



Emulex Driver for Linux

Version 8.2.0.39

User Manual

EMULEX CONFIDENTIAL. Copyright © 2003-2009 Emulex. All rights reserved worldwide. Unpublished work. No part of this document may be reproduced by any means or translated to any electronic medium without (a) the prior written consent of Emulex, and (b) the preservation of this notice on all copies and partial copies. Copying, access, use or distribution requires an applicable written agreement approved by Emulex.

Information furnished by Emulex is believed to be accurate and reliable. However, no responsibility is assumed by Emulex for its use; or for any infringements of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent, copyright, trade secret or related rights of Emulex.

Emulex, the Emulex logo, AutoPilot Installer, AutoPilot Manager, BlockGuard, Connectivity Continuum, Convergenomics, Emulex Connect, Emulex Secure, EZPilot, FibreSpy, HBAnyware, InSpeed, LightPulse, MultiPulse, OneCommand, OneConnect, One Network. One Company., SBOD, SLI, and VEngine are trademarks of Emulex. All other brand or product names referenced herein are trademarks or registered trademarks of their respective companies or organizations.

Emulex provides this documentation "as is" without any warranty of any kind, either expressed or implied, including but not limited to the implied warranties of merchantability or fitness for a particular purpose. Emulex may make improvements and changes to the product described in this manual at any time and without any notice. Emulex assumes no responsibility for its use, nor for any infringements of patents or other rights of third parties that may result. Periodic changes are made to information contained herein; although these changes will be incorporated into new editions of this documentation, Emulex disclaims any undertaking to give notice of such changes.

Emulex, 3333 Susan Street
Costa Mesa, CA 92626

OpenSolaris DHCHAP Notice.

Contains portions of Covered Software subject to the Common Development and Distribution License (CDDL) Version 1.0. Such portions of Covered Software in Source Code form may be obtained from the web site www.opensolaris.org, or by contacting online support from the web site www.emulex.com.

Derived from the RSA Data Security, Inc. MD5 Message-Digest Algorithm.

Copyright (C) 1991-2, RSA Data Security, Inc. Created 1991. All rights reserved.

Installation	1
Driver Information	1
Supported Features.....	1
New Features in this Release.....	1
Prerequisites	2
For the lpfc Driver Kit	2
Compatibility.....	2
Things to Know Before You Download	3
Known Issues	3
Installing the Driver Kit	4
Driver Kit Install Script Options.....	5
Driver Kit Directory Structure	5
Installing the Driver on Unsupported Linux Distributions.....	5
Upgrading the Kernel or Applying a Distribution Service Pack or Update	6
Installing the Driver Kit into an Upgraded Kernel	6
Booting From a Non-Zero LUN Attached to an Emulex Adapter	7
Installing the HBAnyware Utility	7
Uninstalling the Driver Kit	8
Configuration	9
Driver Configuration Methods Using modprobe and /etc/modprobe.conf.....	9
Temporary Configuration Method	9
Persistent Configuration Method	10
Temporary Driver Configuration by Read/Write to sysfs	10
Creating a New Ramdisk Image	11
For Installed lpfc Driver Kits	11
For Distribution In-Box lpfc Drivers.....	11
Dynamically Adding LUNs and Targets.....	11
Driver Parameters Reference Table	12
Using udev for Persistent Naming	16
Using udev to Discover Logical to Physical Mappings for sd Devices	16
Configuring the System to Boot From SAN Using Persistent Names	17
Using udev with st Devices	17
Further Information About Persistent Names	19
Working with Virtual Ports (vports).....	19
Creating, Deleting and Displaying vports.....	19
The mkvport.sh Script	20
The rmvport.sh Script.....	20
The lsvport.sh Script	20
The vport Sysfs Tree	21
Driver Version 8.2.0.x sysfs Structure.....	21
Vport sysfs Entries	22
Vport Configuration Limits	24
Troubleshooting.....	25
Introduction.....	25
Unusual Situations and their Resolutions	25

General Situations	25
lpfc Log Messages	29
Introduction	29
Message Log Example	30
ELS Events (0100 - 0199)	30
Link Discovery Events (0200 - 0299)	35
Mailbox Events (0300 - 0339)	41
Temperature Events (0340 - 0347)	47
Initialization Events (0400 - 0499)	47
FARP Events (0600 - 0699)	51
FCP Traffic History (0700 - 0799)	51
Node Table Events (0900 - 0999)	55
Security Events (1000 - 1099)	57
Miscellaneous and FCoE Events (1200 - 1299)	64
Link Events (1300 - 1399)	67
IOCTL Events (1600 - 1699)	68
VPort Events (1800 - 1832)	69

Installation

Driver Information

Supported Features

- SNIA-CTP compliant SMI-S 1.1 Provider
- Topology support: Fibre Channel Arbitrated Loop (FC-AL), point-to-point, fabric with auto-topology negotiation
- Supports 1, 2, 4 and 8 Gb/s capable adapters with auto-rate negotiation. (1Gb/s is not supported on 8 Gb/s adapters.)
- Protocols: SCSI-FCP, FCP-2 (FC-Tape profile, including use of ADISC instead of PLOGI), FC initiator mode and Fibre Channel over Ethernet (FCoE).
- Tested up to thirty-two adapter ports
- Dynamic parameter setting using Emulex's HBAnyware[®] GUI-based configuration utility version 4.1 as part of a master kit: enabling GUI-based driver configuration and persistent binding management, including in-band (FC) and out-of-band (TCP/IP) remote SAN management capability, diagnostics (loopback and diagnostics dump), LUN masking, (Diffie-Hellmann Challenge Handshake Authentication Protocol) FC-SP DHCHAP Authentication, and virtual port support. See the HBAnyware 4.1 Utility User Manual for a complete list of supported features.
- Support for Common HBA API
- Batch firmware download capability
- Support for the sysfs interface
- PCI hot plug support
- Vital Product Data (VPD) support
- "Linux Tools" link on the Linux portion of the Emulex Web site (visit the link to see the available tools)
- Supports FC-SP DHCHAP Authentication
- Supports NPIV virtual ports

New Features in this Release

The Emulex version 8.2.0.39 driver for Linux includes the following enhancements:

- Supports the LP21000 and LP21002 FCoE adapters (2, 4 and 8 Gb/s capable)
- Supports the LPe1250, LPe1252, LPe12000 and LPe12002 adapters (2, 4 and 8 Gb/s capable)
- Supports the latest HBAnyware utility version 4.1 as part of master kit. Refer to the HBAnyware Utility User Manual for more information.

Prerequisites

For the lpfc Driver Kit

To install the lpfc driver kit, the appropriate distribution kernel development packages must be installed for the currently running kernel, which include the gcc compiler and the kernel sources.

The lpfc driver kit supports the following distributions:

- Red Hat Enterprise Linux 5, 5.1 and 5.2 (Intel x86, Intel Itanium2, Intel EM64T, AMD64, and PowerPC 64-bit architectures).
- SuSE Linux Enterprise Server 10 SP1 and SP2 (Intel x86, Intel Itanium2, Intel EM64T, AMD64, and PowerPC 64-bit architectures).
- The HBAnyware utility must be installed to use DHCHAP Authentication. The HBAnyware utility includes the fcauthd daemon software. See the HBAnyware 4.1 User Manual on the Emulex Web site for instructions on installing and using the HBAnyware utility.

Compatibility

Emulex recommends using the latest released firmware for best reliability and performance. To support DHCHAP, you must use the recommended firmware as a minimum.

Note: Check the Emulex Web site for the latest firmware releases.

- LP21000 and LP21002 (FCoE 2, 4 and 8 Gb/s capable adapters. Check the Emulex Web site for the latest firmware version.)
- LPe12000, LPe12002, LPe1250 and LPe1252 (2, 4 and 8 Gb/s capable adapters. Firmware version 1.00a9 or later is recommended for best performance.)
- LPe11004, LPe11002, LPe11000 and LPe1150 (Firmware version 2.72a2 or later is recommended for best performance.)
- LP11000, LP11002 and LP1150 (Firmware version 2.72a2 or later is recommended for best performance.)
- LP1005DC-CM2 (Firmware version 1.92a1 or later is recommended for best performance.)
- LP10000ExDC and LP1050Ex (Firmware version 1.92a1 or later is recommended for best performance.)
- LP10000DC and LP10000 (Firmware version 1.92a1 or later is recommended for best performance.)
- LP1050DC and LP1050 (Firmware version 1.92a1 or later is recommended for best performance.)
- LP9802DC and LP9802 (Firmware version 1.92a1 or later is recommended for best performance.)
- LP982 (Firmware version 1.92a1 or later is recommended for best performance.)
- LP9402DC, LP9002DC, LP9002L and LP9000 (Firmware version 3.93a0 or later is recommended for best performance.)
- LP952L (Firmware version 3.93a0 or later is recommended for best performance.)
- LP8000 and LP8000DC
 - If your adapter has a Dragonfly chip version 2.00 or greater, use firmware version 3.93a0.
 - If your adapter has a Dragonfly chip below version 2.00, use firmware version 3.30a7.

Refer to the LP8000 and LP8000DC Firmware Download page on the Emulex Web site to determine the Dragonfly chip version in use.

Note: NPIV is supported on Emulex 4 Gb/s and 8 Gb/s adapters that fully support SLI-3. Emulex enterprise class (5 digit adapter model number) and Midrange class (4 digit adapter model number) adapters support SLI-3. Emulex 3 digit model number adapters do not fully support SLI-3 and therefore do not support NPIV. The LPFC 8.2.X driver supports all adapters running SLI-2, but NPIV support is not available in SLI-2 mode.

For SLI-3 supported adapters, use the latest recommended firmware for NPIV support.

Things to Know Before You Download

- You must uninstall any previous lpfc driver kits and/or Application Helper Modules that were installed from the Emulex CD or downloaded from the Emulex Web site, (i.e. not part of a distribution), before installing this driver kit.

Known Issues

- See the product release notes for the latest information.

Installing the Driver Kit

The `lpfc-install` script installs the `lpfcdriver_2.6` RPM.

The RPM:

- Installs the driver source files to the `/usr/src/lpfc` directory.
- Builds the driver for the currently running kernel.
- Installs the driver to the proper directory for the currently running kernel. Maintenance and errata kernels are supported.

Once the RPM is installed, the `lpfc-install` script creates a new ramdisk for the currently running kernel so that the `lpfc` driver is loaded when the kernel is initialized during system startup.

Note: You must uninstall any previous `lpfc` driver kits and/or Application Helper Modules that were installed from the Emulex CD or downloaded from the Emulex Web site, (i.e. not part of a distribution), before installing this driver kit. This installation will fail if a previous version of the `lpfc` driver or the Application Helper Module is detected.

Refer to “Uninstalling the Driver Kit” on page 8 and “” on page 8 for more information.

When invoked without options, the `'lpfc-install'` script automatically archives any driver that is shipped as part of the distribution's kernel during the installation procedure. Old drivers that are archived during installation are then restored when the driver kit is uninstalled.

Note: The HBAnyware utility must be installed separately from the driver. Refer to the “Installing the HBAnyware Utility” on page 7 for more information.

Note: The `lpfc-install` script does not support custom kernels. For example, kernels with `Version_Release` strings that do not match those of the original distribution kernel.

To install the Emulex driver for Linux:

1. Install a supported Emulex adapter in the system. Refer to the adapter's Installation manual for specific hardware installation instructions.
2. Remove any previously installed `lpfc` driver kits and/or Application Helper Modules that were installed from the Emulex CD or downloaded from the Emulex Web site, (i.e. not part of a distribution's kernel) before proceeding. Refer to “Uninstalling the Driver Kit” on page 8 and “” on page 8 for more information.
3. Download the driver kit from the Emulex Web site or copy it to the system from the installation CD.
4. Log on as `'root'` to a terminal, and unpack the tarball with the following command:

```
tar xzf lpfc_2.6_driver_kit-<driver version>.tar.gz
```
5. Change to the directory that is extracted:

```
cd lpfc_2.6_driver_kit-<driver version>/
```
6. Execute the `'lpfc-install'` script with no options to install the new driver kit. Type:

```
./lpfc-install
```

Once the 'lpfc-install' script has completed successfully, the Emulex lpfc driver is loaded and Fibre Channel disks that are properly connected to the system are accessible. Reboot the system now to enable the newly added driver options in the ramdisk. You can also reboot the system later if you wish.

Driver Kit Install Script Options

The following options are available for use with the Emulex install script for Linux:

- -h,--help - Prints a help message describing command line parameters.
- -u,--uninstall - Uninstalls the currently installed driver kit.
- --createramdisk - Creates a new ramdisk image. Use this option after you have modified driver parameters in the /etc/modprobe.conf file.

Driver Kit Directory Structure

After installation, the following directory is created on the system.

Table 1: Driver Kit Directory Structure

Directory	Description
/usr/src/lpfc	Driver source files.

Installing the Driver on Unsupported Linux Distributions

The driver kit supports the Linux distributions listed on page 2. As of Linux kernel 2.6.12, the lpfc driver is distributed with the Linux kernel sources. To install the Emulex lpfc driver on an unsupported distribution of Linux, refer to the distribution's Web site or <http://kernel.org>.

Note: The Emulex version 8.2 driver for Linux is not intended for, and will not operate on, any kernel prior to 2.6.12. If you are using an earlier 2.6 kernel, you must use the Emulex driver for Linux version 8.0.16.x.

Upgrading the Kernel or Applying a Distribution Service Pack or Update

You can install the driver kit into an upgraded kernel. The installation of an update or service pack generally involves updating the kernel.

Note: Some distribution service packs or updates contain an Emulex driver. If the driver version contained in the distribution or service pack is the same version or newer than the currently installed driver kit, re-installation of the driver kit may not be necessary.

Note: The lpfc-install script does not support custom kernels. For example, kernels with Version_Release strings that do not match those of the original distribution kernel.

Note: Follow these steps before installing a new update CD to a distribution or applying a service pack to a distribution. Maintenance and errata kernels are supported.

Installing the Driver Kit into an Upgraded Kernel

To install the driver kit into an upgraded kernel:

1. Execute the lpfc-install script with the '--uninstall' option. Type:

```
/usr/src/lpfc-install --uninstall
```
2. Upgrade the kernel and/or distribution.
3. Reboot the system with the new kernel.
4. Download the driver kit from the Emulex Web site or copy it to the system from the installation CD.
5. Log on as 'root' to a terminal, and unpack the tarball with the following command:

```
tar xzf lpfc_2.6_driver_kit-<driver version>.tar.gz
```
6. Change to the directory that is extracted:

```
cd lpfc_2.6_driver_kit-<driver version>/
```
7. Execute the 'lpfc-install' script with no options to install the new driver kit. Type:

```
./lpfc-install
```
8. Reboot the system to complete re-installation of the Emulex driver.

Booting From a Non-Zero LUN Attached to an Emulex Adapter

This section describes how to configure SLES 10 to boot from an FC attached disk device other than /dev/sda. This example uses /dev/sdb.

To boot from a non-zero LUN attached to an lpfc adapter:

1. Configure the Emulex adapter bootBIOS to boot from the desired LUN.
2. Start the standard SLES 10 SP1 installation.
3. At the Installation Settings screen, after configuring the desired partitions, select the **Expert** tab.
4. Select **Booting** to change the bootloader configuration.
5. The Boot Loader Settings window appears. Select the **Boot Loader Installation** tab.
6. In the section labeled Boot Loader Location, select **Custom Boot Partition**, then select the **root partition** (or **boot partition** if you configured one) from the dropdown box.
7. Click the **Boot Loader Options** button. The Boot Loader Options window appears. Select the **Write generic Boot Code to MBR** checkbox.
8. Click **OK**.
9. In the Boot Loader Settings window, Click **Finish**.
10. Proceed with the installation.
11. During the first boot after the installation, use the GRUB command line to change all hd1 references to hd0, then continue the boot process.
12. Edit the GRUB configuration in /boot/grub/menu.lst to change all hd1 references to hd0.

Installing the HBAnyware Utility

The HBAnyware® utility is a powerful, centralized adapter management suite, providing discovery, reporting and management of local and remote adapters from a single console anywhere in the SAN and across platforms. Both a graphical user interface (GUI) and command line interface (CLI) are provided. This remote configuration capability can be provided by either Fibre Channel (FC) access via host systems on the same FC Storage Area Network (SAN) or by Transmission Control Protocol/Internet Protocol (TCP/IP) access from IP addresses of remote machines.

Refer to the HBAnyware 4.1 User Manual, which is available on the Emulex Web site, for instructions on installing and using the HBAnyware utility.

Uninstalling the Driver Kit

Note: Driver parameter changes made using the HBAnyware utility or `/etc/modprobe.conf` persist if the driver is uninstalled. To return to the default settings, you must modify the settings in `/etc/modprobe.conf`.

Note: You must run the uninstall script that shipped with the version of the driver kit you want to remove.

This section describes how to uninstall a previous version of the Emulex 8.x driver for Linux. The uninstall procedure automatically restores the archived lpfc driver.

To uninstall the lpfc driver:

1. Log on as 'root'.
2. If possible, exit all applications that use Fibre Channel-attached drives, then unmount the drives. If you cannot exit all applications that use Fibre Channel-attached drives, the uninstall will work properly, but you must reboot after the uninstallation is complete.
3. Stop the HBAnyware utility. Type:

```
cd /usr/sbin/hbanyware
./stop_hbanyware
```
4. Uninstall the Applications Kit. Refer to the HBAnyware utility version 4.1 User Manual on the Emulex Web site for instructions.
5. Copy the lpfc-install script to the temporary directory. For example:

```
cp /usr/src/lpfc/lpfc-install /tmp
```
6. Execute the lpfc-install script. with the '--uninstall' option. Type:

```
/tmp/lpfc-install --uninstall
```

Configuration

You can configure the driver by:

- Setting module parameters using `modprobe` and `/etc/modprobe.conf`.
- Using the `sysfs` interface (for parameters that can be changed after loading the driver).
- Using the HBAnyware configuration utility. See the HBAnyware 4.1 User Manual for more information.

Note: Driver parameter changes made using `modprobe.conf` or the HBAnyware utility persist if the driver is uninstalled. To return to the default settings, you must modify the settings in `modprobe.conf`.

Note: The Linux 2.6 kernel only supports setting the `lpfc_log_verbose`, `lpfc_devloss_tmo` and `lpfc_use_adisc` driver parameters for individual adapters.

Other driver parameters must be applied to all adapters contained in the host. See the “Driver Parameters Reference Table” on page 12 for a complete list of driver parameters.

Driver Configuration Methods Using `modprobe` and `/etc/modprobe.conf`

The following sections describe how to set driver parameters using the `modprobe` command and by manually editing `/etc/modprobe.conf`.

Note: Emulex recommends using the HBAnyware utility or the `hbacmd` utility to change parameters. See the HBAnyware User Manual for more information.

Temporary Configuration Method

When you manually load the driver as a module using the `modprobe` command and change one or more driver parameter values, it is a temporary configuration. These changes are considered temporary because they are valid for the current session only or until the driver is unloaded again. `Modprobe` uses the `modprobe.conf` file, but parameters passed to it using the command line override parameters in the `modprobe.conf` file.

Values can be expressed in hexadecimal or decimal notation.

Example of Temporary Configuration

You want to temporarily set `lpfc_lun_queue_depth` to 20 (default is 30) for all host bus adapters in your system. Load the driver with the following command:

```
modprobe lpfc lpfc_lun_queue_depth=20
```

Persistent Configuration Method

To make the driver parameters persistent across module loads and reboots, modify the `/etc/modprobe.conf` file. If driver parameters are modified in `/etc/modprobe.conf`, the driver must be reloaded for the parameters to take effect. Also a new ramdisk image is required if you want the changes to take effect in the next boot. See “Creating a New Ramdisk Image” on page 11 to learn how.

The driver parameters are specified in `/etc/modprobe.conf` via the "options" command. For example the following sets the verbose flag.

```
options lpfc lpfc_log_verbose=0xffff
```

If the same option is specified in both the `/etc/modprobe.conf` and on the `modprobe` command line, the option setting in the command line takes precedence.

Temporary Driver Configuration by Read/Write to sysfs

Sysfs is a virtual filesystem that exposes the structure of the system. It also includes interfaces to driver parameters through which the driver parameters can be viewed and modified. Since these interfaces are available only after driver load, only those parameters that can be modified dynamically can be changed. However, all driver parameters can be read through sysfs.

Note: Sysfs changes only exist during driver load and are lost when the driver is unloaded or rebooted.

The sysfs filesystem is mounted and available as `/sys`. You must first identify the `scsi_host` which represents the adapter for which you wish to modify the driver parameters. All `scsi_hosts` bound to the lpfc driver can be viewed with the following command:

```
# ls -d /sys/bus/pci/drivers/lpfc/*/host*
```

Assuming you are interested in adapter `scsi_host 7`, you can list the driver parameters for this particular adapter as:

```
#ls -l /sys/class/scsi_host/host7/lpfc*
```

An example output is as follows:

```
-r--r--r-- 1 root root 4096 Feb 28 17:03 /sys/class/scsi_host/host7/lpfc_ack0
-rw-r--r-- 1 root root 4096 Feb 28 17:03 /sys/class/scsi_host/host7/lpfc_fcp_bind_method
-r--r--r-- 1 root root 4096 Feb 28 17:03 /sys/class/scsi_host/host7/lpfc_fcp_class
-rw-r--r-- 1 root root 4096 Feb 28 17:03 /sys/class/scsi_host/host7/lpfc_fdmi_on
-r--r--r-- 1 root root 4096 Feb 28 17:03 /sys/class/scsi_host/host7/lpfc_link_speed
-rw-r--r-- 1 root root 4096 Feb 28 15:34 /sys/class/scsi_host/host7/lpfc_log_verbose
-r--r--r-- 1 root root 4096 Feb 28 17:03 /sys/class/scsi_host/host7/lpfc_lun_queue_depth
-rw-r--r-- 1 root root 4096 Feb 28 17:03 /sys/class/scsi_host/host7/lpfc_max_luns
-rw-r--r-- 1 root root 4096 Feb 28 17:03 /sys/class/scsi_host/host7/lpfc_nodev_tmo
-rw-r--r-- 1 root root 4096 Feb 28 17:03 /sys/class/scsi_host/host7/lpfc_scan_down
-r--r--r-- 1 root root 4096 Feb 28 17:03 /sys/class/scsi_host/host7/lpfc_topology
-rw-r--r-- 1 root root 4096 Feb 28 17:03 /sys/class/scsi_host/host7/lpfc_use_adisc
```

Notice that the driver parameters are available as files. Reading a file displays the current value of a driver parameter. If the permissions allow it, you can write a value to the file and it will take effect immediately.

For example:

```
[root@emulex]# cat /sys/class/scsi_host/host7/lpfc_log_verbose
0
```

Notice that the current value of lpfc_log_verbose is zero. To set it to 0xffff:

```
[root@emulex]# echo 0xffff > /sys/class/scsi_host/host7/
lpfc_log_verbose
[root@emulex]# cat /sys/class/scsi_host/host7/lpfc_log_verbose
0xffff
```

Creating a New Ramdisk Image

The lpfc-install script creates a ramdisk containing the lpfc driver for the currently running kernel.

Note: You must perform this step whenever the lpfc options in /etc/modprobe.conf are changed and you want the change to take effect on the next reboot.

For Installed lpfc Driver Kits

To create a new initial ramdisk image:

1. su to 'root'.
2. Type:

```
cd /usr/src/lpfc
```
3. Execute the lpfc-install script using the '--createramdisk' option. Type:

```
./lpfc-install --createramdisk
```

For Distribution In-Box lpfc Drivers

To create a new initial ramdisk image:

- For SLES10 PPC64 architecture distributions type:

```
# mkinitrd -k vmlinux -i initrd
```
- For SLES10 non-PPC64 architecture distributions type:

```
# mkinitrd -k vmlinuz -i initrd
```
- For RHEL5 PPC64 and non-PPC64 architecture distributions type:

```
# mkinitrd -f /boot/initrd-<kernel-version>.img <kernel-version>
```

Dynamically Adding LUNs and Targets

The Emulex driver for Linux enables you to dynamically add LUNs and targets without unloading or reloading the lpfc module and without resetting the adapter.

To rescan an adapter's targets with sysfs given the adapter's host number (in this example 3), type:

```
echo "- - -" > /sys/class/scsi_host/host3/scan
```

To limit the rescan to a particular target, given the adapter's host number (in this example 3) and the target number (in this example 2), type:

```
echo "- 2 -" > /sys/class/scsi_host/host3/scan
```

You can also use the Emulex lun_scan script in /usr/sbin/lpfc.

Driver Parameters Reference Table

The driver parameters determine some aspects of the driver behavior. The following tables list the driver parameters. Some driver parameters can be modified and take effect only on a driver load while others can be modified dynamically and take effect immediately. The tables also list the default, minimum and maximum values for these parameters.

Note: The Linux 2.6 kernel only supports setting the `lpfc_log_verbose`, `lpfc_devloss_tmo` and `lpfc_use_adisc` driver parameters for individual adapters.

Other driver parameters must be applied to all adapters contained in the host.

Table 2: lpfc Static Parameters (Requires a driver reload to change)

Variable	Default	Min	Max	Comments	Visible using sysfs
<code>lpfc_ack0</code>	0	0=Off	1=On	Uses ACK0 for class 2.	Yes
<code>lpfc_dev_loss_initiator</code>	0	0	1	Engage devlos timeout for initiators.	Yes
<code>lpfc_discovery_threads</code>	32	1	64	Specifies the maximum number of ELS commands that can be outstanding for a discovery. NOTE: The <code>discovery_threads</code> parameter defaults to a value of 64 for private loop topologies regardless of the configured value. If there are multiple ports configured on the host the value of 64 is only used for those ports that are connected in a private loop topology. The configured value is used for all other ports.	No
<code>lpfc_enable_da_id</code>	0	0 = Disabled (default) 1 = enable – a DA_ID CT command will be sent to the fabric when logging out.		This parameter controls whether the driver will issue a DA_ID CT command to the fabric when vports logout of the fabric.	No
<code>lpfc_enable_hba_heartbeat</code>	1	0 = heartbeat disabled 1 = heartbeat enabled		Controls the adapter heartbeat logic in the driver. If the heartbeat is enabled and the heartbeat logic detects that the adapter is nonfunctional, the driver will shutdown the adapter.	Yes

Table 2: lpfc Static Parameters (Requires a driver reload to change) (Continued)

Variable	Default	Min	Max	Comments	Visible using sysfs
lpfc_enable_hba_reset	1	0 = hba reset disabled 1 = hba reset enabled		Controls whether hba_resets will be allowed by the driver to pass to the adapter. This is used as a debugging tool.	Yes
lpfc_enable_npiv	0	0	1	This parameter controls the driver's ability to use NPIV to create virtual ports. It defaults to off (0) which prevents the driver from creating any virtual ports. When enabled (set to 1) it enables you to create and delete virtual ports (if supported by the fabric).	Yes
lpfc_fcp_class	3	2	3	The FC class for FCP data transmission.	Yes
lpfc_hba_queue_depth	8192	32	8192	The maximum number of FCP commands that can queue to an Emulex adapter.	Yes
lpfc_lun_queue_depth	30	1	128	The default maximum commands sent to a single logical unit (disk).	Yes
lpfc_scan_down	1	0=Off	1=On	Selects method for scanning ALPA to assign a SCSI ID.	Yes
lpfc_sg_seg_cnt	64	64	256	Controls the max scatter gather segment count passed to the driver.	Yes. Displayed as sg_tablesize
lpfc_sli_mode	0	0 = auto (default) 2 = SLI 2 mode 3 = SLI 3 mode (only available on newer adapters)		This parameter allows you to force the SLI mode requested by the adapter driver.	No
lpfc_max_luns	256	1	32768	Specifies the maximum number of LUN IDs per target. A value of 20 means LUN IDs from 0 to 19 are valid. The SCSI layer scans each target until it reaches the specified LUN ID.	Yes

Table 2: lpfc Static Parameters (Requires a driver reload to change) (Continued)

Variable	Default	Min	Max	Comments	Visible using sysfs
lpfc_max_scsicmpl_time	0	0	60000	Controls the I/O queue depth by using SCSI command completion time. Value is in milliseconds.	Yes
lpfc_multi_ring_rctl	4	1	255	Identifies RCTL for additional ring configuration. NOTE: Only used when multi_ring_support is enabled.	Yes
lpfc_multi_ring_support	1	1	2	Determines the number of primary SLI rings over which to spread IOCB entries.	Yes
lpfc_multi_ring_type	5	1	255	Identifies TYPE for additional ring configuration. NOTE: Only used when multi_ring_support is enabled.	Yes
lpfc_use_msi	0	0 = MSI disabled 1 = MSI enabled 2 = MSI-X enabled		Controls whether the driver uses Message Signaled Interrupts.	Yes

All lpfc dynamic parameters are read/write using sysfs.

Table 3: lpfc Dynamic Parameters (Do not require a driver reload to change)

Variable	Default	Min	Max	Comments
lpfc_cr_count	1	1	255	This parameter determines the values for I/O coalescing for cr_count outstanding commands.
lpfc_cr_delay	0	0	63	This parameter determines the values for I/O coalescing for cr_delay (msec) outstanding commands.
lpfc_devloss_tmo	30	0	255	Seconds to hold I/O error if device disappears.
lpfc_enable_auth	0	0	1	This driver property specifies if the DHCHAP is enabled or not. When set to 1, DHCHAP is enabled. When set to 0, DHCHAP support is disabled. NOTE: This property requires a link reset to activate.
lpfc_fdmi_on	0	0	2	False (0) if disabled. (1) or (2) if enabled depending on type of support needed.

Table 3: lpfc Dynamic Parameters (Do not require a driver reload to change) (Continued)

Variable	Default	Min	Max	Comments
lpfc_link_speed	0	0=auto select 1=1 Gb/s 2=2 Gb/s 4=4 Gb/s 8=8 Gb/s		Sets link speed.
lpfc_log_verbose	0x0	0x0	0xffff	(bit mask) Extra activity logging.
lpfc_nodev_tmo (depreicated)	30	1	255	Seconds to hold I/O error if device disappears. This parameter will not work if you altered lpfc_devloss_tmo. NOTE: This is a deprecated field and lpfc_devloss_tmo should be used instead.
lpfc_pci_max_read	2048	512, 1024, 2048, 4096		Maximum DMA read byte count.
lpfc_poll	0	1= poll wiith interrupts enabled 3 = poll and disable FCP ring interrupts		Sets FCP ring polling mode control.
lpfc_poll_tmo	10	1	255	Milliseconds the driver waits between polling FCP ring interrupts.
lpfc_topology	0	0x0=loop then P2P 0x2=P2P only 0x4=loop only 0x6=P2P then loop		FC link topology (defaults to loop, if it fails attempts point-to-point mode).
lpfc_use_adisc	0	0=Off	1=On	Sends ADISC instead of PLOGI for device discovery or RSCN.

Using udev for Persistent Naming

SLES 10 is configured by default with udev to provide persistent names for hard disks, including FC attached disks.

Using udev to Discover Logical to Physical Mappings for sd Devices

Persistent names for sd devices are provided in the `/dev/disk/by-id` directory.

To find the persistent udev name for the disk which is currently `sdc`, type:

```
# cd /dev/disk/by-id
# ls -l | grep sdc
```

The sample output is shown below:

```
lrwxrwxrwx 1 root root 9 2006-08-01 19:08 scsi-32000000c5005d6e6 -> ../../sdc
```

In the above example, the disk has no partitions. If the disk had two partitions, the output would look like the following:

```
lrwxrwxrwx 1 root root 9 2006-08-01 19:08 scsi-32000000c5005d6e6 -> ../../sdc
lrwxrwxrwx 1 root root 10 2006-08-01 19:08 scsi-32000000c5005d6e6-part1 -> ../../sdc1
lrwxrwxrwx 1 root root 10 2006-08-01 19:08 scsi-32000000c5005d6e6-part2 -> ../../sdc2
```

Configuring the System to Boot From SAN Using Persistent Names

To use a persistent name for a boot device (SLES 10):

1. In `/boot/grub/menu.lst`, find the kernel line for the default boot. For example:

```
kernel /boot/vmlinuz root=/dev/sda2 vga=0x314
```
2. Find the persistent name for the root partition (following "root=" on the kernel line) by using the instructions in "Using udev to Discover Logical to Physical Mappings for sd Devices" on page 16.
3. In the same file, `/boot/grub/menu.lst`, replace the text after "root=" with the partition's persistent name. For example:

```
kernel /boot/vmlinuz root=/dev/disk/by-id/scsi-32000000c5005d6e6-part2 vga=0x314
```
4. Change any mounts listed in `/etc/fstab` which refer to this root partition by either it's `/dev/sd` name or a file system LABEL to use the persistent name as well.

To use a persistent name for a boot device (RHEL 5):

1. In `/boot/grub/grub.conf`, find the kernel line for the default boot. For example:

```
kernel /boot/vmlinuz -<kernel version> ro root=/dev/sda2
```
2. Find the persistent name for the root partition (following "root=" on the kernel line) by using the instructions in "Using udev to Discover Logical to Physical Mappings for sd Devices" on page 16.
3. In the same file, `/boot/grub/menu.lst`, replace the text after "root=" with the partition's persistent name. For example:

```
kernel /boot/vmlinuz -<kernel version> ro root=/dev/disk/by-id/scsi-32000000c5005d6e6-part2
```
4. Change any mounts listed in `/etc/fstab` which refer to this root partition by either it's `/dev/sd` name or a file system LABEL to use the persistent name as well.

Using udev with st Devices

The udev rules for tape devices are the same for disk devices. There must be a unique ID that persists across initiator reboots and persists regardless of discovery order.

Another thing to consider is whether or not the tape device is one of many SCSI tape devices residing behind an FC controller, or if it is an FC-Tape device. If it is an FC-Tape device, then the WWPN is unique and can be used to create the persistent name. In fact, the `scsi_id` program should return this as the unique identifier with a single digit prefix.

If the FC controller has multiple SCSI tape devices behind it, the WWPN is not unique and the persistent name must use multiple information elements to build the unique ID.

Below are examples of each scenario. The first example is that of an FC-Tape device. This example uses SCSI generic (sg) rather than the SCSI tape driver.

```
[root@localhost ~]# scsi_id -g -s /sys/class/scsi_generic/sg0  
350060b000029b592
```

The value returned has a leading prefix of 3. This value is the NAA type and what follows is the controller's WWPN.

Below is an example of the same tape device and a `scsi_id` call. The response is the same.

```
[root@localhost ~]# scsi_id -g -s /sys/class/scsi_tape/nst0  
350060b000029b592
```

In both examples, -g was needed because the vendor and model for this tape device were not in /etc/scsi_id.config.

Below is another example for a different FC-Tape Vendor. Notice that the answer is similar with respect to the leading digit and the WWPN.

```
[root@localhost ~]# /sbin/scsi_id -g -s sys/class/scsi_tape/nst0
35005076300015101
```

Below is an example of a FC-SCSI Tape device. Notice that when the Emulex driver loads, the SCSI midlayer discovers the SCSI tape devices as follows:

```
scsi scan: INQUIRY to host 14 channel 0 id 0 lun 0
scsi: unknown device type 12
Vendor: ADIC      Model: SNC 4000      Rev: 42d4
Type: RAID      ANSI SCSI revision: 03
Attached scsi generic sg5 at scsi14, channel 0, id 0, lun 0, type 12
scsi scan: INQUIRY to host 14 channel 0 id 0 lun 1
Vendor: ADIC      Model: Scalar 24      Rev: 227A
Type: Medium Changer ANSI SCSI revision: 02
Attached scsi generic sg6 at scsi14, channel 0, id 0, lun 1, type 8
scsi scan: INQUIRY to host 14 channel 0 id 0 lun 2
Vendor: IBM      Model: ULTRIUM-TD2      Rev: 38D0
Type: Sequential-Access ANSI SCSI revision: 03
Attached scsi tape st0 at scsi14, channel 0, id 0, lun 2
st0: try direct i/o: yes (alignment 512 B), max page reachable by HBA
4503599627370495
Attached scsi generic sg7 at scsi14, channel 0, id 0, lun 2, type 1
scsi scan: INQUIRY to host 14 channel 0 id 0 lun 3
Vendor: IBM      Model: ULTRIUM-TD2      Rev: 38D0
Type: Sequential-Access ANSI SCSI revision: 03
Attached scsi tape st1 at scsi14, channel 0, id 0, lun 3
st1: try direct i/o: yes (alignment 512 B), max page reachable by HBA
4503599627370495
Attached scsi generic sg8 at scsi14, channel 0, id 0, lun 3, type 1
```

This log output shows a controller at LUN 0, the medium changer at LUN 1 and two SCSI tape devices at LUNs 2 and 3. The example below is what the scsi_id call returns:

```
[root@localhost ~]# scsi_id -g -s /sys/class/scsi_tape/nst0
1IBM      ULTRIUM-TD2      1110133831
[[root@localhost ~]# scsi_id -g -s /sys/class/scsi_tape/nst1
1IBM      ULTRIUM-TD2      1110133994
```

Notice that the unique ID is actually comprised of three value with space delimiters. A udev rule must have a unique ID for the device, meaning all three parts of this returned string are required. To do this, use the following command.

```
[root@localhost ~]# scsi_id -u -g -s /sys/class/scsi_tape/nst0
1IBM_____ULTRIUM-TD2_____1110133831
[root@localhost ~]# scsi_id -u -g -s /sys/class/scsi_tape/nst1
1IBM_____ULTRIUM-TD2_____1110133994
```

Creating the udev persistent name for SCSI tape uses the same process as SCSI disk once the SCSI ID call needed to extract a unique ID is known.

Below is the rule for the FC-Tape device:

```
BUS="scsi", SYSFS{vendor}="HP", SYSFS{model}="ULTRIUM 3-SCSI",
PROGRAM="/sbin/scsi_id -p 0x83 -u -g -s /sys/class/scsi_tape/
nst%n",RESULT="350060b000029b592", SYMLINK="fc_lun_st%n"
```

The rule for the FC-SCSI tape device follows:

```
BUS="scsi", SYSFS{vendor}="IBM", SYSFS{model}="ULTRIUM-TD2",  
PROGRAM="/sbin/scsi_id -p 0x83 -u -g -s /sys/class/scsi_tape/  
nst%n", RESULT="1IBM_____ULTRIUM-TD2_____1110133831",  
SYMLINK="fc_lun_st%n"  
BUS="scsi", RESULT="1IBM_____ULTRIUM-TD2_____1110133994",  
SYMLINK="fc_lun_st%n"
```

Create a new file named `/etc/udev/rules.d/45-local.rules` and put the appropriate rule in it. Then run `udevtrigger` to reload the udev rules.

And finally, here is the output of the rule:

```
[root@localhost ~]# udevtrigger  
[root@localhost ~]# ls -al /dev/fc*  
lrwxrwxrwx 1 root root 3 Apr  7 15:03 fc_lun_st0 -> st0  
lrwxrwxrwx 1 root root 3 Apr  7 15:03 fc_lun_st1 -> st1
```

Further Information About Persistent Names

Refer to the following references for more information on persistent naming:

<http://www.reactivated.net/udevrules.php> by Daniel Drake (dsd)

http://kernel.org/pub/linux/utils/kernel/hotplug/udev_vs_devfs by Greg Kroah-Hartman

http://www.novell.com/documentation/sles10/pdfdoc/stor_evms/stor_evms.pdf

Working with Virtual Ports (vports)

Creating, Deleting and Displaying vports

Vports are created through `sysfs` entries that are presented in the physical port's `sysfs` directory. The `vport_create` and `vport_delete` `sysfs` entries are discussed in the `sysfs` section, but there are also three scripts for creating, deleting and displaying vports. The scripts reside in the `/usr/sbin/lpfc` directory and are part of the HBAnyware Applications kit.

When NPIV is enabled and vports are configured it may take longer for the adapter to finish discovery in some cases due to the fact that each virtual port must perform discovery independently. As more vports are configured the amount of time that the driver and adapter take to finish discovery of remote ports on the SAN will increase. To compensate for this extended amount of time taken in discovery it is recommended that you set the `lpfc_devloss_tmo` parameter to 60 when `npiv` is enabled.

Note: Ensure you are using the latest recommended firmware for vport functionality. Check the Emulex Web site for the latest firmware.

Note: Loop devices and NPIV are not supported on the same port simultaneously. If you are running a loop topology and you create a vport, the vport's link state will be off line.

Note: You can only create virtual ports on 4 Gb/s and 8 Gb/s adapters. You cannot create virtual ports on 1 Gb/s and 2 Gb/s adapters.

The mkvport.sh Script

You can use the mkvport script to create vports. To see the usage information, run the script with no parameters specified. The mkvport.sh script uses the following syntax:

```
./mkvport.sh <Physical Port's Host number> <Port Name> <Node Name>
```

For example:

```
> ./mkvport.sh host7 10000000c94ac63a 20010000c94ac63a
```

would create a vport with port name of 10000000c94ac63a and a node name of 20010000c94ac63a on the physical port with scsi_host name "host7". This script will fail if the vport is not created.

Note: You must supply the physical port's host number, WWPN and WWNN when using the mkvport.sh script.

Note: It is possible for a vport to be created successfully, but be in "failed" state. For example, loop devices and NPIV are not supported on the same port simultaneously. If you are running a loop topology and you create a vport, the vport's link state will be off line.

The rmvport.sh Script

You can use the rmvport script to delete vports. To see the usage information, run the script with no parameters specified. The rmvport.sh script uses the following syntax:

```
./rmvport.sh <Virtual Port's Host number>
```

Or

```
./rmvport.sh <Port Name> <Node Name>
```

For example

```
> ./rmvport.sh 10000000c94ac63a 20010000c94ac63a
```

would delete the vport with port name of 10000000c94ac63a and node name of 20010000c94ac63a. This script will fail if the vport is not deleted and may take up to 30 seconds to complete.

Note: You must un-map, un-mount, and flush I/O to vport connected devices before deleting the vport.

The lsvport.sh Script

You can use the lsvport script to list the vports and physical ports that are present on the system. Run the script with no parameters to display port information.

For example:

```
[root@curly scripts]# ./lsvport.sh
lpfc0: host6 10000000c93a5b5e:20000000c93a5b5e LP10000 NPIV Not Supported
lpfc1: host7 10000000c93a5b5d:20000000c93a5b5d LP10000 NPIV Not Supported
lpfc2: host8 10000000c93cc8dd:20000000c93cc8dd LPe12000 NPIV Physical
lpfc4: host10 10000000c94ac63a:20010000c94ac63a NPIV Virtual (VPI 1)
lpfc3: host9 10000000c93cc8dc:20000000c93cc8dc LPe12000 NPIV Physical
[root@curly scripts]#
```

For LPFC0 and LPFC1, “NPIV Not Supported” means that this adapter/firmware combination does not support the creation of vports.

For LPFC2, “NPIV Physical” refers to a physical port of this adapter.

For LPFC4, “NPIV Virtual” refers to a vport of this adapter.

The vport Sysfs Tree

When a vport is created, two new directories are created in the class tree:

```
/sys/class/scsi_host/hostY/  
/sys/class/fc_host/hostY/
```

Creating a new vport also creates a new sysfs directory in the bus and devices tree:

```
[root@curly scripts]# ls /sys/bus/pci/drivers/lpfc/0000:07:00.0/host8/  
fc_host:host8 host10 power scsi_host:host8 uevent  
[root@curly scripts]# ls /sys/bus/pci/drivers/lpfc/0000:07:00.0/host8/host10  
fc_host:host10 power scsi_host:host10 uevent
```

Above host 8 is the physical port and host 10 is a virtual port that was created on host 8.

Driver Version 8.2.0.x sysfs Structure

For the 8.2.0.x driver the `fc_vport` directory does not exist (yet) so a link from the physical port to the vport is present in the `fc_host`'s device directory.

```
[root@doc ~]# ls /sys/class/fc_host/host5/device/  
fc_host:host5 power scsi_host:host5  
host6 uevent
```

To find the vports that have been created by a physical port you can list the `fc_host`'s device directory for the physical port. This gives you a link to the `fc_host` and `scsi_host` directory as usual, but also displays a list of vports (in the form of `hostx`) that were created on this physical port. In the previous example, `host6` is a vport of physical port `host5`.

Vport sysfs Entries

The following table describes vport sysfs entries.

Note: Vport sysfs entries in Table 5 are only present if the driver was loaded with `lpfc_enable_npiv` enabled.

Table 4: Vport sysfs Entries

Vport sysfs Entries	Type	Range/ Input	Location and Description
<code>npiv_vports_inuse</code>	read-only	integers	<p><code>/sys/class/scsi_host/hostX/npiv_vports_inuse</code></p> <p>This entry displays the number of vports that were created on this <code>fc_host</code>. This sysfs entry will only exist if the <code>vport_create</code> and <code>vport_delete</code> sysfs entries exist. If an <code>fc_host</code> does not support NPIV then this sysfs entry may not exist.</p> <p>NOTE: Use this sysfs entry along with <code>max_npiv_vports</code> to determine whether the maximum number of vports have been created on this <code>fc_host</code>.</p>
<code>max_npiv_vports</code>	read-only	integers	<p><code>/sys/class/scsi_host/hostX/max_npiv_vports</code></p> <p>This entry displays the maximum number of vports that are supported by the <code>fc_hosts</code> underlying hardware. This sysfs entry will only exist if the <code>vport_create</code> and <code>vport_delete</code> sysfs entries exist. If an <code>fc_host</code> does not support NPIV then this sysfs entry may not exist.</p> <p>NOTE: Use this sysfs entry along with <code>npiv_vports_inuse</code> to determine whether the maximum number of vports have been created on this <code>fc_host</code>.</p>
<code>vport_create</code>	write-only	WWPN; WWNN	<p><code>/sys/class/scsi_host/hostX/vport_create</code></p> <p>This entry creates a vport on the physical port that <code>hostX</code> is located on. The new vport will have present a WWPN and WWNN on the fabric as indicated by the WWPN and WWNN that is input to this sysfs entry. This sysfs entry will return a 0 if the vport creation was successful. A non-zero value indicates that the vport failed to be created. If an <code>fc_host</code> does not support NPIV then this sysfs entry may not exist.</p> <p>NOTE: It is possible for the vport creation to succeed but for the vport to be in a failed or inoperative state. Use the new sysfs tree created by the new vport to check the state of the new vport.</p>

Table 4: Vport sysfs Entries (Continued)

Vport sysfs Entries	Type	Range/ Input	Location and Description
vport_delete	write-only	WWPN; WWNN	<p>/sys/class/scsi_host/hostX/vport_delete</p> <p>This entry deletes a vport on the physical port that hostX is located on. The vport matching the WWPN and WWNN will be immediately deleted. This entry returns a 0 if the vport deletion was successful. A non-zero value indicates that the vport failed to be deleted. If an fc_host does not support NPIV then this sysfs entry may not exist.</p> <p>NOTE: This entry will delete the vport even if there are mounted file systems being accessed through this vport and/or open files.</p>
node_name	read-only	16 byte hex. value	<p>/sys/class/fc_host/hostX/node_name</p> <p>This entry displays the physical or virtual port's node name. This is the value that is assigned by you upon creation and transmitted to the fabric upon fabric login.</p>
port_name	read-only	16 byte hex. value	<p>/sys/class/fc_host/hostX/port_name</p> <p>This entry displays the physical or virtual port's port name. This is the value that you assign when you create a vport. It is transmitted to the fabric upon fabric login.</p>
lpfc_restrict_login	read/ write	0=Off 1=On (default)	<p>/sys/class/scsi_host/hostX/lpfc_restrict_login (vports only)</p> <p>This entry sets the vport's behavior when discovering targets in the SAN. The default behavior (1) prevents the vport from logging into other initiator ports in the SAN. It will also reject logins from other ports in the SAN because it assumes that all ports that send a PLOGI are initiators. When this sysfs entry is turned off the driver will attempt to log in to every port that it can access in the SAN and will accept logins from all ports.</p> <p>NOTE: This parameter was created to reduce the amount of hardware resources (RPI) that the driver requires. In a SAN where there are other initiators this feature will greatly reduce the number of RPI that the driver utilizes.</p>
lpfc_peer_port_login	read/ write	0=Off (default) 1=On	<p>/sys/class/scsi_host/hostX/lpfc_peer_port_login</p> <p>This entry sets the port's behavior when discovering targets in the SAN. The default behavior (0) will only log in to nports that are physically located on a different port. The port will still attempt to log in to targets on all other ports (including the other port in a dual ported adapter). If this parameter is turned on (1) then the port will attempt to log in to all nports, even if they are physically located on the same port.</p> <p>NOTE: This parameter was created to reduce the amount of hardware resources (RPI) that the driver requires. In a configuration where there are many vports on one physical port this feature will greatly reduce the number of RPI that the driver utilizes.</p>

Vport Configuration Limits

The following is a list of limits that are supported by the 8.2 driver and configurations that were tested with it. It is highly recommended that you adhere to these limits. Configurations exceeding any one or more of these limits are unsupported. These limits are broken up into two groups. Enforced limits are limits that the driver is able to enforce and will prevent you from exceeding. Un-enforced limits are limits that the driver cannot enforce and configurations that exceed these limits are unsupported.

Configuration limits:

- All I/O to devices accessed through a vport must be stopped and all file systems must be unmounted before the vport is deleted.
- Delete all vports created from each physical port before unloading the driver for those physical ports.
- For enterprise class adapters, the maximum number of virtual ports configurable on a physical port is 64. The hardware will allow more than 64 vports to be created, but the driver has only been qualified at 64. For mid-range adapters, the maximum number of vports configurable on a physical port is 16.
- The maximum number of LUNs supported on each driver port is 256.
- The maximum number of targets supported for each driver port is 255.
- The maximum number of driver ports in one zone is 64. This limit is based on the system's ability to recover from link events within the time constraints of the default timers. The use-cases of NPIV that involve virtual server environment include associating a virtual port with a virtual machine, and placing the virtual machine in its own zone. This will result in one virtual port per zone. In the case of load balanced environments, this can increase typically to two virtual ports per virtual machine, to a practical limit of something far less than 50. In the NPIV cases not related to virtual server environments, zoning will typically be initiator-zoning, again resulting in one virtual port, or a low number of virtual ports in the case of load-balancing, within a given zone. If there are too many virtual ports within a single zone, expected behavior will include devices going lost after link events.
- Minimum lifetime of a virtual port: 60 seconds. There is an un-enforced limit of 60 seconds between the creation of a virtual port and the deletion of the same virtual port. Virtual ports are designed to be an entity that lives for a long time in the system and the creation of vports is asynchronous. This means that a virtual port might not be finished with Fibre Channel or SCSI discovery when the command to create a virtual port is finished.
- SMB (3 digit model number) adapters must be zoned so that they can not access adapters with virtual ports configured. SMB adapters have a limited number of resources that make it impossible to operate in the same zone as an adapter that has configured virtual ports.

Troubleshooting

Introduction

There are several circumstances in which your system may operate in an unexpected manner. The Troubleshooting section explains many of these circumstances and offers one or more workarounds for each situation.

Unusual Situations and their Resolutions

General Situations

Table 5: General Driver Situations

Situation	Resolution
<p>FC link fails to come up.</p>	<p>If an FC link fails to come up, verify that an 8 Gb/s adapter is not attempting to connect to a 1 Gb/s device. Only 2, 4 and 8 Gb/s devices are supported on 8 Gb/sec adapters.</p> <p>For LP21000 adapters, ensure the adapter is not in maintenance mode and that it is not running the manufacturing firmware.</p>
<p>Error states “Authentication is enabled but authentication service is not running.”</p>	<p>If you see this message in /var/log/messages and the adapter is in an “Error” state, the fcauthd daemon probably is not running. To check if fcauthd is running execute /etc/init.d/fcauthd status. To start fcauthd execute /etc/init.d/fcauthd start.</p>
<p>If a SAN configuration has 256 targets mapped by the lpfc driver, any additional added targets do not get a target ID mapping by the driver and cause target discovery to fail. Removing targets or reinitializing the link does not solve the problem.</p>	<p>Unload and reload the driver to reset available target IDs. Ensure that the SAN configuration is correct prior to rebooting the driver. This will clear the driver’s consistent binding table and free target IDs for new target nodes.</p>
<p>In some cases, after loading an OEM supplied combined firmware/OpenBoot image you will not be able to enable BootBIOS from the lputil Boot BIOS Maintenance menu. Should you encounter this problem after loading the OEM combined firmware/ OpenBoot image, follow the steps outlined in the resolution.</p>	<ol style="list-style-type: none"> 1. Download the current OpenBoot only image for your adapter from the Emulex Web site. 2. Load the current OpenBoot only image following steps listed in Updating BootBIOS section of this manual. 3. Run lputil, return to Boot BIOS Maintenance menu. 4. Enable BootBIOS.

Table 5: General Driver Situations (Continued)

Situation	Resolution
<p>rmmod fails to unload lpfc driver module due to ERROR: Module lpfc is in use. This message can appear when you attempt to remove the driver and there is a Logical Volume Group dependent on the driver.</p>	<ol style="list-style-type: none"> 1. Make the Logical Volume Group unavailable. Type: <code>lvchange -a n xxxxxx</code> where xxxxxx is the Volume Group Name. 2. Stop the HBAnyware utility. 3. Stop Device Mapper.
<p>rmmod of lpfc driver hangs and module reference count is 0.</p>	<p>Due to a small race condition in the kernel it is possible for an <code>rmmod</code> command to hang. Issue the <code>rmmod -w</code> command. If this does not help, reboot the computer.</p>
<p>rmmod fails to unload driver due to Device or resource busy. This message occurs when you attempt to remove the driver without first stopping the HBAnyware utility or the <code>fcauthd</code> daemon, when the HBAnyware utility is installed and running or when FC disks connected to a LightPulse adapter are mounted.</p>	<p>Stop the HBAnyware utility before attempting to unload the driver. The script is located in the <code>/usr/sbin/hbanyware</code> directory. Type: <code>./stop_hbanyware</code> Unmount any disks connected to the adapter. Unload the driver. Type: <code>rmmod lpfcdfc</code> Type: <code>rmmod lpfc</code></p>
<p>An lspci will show recent Emulex adapters as "unknown". This is because of the delay of getting new product ID's into the Linux development cycle.</p>	<p>None at this time.</p>
<p>Slow targets or extended link faults on the storage side may result in storage being marked off-line by the mid-layer and remaining off-line (not recovered) when the link faults are corrected.</p>	<p>This version of the driver should eliminate this problem. However, should you experience off-line device issues, increase the SCSI command timeout to a value greater than or equal to sixty seconds. Emulex also provides a script which addresses this issue (for 2.6 kernels). To access the <code>lun_change_state.sh</code> script, click http://www.emulex.com/support/linux/index.jsp, then click the link to the appropriate driver, and click the Linux tools link.</p>
<p>Under certain conditions of an I/O load, some targets cannot retire an I/O issued by a Linux initiator within the default timeout of 30 seconds given by the scsi midlayer. If the situation is not corrected, the initiator-to-target condition deteriorates into abort/recovery storms leading to I/O failures in the block layer. These types of failures are preceded by a SCSI IO error of hex 6000000.</p>	<p>Emulex provides a script which addresses this issue. To access the <code>set_target_timeout.sh</code> script, click http://www.emulex.com/support/linux/index.jsp, then click the link to the appropriate driver, and click the Linux tools link.</p>
<p>lpfc driver fails to recognize an adapter and logs "unknown IOCB" messages in the system log during driver load. The adapter is running outdated firmware.</p>	<p>Upgrade adapter firmware to minimum supported revision listed in installation guide (or newer).</p>
<p>Loading the lpfc driver on SLES 10 reports "unsupported module, tainting kernel" in system log.</p>	<p>This message is logged by the kernel whenever a module which is not shipped with the kernel is loaded. This message can be ignored.</p>
<p>System panics when booted with a failed adapter installed.</p>	<p>Remove the failed adapter and reboot.</p>

Table 5: General Driver Situations (Continued)

Situation	Resolution
<p>lpfc driver unload on SLES 10 causes messages like the following to be logged in the system log: "umount: /dev/disk/bypath/pci-0000:02:04.0-scsi-0:0:1:0: not mounted"</p>	<p>These messages are normal output from the SLES 10 hotplug scripts and can be safely ignored.</p>
<p>Driver Install Fails. The lpfc-install script fails to install the driver.</p>	<p>The install script may fail for the following reasons:</p> <ul style="list-style-type: none"> • A previous version of the driver is installed. Run the lpfc-install --uninstall script and then try to install the driver. • The current driver is already installed. • Run a supported RHEL or SLES kernel.
<p>"No module lpfc found for kernel" error message. When upgrading the kernel, rpm generates the following error: "No module lpfc found for kernel KERNELVERSION".</p> <p>A recently upgraded kernel cannot find the ramdisk. After upgrading the kernel, the kernel cannot find the ramdisk which halts or panics the system.</p> <p>The driver is not loaded after a system reboot after upgrading the kernel.</p>	<p>These three situations may be resolved by upgrading the kernel. There are two ways to install the driver into an upgraded kernel. The method you use depends on whether or not you are upgrading the driver.</p> <ul style="list-style-type: none"> • Upgrade the kernel using the same version of the driver. • Upgrade the kernel using a new version of the driver. <p>See the Installation section for these procedures.</p>
<p>Driver uninstall fails. The lpfc-install --uninstall script fails with an error.</p>	<p>Try the following solutions:</p> <ul style="list-style-type: none"> • Uninstall the HBAnyware and SSC software packages. These can be removed by running the ./uninstall script from the HBAnyware installation directory. • Unmount all FC disk drives. • Unload the lpfc and lpfc driver. • Use rpm -e lpfcdriver and -e hbaanyware and uninstall the new kits.
<p>The HBAnyware software package will not install. An error message states that: "inserv Service Elxlpfc has to be enabled for service ElxDiscSrvinserv: exiting now/sbin/ inserv failed exit code 1."</p>	<p>Reinstall the driver with the lpfc-install script.</p>

Table 5: General Driver Situations (Continued)

Situation	Resolution
<p>The Emulex driver for Linux does not load in ramdisk for a custom built kernel.</p>	<p>Custom built kernels are not supported by Emulex. However, the Emulex install script will attempt to install the driver into a ramdisk that follows the naming scheme used by Red Hat or SLES kernels.</p> <ul style="list-style-type: none"> • The SLES naming scheme for IA64 ramdisk images is: <code>/boot/efi/efi/suse/initrd</code>. • The SLES naming scheme for ramdisk images on all other architectures is: <code>/boot/initrd</code>. <p>If a custom built kernel has a ramdisk image that does not follow the appropriate naming scheme, the name of the image can be changed using the following procedure:</p> <ol style="list-style-type: none"> 1. Change the name of the ramdisk image to match the SLES naming scheme. 2. Update any file links to the ramdisk image. 3. Edit the boot loader configuration file: (i.e., <code>/etc/lilo.conf</code>, <code>/etc/yaboot.conf</code>, <code>/boot/grub/grub.conf</code>, <code>/boot/grub/menu.lst</code>), find any references to the old ramdisk image name, and replace them with the new name. 4. Reboot the system to verify the changes. 5. Install the Emulex lpfc Linux driver kit.
<p>The Linux SCSI subsystem only sees 8 LUNs when more are present.</p>	<p>Some SCSI drivers will not scan past 8 LUNs when the target reports as a SCSI-2 device. Force SCSI bus scan with <code>/usr/sbin/lpfc/lun_scan</code>. SuSE supplies <code>/bin/rescan-scsi-bus.sh</code> which can be changed to scan everything.</p>
<p>Cannot See Multiple Zones from the Management Server. Cannot see multiple zones on the same screen of my management server running the HBAnyware utility.</p>	<p>Provide a physical FC connection into each of the zones. For each zone you want to see, connect an Emulex HBAnyware utility enabled port into that zone. Use Out-of-Band discovery, Ethernet, to connect to the undiscovered server.</p>

Ipfc Log Messages

Introducton

Log messages are organized into logical groups based on code functionality within the Fibre Channel driver. Each group consists of a block of 100 log message numbers. Most groups require a single block of 100 message numbers, however some groups (INIT, FCP) require two blocks. Log messages are located in `/var/log/messages`.

The groups and the associated number ranges are defined in the Message Log table below.

Table 6: Message Log Table

LOG Message Verbose Mask Definition	From	To	Verbose Bit	Verbose Description
LOG_ELS	0100	0199	0x1	ELS events
LOG_DISCOVERY	0200	0299	0x2	Link discovery events
LOG_SLI	0300	0399	0x800	SLI events
LOG_MBOX	0300	0339	0x4	Mailbox events
LOG_TEMP	0340	0347	0x100	Temperature sensor events
LOG_INIT	0400	0499	0x8	Initialization events
Reserved	0500	0599		
LOG_IP	0600	0699	0x20	IPFC events
LOG_FCP	0700	0799	0x40	FCP traffic history
Reserved	0800	0899		
LOG_NODE	0900	0999	0x80	Node table events
LOG_SECURITY	1000	1099	0x8000	FC Security
Reserved	1100	1199		
LOG_MISC LOG_FCoE	1200	1299	0x400	Miscellaneous and FCoE events
LOG_LINK_EVENT	1300	1399	0x10	Link events
Reserved	1400	1499		
Reserved	1500	1599		

Table 6: Message Log Table (Continued)

LOG Message Verbose Mask Definition	From	To	Verbose Bit	Verbose Description
LOG_LIBDFC	1600	1699	0x2000	IOCTL events
LOG_VPORT	1800	1832	0x4000	NPIV events
LOG_ALL_MSG	0100	1699	0xffff	Log all messages

Message Log Example

The following is an example of a LOG message:

```
Jul  2 04:23:34 daffy kernel: lpfc 0000:03:06.0: 0:1305 Link Down
Event x2f2 received Data: x2f2 x20 x110
```

In the above LOG message:

- lpfc 0000:03:06.0: identifies the identifies the pci location of the particular lpfc hw port.
- 0: identifies Emulex HBA0.
- 1305 identifies the LOG message number.

Note: If the word 'Data:' is present in a LOG message, any information to the right of 'Data:' is intended for Emulex technical support/engineering use only.

ELS Events (0100 - 0199)

elx_mes0100: FLOGI failure

DESCRIPTION: An ELS FLOGI command that was sent to the fabric failed.

DATA: (1) ulpStatus (2) ulpWord[4] (3) ulpTimeout

SEVERITY: Information

LOG: LOG_ELS verbose

ACTION: No action needed, informational.

elx_mes0101: FLOGI completes successfully

DESCRIPTION: An ELS FLOGI command that was sent to the fabric succeeded.

DATA: (1) ulpWord[4] (2) e_d_tov (3) r_a_tov (4) edtovResolution

SEVERITY: Information

LOG: LOG_ELS verbose

ACTION: No action needed, informational.

elx_mes0102: PLOGI completes to NPort <nlp_DID>

DESCRIPTION: The HBA performed a PLOGI into a remote NPort.

DATA: (1) ulpStatus (2) ulpWord[4] (3) ulpTimeout (4)disc (5) num_disc_nodes

SEVERITY: Information

LOG: LOG_ELS verbose

ACTION: No action needed, informational.

elx_mes0103: PRLI completes to NPort <nlp_DID>

DESCRIPTION: The HBA performed a PRLI into a remote NPort.
DATA: (1) ulpStatus (2) ulpWord[4] (3) ulpTimeout (4) num_disc_nodes
SEVERITY: Information
LOG: LOG_ELS verbose
ACTION: No action needed, informational.

elx_mes0104: ADISC completes to NPort <nlp_DID>

DESCRIPTION: The HBA performed a ADISC into a remote NPort.
DATA: (1) ulpStatus (2) ulpWord[4] (3) ulpTimeout (4) disc (5) num_disc_nodes
SEVERITY: Information
LOG: LOG_ELS verbose
ACTION: No action needed, informational.

elx_mes0105: LOGO completes to NPort <nlp_DID>

DESCRIPTION: The HBA performed a LOGO to a remote NPort.
DATA: (1) ulpStatus (2) ulpWord[4] (3) ulpTimeout (4) num_disc_nodes
SEVERITY: Information
LOG: LOG_ELS verbose
ACTION: No action needed, informational.

elx_mes0106: ELS cmd tag <ulploTag> completes

DESCRIPTION: The specific ELS command was completed by the firmware.
DATA: (1) ulpStatus (2) ulpWord[4] (3) ulpTimeout
SEVERITY: Information
LOG: LOG_ELS verbose
ACTION: No action needed, informational.

elx_mes0107: Retry ELS command <elsCmd> to remote NPORT <did>

DESCRIPTION: The driver is retrying the specific ELS command.
DATA: (1) retry (2) delay
SEVERITY: Information
LOG: LOG_ELS verbose
ACTION: No action needed, informational.

elx_mes0108: No retry ELS command <elsCmd> to remote NPORT <did>

DESCRIPTION: The driver decided not to retry the specific ELS command that failed.
DATA: (1) retry
SEVERITY: Information
LOG: LOG_ELS verbose
ACTION: No action needed, informational.

elx_mes0109: ACC to LOGO completes to NPort <nlp_DID>

DESCRIPTION: The driver received a LOGO from a remote NPort and successfully issued an ACC response.
DATA: (1) nlp_flag (2) nlp_state (3) nlp_rpi
SEVERITY: Information
LOG: LOG_ELS verbose
ACTION: No action needed, informational.

elx_mes0110: ELS response tag <ulploTag> completes

DESCRIPTION: The specific ELS response was completed by the firmware.

DATA: (1) ulpStatus (2) ulpWord[4] (3) nlp_DID (4) nlp_flag (5) nlp_state (6) nlp_rpi

SEVERITY: Information

LOG: LOG_ELS verbose

ACTION: No action needed, informational.

elx_mes0111: Dropping received ELS cmd

DESCRIPTION: The driver decided to drop an ELS Response ring entry.

DATA: (1) ulpStatus (2) ulpWord[4] (3) ulpTimeout

SEVERITY: Error

LOG: Always

ACTION: This error could indicate a software driver or firmware problem. If problems persist report these errors to Technical Support.

elx_mes0112: ELS command <elsCmd> received from NPORT <did>

DESCRIPTION: Received the specific ELS command from a remote NPort.

DATA: (1) hba_state

SEVERITY: Information

LOG: LOG_ELS verbose

ACTION: No action needed, informational.

elx_mes0113: An FLOGI ELS command <elsCmd> was received from DID <did> in Loop Mode

DESCRIPTION: While in Loop Mode an unknown or unsupported ELS command was received.

DATA: None

SEVERITY: Error

LOG: Always

ACTION: Check device DID.

elx_mes0114: PLOGI chkparm OK

DESCRIPTION: Received a PLOGI from a remote NPORT and its Fibre Channel service parameters match this HBA. Request can be accepted.

DATA: (1) nlp_DID (2) nlp_state (3) nlp_flag (4) nlp_Rpi

SEVERITY: Information

LOG: LOG_ELS verbose

ACTION: No action needed, informational.

elx_mes0115: Unknown ELS command <elsCmd> received from NPORT <did>

DESCRIPTION: Received an unsupported ELS command from a remote NPORT.

DATA: None

SEVERITY: Error

LOG: Always

ACTION: Check remote NPORT for potential problem.

elx_mes0116: Xmit ELS command <elsCmd> to remote NPORT <did>

DESCRIPTION: Xmit ELS command to remote NPORT.

DATA: (1) icmd->ulploTag (2) hba_state

SEVERITY: Information

LOG: LOG_ELS verbose

ACTION: No action needed, informational.

elx_mes0117: Xmit ELS response <elsCmd> to remote NPORT <did>

DESCRIPTION: Xmit ELS response to remote NPORT.

DATA: (1) icmd->ulploTag (2) size

SEVERITY: Information

LOG: LOG_ELS verbose

ACTION: No action needed, informational.

elx_mes0118: Xmit ELS RPS ACC response tag <ulploTag>

DESCRIPTION: An RPS ACC response for the specified IO tag has been sent.

DATA:(1) ulpContext (2) nlp_DID (3) nlp_flag (4) nlp_state (5) nlp_rpi

SEVERITY: Information

LOG: LOG_ELS verbose

ACTION: None required.

elx_mes0119: Issue GEN REQ IOCB for NPORT <ulpWord[5]>

DESCRIPTION: Issue a GEN REQ IOCB for remote NPORT. These are typically used for CT request.

DATA: (1) ulploTag (2) hba_state

SEVERITY: Information

LOG: LOG_ELS verbose

ACTION: No action needed, informational.

elx_mes0120: Xmit ELS RPL ACC response tag <ulploTag>

DESCRIPTION: An RPL ACC response for the specified IO tag has been sent.

DATA:(1) ulpContext (2) nlp_DID (3) nlp_flag (4) nlp_state (5) nlp_rpi

SEVERITY: Information

LOG: LOG_ELS verbose

ACTION: None required

elx_mes0121: PLOGI chkparm OK

DESCRIPTION: Received a PLOGI from a remote NPORT and its Fibre Channel service parameters match this HBA. Request can be accepted.

DATA: (1) nlp_DID (2) nlp_state (3) nlp_flag (4) nlp_Rpi

SEVERITY: Information

LOG: LOG_ELS verbose

ACTION: No action needed, informational.

elx_mes0125: FDISC Failed (x%x). Fabric out of resources

DESCRIPTION: The fabric rejected an FDISC because the switch can not support any more Virtual ports.

DATA: IsRjtError

SEVERITY: Error

LOG: Always

ACTION: Reconfigure the switch to support more NPIV loggins. If problem persists, contact Technical Support.

elx_mes0127: ELS timeout

DESCRIPTION: An ELS IOCB command was posted to a ring and did not complete within ULP timeout seconds.

DATA: (1) elscmd (2) remote_id (3) ulpcommand (4) ulploTag

SEVERITY: Error

LOG: Always

ACTION: If no ELS command is going through the adapter, reboot the system; If problem persists, contact Technical Support.

elx_mes0128 - Xmit ELS ACC response tag <ulploTag>

DESCRIPTION: An ELS accept response for the specified IO tag has been sent.

DATA: (1) ulpContext (2) nlp_DID (3) nlp_flag (4) nlp_state (5) nlp_rpi

SEVERITY: Information

LOG: LOG_ELS verbose

ACTION: No action needed, informational.

elx_mes0129 - Xmit ELS RJT <rejectError> response tag <ulploTag>

DESCRIPTION: An ELS reject response with the specified error for the specified IO tag has been sent.

DATA: (1) ulpContext (2) nlp_DID (3) nlp_flag (4) nlp_state (5) nlp_rpi

SEVERITY: Information

LOG: LOG_ELS verbose

ACTION: No action needed, informational.

elx_mes0130 - Xmit ADISC ACC response tag <ulploTag>

DESCRIPTION: An ADISC ACC response for the specified IO tag has been sent.

DATA: (1) ulpContext (2) nlp_DID (3) nlp_flag (4) nlp_state (5) nlp_rpi

SEVERITY: Information

LOG: LOG_ELS verbose

ACTION: No action needed, informational.

elx_mes0131 - Xmit PRLI ACC response tag <ulploTag>

DESCRIPTION: A PRLI ACC response for the specified IO tag has been sent.

DATA: (1) ulpContext (2) nlp_DID (3) nlp_flag (4) nlp_state (5) nlp_rpi

SEVERITY: Information

LOG: LOG_ELS verbose

ACTION: No action needed, informational.

elx_mes0132 - Xmit RNID ACC response tag <ulploTag>

DESCRIPTION: A RNID ACC response for the specified IO tag has been sent.

DATA: (1) ulpContext

SEVERITY: Information

LOG: LOG_ELS verbose

ACTION: No action needed, informational.

Link Discovery Events (0200 - 0299)

elx_mes0200: CONFIG_LINK bad hba state <hba_state>

DESCRIPTION: A CONFIG_LINK mbox command completed and the driver was not in the right state.

DATA: None

SEVERITY: Error

LOG: Always

ACTION: Software driver error. If this problem persists, report these errors to Technical Support.

elx_mes0202: Start Discovery hba state <hba_state>

DESCRIPTION: Device discovery / rediscovery after FLOGI, FAN or RSCN has started.

DATA: (1) fc_flag (2) fc_plogi_cnt (3) fc_adisc_cnt

SEVERITY: Information

LOG: LOG_DISCOVERY verbose

ACTION: No action needed, informational.

elx_mes0203: Devloss timeout on WWPN <address> NPort <nlp_DID>

DESCRIPTION: A remote NPort that was discovered by the driver disappeared for more than lpfc_devloss_tmo seconds.

DATA: (1) nlp_flag (2) nlp_state (3) nlp_rpi

SEVERITY: Error

LOG: Always

ACTION: If the device generating this message is not a target to which the HBA is connected, this error will not affect the data integrity of the I/O between the HBA and the attached storage and can be ignored.

elx_mes0204: Devloss timeout on WWPN <address> NPort <nlp_DID>

DESCRIPTION: A remote NPort that was discovered by the driver disappeared for more than lpfc_devloss_tmo seconds.

DATA: (1) nlp_flag (2) nlp_state (3) nlp_rpi

SEVERITY: Informational

LOG: LOG_DISCOVERY verbose

ACTION: If the device generating this message is not a target to which the HBA is connected, this error will not affect the data integrity of the I/O between the HBA and the attached storage and can be ignored.

elx_mes0205: Abort outstanding I/O on NPort <Fabric_DID>

DESCRIPTION: All outstanding I/Os are cleaned up on the specified remote NPort.

DATA: (1) nlp_flag (2) nlp_state (3) nlp_rpi

SEVERITY: Information

LOG: LOG_DISCOVERY verbose

ACTION: No action needed, informational.

elx_mes0206: Device discovery completion error

DESCRIPTION: This indicates that an uncorrectable error was encountered during device (re)discovery after a link up. Fibre Channel devices will not be accessible if this message is displayed.

DATA: None

SEVERITY: Error

LOG: Always

ACTION: Reboot the system. If the problem persists, report the error to Technical Support. Run with verbose mode on for more details.

elx_mes0207: Device <DID> (<WWN>) sent invalid service parameters. Ignoring device.

DESCRIPTION: Invalid service parameters were received from DID. Ignoring this remote port.

DATA: DID, WWN

SEVERITY: Error

LOG: Always

ACTION: Verify the remote port's configuration. If the problem persists, report the error to Technical Support. Run with verbose mode on for more details.

elx_mes0208: Skip <Did> NameServer Rsp

DESCRIPTION: The driver received a NameServer response.

DATA: (1) size (2) fc_flag (3) fc_rscn_id_cnt

SEVERITY: Information

LOG: LOG_DISCOVERY verbose

ACTION: No action needed, informational.

elx_mes0209: CT request completes <ulpStatus> <ulpStatus> <CmdRsp> <CmdRsp>

DESCRIPTION: A RFT request that was sent to the fabric completed.

DATA: latt, ulpStatus, CmdRsp, Context, Tag

SEVERITY: Information

LOG: LOG_DISCOVERY verbose

ACTION: No action needed, informational.

elx_mes0210: Continue discovery with <num_disc_nodes> ADISCs to go

DESCRIPTION: A device discovery is in progress.

DATA: (1) fc_adisc_cnt (2) fc_flag (3) phba->hba_state

SEVERITY: Information

LOG: LOG_DISCOVERY verbose

ACTION: No action needed, informational.

elx_mes0211: DSM in event <evt> on NPort <nlp_DID> in state <cur_state>

DESCRIPTION: The driver Discovery State Machine is processing an event.

DATA: (1) nlp_flag

SEVERITY: Information

LOG: LOG_DISCOVERY verbose

ACTION: No action needed, informational.

elx_mes0212: DSM out state <rc> on NPort <nlp_DID>

DESCRIPTION: The driver Discovery State Machine completed processing an event.

DATA: (1) nlp_flag

SEVERITY: Information

LOG: LOG_DISCOVERY verbose

ACTION: No action needed, informational.

elx_mes0214: RSCN received

DESCRIPTION: An RSCN ELS command was received from a fabric.

DATA: (1) fc_flag (2) payload_len (3) *lp (4) fc_rscn_id_cnt

SEVERITY: Information

LOG: LOG_DISCOVERY verbose

ACTION: No action needed, informational.

elx_mes0215: RSCN processed

DESCRIPTION: An RSCN ELS command was received from a fabric and processed.

DATA: (1) fc_flag (2) cnt (3) fc_rscn_id_cnt (4) hba_state

SEVERITY: Information

LOG: LOG_DISCOVERY verbose

ACTION: No action needed, informational.

elx_mes0217: Unknown Identifier in RSCN payload

DESCRIPTION: Typically the identifier in the RSCN payload specifies a domain, area or a specific NportID. If neither of these are specified, a warning will be recorded.

DATA: (1) un.word

SEVERITY: Error

LOG: Always

ACTION: Potential problem with Fabric. Check with Fabric vendor.

elx_mes0218: FDMI Request

DESCRIPTION: The driver is sending an FDMI request to the fabric.

DATA: (1) fc_flag (2) hba_state (3) cmdcode

SEVERITY: Information

LOG: LOG_DISCOVERY verbose

ACTION: No action needed, informational.

elx_mes0220: FDMI rsp failed

DESCRIPTION: An error response was received to FDMI request.

DATA:(1) SWAP_DATA16(fdmi_cmd)

SEVERITY: Information

LOG: LOG_DISCOVERY verbose

ACTION: The fabric does not support FDMI, check fabric configuration.

elx_mes0221: FAN timeout

DESCRIPTION: A link up event was received without the login bit set, so the driver waits E_D_TOV for the Fabric to send a FAN. If no FAN is received, a FLOGI will be sent after the timeout.

DATA: None

SEVERITY: Warning

LOG: LOG_DISCOVERY verbose

ACTION: None required. The driver recovers from this condition by issuing a FLOGI to the fabric.

elx_mes0222: Initial FLOG/FDISKI timeout

DESCRIPTION: The driver sent the initial FLOGI or FDISK to the fabric and never got a response back.

DATA: None

SEVERITY: Error

LOG: Always

ACTION: Check Fabric configuration. The driver recovers from this and continues with device discovery.

elx_mes0223: Timeout while waiting for NameServer login

DESCRIPTION: Our login request to the NameServer was not acknowledged within RATOV.

DATA: None

SEVERITY: Error

LOG: Always

ACTION: Check the fabric configuration. The driver recovers from this and continues with device discovery.

elx_mes0224: NameServer Query timeout

DESCRIPTION: Node authentication timeout, node Discovery timeout. A NameServer Query to the Fabric or discovery of reported remote NPorts is not acknowledged within R_A_TOV.

DATA: (1) fc_ns_retry (2) fc_max_ns_retry

SEVERITY: Error

LOG: Always

ACTION: Check Fabric configuration. The driver recovers from this and continues with device discovery.

elx_mes0225: Device Discovery completes

DESCRIPTION: This indicates successful completion of device (re)discovery after a link up.

DATA: None

SEVERITY: Information

LOG: LOG_DISCOVERY verbose

ACTION: No action needed, informational.

elx_mes0226: Device discovery completion error

DESCRIPTION: This indicates that an uncorrectable error was encountered during device (re)discovery after a link up. Fibre Channel devices will not be accessible if this message is displayed.

DATA: None

SEVERITY: Error

LOG: Always

ACTION: Reboot the system. If the problem persists, report the error to Technical Support. Run with verbose mode on for more details.

elx_mes0227: Node Authentication timeout

DESCRIPTION: The driver has lost track of what NPORTs are being authenticated.

DATA: None

SEVERITY: Error

LOG: Always

ACTION: None required. The driver should recover from this event.

elx_mes0228: CLEAR LA timeout

DESCRIPTION: The driver issued a CLEAR_LA that never completed.

DATA: None

SEVERITY: Error

LOG: Always

ACTION: None required. The driver should recover from this event.

elx_mes0231: RSCN timeout

DESCRIPTION: The driver has lost track of what NPORTs have RSCNs pending.

DATA: (1) fc_ns_retry (2) lpfc_max_ns_retry

SEVERITY: Error

LOG: Always

ACTION: None required. The driver should recover from this event.

elx_mes0232: Continue discovery with <num_disc_nodes> PLOGIs to go

DESCRIPTION: Device discovery is in progress.

DATA: (1) fc_plogi_cnt (2) fc_flag (3) phba->hba_state

SEVERITY: Information

LOG: LOG_DISCOVERY verbose

ACTION: No action needed, informational.

elx_mes0234: ReDiscovery RSCN

DESCRIPTION: The number / type of RSCNs has forced the driver to go to the nameserver and re-discover all NPORTs.

DATA: (1) fc_rscn_id_cnt (2) fc_flag (3) hba_state

SEVERITY: Information

LOG: LOG_DISCOVERY verbose

ACTION: No action needed, informational.

elx_mes0235: Deferred RSCN

DESCRIPTION: The driver has received multiple RSCNs and has deferred the processing of the most recent RSCN.

DATA: (1) fc_rscn_id_cnt (2) fc_flag (3) hba_state

SEVERITY: Information

LOG: LOG_DISCOVERY verbose

ACTION: No action needed, informational.

elx_mes0236: NameServer req

DESCRIPTION: The driver is issuing a NameServer request to the fabric.

DATA: (1) cmdcode (2) fc_flag (3) fc_rscn_id_cnt

SEVERITY: Information

LOG: LOG_DISCOVERY verbose

ACTION: No action needed, informational.

elx_mes0237: Pending Link Event during Discovery: State <hba_state>

DESCRIPTION: Received link event during discovery. Causes discovery restart.

DATA: None

SEVERITY: Warning

LOG: LOG_DISCOVERY verbose

ACTION: None required unless problem persists. If persistent check cabling.

elx_mes0238: Process <Did> NameServer Rsp

DESCRIPTION: The driver received a NameServer response.

DATA: (1) nlp_flag (2) fc_flag (3) fc_rscn_id_cnt

SEVERITY: Information

LOG: LOG_DISCOVERY verbose

ACTION: No action needed, informational.

elx_mes0240: NameServer Rsp Error

DESCRIPTION: The driver received a NameServer response containing a status error.

DATA: (1) CommandResponse.bits.CmdRsp (2) ReasonCode (3) Explanation (4) fc_flag

SEVERITY: Information

LOG: LOG_DISCOVERY verbose

ACTION: Check the fabric configuration. The driver recovers from this and continues with device discovery.

elx_mes0241: NameServer rsp error

DESCRIPTION: The driver received a NameServer response containing a status error.

DATA: (1) CommandResponse.bits.CmdRsp (2) ReasonCode (3) Explanation (4) fc_flag

SEVERITY: Information

LOG: LOG_DISCOVERY verbose

ACTION: Check the fabric configuration. The driver recovers from this and continues with device discovery.

elx_mes0244: Issue FDMI request failed

DESCRIPTION: Cannot issue an FDMI request to the HBA.

DATA: (1) cmdcode

SEVERITY: Information

LOG: LOG_Discovery verbose

ACTION: No action needed, informational.

elx_mes0246: RegLogin failed

DESCRIPTION: The firmware returned a failure for the specified RegLogin.

DATA: Did, mbxStatus, hbaState

SEVERITY: Error

LOG: Always

ACTION: This message indicates that the firmware could not do RegLogin for the specified Did. There may be a limitation on how many nodes an HBA can see.

elx_mes0247: Start Discovery Timer state <hba_state>

DESCRIPTION: Start the device discovery / RSCN rescue timer.

DATA: (1) tmo (2) fc_disctmo (3) fc_plogi_cnt (4) fc_adisc_cnt

SEVERITY: Information

LOG: LOG_DISCOVERY verbose

ACTION: No action needed, informational.

elx_mes0248: Cancel Discovery Timer state <hba_state>

DESCRIPTION: Cancel the device discovery / RSCN rescue timer.

DATA: (1) fc_flag (2) fc_plogi_cnt (3) fc_adisc_cnt

SEVERITY: Information

LOG: LOG_DISCOVERY verbose

ACTION: No action needed, informational.

elx_mes0253 - Illegal State Transition: node <nlp_DID> event <evt>, state <nlp_state>

DESCRIPTION: An unexpected response was received from the specified node.

DATA: (1) nlp_rpi (2) nlp_flag

SEVERITY: Error

LOG: Always

ACTION: Check connection to fabric and/or remove device. If problem persists, please report the issue to Technical Support.

Mailbox Events (0300 - 0339)

elx_mes0300: READ_LA: no buffers

DESCRIPTION: The driver attempted to issue a READ_LA mailbox command to the HBA, but there were no buffers available.

DATA: None

SEVERITY: Warning

LOG: LOG_MBOX verbose

ACTION: This message indicates: (1) Kernel virtual memory is depleted. Check that the system meets minimum RAM requirements for the Emulex Fibre Channel adapter. Try closing other applications to free some memory. (2) A possible driver buffer management problem. If this problem persists, report the error to Technical Support.

elx_mes0301: READ_SPARAM: no buffers

DESCRIPTION: The driver attempted to issue a READ_SPARAM mailbox command to the HBA, but there were no buffers available.

DATA: None

SEVERITY: Warning

LOG: LOG_MBOX verbose

ACTION: This message indicates: (1) Kernel virtual memory is depleted. Check that the system meets minimum RAM requirements for the Emulex Fibre Channel adapter. Try closing other applications to free some memory. (2) A possible driver buffer management problem. If the problem persists, report the error to Technical Support.

elx_mes0302: REG_LOGIN: no buffers

DESCRIPTION: The driver attempted to issue a REG_LOGIN mailbox command to the HBA, but there were no buffers available.

DATA: (1) Did (2) flag

SEVERITY: Warning

LOG: LOG_MBOX verbose

ACTION: This message indicates: (1) Kernel virtual memory is depleted. Check that the system meets minimum RAM requirements for the Emulex Fibre Channel adapter. Try closing other applications to free some memory. (2) A possible driver buffer management problem. If the problem persists, report the error to Technical Support.

elx_mes0303: Ring <ringno> handler: portRspPut <portRspPut> is bigger then rsp ring <portRspMax>

DESCRIPTION: The port rsp ring put index is larger than the size of the rsp ring.

DATA: None

SEVERITY: Error

LOG: Always

ACTION: This error could indicate a software driver, firmware or hardware problem. Report these errors to Technical Support.

elx_mes0304: Stray mailbox interrupt, mbxCommand <mbxcommand> mbxStatus <mbxstatus>

DESCRIPTION: Received a mailbox completion interrupt and there are no outstanding mailbox commands.

DATA: None

SEVERITY: Error

LOG: Always

ACTION: This error could indicate a hardware or firmware problem. If the problem persists, report the error to Technical Support.

elx_mes0305: Mbox cmd cmpl error - RETRYing

DESCRIPTION: A mailbox command completed with an error status that causes the driver to reissue the mailbox command.

DATA: (1) mbxCommand (2) mbxStatus (3) un.varWords[0] (4) hba_state

SEVERITY: Information

LOG: LOG_MBOX verbose, LOG_SLI verbose

ACTION: No action needed, informational.

elx_mes0306: CONFIG_LINK mbxStatus error <mbxStatus> HBA state <hba_state>

DESCRIPTION: The driver issued a CONFIG_LINK mbox command to the HBA that failed.

DATA: None

SEVERITY: Error

LOG: Always

ACTION: This error could indicate a firmware or hardware problem. Report these errors to Technical Support.

elx_mes0307: Mailbox cmd <mbxCommand> Cmpl <mbox_cmpl>

DESCRIPTION: A mailbox command completed.

DATA: (1) pmbox (2) varWords[0], (3) varWords[1], (4) varWords[2], (5) varWords[3], (6) varWords[4], (7) varWords[5], (8) varWords[6], (9) varWords[7]

SEVERITY: Information

LOG: LOG_MBOX verbose, LOG_SLI verbose

ACTION: No action needed, informational.

elx_mes0308: Mbox cmd issue - BUSY

DESCRIPTION: The driver attempted to issue a mailbox command while the mailbox was busy processing the previous command. The processing of the new command will be deferred until the mailbox becomes available.

DATA: (1) mbxCommand (2) hba_state (3) sli_flag (4) flag

SEVERITY: Information

LOG: LOG_MBOX verbose, LOG_SLI verbose

ACTION: No action needed, informational.

elx_mes0309: Mailbox cmd <mbxcommand> issue

DESCRIPTION: The driver is in the process of issuing a mailbox command.

DATA: (1) hba_state (2) sli_flag (3) flag

SEVERITY: Information

LOG: LOG_MBOX verbose, LOG_SLI verbose

ACTION: No action needed, informational.

elx_mes0310: Mailbox command <mbxcommand> timeout

DESCRIPTION: A mailbox command was posted to the adapter and did not complete within 30 seconds.

DATA: (1) hba_state (2) sli_flag (3) mbox_active

SEVERITY: Error

LOG: Always

ACTION: This error could indicate a software driver or firmware problem. If no I/O is going through the adapter, reboot the system. If the problem persists, report the error to Technical Support.

elx_mes0311: Mailbox command <mbxcommand> cannot issue

DESCRIPTION: The driver is in the wrong state to issue the specified command.

DATA: (1) hba_state (2) sli_flag (3) flag

SEVERITY: Information

LOG: LOG_MBOX verbose, LOG_SLI verbose

ACTION: No action needed, informational.

elx_mes0313: Ring <ringno> handler: unexpected Rctl <Rctl> Type <Type> received

DESCRIPTION: The Rctl/Type of a received frame did not match any for the configured masks for the specified ring.

DATA: None

SEVERITY: Warning

LOG: LOG_SLI verbose

ACTION: This error could indicate a software driver, firmware or hardware problem. Report these errors to Technical Support.

elx_mes0315: Ring <ringno> issue: portCmdGet <local_getidx> is bigger then cmd ring <max_cmd_idx>

DESCRIPTION: The port cmd ring get index is greater than the size of cmd ring.

DATA: None

SEVERITY: Error

LOG: Always

ACTION: This error could indicate a software driver, firmware or hardware problem. Report these errors to Technical Support.

elx_mes0317: iotag <ulp_loTag> is out of range: max iotag <max_iotag> wd0 <wd0>

DESCRIPTION: The IoTag in the completed IOCB is out of range.

DATA: None

SEVERITY: Error

LOG: Always

ACTION: This error could indicate a software driver, firmware or hardware problem. Report these errors to Technical Support.

elx_mes0318: Failed to allocate IOTAG. last IOTAG is <last_allocated_iotag>

DESCRIPTION: The driver cannot allocate an IoTag. Display the last value used.

DATA: None

SEVERITY: Error

LOG: Always

ACTION: This message indicates the adapter HBA I/O queue is full. Typically this happens when heavy I/O is running on a low-end (3 digit) adapter. We suggest you upgrade to a higher-end adapter.

elx_mes0319: READ_SPARAM mbxStatus error <mbxStatus> hba state <hba_state>

DESCRIPTION: The driver issued a READ_SPARAM mbox command to the HBA that failed.

DATA: None

SEVERITY: Error

LOG: Always

ACTION: This error could indicate a firmware or hardware problem. Report these errors to Technical Support.

elx_mes0320: CLEAR_LA mbxStatus error <mbxStatus> hba state <hba_state>

DESCRIPTION: The driver issued a CLEAR_LA mbox command to the HBA that failed.

DATA: None

SEVERITY: Error

LOG: Always

ACTION: This error could indicate a firmware or hardware problem. Report these errors to Technical Support.

elx_mes0321: Unknown IOCB command

DESCRIPTION: Received an unknown IOCB command completion.

DATA: (1) type (2) ulpCommand (3) ulpStatus (4) ulploTag (5) ulpContext)

SEVERITY: Error

LOG: Always

ACTION: This error could indicate a software driver or firmware problem. If these problems persist, report these errors to Technical Support

elx_mes0322: Ring <ringno> handler: unexpected completion IoTag <IoTag>

DESCRIPTION: The driver could not find a matching command for the completion received on the specified ring.

DATA: (1) ulpStatus (2) ulpWord[4] (3) ulpCommand (4) ulpContext

SEVERITY: Warning

LOG: LOG_SLI verbose

ACTION: This error could indicate a software driver or firmware problem. If problems persist report these errors to Technical Support.

elx_mes0323: Unknown Mailbox command <mbxCommand> Cmpl

DESCRIPTION: A unknown mailbox command completed.

DATA: None

SEVERITY: Error

LOG: Always

ACTION: This error could indicate a software driver, firmware or hardware problem. Report these errors to Technical Support.

elx_mes0324: Config port initialization error, mbxCmd <mbxCommand> READ_NVPARAM, mbxStatus <mbxStatus>

DESCRIPTION: A read nvparams mailbox command failed during port configuration.

DATA: None

SEVERITY: Error

LOG: Always

ACTION: This error could indicate a software driver, firmware or hardware problem. Report these errors to Technical Support.

elx_mes0325 - Reset HBA

DESCRIPTION: An HBA has been reset.

DATA: (1) hba_state (2) sli_flag

SEVERITY: Information

LOG: LOG_SLI verbose

ACTION: No action needed, informational.

elx_mes0330: IOCB wake NOT set

DESCRIPTION: The completion handler associated with the IOCB was never called.

DATA: (1) timeout (2) timeleft/jiffies

SEVERITY: Error

LOG: Always

ACTION: This error could indicate a software driver, firmware or hardware problem. If the problem persists, report the error to Technical Support.

elx_mes0331: IOCB wake signaled

DESCRIPTION: The IOCB completed successfully.

DATA: None

SEVERITY: Information

LOG: LOG_SLI verbose

ACTION: None required.

elx_mes0332: IOCB wait issue failed

DESCRIPTION: The lpfc driver failed to issue an IOCB.

DATA:(1) retval

SEVERITY: Information

LOG: LOG_SLI verbose

ACTION: None required.

elx_mes0334: Unknown IOCB command

DESCRIPTION: Received an unknown IOCB command completion.

DATA: (1) type (2) ulpCommand (3) ulpStatus (4) ulploTag (5) ulpContext)

SEVERITY: Error

LOG: Always

ACTION: This error could indicate a software driver or firmware problem. If these problems persist, report these errors to Technical Support.

elx_mes0335: Unknown IOCB command

DESCRIPTION: Received an unknown IOCB command completion.

DATA: (1) ulpCommand (2) ulpStatus (3) ulploTag (4) ulpContext)

SEVERITY: Error

LOG: Always

ACTION: This error could indicate a software driver or firmware problem. If these problems persist, report these errors to Technical Support

elx_mes0336 - Rsp Ring <ringno> error: IOCB

DESCRIPTION: An IOCB error has occurred on the specified ring.

DATA: (1) ulpWord[0] (2) ulpWord[1] (3) ulpWord[2] (4) ulpWord[3] (5) ulpWord[4] (6) ulpWord[5] (7) irsp+6 (8) irsp+7

SEVERITY: Warning

LOG: LOG_SLI verbose

ACTION: If the problem persists, check the targets. If the targets are okay, report the error to Technical Support.

elx_mes0337 - Rsp Ring <ringno> error: IOCB

DESCRIPTION: An IOCB error has occurred on the specified ring.

DATA: (1) ulpWord[0] (2) ulpWord[1] (3) ulpWord[2] (4) ulpWord[3] (5) ulpWord[4] (6) ulpWord[5] (7) irsp+6 (8) irsp+7

SEVERITY: Warning

LOG: LOG_SLI verbose

ACTION: If the problem persists, check the targets. If the targets are functioning properly, report the error to Technical Support.

elx_mes0338: Kill HBA

DESCRIPTION: The driver is sending a Kill Board mailbox command to the FW.
DATA:(1) hba_state (2) sli_flag
SEVERITY: Informational
LOG: LOG_SLI verbose
ACTION: No action needed. Informational.

Temperature Events (0340 - 0347)

elx_mes0340: Adapter temperature is OK now

DESCRIPTION: Adapter temperature has reverted to normal range.
DATA: Temperature in Celsius
SEVERITY: Error
LOG: LOG_TEMP verbose
ACTION: No action needed, informational.

elx_mes0347: Adapter is very hot, please take corrective action

DESCRIPTION: Adapter temperature is above normal range
DATA: Temperature in Celsius
SEVERITY: Error
LOG: LOG_TEMP verbose
ACTION: Shutdown and remove the HBA. Contact Technical Support.

Initialization Events (0400 - 0499)

elx_mes0405: Service Level Interface (SLI) 2 selected

DESCRIPTION: A CONFIG_PORT (SLI2) mailbox command was issued.
DATA: None
SEVERITY: Information
LOG: LOG_INIT verbose
ACTION: No action needed, informational.

elx_mes0410: Cannot find virtual addr for mapped buf on ring <ringno>

DESCRIPTION: The driver cannot find the specified buffer in its mapping table. Thus it cannot find the virtual address needed to access the data.
DATA: (1) phys (2) next (3) prev (4) postbufq_cnt
SEVERITY: Error
LOG: Always
ACTION: This error could indicate a software driver or firmware problem. If the problem persists report these errors to Technical Support.

elx_mes0436: Adapter failed to init, timeout, status reg <status>

DESCRIPTION: The adapter failed during powerup diagnostics after it was reset.
DATA: None
SEVERITY: Error
LOG: Always
ACTION: This error could indicate a hardware or firmware problem. If the problem persists, report the error to Technical Support.

elx_mes0437: Adapter failed to init, chipset, status reg <status>

DESCRIPTION: The adapter failed during powerup diagnostics after it was reset.

DATA: None

SEVERITY: Error

LOG: Always

ACTION: This error could indicate a hardware or firmware problem. If the problem persists, report the error to Technical Support.

elx_mes0438: Adapter failed to init, chipset, status reg <status>

DESCRIPTION: The adapter failed during powerup diagnostics after it was reset.

DATA: None

SEVERITY: Error

LOG: Always

ACTION: This error could indicate a hardware or firmware problem. If the problem persists, report the error to Technical Support.

elx_mes0439: Adapter failed to init, mbxCmd <mbxCommand> READ_REV, mbxStatus <mbxStatus>

DESCRIPTION: Adapter initialization failed when issuing a READ_REV mailbox command.

DATA: None

SEVERITY: Error

LOG: Always

ACTION: This error could indicate a hardware or firmware problem. If the problem persists, report the error to Technical Support.

elx_mes0440: elx_mes0440: Adapter failed to init, READ_REV has missing revision information

DESCRIPTION: A firmware revision initialization error was detected.

DATA: None

SEVERITY: Error

LOG: Always

ACTION: This error could indicate a hardware or firmware problem. Update the firmware. If the problem persists, report the error to Technical Support.

elx_mes0441: VPD not present on adapter, mbxCmd <mbxCommand> DUMP_VPD, mbxStatus <mbxStatus>

DESCRIPTION: The DUMP_VPD mailbox command failed.

DATA: None

SEVERITY: Information

LOG: LOG_INIT verbose

ACTION: This error could indicate a hardware or firmware problem. If the problem persists, report the error to Technical Support.

elx_mes0442: Adapter failed to init, mbxCmd <mbxCommand> CONFIG_PORT, mbxStatus <mbxStatus>

DESCRIPTION: Adapter initialization failed when issuing a CONFIG_PORT mailbox command.
DATA: (1) hbainit
SEVERITY: Error
LOG: Always
ACTION: This error could indicate a hardware or firmware problem. If the problem persists, report the error to Technical Support.

elx_mes0446: Adapter failed to init, mbxCmd <mbxCommand> CFG_RING, mbxStatus <mbxStatus>, ring <num>

DESCRIPTION: Adapter initialization failed when issuing a CFG_RING mailbox command.
DATA: None
SEVERITY: Error
LOG: Always
ACTION: This error could indicate a hardware or firmware problem. If the problem persists, report the error to Technical Support.

elx_mes0447: Adapter failed init, mbxCmd <mbxCommand> CONFIG_LINK mbxStatus <mbxStatus>

DESCRIPTION: Adapter initialization failed when issuing a CONFIG_LINK mailbox command.
DATA: None
SEVERITY: Error
LOG: Always
ACTION: This error could indicate a hardware or firmware problem. If the problem persists, report the error to Technical Support.

elx_mes0448: Adapter failed to init, mbxCmd <mbxCommand> READ_SPARM, mbxStatus <mbxStatus>

DESCRIPTION: Adapter initialization failed when issuing a READ_SPARM mailbox command.
DATA: None
SEVERITY: Error
LOG: Always
ACTION: This error could indicate a hardware or firmware problem. If the problem persists, report the error to Technical Support.

elx_mes0449: lpfc_%attr attribute cannot be initialized to %d, allowed range is [%min, %max]

DESCRIPTION: Sysfs attribute value written exceeds attribute range
DATA: (1) attribute name (2) value written (3) minimum value (3) maximum value
SEVERITY: Error
LOG: Always
ACTION: Write a value within the supported range.

elx_mes0450: lpfc_%attr attribute cannot be set to %d, allowed range is [%min, %max]

DESCRIPTION: Sysfs attribute value written exceeds attribute range
DATA: (1) attribute name (2) value written (3) minimum value (3) maximum value
SEVERITY: Error
LOG: Always
ACTION: Write a value within the supported range.

elx_mes0451: Enable interrupt handler failed

DESCRIPTION: The driver attempted to register the HBA interrupt service routine with the host operating system, but failed.

DATA: None

SEVERITY: Error

LOG: Always

ACTION: This error could indicate a hardware or driver problem. If the problem persists, report the error to Technical Support.

elx_mes0453: Adapter failed to init, mbxCmd <mbxCommand> READ_CONFIG, mbxStatus <mbxStatus>

DESCRIPTION: Adapter initialization failed when issuing a READ_CONFIG mailbox command.

DATA: None

SEVERITY: Error

LOG: Always

ACTION: This error could indicate a hardware or firmware problem. If the problem persists, report the error to Technical Support.

elx_mes0454: Adapter failed to init, mbxCmd <mbxCommand> INIT_LINK, mbxStatus <mbxStatus>

DESCRIPTION: Adapter initialization failed when issuing an INIT_LINK mailbox command.

DATA: None

SEVERITY: Error

LOG: Always

ACTION: This error could indicate a hardware or firmware problem. If the problem persists, report the error to Technical Support.

elx_mes0455: Vital Product

DESCRIPTION: Vital product data (VPD) contained in the HBA flash.

DATA: (1) vpd[0] (2) vpd[1] (3) vpd[2] (4) vpd[3]

SEVERITY: Information

LOG: LOG_INIT verbose

ACTION: No action needed, informational.

elx_mes0457: Adapter Hardware Error

DESCRIPTION: The driver received an interrupt indicating a possible hardware problem.

Data: (1) status (2) status1 (3) status2

SEVERITY: Error

LOG: Always

ACTION: This error could indicate a hardware or firmware problem. If the problem persists, report the error to Technical Support.

elx_mes0458: Bring adapter online

DESCRIPTION: The FC driver has received a request to bring the adapter online. This may occur when running lputil.

DATA: None

SEVERITY: Warning

LOG: LOG_INIT verbose

ACTION: None required.

elx_mes0460: Bring adapter offline

DESCRIPTION: The FC driver has received a request to bring the adapter offline. This may occur when running lputil.

DATA: None

SEVERITY: Warning

LOG: LOG_INIT verbose

ACTION: None required.

elx_mes0462: Too many cmd / rsp ring entries in SLI2 SLIM

DESCRIPTION: The configuration parameter for Scan-down is out of range.

DATA: (1) totiocb (2) MAX_SLI2_IOCB

SEVERITY: Error

LOG: Always

ACTION: This is a software driver error. If this problem persists, report these errors to Technical Support.

elx_mes0466: Too many cmd / rsp entries in SLI2 SLIM

DESCRIPTION: The driver has configured too many command and response IOCBs in all rings.

DATA: (1) total configured IOCBs (2) maximum number allowed.

SEVERITY: Error

LOG: Always

ACTION: This error could indicate a software driver, firmware or hardware problem. Report these errors to Technical Support.

FARP Events (0600 - 0699)

elx_mes0600: FARP-RSP received from DID <did>

DESCRIPTION: A FARP response was received.

DATA: None

SEVERITY: Information

LOG: LOG_IP verbose

ACTION: None required.

elx_mes0601: FARP-REQ received from DID <did>

DESCRIPTION: An unsolicited FARP request was received.

DATA: None

SEVERITY: Information

LOG: LOG_IP verbose

ACTION: None required.

FCP Traffic History (0700 - 0799)

elx_mes0700: SCSI layer issued LUN reset (<target>,<LUN>)

DESCRIPTION: The SCSI layer is requesting the driver to abort I/O to a specific LUN.

DATA: (1) ret (2) status (3) result

SEVERITY: Error

LOG: Always

ACTION: Check the state of the target in question.

elx_mes0702: Issue Target Reset to TGT <num>

DESCRIPTION: The SCSI layer detected that it needs to abort all I/O to a specific target. This results in an FCP Task Management command to abort the I/O in progress.

DATA: (1) rpi (2) flags

SEVERITY: Information

LOG: LOG_FCP verbose

ACTION: Check the state of the target in question.

elx_mes0703: Issue LUN Reset to TGT <num> LUN <num>

DESCRIPTION: The SCSI layer detected that it must abort all I/O to a specific device. This results in an FCP Task Management command to abort the I/O in progress.

DATA: (1) rpi (2) flags

SEVERITY: Information

LOG: LOG_FCP verbose

ACTION: Check the state of the device in question.

elx_mes0704: At limitation of <total> preallocated command buffers

DESCRIPTION: The maximum number of command buffers have already been allocated.

DATA: None

SEVERITY: Warning

LOG: LOG_FCP verbose

ACTION: None required.

elx_mes0705: Allocation request of <num> command buffers will exceed max of <hba_queue_depth>. Reducing allocation request to <size>

DESCRIPTION: The number of command buffers requested will exceed the maximum so a smaller quantity will be allocated.

DATA: None

SEVERITY: Warning

LOG: LOG_FCP verbose

ACTION: None required.

elx_mes0706: Failed to allocate command buffer

DESCRIPTION: There was not enough memory on the system to allocate a command buffer.

DATA: None

SEVERITY: Error

LOG: Always

ACTION: This error could indicate a heavily loaded system or a memory leak. If the problem persists, report the error to Technical Support.

elx_mes0707: driver's buffer pool is empty, IO busied

DESCRIPTION: Resources were not available to process an IO request. A busy status will be returned.

DATA: None

SEVERITY: Information

LOG: LOG_FCP verbose

ACTION: None required.

elx_mes0710: Iodone <target>/<lun>cmd <cmd> error <result> SNS <lp> <lp3>

DESCRIPTION: This error indicates that the Fibre Channel driver is returning a SCSI command to the SCSI layer in error or with sense data.

DATA: (1) retry (2) resid

SEVERITY: Information

LOG: LOG_FCP verbose

ACTION: None required.

elx_mes0711: detected queue full - lun queue depth adjusted to %d

DESCRIPTION: The driver detected a queue full status on a scsi command response. New lun queue depth is reported

DATA: (1) New lun queue depth

SEVERITY: Warning

LOG: LOG_FCP verbose

ACTION: This may indicate an oversubscribed target array. Check your SAN configuration and IO workload.

elx_mes0714: SCSI layer issued bus reset

DESCRIPTION: The SCSI layer is requesting the driver to abort all I/Os to all targets on this HBA.

DATA: (1) ret

SEVERITY: Error

LOG: Always

ACTION: Check the state of the targets in question.

elx_mes0715 - Bus Reset I/O flush failure: cnt <cnt> left <index>

DESCRIPTION: Timed out while waiting during a bus reset.

DATA: none

SEVERITY: Information

LOG: LOG_FCP verbose

ACTION: If other errors are also occurring, please report this message to Technical Support.

elx_mes0716: FCP read underrun, expected <len>, residual <resid>

DESCRIPTION: An FCP device provided less data than was requested.

DATA: (1) fcpi_parm (2) cmdnd[0] (3) underflow

SEVERITY: Information

LOG: LOG_FCP verbose

ACTION: None required.

elx_mes0717: FCP command <cmd> residual underrun converted to error

DESCRIPTION: The driver converted this underrun condition to an error based on the underflow field in the SCSI command.

DATA: (1) len (2) resid (3) underflow

SEVERITY: Information

LOG: LOG_FCP verbose

ACTION: None required.

elx_mes0718 - Unable to dma_map_single request_buffer: <dma_error>

DESCRIPTION: An error occurred while sending a command, and the command will be retried.

DATA: none

SEVERITY: Error

LOG: Always

ACTION: If the problem persists, please report the error to Technical Support.

elx_mes0719 - LUN Reset I/O flush failure: cnt <cnt>

DESCRIPTION: Timed out while waiting during a LUN reset.

DATA: none

SEVERITY: Information

LOG: LOG_FCP verbose

ACTION: If other errors are also occurring, please report this message to Technical Support.

elx_mes0720 - FCP command <cmnd[0]> residual overrun error

DESCRIPTION: A residual overrun error has occurred while processing the specified FCP command.

DATA: (1) request_bufflen (2) resid

SEVERITY: Warning

LOG: LOG_FCP verbose

ACTION: If the problem persists, check the targets for errors.

elx_mes0729: FCP cmd <cmnd> failed <target>/<lun> status: <status> result: <result>

DESCRIPTION: The specified device failed an FCP command.

DATA: (1) ulpContext (2) iotag

SEVERITY: Warning

LOG: LOG_FCP verbose

ACTION: Check the state of the target in question.

elx_mes0730: FCP command failed: RSP

DESCRIPTION: The FCP command failed with a response error.

DATA: (1) resp_info (2) scsi_status (3) ResId (4) SnsLen (5) RspLen (6)rsplInfo3

SEVERITY: Warning

LOG: LOG_FCP verbose

ACTION: Check the state of the target in question.

elx_mes0734: FCP read check error

DESCRIPTION: The issued FCP command returned a read check error.

DATA: (1) fcpDI (2) rspResId (3) fcpi_parm (4) cmd[0]

SEVERITY: Warning

LOG: LOG_FCP verbose

ACTION: Check the state of the target in question.

elx_mes0735: FCP Read Check Error and Underrun Data

DESCRIPTION: HBA reported under run from storage array

DATA: (1) vpi (2) fcpDI (3) res_id (4) fcpi_parm

SEVERITY: Warning

LOG: LOG_FCP_ERROR verbose

ACTION: No action needed, informational.

elx_mes0748: Abort handler timed out waiting for abort to complete:ret <status> D <target id>
LUN <lun id>

DESCRIPTION: The abort handler timed out waiting for abort to complete.

DATA: None

SEVERITY: Error

LOG: Always

ACTION: None required.

elx_mes0749: SCSI layer issued abort device

DESCRIPTION: The SCSI layer aborted a device.

DATA: (1) ret (2) id (3) lun (4) snum

SEVERITY: Warning

LOG: LOG_FCP verbose

ACTION: None required.

Node Table Events (0900 - 0999)

elx_mes0900: Cleanup node for NPort <nlp_DID>

DESCRIPTION: The driver node table entry for a remote NPort was removed.

DATA: (1) nlp_flag (2) nlp_state (3) nlp_rpi

SEVERITY: Information

LOG: LOG_NODE verbose

ACTION: None required.

elx_mes0901: FIND node DID reglogin

DESCRIPTION: The driver is searching for a node table entry, on the binding list, based on DID.

DATA: (1) ndlp (2) nlp_DID (3) nlp_flag (4) data1

SEVERITY: Information

LOG: LOG_NODE verbose

ACTION: None required.

elx_mes0902: FIND node DID prli

DESCRIPTION: The driver is searching for a node table entry, on the binding list, based on DID.

DATA: (1) ndlp (2) nlp_DID (3) nlp_flag (4) data1

SEVERITY: Information

LOG: LOG_NODE verbose

ACTION: None required.

elx_mes0903: FIND node DID npr

DESCRIPTION: The driver is searching for a node table entry, on the binding list, based on DID.

DATA: (1) ndlp (2) nlp_DID (3) nlp_flag (4) data1

SEVERITY: Information

LOG: LOG_NODE verbose

ACTION: None required.

elx_mes0904: Add NPort <did> to <list> list

DESCRIPTION: The driver is putting the node table entry on the specified list.

DATA: (1) nlp_flag

SEVERITY: Information

LOG: LOG_NODE verbose

ACTION: None required.

elx_mes0905: FIND node DID unused

DESCRIPTION: The driver is searching for a node table entry, on the binding list, based on DID.

DATA: (1) ndlp (2) nlp_DID (3) nlp_flag (4) data1

SEVERITY: Information

LOG: LOG_NODE verbose

ACTION: None required.

elx_mes0908: FIND node DID plogi

DESCRIPTION: The driver is searching for a node table entry, on the plogi list, based on DID.

DATA: (1) ndlp (2) nlp_DID (3) nlp_flag (4) data1

SEVERITY: Information

LOG: LOG_NODE verbose

ACTION: None required.

elx_mes0929: FIND node DID unmapped

DESCRIPTION: The driver is searching for a node table entry, on the unmapped node list, based on DID.

DATA: (1) ndlp (2) nlp_DID (3) nlp_flag (4) data1

SEVERITY: Information

LOG: LOG_NODE verbose

ACTION: None required.

elx_mes0930: FIND node DID mapped

DESCRIPTION: The driver is searching for a node table entry, on the mapped node list, based on DID.

DATA: (1) ndlp (2) nlp_DID (3) nlp_flag (4) data1

SEVERITY: Information

LOG: LOG_NODE verbose

ACTION: None required.

elx_mes0931: FIND node DID adisc

DESCRIPTION: The driver is searching for a node table entry, on the binding list, based on DID.

DATA: (1) ndlp (2) nlp_DID (3) nlp_flag (4) data1

SEVERITY: Information

LOG: LOG_NODE verbose

ACTION: None required.

elx_mes0932: FIND node did <did> NOT FOUND

DESCRIPTION: The driver was searching for a node table entry based on the DID and the entry was not found.

DATA: (1) order

SEVERITY: Information

LOG: LOG_NODE verbose

ACTION: None required.

Security Events (1000 - 1099)

Elx_msg1003 Send dhchap challenge local wwpn (<) local_wwpn > remote_wwpn
< remote_wwpn >

DESCRIPTION: Informational message during DHCP authentication challenge and response process.
DATA: (1) local_wwpn (2) remote_wwpn
SEVERITY: Information
LOG: LOG_SECURITY
ACTION: Software driver Info. Contact Technical Support for further information.

Elx_msg1005 AUTHENTICATION_FAILURE Nport:<port>

DESCRIPTION: The system detected DHCP authentication failure on a port.
DATA: nlp_DID
SEVERITY: Error
LOG: LOG_SECURITY
ACTION: Verify authentication settings and keys on local and remote port.

Elx_msg1006 Bad Name tag in auth message < message >

DESCRIPTION: DHCP Authentication process failed when invalid tag was detected.
DATA: message
SEVERITY: Error
LOG: LOG_SECURITY
ACTION: Software driver Error. If this problem persists, report errors to the Technical Support.

Elx_msg1007 Bad Name length in auth message < message >

DESCRIPTION: DHCP Authentication process failed when invalid name was detected.
DATA: message
SEVERITY: Error
LOG: LOG_SECURITY
ACTION: Software driver Error. If this problem persists, report errors to the Technical Support.

Elx_msg1008 Bad Number of Protocols <message>

DESCRIPTION: DHCP Authentication process failed due to unexpected protocol number.
DATA: message
SEVERITY: Error
LOG: LOG_SECURITY
ACTION: Software driver Error. If this problem persists, report errors to the Technical Support.

Elx_msg1009 Bad param type <message>

DESCRIPTION: DHCP Authentication process failed when invalid protocol was detected.
DATA: message
SEVERITY: Error
LOG: LOG_SECURITY
ACTION: Software driver Error. If this problem persists, report errors to the Technical Support.

Elx_msg1010 Bad Tag 1 <message>

DESCRIPTION: DHCP Authentication process failed when bad Tag was detected.

DATA: message

SEVERITY: Error

LOG: LOG_SECURITY

ACTION: Software driver Error. If this problem persists, report errors to the Technical Support.

Elx_msg 1011 Auth_neg no hash function chosen

DESCRIPTION: DHCP Authentication process failed when an incorrect hash function was specified.

DATA: message

SEVERITY: Error

LOG: LOG_SECURITY

ACTION: Software driver Error. If this problem persists, report errors to the Technical Support.

Elx_msg1012 Auth_negotiate Bad Tag <message>

DESCRIPTION: DHCP Authentication process failed due to bad Tag for auto negotiation.

DATA: message

SEVERITY: Error

LOG: LOG_SECURITY

ACTION: Software driver Error. If this problem persists, report errors to the Technical Support.

Elx_msg 1013 Auth_negotiate no DH_group found

DESCRIPTION: DHCP Authentication process failed when incorrect or missing DH Group was detected.

DATA: message

SEVERITY: Error

LOG: LOG_SECURITY

ACTION: Software driver Error. If this problem persists, report errors to the Technical Support.

Elx_msg1014 dhchap challenge bad name tag <message>

DESCRIPTION: DHCP Authentication process failed when incorrect Challenge name tag was detected.

DATA: message

SEVERITY: Error

LOG: LOG_SECURITY

ACTION: Software driver Error. If this problem persists, report errors to the Technical Support.

Elx_msg1015 dhchap challenge bad name length <message>

DESCRIPTION: DHCP Authentication process failed due to unexpected Challenge name length.

DATA: message

SEVERITY: Error

LOG: LOG_SECURITY

ACTION: Software driver Error. If this problem persists, report errors to the Technical Support.

Elx_msg1016 dhchap challenge Hash ID not Supported <message>

DESCRIPTION: DHCHAP Authentication process failed due to uncorroborated Challenge Hash ID.

DATA: message

SEVERITY: Error

LOG: LOG_SECURITY

ACTION: Software driver Error. If this problem persists, report errors to the Technical Support.

Elx_msg1017 dhchap challenge could not find DH Group

DESCRIPTION: DHCHAP Authentication process failed due to uncorroborated Challenge Group.

DATA: None

SEVERITY: Error

LOG: LOG_SECURITY

ACTION: Software driver Error. If this problem persists, report errors to the Technical Support.

Elx_mes1019 Request tranid <tran_id> timed out

DESCRIPTION: A transaction with storage array could not complete due to timeout

DATA: tran_id

SEVERITY: Warning

LOG: LOG_SECURITY verbose

ACTION: Software driver warning. If this problem persists, report these errors to Technical Support.

Elx_mes1020 Dropped Message type <msg_type> to PID < fc_service_pid > : < fn > err < err >

DESCRIPTION: A netlink message was dropped due to some error. Display shows the message type, PID, service pid, function and error.

DATA: (1) msg_type (2) fc_service_pid (3) fn (4) err

SEVERITY: Warning

LOG: LOG_SECURITY

ACTION: Software driver warning. If this problem persists, report these errors to Technical Support.

Elx_mes1021 ERROR: attempted to queue security work, when no workqueue created

DESCRIPTION: Driver encountered missing queue required for processing security information

DATA: None

SEVERITY: Error

LOG: LOG_SECURITY

ACTION: Software driver Error. If this problem persists, report these errors to Technical Support.

Elx_mes1022 Security request does not exist

DESCRIPTION: A security request operation failed because there was no match found for such request.

DATA: None

SEVERITY: Warning

LOG: LOG_SECURITY

ACTION: Software driver warning. If this problem persists, report these errors to Technical Support.

Elx_mes1023 Warning - data may have been truncated. Data: <data> reqdl: <data_len>
mesdl:<data_len>

DESCRIPTION: A security message exchange operation failed because the response was missing or unreliable.

DATA: None

SEVERITY: Warning

LOG: LOG_SECURITY

ACTION: Software driver warning. If this problem persists, report these errors to Technical Support.

Elx_msg1025 Received security config local_wwpn:< > remote_wwpn:<> mode:<> hash <>
:bidir <> dh_group<> reauth_interval <>

DESCRIPTION: Re-Authentication succeeded.

DATA: (1) local_wwpn (2) remote_wwpn (3) auth_mode (4) hash_len (5) hash_priority (6) bidirectional (7)
dh_group_len (8) dh_group_priority (9) reauth_interval

SEVERITY: Information

LOG: LOG_SECURITY

ACTION: Informational message only. If you have questions please contact the Technical Support.

Elx_msg1028 Start Authentication: No buffers

DESCRIPTION: The authentication failed because some memory resources were not allocated.

DATA: None

SEVERITY: Error

LOG: LOG_SECURITY

ACTION: Software driver Error. If this problem persists, report errors to the Technical Support.

Elx_msg1029 Reauthentication Failure

DESCRIPTION: The driver encountered errors and there was a failure to re-authenticate.

DATA: None

SEVERITY: Error

LOG: LOG_SECURITY

ACTION: Software driver Error. If this problem persists, report errors to the Technical Support.

Elx_msg 1031 Start Authentication: Get config failed

DESCRIPTION: The authentication failed due to some error during port configuration.

DATA: None

SEVERITY: Error

LOG: LOG_SECURITY

ACTION: Software driver Error. If this problem persists, report errors to the Technical Support.

Elx_msg1032 Start Authentication: get config timed out

DESCRIPTION: The node authentication was aborted because waiting for port configuration to complete,
timed out.

DATA: None

SEVERITY: Error

LOG: LOG_SECURITY

ACTION: Software driver Error. If this problem persists, report errors to the Technical Support.

EIx_msg1033 Received auth_negotiate from Nport: < nlp_DID>

DESCRIPTION: Unsolicited authentication negotiation message received from a port.

DATA: nlp_DID

SEVERITY: Warning

LOG: LOG_SECURITY

ACTION: No action, this message is informational.

EIx_msg1034 Not Expecting Challenge - Rejecting Challenge

DESCRIPTION: Unsolicited authentication challenge received from a port, was rejected.

DATA: None

SEVERITY: Warning

LOG: LOG_SECURITY

ACTION: Software driver warning. If this problem persists, report errors to the Technical Support.

EIx_msg1035 Transport ID does not match - Rejecting Challenge.

DESCRIPTION: Security Authentication failed due to contradictory Transport ID.

DATA: None

SEVERITY: Error

LOG: LOG_SECURITY

ACTION: Software driver Error. If this problem persists, report errors to the Technical Support.

EIx_mag1036 Authentication transaction reject - re-auth request reason <reason> exp <explanation>

DESCRIPTION: An Authentication was rejected and requested again due to reason as displayed with explanation.

DATA: (1) reason (2) explanation.

SEVERITY: Error

LOG: LOG_SECURITY

ACTION: Software driver Error. If this problem persists, report errors to the Technical Support.

EIx_msg1037 Authentication transaction reject - restarting authentication, reason <reason> exp <explanation>

DESCRIPTION: An Authentication process was rejected then restarted and authentication requested again due to reason as displayed with explanation.

DATA: (1) reason (2) explanation.

SEVERITY: Error

LOG: LOG_SECURITY

ACTION: Software driver Error. If this problem persists, report errors to the Technical Support

EIx_msg1038 Authentication not required by the fabric Disabled

DESCRIPTION: For a given security configuration Authentication is disabled by the fabric as it not required.

DATA: None

SEVERITY: Information

LOG: LOG_SECURITY

ACTION: Informational message only. If you have questions please contact the Technical Support.

Elx_msg1039 Not Expecting Reply - rejecting. State <state>

DESCRIPTION: An unanticipated reply was received during authentication and was subsequently rejected.

DATA: (1) auth_state.

SEVERITY: Error

LOG: LOG_SECURITY

ACTION: Software driver Error. If this problem persists, report errors to the Technical Support.

Elx_msg1040 Bad Reply trans_id- rejecting. Trans_id < trans_id > Expecting: < trans_id>

DESCRIPTION: Unexpected transaction id was received during authentication and was subsequently rejected.

DATA: (1) auth_state.

SEVERITY: Error

LOG: LOG_SECURITY

ACTION: Software driver Error. If this problem persists, report errors to the Technical Support.

Elx_msg1041 Authentication Successful

DESCRIPTION: Authentication succeeded.

DATA: None

SEVERITY: Information

LOG: LOG_SECURITY

ACTION: Informational message only. If you have questions please contact the Technical Support.

Elx_msg1042 Re-Authentication Successful

DESCRIPTION: Re-Authentication succeeded.

DATA: None

SEVERITY: Information

LOG: LOG_SECURITY

ACTION: Informational message only. If you have questions please contact the Technical Support.

Elx_msg1046 Authentication Successful

DESCRIPTION: Authentication succeeded.

DATA: None

SEVERITY: Information

LOG: LOG_SECURITY

ACTION: Informational message only. If you have questions please contact the Technical Support.

Elx_msg1047 Re-Authentication Successful

DESCRIPTION: Re-Authentication succeeded.

DATA: None

SEVERITY: Information

LOG: LOG_SECURITY

ACTION: Informational message only. If you have questions please contact the Technical Support.

Elx_msg1049 Authentication is enabled but authentication service is not running

DESCRIPTION: Discovery failed because DHCHAP Authentication was enabled while no authentication service was established.

DATA: None

SEVERITY: Error

LOG: LOG_SECURITY

ACTION: Start the authentication daemon (fcauthd).

Elx_msg1050 Authentication mode is disabled, but is required by the fabric

DESCRIPTION: Discovery failed because the switch fabric required authentication, but authentication was not configured or the authentication mode for this port pair is disabled.

DATA: None

SEVERITY: Error

LOG: LOG_SECURITY

ACTION: Configure the driver to authenticate with the switch or disable authentication on the switch to this port.

Elx_msg1053 Start Authentication: Security service offline

DESCRIPTION: The authentication failed because security service was not available.

DATA: None

SEVERITY: Error

LOG: LOG_SECURITY

ACTION: Software driver Error. If this problem persists, report errors to the Technical Support.

Elx_msg1055 Authentication parameter is disabled, but is required by the fabric

DESCRIPTION: FLOGI failed because the fabric has indicated that Authentication is required, but authentication has not yet been configured or enabled on the HBA.

DATA: None

SEVERITY: Error

LOG: LOG_SECURITY

ACTION: Configure authentication on this HBA.

Elx_msg 1056 Authentication mode is disabled, but is required by the fabric

DESCRIPTION: The discovery failed because fabric requires authentication mode but that mode is currently disabled.

DATA: None

SEVERITY: Information

LOG: LOG_SECURITY

ACTION: Informational message only. If you have questions please contact the Technical Support.

Elx_msg1057 Authentication transaction reject. reason <reason> exp <explanation>

DESCRIPTION: An Authentication was rejected and requested again due to reason as displayed with explanation.

DATA: (1) reason (2) explanation.

SEVERITY: Error

LOG: LOG_SECURITY

ACTION: Software driver Error. If this problem persists, report errors to the Technical Support.

Elx_mes1058 Waiting for authentication service

DESCRIPTION: There was a delay when the authentication service was not initially available as expected.

DATA: None

SEVERITY: Warning

LOG: LOG_SECURITY

ACTION: Software driver warning. If this problem persists, report these errors to Technical Support.

Elx_mes1059 Authentication became available

DESCRIPTION: The authentication service came online but was not initially available as expected.

DATA: None

SEVERITY: Warning

LOG: LOG_SECURITY

ACTION: Software driver warning. If this problem persists, report these errors to Technical Support.

Miscellaneous and FCoE Events (1200 - 1299)

elx_mes1209: C_CT request error

DESCRIPTION: The CT response returned more data than the user buffer could hold.

DATA: (1) outdmp->flag (2) 4096

SEVERITY: Information

LOG: LOG_LIBDFC verbose

ACTION: Modify the user application issuing a CT request to allow for a larger response buffer.

elx_mes1211 genreq alloc failed\n");

DESCRIPTION: Resource allocation failure.

DATA: return code.

LOG: LOG_LIBDFC

SEVERITY: ERROR

ACTION: kernel memory resources to low.

elx_mes1213 FCoE cmd overflow: off <#> + cnt <#> > cmdsz <#>

DESCRIPTION: Application has tried to read more data than originally requested.

DATA: response offset, size, cmd size

LOG: LOG_LIBDFC

SEVERITY: ERROR

ACTION: Application may have sent a invalid command.

elx_mes1214 Can not issue FCoE cmd SLI not active: <#> rc= -EACCESS

DESCRIPTION: The SLI layer has not been initialized.

DATA: offset

LOG: LOG_LIBDFC

SEVERITY: ERROR

ACTION: Restart the HBA.

elx_mes1215 Can not issue FCoE cmd: not ready or not in maint mode"

DESCRIPTION: Either the external link is unplugged, link down, and the FCoE is not in maintenance mode.

DATA: current offset and return code.

LOG: LOG_LIBDFC
SEVERITY: ERROR
ACTION: Plug external cable in or set FCoE in maintenance mode.

elx_mes1216 FCoE IOCB failed: off <#> rc <#>

DESCRIPTION: FCoE command generated by the application has failed.
DATA: offset, return code.
LOG: LOG_LIBDFC
SEVERITY: ERROR
ACTION: Application should retry the command.

elx_mes1223 menlo_write: couldn't alloc genreq

DESCRIPTION: Resource allocation failure.
DATA: (None)
LOG: LOG_LIBDFC
SEVERITY: ERROR
ACTION: kernel memory resources too low.

elx_mes1224 FCoE iocb failed off <#> rc=<#>",

DESCRIPTION: FCoE command failed in SLI.
DATA: offset , return code
LOG: LOG_LIBDFC
SEVERITY: Informational.
ACTION: Retry the command, if it fails again, reset HBA when convenient.

elx_mes1230 Could not find buffer for FCoE cmd:off <#> indmp <addr> off <#>

DESCRIPTION: Could not find resources associated with this FCoE cmd.
DATA: current offset, buffer desc pointer, size.
LOG: LOG_LIBDFC
SEVERITY: ERROR
ACTION: Try reloading the driver when convenient.

elx_mes1235 Could not find buffer for FCoE cmd: off:<#> poff:<#> cnt:<#> mlascnt:<#>
addl:<x> addh:<x> mdsz:<#>

DESCRIPTION: FCoE command failed because it could not find the resource.
DATA: current offset, previous offset, count, last count, address low, address high
LOG: LOG_LIBDFC
SEVERITY: ERROR
ACTION: No Action needed, informational.

elx_mes1238 FCoE IOCB failed: off <#> rc=<#>

DESCRIPTION: The command generated by the driver to check the FCoE has failed.
DATA: offset, return code.
LOG: LOG_LIBDFC
SEVERITY: ERROR
ACTION: Make sure link is up or the adapter has set menlo in maintenance mode.

elx_mes1246 FCoE chip is running golden firmware. Update FCoE chip firmware immediately
<fw_type>

DESCRIPTION: The FCoE is running the golden firmware.

DATA: firmware-type

LOG: LOG_LINK_EVENT

Severity: ERROR

ACTION: Try resetting the FCoE to operational mode and disable maintenance mode.

elx_mes1247 FCoE chip is running diagnostic firmware. Operational use suspended.
<fw_type>

DESCRIPTION: The FCoE is running a diagnostic.

DATA: firmware-type

LOG: LOG_LINK_EVENT

Severity: ERROR

ACTION: Try resetting the FCoE to operational mode.

elx_mes1248 FCoE chip is running unknown firmware. <fw_type>

DESCRIPTION: The FCoE is running a unknown.

DATA: firmware-type

LOG: LOG_LINK_EVENT

Severity: ERROR

ACTION: Try resetting the FCoE to operational mode. Try loading latest FCoE firmware.

elx_mes1249 Invalid FRU data found on adapter. Return adapter to Emulex for repair.

DESCRIPTION: The FRU data on the FCoE chip is invalid.

DATA: firmware-type

LOG: LOG_LINK_EVENT

Severity: ERROR

ACTION: Try resetting the FCoE to operational mode. Try loading latest FCoE firmware or send the HBA back to Emulex for repair.

elx_mes1250 Menlo command error. code=<#>

DESCRIPTION: The IOCB driver sent to check FCoE state has bad header size.

DATA: return code

LOG: LOG_LINK_EVENT

Severity: ERROR

ACTION: Try resetting the FCoE to operational mode.

elx_mes1251 Menlo command error. code=<#>

DESCRIPTION: The IOCB driver sent to check FCoE state has failed, no resources.

DATA: return code

LOG: LOG_LINK_EVENT

Severity: ERROR

ACTION: Try resetting the FCoE to operational mode.

elx_mes1252 Menlo command error. code=<#>

DESCRIPTION: The IOCB driver sent to check FCoE state has failed.

DATA: return code

LOG: LOG_LINK_EVENT

Severity: ERROR

ACTION: Try resetting the FCoE to operational mode.

Link Events (1300 - 1399)

elx_mes1300: Re-establishing Link, timer expired

DESCRIPTION: The driver detected a condition where it had to re-initialize the link.

DATA: (1) fc_flag (2) hba_state

SEVERITY: Error

LOG: Always

ACTION: If numerous link events are occurring, check the physical connections to the Fibre Channel network.

elx_mes1301: Re-establishing Link

DESCRIPTION: The driver detected a condition in which it had to re-initialize the link.

DATA: (1) status (2) status1 (3) status2

SEVERITY: Information

LOG: LOG_LINK_EVENT verbose

ACTION: If numerous link events are occurring, check the physical connections to the Fibre Channel network.

elx_mes1302: Invalid speed for this board: Reset link speed to auto: <cfg_link_speed>

DESCRIPTION: The driver is reinitializing the link speed to auto-detect.

DATA: None

SEVERITY: Warning

LOG: LOG_LINK_EVENT verbose

ACTION: None required.

elx_mes1303: Link Up Event <eventTag> received

DESCRIPTION: A link up event was received. It is also possible for multiple link events to be received together.

DATA:(1) fc_eventTag (2) granted_AL_PA (3) UlnkSpeed (4) alpa_map[0]

Detail: If link events received, log (1) last event number received, (2) ALPA granted, (3) Link speed (4) number of entries in the loop init LILP ALPA map. An ALPA map message is also recorded if LINK_EVENT verbose mode is set. Each ALPA map message contains 16 ALPAs.

SEVERITY: Error

LOG: Always

ACTION: If numerous link events are occurring, check the physical connections to the Fibre Channel network.

elx_mes1304: Link Up Event ALPA map

DESCRIPTION: A link up event was received.

DATA: (1) wd1 (2) wd2 (3) wd3 (4) wd4

SEVERITY: Warning

LOG: LOG_LINK_EVENT verbose

ACTION: If numerous link events are occurring, check the physical connections to the Fibre Channel network.

elx_mes1305: Link Down Event <eventTag> received

DESCRIPTION: A link down event was received.

DATA: (1) fc_eventTag (2) hba_state (3) fc_flag

SEVERITY: Error

LOG: Always

ACTION: If numerous link events are occurring, check the physical connections to the Fibre Channel network.

elx_mes1307: READ_LA mbox error <mbxStatus> state <hba_state>

DESCRIPTION: The driver cannot determine what type of link event occurred.

DATA: None

SEVERITY: Information

LOG: LOG_LINK_EVENT verbose

ACTION: If numerous link events are occurring, check the physical connections to the Fibre Channel network. May indicate a possible hardware or firmware problem.

IOCTL Events (1600 - 1699)

elx_mes1601: libdfc ioctl entry

DESCRIPTION: The entry point for processing an ioctl.

DATA:(1) lpfc_cmd (2) lpfc_arg1 (3) lpfc_arg2 (4) lpfc_outsz

SEVERITY: Information

LOG: LOG_LIBDFC verbose

ACTION: None required.

elx_mes1602: libdfc ioctl exit

DESCRIPTION: The exit point for processing an ioctl.

DATA:(1) rc (2) lpfc_outsz (3) lpfc_dataout

SEVERITY: Information

LOG: LOG_LIBDFC verbose

ACTION: None required.

elx_mes1604: libdfc error

DESCRIPTION: An error occurred in the lpfcdfc ioctl module.

DATA: (1) error number index

SEVERITY: Error

LOG: Always

ACTION: Reduce the application program's SCSI send request buffer size to less than 320K bytes.

VPort Events (1800 - 1832)

elx_mes1800 Could not issue unreg_vpi

DESCRIPTION: Driver attempt to unregister vpi failed

DATA: None

SEVERITY: Error

LOG: LOG_VPORT verbose

ACTION: Software driver error. If this problem persists, report these errors to Technical Support.

elx_mes1801 Create vport work array FAILED: cannot do scsi_host_get

DESCRIPTION: The driver was unable to get a reference to a SCSI host.

DATA: None

SEVERITY: Warning

LOG: LOG_VPORT verbose

ACTION: Software driver warning. If this problem persists, report these errors to Technical Support.

elx_mes1802 HBQ <index> : local_hbqGetIdx <index> is > than hbqp->entry_count <count>

DESCRIPTION: An error occurred when processing queue related to an HBA in a particular slot.

DATA: (1) hbqno (2) local_hbqGetIdx (3) entry_count

SEVERITY: Error

LOG: LOG_VPORT verbose

ACTION: Software driver error. If this problem persists, report these errors to Technical Support.

elx_mes1803 Bad hbq tag. Data: <tag> <count>

DESCRIPTION: An error occurred when processing queue related tags for an HBA in a particular slot.

DATA: (1) tag (2) buffer_count

SEVERITY: Error

LOG: LOG_VPORT verbose

ACTION: Software driver error. If this problem persists, report these errors to Technical Support.

elx_mes1805 Adapter failed to init.Data: <command> <status> <queue num>

DESCRIPTION: An error occurred when processing queue related tags for an HBA in a particular slot.

DATA: (1) mbxCommand (2) mbxStatus (3) hbaqno

SEVERITY: Error

LOG: LOG_VPORT verbose

ACTION: Software driver error. If this problem persists, report these errors to Technical Support.

elx_mes1806 Mbox <command> failed. No vport.

DESCRIPTION: A mailbox command could not be communicated because there was no vport associated with the mailbox command.

DATA: mbxCommand

SEVERITY: Error

LOG: LOG_VPORT verbose

ACTION: Software driver error. If this problem persists, report these errors to Technical Support.

elx_mes1807 IOCB <value> failed. No vport

DESCRIPTION: An IOCB command could not be communicated because there was no vport associated with the mailbox command.

DATA: ulpCommand

SEVERITY: Error

LOG: LOG_VPORT verbose

ACTION: Software driver error. If this problem persists, report these errors to Technical Support.

elx_mes1808 Create VPORT failed: NPIV is not enabled: SLImode <mode>

DESCRIPTION: The driver failed to create a port because the HBA was in wrong mode or was not capable of NPIV.

DATA: (1) sli_rev

SEVERITY: Error

LOG: LOG_VPORT verbose

ACTION: Load the driver with npiv enabled on an HBA that supports SLI-3.

elx_mes1809 Create VPORT failed: Max VPORTs (<vpi>) exceeded.

DESCRIPTION: The driver failed to create a port because the maximum number of port supported by the driver will be exceeded.

DATA: (1) max_vpi

SEVERITY: Error

LOG: LOG_VPORT verbose

ACTION: No Action. The driver can not create any more vports.

elx_mes1810 Create VPORT failed: Cannot get instance number.

DESCRIPTION: The driver failed to allocate resources for an adapter and could not assign an instance number

DATA: None

SEVERITY: Error

LOG: LOG_VPORT verbose

ACTION: Software driver error. If this problem persists, report these errors to Technical Support.

elx_mes1811 Create VPORT failed: vpi x<vpi>

DESCRIPTION: The driver failed to create a port and had to eliminate all its resources.

DATA: vpi

SEVERITY: Error

LOG: LOG_VPORT verbose

ACTION: Software driver error. If this problem persists, report these errors to Technical Support.

elx_mes1812 vport_delete failed: Cannot delete physical host

DESCRIPTION: An attempt to delete a port failed because it was to delete a physical port and not a virtual port. Only vports on physical ports can be deleted on an NPIV system.

DATA: None

SEVERITY: Error

LOG: LOG_VPORT verbose

ACTION: Software driver error. If this problem persists, report these errors to Technical Support.

elx_mes1813 Create VPORT failed. Cannot get sparam.

DESCRIPTION: The port could not be created because it could not be initialized possibly due to unavailable resources.

DATA: None

SEVERITY: Error

LOG: LOG_VPORT verbose

ACTION: Software driver error. If this problem persists, report these errors to Technical Support.

elx_mes1815 Could not issue unreg_did (default rpis)

DESCRIPTION: Attempt to unregister rpi failed

DATA: None

SEVERITY: Error

LOG: LOG_VPORT verbose

ACTION: Software driver error. If this problem persists, report these errors to Technical Support.

elx_mes1816 FLOGI NPIV supported, response data <port>

DESCRIPTION: The fabric reports support for NPIV upon FLOGI

DATA: (1) response_multiple_NPort

SEVERITY: Warning

LOG: LOG_VPORT verbose

ACTION: No action needed, informational.

elx_mes1817 Fabric does not support NPIV - configuring single port mode

DESCRIPTION: The fabric reports no support for NPIV upon FLOGI

DATA: None

SEVERITY: Warning

LOG: LOG_VPORT verbose

ACTION: No action needed, informational.

elx_mes1818 VPort failed init, mbxCmd <mailbox command> READ_SPARM mbxStatus <mailbox status> , rc = <status>

DESCRIPTION: A pending mailbox command issued to initialize port, failed.

DATA: (1) mbxCommand (2) mbxStatus (3) rc

SEVERITY: Error

LOG: LOG_VPORT verbose

ACTION: Software driver error. If this problem persists, report these errors to Technical Support.

elx_mes1819 Unrecognized lpfc_sli_mode parameter: <mode>

DESCRIPTION: The user has attempted to set the SLI mode to an invalid value. The only valid values for the SLI mode are 0, 2, and 3.

DATA: (1) lpfc_sli_mode

SEVERITY: Error

LOG: LOG_VPORT verbose

ACTION: The lpfc_sli_mode driver parameter setting must be corrected. Valid values are 0, 2, and 3.

elx_mes1820 Unable to select SLI-3. Not supported by adapter.

DESCRIPTION: The HBA is not capable of operating in a given mode.

DATA: None

SEVERITY: Error

LOG: LOG_VPORT verbose

ACTION: SLI-3 mode is only available on some HBAs. Do not attempt to force the SLI mode to 3 on HBAs that do not support SLI-3 mode. This is an informational message. HBAs that do not support SLI-3 will be configured to run in SLI-2 mode, but it is recommended to use the auto setting (0).

elx_mes1821 Create VPORT failed. Invalid WWN format

DESCRIPTION: The port could not be created due to an invalid WWNN or WWPN format.

DATA: None

SEVERITY: Error

LOG: LOG_VPORT verbose

ACTION: Provide a valid WWN when creating Vports.

elx_mes1822 Invalid <name>: <xx: xx: xx: xx: xx: xx: xx: xx>

DESCRIPTION: An invalid WWN was used when creating a vport.

DATA: (1) type_name (2) wwn[1] (3) wwn[3] (3) wwn[5] (4) wwn[7]

SEVERITY: Error

LOG: LOG_VPORT verbose

ACTION: When creating a vport you must furnish a valid WWN.

elx_mes1823 Create VPORT failed. Duplicate WWN on HBA.

DESCRIPTION: The port could not be created because it would duplicate an existing WWNN HBA address. The resources for the port had to be discarded.

DATA: None

SEVERITY: Error

LOG: LOG_VPORT verbose

ACTION: Provide a WWN that is unique.

elx_mes1824 NPIV enabled: Override lpfc_sli_mode parameter (<mode>) to auto(0)

DESCRIPTION: The lpfc_enable_npiv and lpfc_sli_mode driver parameter settings conflict. The HBA must be configured for SLI-3 mode to support NPIV.

DATA: (1) lpfc_sli_mode

SEVERITY: Error

LOG: LOG_VPORT verbose

ACTION: This is an informational message that indicates that the lpfc_enable_npiv and lpfc_sli_mod parameter settings are not compatible. Resolve the parameter conflict by setting the SLI mode to 0 or 3 or, if SLI-2 mode is required then disable NPIV.

elx_mes1825 Vport Created.

DESCRIPTION: This message is displayed to indicate that a port was created in the system. It is displayed at this level to ensure it is always appears at all log levels.

DATA: None

SEVERITY: Error

LOG: LOG_VPORT verbose

ACTION: No action, informational.

elx_mes1826 Vport Disabled.

DESCRIPTION: The port had to be disabled in the system

DATA: None

SEVERITY: Error

LOG: LOG_VPORT verbose

ACTION: No action, informational.

elx_mes1827 Vport Enabled.

DESCRIPTION: The port had to be enabled after possible recovery from some errors.

DATA: None

SEVERITY: Error

LOG: LOG_VPORT verbose

ACTION: No action, informational.

elx_mes1828 Vport Deleted.

DESCRIPTION: A Vport was deleted.

DATA: None

SEVERITY: Error

LOG: LOG_VPORT verbose

ACTION: No action, informational.

elx_mes1829 CT command failed to delete objects on fabric.

DESCRIPTION: A command issued to the fabric to delete an associated resource for an object such as for a port, failed.

DATA: None

SEVERITY: Error

LOG: LOG_VPORT verbose

ACTION: Software driver error. If this problem persists, report these errors to Technical Support.

elx_mes1830 Signal aborted mbxCmd <command>

DESCRIPTION: A pending mailbox command was aborted because the thread received a signal.

DATA: None

SEVERITY: Error

LOG: LOG_VPORT verbose

ACTION: You should retry the attempted command.

elx_mes1831 Create VPORT Interrupted.

DESCRIPTION: The port creation process was unexpectedly interrupted at a critical time and the operation was unsuccessful.

DATA: None

SEVERITY: Error

LOG: LOG_VPORT verbose

ACTION: The process was interrupted while creating a vport. Retry the command.

elx_mes1832 Delete VPORT can not proceed at this time due to SCSI layer busy.

DESCRIPTION: An attempt to delete a port failed because it was deemed unsafe as the system was not in proper state, such as link down or SCSI layer has not released all the targets associated with the port.

DATA: None

SEVERITY: Error

LOG: LOG_VPORT verbose

ACTION: Retry the command. If this problem persists, report these errors to Technical Support.