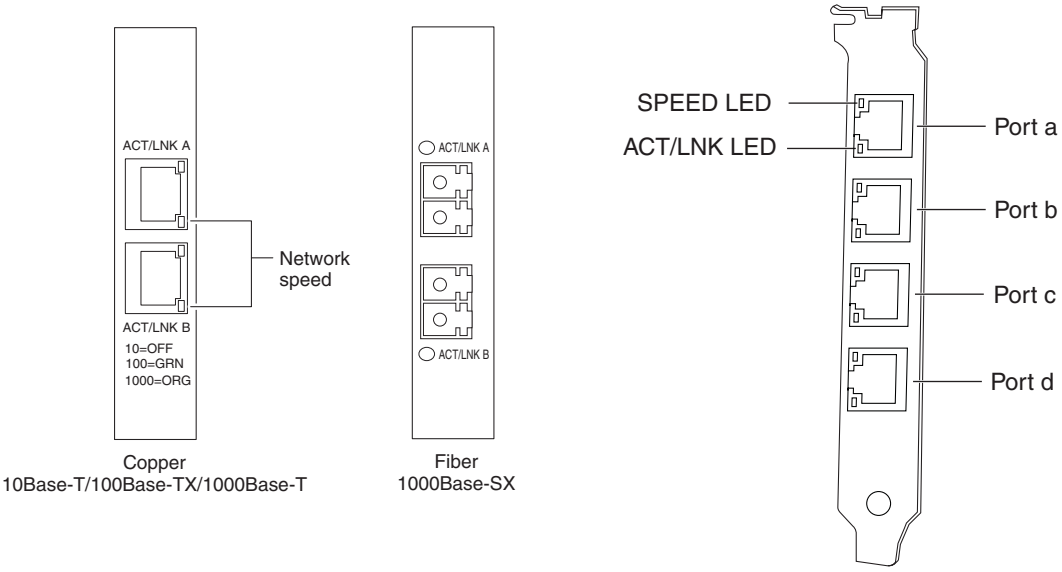


Copper
10Base-T/100Base-TX/1000Base-T

Fiber
1000Base-SX

Location of LEDs on multiport GbE NICs

The following illustration shows the location of LEDs for both the copper and fiber dual-port or quad-port GbE NICs.



What the copper GbE NIC LEDs mean

The following table describes the LEDs on your multiport GbE NIC.

Attention

The LEDs on the quad-port copper GbE NIC are the same as those on the dual-port copper GbE NIC.

LED type	Status indicator	Description
ACT/LNK	Green	A valid network connection is established.
	Blinking green or blinking amber	There is data activity.
	Off	There is no network connection.

LED type	Status indicator	Description
10=OFF 100=GRN 1000=YLW or 1000=ORG	Off	Data transmits at 10 Mbps.
	Green	Data transmits at 100 Mbps.
	Yellow (single-port) Orange (multiport)	Data transmits at 1000 Mbps.

What the fiber GbE NIC LEDs mean

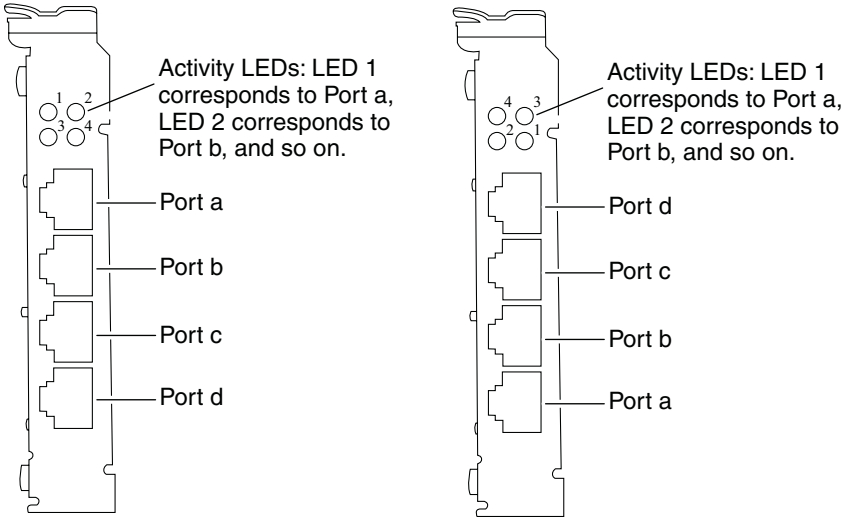
The following table explains what the LEDs on the fiber GbE NIC mean.

LED type	Status indicator	Description
LNK	On	A valid network connection is established.
	Off	There is no network connection.
ACT	On	There is data activity.
	Off	There is no network activity present.

TCP Offload Engine (TOE) NIC LEDs

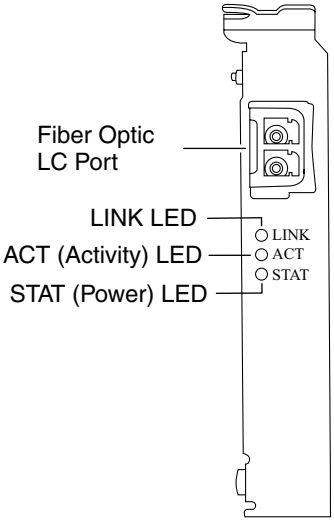
Location of the LEDs the quad-port TOE NICs

The quad-port TOE NIC is a 1000Base-T copper TOE NIC. It uses an RJ-45 connector. Port numbering on this NIC starts at the top, with the corresponding LED labeled at the top of the NIC. The following illustration shows the location of LEDs for this NIC.



Location of the LEDs the single-port TOE NICs

The single-port TOE is a 10GBase-SR Fiber NIC. The following illustration shows the location of LEDs this NIC.



What the TOE NIC LEDs mean

The following table explains what the LEDs on the TOE NIC mean.

NIC ID	LED Label	Status Indicator	Description
Quad-Port TOE	Labeled by port number.	Yellow	Data transmits at 1 Gbps.
		Green	Data transmits at 10/100 Mbps.
		Blinking	There is data activity
Single-Port TOE	ACT/LNK	Green	A valid network connection is established.
		Blinking green	There is data activity.
		Off	There is no network connection.
	STAT	Red	The card is receiving power and is on
		Off	The operating system has booted.

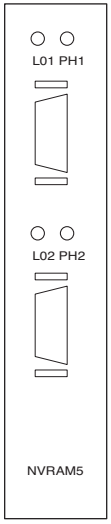
NVRAM5 and NVRAM6 adapter LEDs

About NVRAM5

The NVRAM5 and NVRAM6 adapters are also the cluster interconnect adapter when your storage system is in a clustered configuration. The NVRAM5 adapter is supported in all N5200 and N5500 cluster configurations except MetroCluster. The NVRAM6 adapter is supported in all N5600 and N7000 series cluster configurations except MetroCluster.

Location of LEDs

The following illustration shows the LED locations for your NVRAM5 or NVRAM6 adapter. There are two sets of LEDs by each port that operate when you use the adapter as a cluster interconnect adapter. There is also an internal red LED that you can see through the faceplate.



What the LEDs mean

The following table describes the LEDs for an NVRAM5 or NVRAM6 adapter.

LED type	Indicator	Status	Description
Internal	Red	Blinking	There is valid data in the NVRAM5 or NVRAM6. **Caution** This might occur if your system did not shut down properly, as in the case of a power failure or panic. The data is replayed when the system boots up again.
PH1	Green	On	The physical connection is working.
		Off	No physical connection exists.
LO1	Yellow	On	The logical connection is working.
		Off	No logical connection exists.

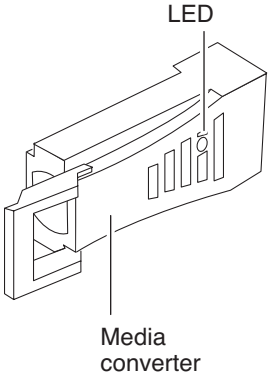
NVRAM5 and NVRAM 6 media converter LEDs

About the media converter

The media converter enables you to use fiber cabling to cable your storage systems in a clustered configuration.

Location of LEDs

The following illustration shows the LED location for your NVRAM5 or NVRAM6 media converter.



Media converter LEDs

The following table describes the LEDs for an NVRAM5 and NVRAM6 media converter.

Indicator	Status	Description
Green	On	Normal operation.
Green/Amber	On	Power is present but link is down.
Green	Flickering or off	Power is present but link is down.

Startup Error Messages 3

About this chapter

This chapter lists error messages you might encounter during the boot process.

Topics in this chapter

This chapter discusses the following topics:

Types of startup error messages

Startup sequence

When you apply power to the your storage system, it verifies the hardware that is in the system, loads the operating system, and displays two types of startup informational and error messages on the system console:

- Power-on self-test (POST) messages
- Boot messages

CFE and LOADER message

CFE and LOADER messages occur when an error occurs when the CFE and LOADER run through the POST. This happens before the Data ONTAP software is loaded.

POST messages

POST is a series of tests run from the motherboard PROM. These tests check the hardware on the motherboard and differ depending on your system configuration.

The following series of messages are examples of POST messages displayed on the console on a system that uses CFE. LOADER displays similar messages.

Header:

```
CFE version 2.0.0 based on Broadcom CFE: 1.0.40

Copyright (C) 2000,2001,2002,2003 Broadcom Corporation.

Portions Copyright (c) 2002-2005 Network Appliance, Inc.

CPU type 0xF29: 2800MHz

Total memory: 0x80000000 bytes (2048MB)

Starting AUTOBOOT press any key to abort...

Loading....

Entry at...

Starting program...

Press CTRL-C for special boot menu
```

Attention

Your storage system LCD, where applicable, displays only the POST messages without the preceding header.

Boot messages

After the boot is successfully completed, your storage system loads the operating system.

The following message is an example of the boot message that appears on the system console of an N series storage system at first boot.

Attention

The exact boot messages that appear on your system console depend on your system configuration.

```
NetApp Release 7.0.1X19: Sun Apr 10 03:04:35 PDT 2005

Copyright (c) 1992-2005 Network Appliance, Inc.

Starting boot on Wed Apr 13 15:30:51 GMT 2005

NetApp Release 7.0.1: Sun Apr 10 03:04:35 PDT 2005

System ID: xxxxxxxxxx

System Serial Number: xxxxxx

System Rev: X0

NetApp Release 7.0.1X19: Sun Apr 10 03:04:35 PDT 2005

        System ID: 0101165550

        System Serial Number: 1045937

        System Rev: B0

        slot 0: System Board

                Processors: 2

                Memory Size: 2048 MB

        Remote LAN Module Status: Online

        slot 0: Dual 10/100/1000 Ethernet Controller VI

e0a MAC Address: 00:a0:98:02:44:5a (auto-1000t-fd-up)
```

```
e0b MAC Address: 00:a0:98:02:44:5b (auto-unknown-cfg_down)

e0c MAC Address: 00:a0:98:02:44:58 (auto-unknown-cfg_down)

e0d MAC Address: 00:a0:98:02:44:59 (auto-unknown-cfg_down)

        slot 0: FC Host Adapter 0a

                3 Disks:             204.0GB

                1 shelf with LRC

        slot 0: FC Host Adapter 0b

        slot 0: FC Host Adapter 0c

        slot 0: FC Host Adapter 0d

        slot 0: SCSI Host Adapter 0e

        slot 0: NetApp ATA/IDE Adapter 0f (0x000001f0)

                0f.0 245MB

        slot 1: NVRAM

                Memory Size: 512 MB

Please enter the new hostname []:
```

Types of startup error messages

You might encounter two groups of startup error messages during the boot process:

- POST error messages
- Boot error messages

Both error message types are displayed on the system console, and an e-mail notification is sent out by your remote management card, if it is configured to do so.

For detailed information

For a detailed list of the startup error messages, see the following sections:

- “POST error messages” on page 33
- “Boot error messages” on page 41

POST error messages

POST error messages

The following section describes POST error messages specific to the following platforms:

- N7000 series filers and gateways
- N5000 series filers and gateways

POST error messages

The following table describes POST error messages that might appear on the system console if your storage system encounters errors while the BIOS and loader initiate the hardware.

Attention

Always power-cycle your storage system when you receive any of the following errors. If the system repeats the error message, follow the corrective action for that error message.

Error message or code	Description	Corrective action
Failure Fixed Disk	A disk error occurred.	**5.** Reboot the system. **6.** If the problem persists, call technical support.
Stuck key *Keyboard error* *Keyboard controller failed* *Keyboard locked-unlock key switch*	The keyboard controller is not responding when the BIOS attempts to initialize it.	**1.** Power-cycle the system. **2.** If the problem persists, call technical support.
Monitor type does not match CMOS run Setup	BIOS cannot initialize CMOS Setup.	**1.** Power-cycle the system. **2.** If the problem persists, call technical support.
Local memory	The memory test failed.	**1.** Make sure that DIMMs are seated properly, then power-cycle your storage system. **2.** Replace the DIMM if the problem still persists.

Error message or code	Description	Corrective action
System RAM failed at offset *Shadow RAM failed at offset* *Extended RAM failed at address line* *Memory type mixing detected* *Single-bit ECC error occurred* *Multiple-bit ECC error occurred* *Memory decreased in size* *One or more RDRAM devices have bad architecture/timing* *One or more RDRAM devices are disabled* *There are more than 32 RDRAM devices in the system* *Bad DIMM found in slot #*	The BIOS cannot initialize the system memory or a DIMM failed.	**1.** Make sure that DIMMs are seated properly, then power-cycle your storage system. **2.** Replace the DIMM if the problem persists. **3.** Power-cycle the system. **4.** If the problem persists, call technical support.
System battery dead	The real-time clock (RTC) battery is dead.	**1.** Replace the RTC battery. **2.** Replace the motherboard tray if the problem persists.

Error message or code	Description	Corrective action
System CMOS checksum bad - Default configuration used	Autoboot is prevented from executing, the RTC battery is dead, or the system is being reset during BIOS boot.	**1.** Replace the RTC battery. **2.** Replace the motherboard tray if the problem persists. **3.** Type **bye** at the bootloader prompt. The system should reset and the CMOS checksum error should be cleared. Autoboot will resume.
Clear CMOS jumper detected - Please remove for normal operation	Clear CMOS jumper is installed on the main board.	**1.** Remove the clear CMOS jumper, and reset the system. **2.** If the problem persists, call technical support.
Microcode Update Checksum Bad	The BIOS image might be corrupted.	**1.** Run the `software install` command with correct parameters before running the `rlm update` command. Run the following command to download the RLM firmware image before running the `rlm update` command: `software install http://pathto/RLM_FW.zip -f' c` **2.** Issue the `rlm status` command at the Data ONTAP prompt to check whether the RLM is still operational. **3.** Retry the RLM firmware update. **4.** If the failure persists, contact technical support.

Error message or code	Description	Corrective action
System cache error - Cache disabled *System Memory exceeds the CPU's caching limit.* *CPU ID:* *EISA CMOS not writable* *DMA Test Failed* *Software NMI Failed* *Fail-safe Timer NMI Failed*	The system encountered a hardware error.	1. Power-cycle the system. 2. If the failure persists, contact technical support.
FPGA jumper detected – Please remove for normal operation	The FPGA jumper was installed on the motherboard.	1. Remove all jumpers on the main motherboard. 2. Reboot the system. 3. If the failure persists, contact technical support.
Watch Dog Timer initiated a reboot during POST task 49	BIOS detects an initialization problem with HT links and reboots to recover. A watchdog timer was used to detect the problem and perform the reboot.	Use the `bye` command at the loader prompt to perform an autoboot. 1. Perform an autoboot by entering the following command from the loader prompt: **`bye`** 2. If the failure persists, contact technical support.

POST error messages

The following table describes POST error messages that might appear on the system console if your storage system encounters errors while CFE initiates the hardware.

Attention

Always power-cycle your storage system when you receive any of the following errors. If the system repeats the error message, follow the corrective action for that error message.

Note

There is an LED next to each DIMM on the motherboard. When a DIMM fails, the LED lights to help you find the failed DIMM.

Error message or code	Description	Corrective action
Memory init failure: Data segment does not compare at XXXX	XXXX denotes memory address. The CFE failed to initialize the system memory properly.	**1.** Make sure that the DIMM is supported. **2.** Make sure that the DIMM is seated properly. **3.** Replace the DIMM if the problem persists.
Unsupported system bus speed 0xXXXX defaulting to 1000Mhz	The CFE detects an unsupported DIMM.	**1.** Make sure that the DIMM is seated properly. **2.** Replace the DIMM if the problem persists.
No Memory found	The CFE cannot detect the system DIMMs.	**1.** Make sure that the DIMM is seated properly and power-cycle your storage system. **2.** Replace the DIMM if the problem persists.

Error message or code	Description	Corrective action
Abort Autoboot–POST Failure(s): MEMORY	The memory test failed.	1. Make sure that DIMMs are seated properly, then power-cycle your storage system. 2. Replace the DIMM if the problem still persists.
Abort Autoboot–POST Failure(s): RTC, RTC_IO	The CFE cannot read the real-time clock (RTC_IO) or the RTC date is invalid (RTC).	1. Use the `set date` and the `set time` command to set the date and time. 2. Make sure that the RTC battery is still good.
Abort Autoboot–POST Failure(s): CPU	At least one CPU fails to start up properly.	1. Power-cycle the system to see whether the problem still persists. 2. Replace the motherboard tray if the problem persists.
Abort Autoboot–POST Failure(s): UCODE	At least one CPU fails to load the microcode.	1. Power-cycle your system to see whether the problem still persists. 2. Replace the motherboard tray if the problem persists.
Invalid FRU EEPROM Checksum	The system back plane or motherboard EEPROM is corrupted.	Call technical support.
Autoboot of primary image aborted *Autoboot of backup image aborted*	Autoboot is stopped due to a key being pressed during the autoboot process.	Power-cycle the system and avoid pressing any keys during the autoboot process.

Error message or code	Description	Corrective action
Autoboot of Back up image failed Autoboot of primary image failed	The kernel could not be found on the CompactFlash.	**1.** Check the CompactFlash connection. **2.** Make sure the CompactFlash content is valid; if it is not, replace the CompactFlash. **3.** Follow the netboot procedure on your CompactFlash documentation to download a new kernel.

Boot error messages

When boot error messages appear

Boot error messages might appear after the hardware passes all POSTs and your storage system begins to load the operating system.

Boot error messages

The following table describes the error messages that might appear on the LCD if your storage system encounters errors while starting up.

Boot error message	Explanation	Corrective action
**Boot device err*	A CompactFlash card could not be found to boot from.	Insert a valid CompactFlash card.
Cannot initialize labels	When the system tries to create a new file system, it cannot initialize the disk labels.	Usually, you do not need to create and initialize a file system; do so only after consulting technical support.
Cannot read labels	When your storage system tries to initialize a new file system, it has a problem reading the disk labels it wrote to the disks. This problem can be because the system failed to read the disk size, or the written disk labels were invalid	Usually, you do not need to create and initialize a file system; do so only after consulting technical support.
Configuration exceeds max PCI space	The memory space for mapping PCI adapters has been exhausted, because either ◆ There are too many PCI adapters in the system ◆ An adapter is demanding too many resources	Verify that all expansion adapters in your storage system are supported. Contact technical support for help. Have a list ready of all expansion adapters installed in your storage system.
Dirty shutdown in degraded mode	The file system is inconsistent because you did not shut down the system cleanly when it was in degraded mode.	Contact technical support for instructions about repairing the file system.

Boot error message	Explanation	Corrective action
DIMM slot # has correctable ECC errors.	The specified DIMM slot has correctable ECC errors.	Run diagnostics on your DIMMs. If the problem persists, replace the specified DIMM.
Disk label processing failed	Your storage system detects that the disk is not in the correct drive bay.	Make sure that the disk is in the correct bay.
Drive %s.%d not supported	*%s*—The disk number; *%d*—The disk ID number. The system detects an unsupported disk drive.	1. Remove the drive immediately or the system drops down to the PROM monitor within 30 seconds. 2. Verify support for your disk drive. Check the Interoperability Matrix on the IBM NAS Support site at: http://www.ibm.com/storage/support/nas/
Error detection detected too many errors to analyze at once	This message occurs when other error messages occur at the same time.	See the other error messages and their respective corrective actions. If the problem persists, contact technical support.
FC-AL loop down, adapter %d	The system cannot detect the FC-AL loop or adapter.	1. Identify the adapter by entering the following command: `storage show adapter` 2. Turn off the power on your storage system and verify that the adapter is properly seated in the expansion slot. 3. Verify that all Fibre Channel cables are connected.

Boot error message	Explanation	Corrective action
File system may be scrambled	One of the following errors causes the file system to be inconsistent:	
	◆ An unclean shutdown when your storage system is in degraded mode and when NVRAM is not working.	Contact technical support to learn how to start the system from a system boot diskette and repair the file system.
	◆ The number of disks detected in the disk array is different from the number of disks recorded in the disk labels. The system cannot start when more than one disk is missing.	Make sure that all disks on the system are properly installed in the disk shelves.
	◆ The system encounters a read error while reconstructing parity.	Contact technical support for help.
	◆ A disk failed at the same time the system crashed.	Contact technical support to learn how to repair the file system.
Halted disk firmware too old	The disk firmware is an old version.	Update the disk firmware by entering the following command: `disk_fw_update`
Halted: Illegal configuration	Incorrect cluster configuration.	1. Check the console for details. 2. Verify that all cables are correctly connected.
Invalid PCI card slot %d	*%d*—The expansion slot number. The system detects a adapter that is not supported by IBM.	Replace the unsupported adapter with an adapter that is included in the Interoperability Matrix on the IBM NAS Support site at: http://www.ibm.com/storage/support/nas//
No disks	The system cannot detect any FC-AL disks.	Verify that all disks are properly seated in the drive bays.

Boot error message	Explanation	Corrective action
No disk controllers	The system cannot detect any FC-AL disk controllers.	Turn off your storage system power and verify that all NICs are properly seated in the appropriate expansion slots.
No /etc/rc	The /etc/rc file is corrupted.	1. At the hostname> prompt, enter **`setup`**. 2. As the system prompts for system configuration information, use the information you recorded in your storage system configuration information worksheet in the *Installation and Setup Instructions* for your N series product. For more information about your storage system setup program, see the appropriate system administration guide.
No /etc/rc, running setup	The system cannot find the /etc/rc file and automatically starts `setup`.	As the system prompts for system configuration information, use the information you recorded in your storage system configuration information worksheet in the *Installation and Setup Instructions* for your N series product. For more information about your storage system `setup` program, see the appropriate *System Administration Guide*.

Boot error message	Explanation	Corrective action
No network interfaces	The system cannot detect any network interfaces.	1. Turn off the system and verify that all NICs are seated properly in the appropriate expansion slots. 2. Run diagnostics to check the onboard Ethernet port. If the problem persists, contact technical support.
NVRAM: wrong pci slot	The system cannot detect the NVRAM adapter.	◆ For a stand-alone N5000 series system, make sure that the NVRAM adapter is in slot 1. For a clustered N5000 series system, make sure that the NVRAM adapter is in slot 2.
No NVRAM present	The system cannot detect the NVRAM adapter.	Make sure that the NVRAM adapter is securely installed in the appropriate expansion slot.
NVRAM #n downrev	*n*—The serial number of the NVRAM adapter. The NVRAM adapter is an early revision that cannot be used with the system.	Check the console for information about which revision of the NVRAM adapter is required. Replace the NVRAM adapter.
Panic: DIMM slot #n has uncorrectable ECC errors. Replaces these DIMMS.	The specified DIMM has uncorrectable ECC errors.	Replace the specified DIMM.
This platform is not supported on this release. Please consult the release notes. *Please downgrade to a supported release!* *Shutting down: EOL platform*	This platform is not supported on this release. Please consult the release notes for your software.	You must downgrade your software version to a compatible release. Verify that you have the correct URL for software download.

Boot error message	Explanation	Corrective action
Too many errors in too short time	The error detection system is experiencing problems. This message occurs when other error messages occur at the same time.	See the other error messages and their respective corrective actions. If the problem persists, call technical support.
Warning: system serial number is not available. System backplane is not programmed.	The backplane of your system does not have the correct system serial number.	Report the problem to technical support so that your storage system can be replaced.
Warning: Motherboard Revision not available. Motherboard is not programmed.	The system motherboard is not programmed with the correct revision.	Replace the motherboard.
Warning: Motherboard Serial Number not available. Motherboard is not programmed	The system motherboard is not programmed with the correct serial number.	Replace the motherboard.
**Watchdog error*	An error occurred during the testing of the watchdog timer.	Replace the motherboard.
**Watchdog failed*	Your storage system watchdog reset hardware, used to reset your storage system from a system hang condition, is not functioning properly.	Replace the motherboard.

Interpreting EMS and Operational Error Messages 4

About this chapter

This chapter lists error messages you might encounter during normal operation.

Topics in this chapter

This chapter discusses the following topics:

Environmental EMS messages

When environmental EMS messages appear

Environmental EMS messages appear on the LCD display and in AutoSupport (ASUP) messages if your storage system encounters extremes in its operational environment.

Environmental EMS messages

The following table describes the environmental EMS messages and their corrective actions.

LCD display	ASUP message and LED behavior	Event description	Corrective action	SNMP Trap ID
Power supply degraded	*Chassis Power degraded: PS#* FRU LED: Amber	There is a problem with one of the power supplies.	**1.** Check that the power supply is seated properly in its bay and that all power cords are connected. **2.** Power-cycle your system and run diagnostics on the identified power supply. **3.** If the problem persists, replace the identified power supply.	#392: Chassis power supply is degraded
Power supply degraded	*Chassis Power Supply: PS# removed system will shutdown in 2 minutes* FRU LED: Amber	Power supply unit was removed from the system and the system will shutdown unless the power supply is replaced.	**1.** Power-cycle your system and run diagnostics on the identified power supply. **2.** If the problem persists, replace the identified power supply.	#501: Chassis power supply is degraded

LCD display	ASUP message and LED behavior	Event description	Corrective action	SNMP Trap ID
Power supply degraded	*Chassis Power Shutdown: Chassis Power Supply Fail: PS#*	The system is in a warning state. The system shuts down immediately.	**1.** Power-cycle the system and run diagnostics on the motherboard or power supply. **2.** If the problem persists, replace the motherboard or power supply.	#392: Chassis power supply is degraded
Power supply degraded	*Chassis Power Fail: PS#*	The power supply has failed.	**1.** Power-cycle the system and run diagnostics on the motherboard. **2.** If the problem persists, replace the motherboard.	#6: Chassis power is degraded
Power supply degraded	*Multiple fan failure*	Multiple fans have failed. The system shuts down immediately.	**1.** Power-cycle the system and run diagnostics on the motherboard. **2.** If the problem persists, replace the motherboard.	#6: Chassis power is degraded
Power supply degraded	*Chassis Power Degraded: 3.3V is in warn high state current voltage is 3273 mV on XXXX at* [time stamp].	The system is operating above the high-voltage threshold.	**1.** Power-cycle the system and run diagnostics on the motherboard. **2.** If the problem persists, replace the motherboard.	#403: Chassis power is degraded

LCD display	ASUP message and LED behavior	Event description	Corrective action	SNMP Trap ID
Power supply degraded	*Chassis power shutdown: 3.3V is in warn low state current voltage is 3273 mV on XXXX at* [time stamp].	The system is operating below the low-voltage threshold. The system shuts down immediately.	**1.** Power-cycle the system and run diagnostics on the motherboard. **2.** If the problem persists, replace the motherboard.	#403: Chassis power is degraded
Power supply degraded	*Chassis power supply fail: PS#*	The system is operating below the low-voltage threshold. The system shuts down immediately.	**1.** Power-cycle the system and run diagnostics on the motherboard. **2.** If the problem persists, replace the motherboard.	None
Power supply degraded	*Multiple power supply fans failed: system will shutdown in 2 minutes.*	Multiple power supplies and fans have failed; the system will shutdown in 2 minutes if uncorrected.	**1.** Power-cycle the system and run diagnostics on the motherboard. **2.** If the problem persists, replace the motherboard.	#521: Chassis power is degraded
Power supply degraded	*Chassis power supply off: PS#*	One or more chassis power supplies are turned off.	**1.** Check that the power supply is seated properly in its bay and that all power cords are connected. **2.** Verify that the power supplies are turned on.	#395

LCD display	ASUP message and LED behavior	Event description	Corrective action	SNMP Trap ID
Temperature exceeds limits	*Chassis over temperature shutdown on XXXX at* [time stamp].	The system is operating above the high-temperature threshold. The system shuts down immediately.	**1.** Make sure that the system has proper ventilation. **2.** Power-cycle the system and run diagnostics on the system.	#371: Chassis temperature is too hot
Temperature exceeds limits	*Chassis over temperature on XXXX at* [time stamp].	The system is operating above the high-temperature threshold.	**1.** Make sure that the system has proper ventilation. **2.** Power-cycle the system and run diagnostics on the system.	#372: Chassis temperature is too hot
Temperature exceeds limits	*Chassis under temperature on XXXX at* [time stamp].	The system is operating below the low-temperature threshold.	**1.** Raise the ambient temperature around the storage system. **2.** Power-cycle the system and run diagnostics on the system.	#372: Chassis temperature is too cold
Temperature exceeds limits	*Chassis under temperature shutdown on XXXX at* [time stamp].	The system is operating below the low-temperature threshold.	**1.** Check that the system has proper ventilation. You might need to raise the ambient temperature around the storage system. **2.** Power-cycle the system and run diagnostics on the system.	#371: Chassis temperature is too cold

LCD display	ASUP message and LED behavior	Event description	Corrective action	SNMP Trap ID
Fans stopped; replace them	*Chassis fan FRU failed: current speed is 4272 RPM, on* [times stamp]. FRU LED: Green if problem is PSU; off if problem is fan.	A system fan failed.	Check LEDs on the fans and power supply. ◆ If both fan LEDs are green, run diagnostics on the power supplies. ◆ If the fan LED is off, replace the fan.	#414: Chassis fan is degraded
Fans stopped; replace them	*Fan: # is spinning below tolerable speed replace immeduately to avoid overheating*	One or more chassis fans is spinning too slowly.	Check LEDs on the fans. ◆ If both fan LEDs are green, run diagnostics on the motherboard ◆ If the fan LED is off, replace the fan.	#415: Chassis fan is degraded
Fans stopped; replace them	*Multiple fan failure on XXXX at* [time stamp]. FRU LED: Amber	Both system fans failed. The system shuts down immediately.	**1.** Replace both fans. **2.** Power-cycle and run diagnostics on the system.	#6 Emergency shutdown
Fans stopped; replace them	*Multiple chassis fans have failed system will shutdown in 2 minutes.*	Multiple chassis fan failure. System will shutdown in 2 minutes if uncorrected.	**1.** Replace both fans. **2.** Power-cycle and run diagnostics on the system.	#511: Chassis fan is degraded

Attention

Degraded power might be caused by bad power supplies, bad wall power, or bad components on the motherboard. If spare power supplies are available, try replacing them to see whether that alleviates the problem.

Operational error messages

When operational error messages appear

These error messages might appear on the system console or LCD when the system is operating, when it is halted, or when it is restarting because of system problems.

Operational error messages

The following table describes operational error messages that might appear on the LCD if your storage system encounters errors while starting up or during operation.

Error message	Explanation	Fatal?	Corrective action
Disk n is broken	*n*—The RAID group disk number. The solution depends on whether you have a hot spare in the system.	No	See the appropriate *System Administration Guide* for information about how to locate a disk based on the RAID group disk number and how to replace a faulty disk.
Dumping core	The system is dumping core after a system crash.	Yes	Write down the system crash message on the system console and report the problem to technical support.
Disk hung during swap	A disk error occurred as you were hot-swapping a disk.	Yes	**1.** Disconnect the disk from the power supply by opening the latch and pulling it halfway out. **2.** Wait 15 seconds to allow all disks to spin down. **3.** Reinstall the disk. **4.** Restart the system by entering the following command: `boot`

Error message	Explanation	Fatal?	Corrective action
Error dumping core	The system cannot dump core during a system crash and restarts without dumping core.	Yes	Report the problem to technical support.
Panicking	The system is crashing. If the system does not hang while crashing, the message `Dumping core` appears.	Yes	Report the problem to technical support.

Understanding Remote LAN Module Messages 5

What the RLM does

The Remote LAN Module (RLM) provides remote platform management capabilities, which include remote access, monitoring, troubleshooting, logging, and alerting features. The RLM extends AutoSupport capabilities by sending alerts or "down system" notification through an AutoSupport Message when the system goes down, regardless of whether the system can send AutoSupport messages.

RLM-generated AutoSupport messages

These messages include the following information:

- Subject line—A system notification from the RLM of the system, listing the system condition or event that caused the AutoSupport message and the log level.
- In the message body—The RLM configuration and version information, the system ID, serial number, model number, and host name.
- In the zipped attachments—The System Event Logs, the system sensor state as determined by the RLM, and console logs.

Typical RLM-generated AutoSupport messages occur in the following conditions:

- The system reboots unexpectedly
- The System stops communicating with the RLM
- A watchdog reset occurs
- The system is power-cycled
- Firmware POST errors occur
- A user-initiated AutoSupport message occurs

RLM e-mail Notifications

RLM e-mail notifications are sent to configured recipients designated by the AutoSupport feature. The e-mail notifications have the title "System Notification from the RLM of <hostname>", followed by the message type.

RLM-generated messages

The following table describes messages sent by the RLM and the appropriate corrective actions.

RLM message	Explanation	Action
RLM heartbeat stopped	The system software cannot see the RLM.	1. Connect to the RLM CLI to check whether the RLM is operational. 2. Contact technical support if the problem persists.
RLM HEARTBEAT LOSS	The Remote LAN Module (RLM) detects the loss of heartbeat from Data ONTAP. The system possibly has stopped serving data	1. Connect to the RLM CLI to check whether the RLM is operational. 2. Contact technical support if the problem persists.
Reboot warning	The RLM detects an abnormal system reboot.	If this was a manually triggered or expected reboot, no action is necessary. 1. Check the status of the storage system and determine the cause of the reboot. 2. Contact technical support if the storage system fails to reboot.
Heartbeat loss warning	The RLM detects the system is offline, possibly because the system has stopped serving data.	If this system shutdown was manually triggered, no action is necessary. 1. Check the status of your system and verify that the storage system and disk shelves are operational. 2. Contact technical support if the problem persists.
Reboot (power loss) critical	The RLM detects that the storage system has lost AC power.	If you switched off the storage system before you received the notification, no action is necessary. Restore power to the storage system.

RLM message	Explanation	Action
Reboot (watchdog reset) warning	The RLM detects a watchdog reset error.	**1.** Check the system to verify that it is operational. **2.** If your system is operational, run diagnostics on your entire system. **3.** Contact technical support if the storage system is not serving data.
System boot failed (POST failed)	The RLM detects that during POST a system error occurred and the system software cannot be booted.	**1.** Run diagnostics on your system. **2.** Contact technical support if running diagnostics does not detect any faulty components.
User_triggered (system power cycle)	A user is initiating a system power-cycle the storage system through the RLM.	No action is necessary.
User_triggered (system power on)	A user is powering on the storage system through the RLM.	No action is necessary.
User_triggered (system power off)	A user is powering off the storage system through the RLM.	No action is necessary.
User_triggered (system nmi)	A user is initiating a system core dump (nmi) through the RLM.	No action is necessary.
User_triggered (system reset)	A user is resetting the system through the RLM.	No action is necessary.
User triggered (RLM test)	The RLM received the RLM test command, which tests the RLM configuration.	No action is necessary.

EMS messages about the RLM

The following messages are EMS events sent to your console regarding the status of your RLM.

Name	Description	Corrective action
rlm.driver.hourly.stats	An error occurred while the system was trying to get hourly statistics from the RLM.	**1.** Issue the `rlm status` command at the Data ONTAP prompt to check whether the RLM is online. **2.** If the RLM is operational and this message persists, issue the `rlm reboot` command at the Data ONTAP prompts to reboot the RLM.
rlm.driver.mailhost	RLM setup verifies that a mail host specified in `options autosupport.mailhost` can be reached. In this case, the RLM setup could not connect to the specified mail host.	**1.** Verify the current option of the *autosupport.mailhost* using the `options autosupport.mailhost` command. If the autosupport.mailhost is not correct, set it to the correct value using the command `options autosupport.mailhost` *`mailhost-name`*. **2.** If *mailhost name* in the *autosupport.mailhost* is correct, there might be an incorrect entry corresponding to this mail host in the /etc/hosts file. ❖ Verify and correct the associated IP address for this mail host stored in the /etc/hosts file. You can do this by mounting the root volume of your storage system on an administrative host and editing the /etc/hosts file under the root volume. ❖ You can also run the `setup` command again with the correct IP address for the mail host.

Name	Description	Corrective action
rlm.driver.network.failure	There was a failure during the network configuration of the RLM. The RLM could not be assigned a DHCP or fixed IP address.	**1.** Check whether a network cable is correctly plugged into the RLM network port. **2.** Check the link status LED on the RLM. **3.** The RLM supports a 10/100 Ethernet network in auto-negotiation mode. The network that the RLM is connected to needs to support auto-negotiation to 10/100 speed or be running at one of those speeds for the RLM network connectivity to work.
rlm.firmware.update.failed	There was an error updating the RLM's firmware.	**1.** Run the `software install` command with correct parameters before running the `rlm update` command. Run the following command to download the RLM firmware image before running the `rlm update` command: `software install http://pathto/RLM_FW.zip -f' c` **2.** Issue the `rlm status` command at the Data ONTAP prompt to check whether the RLM is still operational. **3.** Retry the RLM firmware update. **4.** If the failure persists, then contact technical support.

Name	Description	Corrective action
rlm.heartbeat.bootFromBackup	The RLM was rebooted from its backup firmware by the storage system to restore RLM availability. When the storage system stops receiving heartbeat notifications from the RLM, the RLM is considered unavailable. To restore availability, the storage system first attempts to reboot the RLM from the RLM's primary firmware. If that fails, the storage system attempts to reboot the RLM from its backup firmware. If the reboot from backup firmware restores availability, (heartbeat notifications are received) this message is generated.	Update the RLM firmware.
rlm.heartbeat.resumed	The storage system detected the resumption of RLM heartbeat notifications, indicating that the RLM is now available. The earlier issue indicated by the rlm.heartbeat.stopped message was resolved.	No action is needed; this message is user-generated.

Name	Description	Corrective action
rlm.heartbeat.stopped	The appliance did not receive an expected heartbeat message from the RLM. The RLM and the storage system exchange heartbeat messages so that they can detect when one or the other is unavailable.	**1.** Run diagnostics on the RLM. **2.** Run diagnostics on your system. **3.** If the problem persists, contact technical support.
rlm.orftp.failed	A communication error occurred while sending or receiving information from the RLM.	**1.** Issue the `rlm status` command at the Data ONTAP prompt to check whether the RLM is operational. **2.** If the RLM is operational and this message persists, issue the `rlm reboot` command at the Data ONTAP prompt to reboot the RLM. **3.** If this message persists after you reboot the RLM, contact technical support.
rlm.userlist.update.failed	There was an error while updating user information for the RLM. When user information is updated on Data ONTAP, the RLM is also updated with the new changes. This enables users to log in to the RLM.	**1.** Issue the `rlm status` command at the Data ONTAP prompt to check whether the RLM is operational. **2.** If the RLM is operational and this message persists, issue the `rlm reboot` command at the Data ONTAP prompt to reboot the RLM. **3.** Retry the operation that caused the error message. **4.** If this message persists after you reboot the RLM, contact technical support.

Name	Description	Corrective action
rlm.notConfigured	This message occurs weekly to remind you to configure and unconfigured Remote LAN Module (RLM). The RLM is a physical device that provides remote access and remote management capabilities. To use the full functionality of RLM, you need to configure it.	**1.** Issue the `rlm setup` command to configure the RLM. If necessary, use the `rlm status` command to obtain its MAC address. **2.** Issue the `rlm setup` command to verify the RLM network configuration. **3.** Issue the `rlm test autosupport` command to verify the RLM can send AutoSupport email. **Note** The *autosupport.mailhost* and *autosupport to* options must be set before this command is issued.

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IBM System Storage N series
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Publication No. GC26-7984-01

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