



Emulex Driver for Linux

Version 8.0.16.34

User Manual

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Installation

Driver Information

Supported Features

- Topology support: Fibre Channel Arbitrated Loop (FC-AL), point-to-point, fabric with auto-topology negotiation
- Supports 1, 2 and 4 gigabit (Gb) with auto-rate negotiation
- Protocols: SCSI-FCP, FCP-2 (FC-Tape profile, including use of ADISC instead of PLOGI), FC initiator mode
- Supports up to thirty-two host bus adapter (HBA) ports
- Supports the latest HBAnyware configuration utility version 3.3 as part of master kit: enabling GUI-based driver configuration and persistent binding management, including inband (FC) and out of band (TCP/IP) remote SAN management capability, diagnostics (loopback and diagnostics dump).
- Supports Common HBA API
- Batch firmware download capability
- Supports the sysfs interface
- PCI hot plug support
- Vital Product Data (VPD) support
- The “Linux Tools” link on the Linux portion of the Emulex Web site (visit the link to see the available tools)

New Features in this Release

The Emulex version 8.0.16.34 driver for Linux includes the following enhancements:

- Supports the latest HBAnyware configuration utility version 3.3 as part of master kit. Refer to the HBAnyware 3.3 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:

- SuSE Linux Enterprise Server 9 Service Pack 2 or later (Intel x86, Intel Itanium2, Intel EM64T, AMD64, and PowerPC 64-bit architectures).
- Red Hat Enterprise Linux 4 update 3 or later updates (Intel x86, Intel Itanium2, Intel EM64T, AMD64, and PowerPC 64-bit architectures).

Compatibility

- LPe11000, LPe11002 and LPe1150 (minimum firmware version 2.50a4. Firmware version 2.72a2 is recommended for best performance.)
- LP11000, LP11002 and LP1150 (minimum firmware version 2.10a7. Firmware version 2.72a2 is recommended for best performance.)
- LP1005DC-CM2 (minimum firmware version 1.90a5)
- LP10000ExDC and LP1050Ex (minimum firmware version 1.91a1)
- LP10000DC and LP10000 (minimum firmware version 1.91a1)
- LP1050DC and LP1050 (minimum firmware version 1.91a1)
- LP9802DC (minimum firmware version 1.91a1)
- LP9802 (minimum firmware version 1.91a1)
- LP982 (minimum firmware version 1.91a1)
- LP9402DC, LP9002DC, LP9002L and LP9000 (minimum firmware version 3.93a0)
- LP952L (minimum firmware version 3.93a0)
- LP8000 and LP8000DC
 - If your HBA has a Dragonfly chip version 2.00 or greater, use firmware version 3.93a0.
 - If your HBA 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.

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.
- You must be running RHEL 4.4 (kernel 2.6.9-42.EL) or above to use the diskdump feature in RHEL 4.

Known Issues

- Some Web browsers attempt to continually reload the HBAnyware online help rendering it unusable. In this case, disable the Web browser's JavaScript capability. Refer to the Web browser's documentation for instructions.

Installing the Driver Kit

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

The RPM:

- Installs the driver sources 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.

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 10, “Uninstalling a Previous Application Helper Module (Stand Alone Kit)” on page 11 and “Uninstalling the Utilities” on page 12 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 configuration utility and the Application Helper Module are bundled together and must be installed separately from the driver. Refer to the "Installing the Utilities" on page 12 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 HBA in the system. Refer to the HBA'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 10, “Uninstalling a Previous Application Helper Module (Stand Alone Kit)” on page 11 and “Uninstalling the Utilities” on page 12 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:

- --createramdisk - Creates a new ramdisk image. Use this option after you have rebuilt the driver. (This is done by default during installation.)
- -h,--help - Prints a help message describing command line parameters.
- -u,--uninstall - Uninstalls the currently installed driver kit.

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>.

Upgrading the Kernel or Applying a Distribution Service Pack or Update

You can install the driver kit into an upgraded kernel. The installation of a Red Hat Enterprise Linux update or SuSE Linux Enterprise Server 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 Red Hat Enterprise Linux distribution or applying a service pack to a SuSE Linux Enterprise Server distribution.

Installing the Driver Kit into an Upgraded Kernel

To install the driver kit into an upgraded kernel:

1. Copy the lpfc-install script to the temporary directory. For example:

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

```
/tmp/lpfc-install --uninstall
```
3. Upgrade the kernel and/or distribution.
4. Reboot the system with the new kernel.
5. Download the driver kit from the Emulex web site or copy it to the system from the installation CD.
6. 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
```
7. Change to the directory that is extracted:

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

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

Installing the Utilities and the Application Helper Module

Follow these instructions to install the HBAnyware configuration utility and the Application Helper Module on your system. For ease of installation, HBAnyware and the Application Helper Module are bundled together.

The 'elxlpfc' init script is also installed and configured to start and stop the 'lpfcdfc' driver during system startup and shutdown.

Prerequisites

- The lpfc driver must be installed.
- Previous versions of the Application Helper Module must be uninstalled.

Note: You must run the uninstall script that shipped with the version of the Application Helper Module you want to remove. If the uninstall script resides in the `usr/src` directory, be sure to copy it to a temporary directory before you run it.

Procedure

To install HBAnyware and the Application Helper Module:

1. Log on as 'root'.
2. Download the utilities from the Emulex web site or copy them to the system from the installation CD.
3. Copy the `ElxLinuxApps-<AppsRev><DriverRev>.tar` file to a directory on the install machine.
4. Change (use `cd` command) to the directory to which you copied the tar file.
5. Untar the file. Type:

```
tar xvf ElxLinuxApps-<AppsRev><DriverRev>.tar
```
6. Uninstall any previously installed versions. Type:

```
./uninstall
```

Note: You must run the uninstall script that shipped with the version of the Application Helper Module you want to remove. If the uninstall script resides in the `/src` directory, be sure to copy it to a temporary directory before you run it.

7. Run the install script. Type:

```
./install
```
8. Enter the type of management you want to use:
 - 1 Local Mode : HBA's on this Platform can be managed by HBAnyware clients on this Platform Only.
 - 2 Managed Mode: HBA's on this Platform can be managed by local or remote HBAnyware clients.
 - 3 Remote Mode : Same as '2' plus HBAnyware clients on this Platform can manage local and remote HBA's.
9. You are prompted as to whether or not to allow users to change management mode after installation. Enter the letter 'y' for yes, or 'n' for no.

Utilities Directory Structure

After installation, the following directories are created on the system.

Table 2: Utilities Directory Structure

Directory	Description
/usr/src/lpfcdfc	Application Helper Module source files.
/usr/sbin/hbanyware	HBAnyware files.

Installing the HBAnyware Utility with Web Launch

Prerequisites

Before installing the HBAnyware utility with Web Launch, ensure your systems meet the following requirements. See page 13 for more information about the HBAnyware utility with Web Launch.

- The system on which you are installing the Web Launch services package (the server) requires the following:
 - The HTTP server must be configured to handle the JNLP MIME file type. The following MIME file type/file extension must be added to your server configuration:
MIME type: application/x-java-jnlp-file
File Extension: jnlp
 - The HTTP server must be configured and running.
- The system on which you are running the browser (the client) requires the following:
 - The Java Runtime Environment (JRE) 5.0 or later must be installed. Below are the specific requirements:
 - Sun 32-bit JRE 5.0 or later for Intel based systems (x86 and IA64)
 - IBM 64-bit JRE 5.0 or later for PowerPC
 - Sun 32-bit JRE 5.0 or later x86-64

Refer to the appropriate vendor documentation for detailed instructions about configuring MIME types, configuring and starting the HTTP server and installing the JRE.

- The HBAnyware utility must be installed before installing HBAnyware with Web Launch.

Procedure

To install HBAnyware with Web Launch:

1. Log on as 'root'.
2. Navigate to the HBAnyware directory. Type:
`cd /usr/sbin/hbanyware`
3. Run the install script. Type:
`./wsinstall`
4. When prompted, enter the Web server's document root directory. For example:
`/srv/www/htdocs`

5. You are provided with the IP address of the host and asked if that is the IP address that is being used by your Web server. Answer Y or N as appropriate. If you answer N, you are prompted for the IP address you wish to use.
6. You are asked if your web server listening on the normal default HTTP port (80)? Answer Y or N as appropriate. If you answer N, you are prompted for the port you wish to use.

You are notified the installation of the HBAnyware Web Launch package has completed.

Installing the HBAnyware Security Configurator

Follow these instructions to install the HBAnyware Security Configurator on your system. The install script is located in /usr/sbin/hbanyware directory.

Prerequisites

- The lpfc driver must be installed.
- Previous versions of the Application Helper Module must be uninstalled.
- HBAnyware must be installed on all participating systems.

Procedure

To install the HBAnyware Security Configurator utility:

1. Log on as 'root'.
2. Change (use the cd command) to the directory to which you copied the tar file. (See "Installing the Utilities and the Application Helper Module" on page 7 step 2 for reference.)
3. Run the install script with the "ssc" parameter specified. Type:

```
./install ssc
```

Installing HBAnyware and the Application Helper Module using the Upgrade Kernel Option

If you wish, you can install the Applications Kit on an upgraded kernel. The Applications Kit contains HBAnyware and the Application Helper Module.

Prerequisites

- The lpfc driver must be part of the target kernel distribution.
- The utilities package was previously installed on the current kernel.

Procedure

To install the Applications Kit on an upgraded kernel:

1. Boot to the new kernel.
2. Log on as 'root'.
3. Change (use the cd command) to the directory containing the unpacked Applications Kit.
4. Run the install upgrade kernel script. Type:

```
./install upgradkernel
```

Uninstalling the Driver Kit

Note: Driver parameter changes made using HBAnyware 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. If the uninstall script resides in the `usr/src` directory, be sure to copy it to a temporary directory before you run it.

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 HBAnyware. Type:

```
cd /usr/sbin/hbanyware
./stop_hbanyware
```
4. Uninstall the utilities. See page 12 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
```

If the machine is configured to boot from a SAN-attached disk through an Emulex HBA, one of the following tasks is required depending upon your OS version. These steps ensure that your system will boot successfully by creating a new ramdisk image containing the lpfc driver that originally shipped with the distribution.

- For a system with SuSE Linux Enterprise Server without a Service Pack or with Service Pack 1 installed, edit the `INITRD_MODULES` string in the `/etc/sysconfig/kernel` file to include the 'lpfcdd' driver. For example, a string that looks like:

```
INITRD_MODULES="mptscsih jbd ext3"
```


should be modified to look like:

```
INITRD_MODULES="mptscsih jbd ext3 lpfcdd"
```
- For a system with SuSE Linux Enterprise Server Service Pack 2, edit the `INITRD_MODULES` string in the `/etc/sysconfig/kernel` file to include the 'lpfc' driver. For example, a string that looks like:

```
INITRD_MODULES="mptscsih jbd ext3"
```


should be modified to look like:

```
INITRD_MODULES="mptscsih jbd ext3 lpfc"
```
- For a system with Red Hat Enterprise Linux 4 (with or without updates), add the following line to the `/etc/modprobe.conf` file if it does not already exist:

```
alias scsi_hostadapter<n> lpfc
```


where `<n>` is a number that is not used in any other `scsi_hostadapter` lines in the file.

7. Execute the lpfc-install script with the "--createramdisk" option:

```
/tmp/lpfc-install --createramdisk
```

8. If prompted, reboot the system.

Uninstalling a Previous Application Helper Module (Stand Alone Kit)

Note: You must run the uninstall script that shipped with the version of the Application Helper Module you want to remove. If the uninstall script resides in the usr/src directory, be sure to copy it to a temporary directory before you run it.

To completely remove the Emulex Application Helper Module:

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 HBAnyware. Type:

```
cd /usr/src/hbanyware  
./stop_hbanyware
```

The script is located in the /usr/sbin/hbanyware directory.
4. Copy the ioctl-install script to the temporary directory. For example:

```
cp /usr/src/lpfcdfc/ioctl-install /tmp
```
5. Execute the ioctl-install script. with the '--uninstall' option. Type:

```
/tmp/ioctl-install --uninstall
```
6. If prompted, reboot the system.

Uninstalling the Utilities

Follow these instructions to uninstall the utility and the Application Helper Module.

Note: If the HBAware Security Configurator is installed, it must be uninstalled before uninstalling HBAware.

Uninstalling the HBAware Security Configurator

Note: You must run the uninstall script that shipped with the version of HBAware Security Configurator you want to remove. If the uninstall script resides in the `usr/src` directory, be sure to copy it to a temporary directory before you run it.

To install the HBAware Security Configurator:

1. Log on as 'root'.
2. Change (use `cd` command) to the directory to which you copied the tar file during installation.
3. Run the uninstall script with the `ssc` parameter specified. Type:

```
./uninstall ssc
```

Uninstalling HBAware Web Launch only

Note: If you installed HBAware Web Launch, you must uninstall it before uninstalling HBAware.

To uninstall HBAware Web Launch only:

1. Log on as 'root'.
2. Execute the following script:

```
/usr/sbin/hbaware/wsuninstall
```

This script stops the HBAware Web Launch Service daemons (if they are running) and removes all Web Launch related files from the host.

Uninstalling HBAware and the Application Helper Module

Note: You must run the uninstall script that shipped with the version of HBAware and the Application Helper Module you want to remove. If the uninstall script resides in the `usr/src` directory, be sure to copy it to a temporary directory before you run it.

To uninstall HBAware and the Application Helper Module:

1. Log on as 'root'.
2. Change (use `cd` command) to the directory to which you copied the tar file during installation.
3. Uninstall any previously installed versions. Type:

```
./uninstall
```


Configuration

You can configure the driver by:

- Setting module parameters using modprobe and /etc/modprobe.conf.
- Using the sysfs interface (for parameters which can be changed after loading the driver).
- Editing the driver properties in the lpfc.conf file. See the “Driver Parameters Reference Table” on page 16 to view the list of configurable driver properties.
- Using the HBAnyware configuration utility. See the HBAnyware 3.3 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 log_verbose, nodev_tmo and use_adisk driver parameters for individual HBAs. You must apply other driver parameters to all HBAs contained in the host.

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 hbaconf 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 manually loaded again. Using the insmod command requires no editing or saving. This temporary configuration method overrides the modprobe.conf file for the current session.

Values can be expressed in hexadecimal or decimal notation.

Example of Temporary Configuration

You want to temporarily set 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
```

Note: You cannot override parameters set in modprobe.conf

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 will be needed. See “Creating a New Ramdisk Image” on page 15 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 `/etc/modprobe.conf` file takes precedence.

Temporary Driver Configuration by Read/Write to sysfs

Sysfs is a virtual filesystem that exposes the structure of the system to the user. 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 in this manner. Nevertheless all driver parameters can be read through sysfs. It is important to note that sysfs changes exist only for the lifetime of the driver load and are lost on driver unload or reboot.

The sysfs filesystem is mounted and available as `/sys`. We must first identify the `scsi_host` which represents the HBA for which we 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 we are interested in HBA `scsi_host 7`, we can list the driver parameters for this particular HBA 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 on systems running Red Hat Enterprise Linux or SuSE Linux Enterprise Server.

Note: You must perform this step whenever the lpfc options in /etc/modprobe.conf are changed and you want the change to take affect 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 RHEL4 distributions type:

```
# mkinitrd --allow-missing -f /boot/initrd-$(uname -r).img $(uname -r)
```
- For SLES9 PPC64 architecture distributions type:

```
# mkinitrd -k vmlinux -i initrd
```
- For SLES9 non-PPC64 architecture distributions type:

```
# mkinitrd -k vmlinuz -i initrd
```

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 HBA's targets with sysfs given the HBA'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 HBA'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.

Changing Non-dynamic Parameter Values

To change non-dynamic parameter values:

1. Navigate to the /usr/sbin/hbanyware directory and run the scripts to stop the HBAnyware utility processes. Type:

```
./stop_hbanyware
```

2. Stop all I/O to lpfc attached devices.

3. Unload the lpfc driver. Type:

```
rmmod lpfc
```

4. Unload the lpfc driver. Type:

```
rmmod lpfc
```

5. Reload the driver. Type:

```
modprobe lpfc
```

```
modprobe lpfc
```

The HBAnyware utility services will start automatically when you launch the application.

For these changes to persist after a reboot you must create a new ramdisk image. See "Creating a New Ramdisk Image" on page 15 to learn how.

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.

To change driver properties:

1. Open the lpfc.conf file in a text editor.
2. Change the properties you wish.
3. Save the file.
4. If required, reboot the system for the changes to take effect.

Table 3: lpfc Static Parameters (Requires a driver reload to change)

Variable	Default	Min	Max	Comments	Visible using sysfs
lpfc_ack0	0	0=Off	1=On	Use ACK0 for class 2.	Yes
lpfc_cr_count	1	1	255	This parameter determines the values for I/O coalescing for cr_delay (msec) or cr_count outstanding commands.	No

Table 3: lpfc Static Parameters (Requires a driver reload to change) (Continued)

Variable	Default	Min	Max	Comments	Visible using sysfs
lpfc_cr_delay	0	0	63	This parameter determines the values for I/O coalescing for cr_delay (msec) or cr_count outstanding commands.	No
lpfc_discovery_threads	32	1	64	Specifies the maximum number of ELS commands that can be outstanding for a discovery. Note: The discovery_threads parameter will default 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 will only be used for those ports that are connected in a private loop topology. The configured value will be used for all other ports.	No
lpfc_fcp_class	3	2	3	Fibre Channel class for FCP data transmission.	Yes
lpfc_link_speed	0	0=auto select 1=1G 2=2G 4=4G		Sets link speed.	Yes
lpfc_hba_queue_depth	8192	32	8192	Maximum number of FCP commands that can queue to an Emulex HBA.	Yes
lpfc_lun_queue_depth	30	1	128	Default max commands sent to a single logical unit (disk).	Yes
lpfc_topology	0	0x0=loop then P2P 0x2=P2P only 0x4=loop only 0x6=P2P then loop		Fibre Channel link topology (defaults to loop, if it fails attempts point-to-point mode).	Yes

Table 3: lpfc Static Parameters (Requires a driver reload to change) (Continued)

Variable	Default	Min	Max	Comments	Visible using sysfs
lpfc_fcp_bind_method	2	1	4	Specifies method of binding each port. Values: 1: WWNN binding 2: WWPN binding 3: D_ID binding 4: ALPA binding	Yes
lpfc_fdmi_on	0	0	2	False (0) if disabled. (1) or (2) if enabled depending on type of support needed.	Yes
lpfc_scan_down	1	0=Off	1=On	Select method for scanning ALPA to assign a SCSI ID.	Yes
lpfc_max_luns	256	1	32768	Specifies the maximum number of LUNs per target. A value of 20 means LUNs from 0 to 19 are valid.	Yes
lpfc_multi_ring_support	1	1	2	Determines the number of primary SLI rings over which to spread IOCB entries.	No

All lpfc dynamic parameters are read/write using sysfs.

Table 4: lpfc Dynamic Parameters (Do not require a driver reload to change)

Variable	Default	Min	Max	Comments
lpfc_discovery_min_wait	3	0	60	The minimum number of seconds the driver waits for the discovery to complete.
lpfc_discovery_wait_limit	600	0	600 (special value meaning no limit)	The maximum number of seconds the driver waits for the discovery to complete.
lpfc_linkup_wait_limit	15	0	60	The number of seconds the driver waits for the link to come up.
lpfc_log_verbose	0x0	0x0	0xffff	(bit mask) Extra activity logging.
lpfc_nodev_tmo	30	0	255	Seconds to hold I/O err if device disappears.
lpfc_use_adisc	0	0=Off	1=On	Send ADISC instead of PLOGI for device discovery or RSCN.

Table 5: lpfcdfc Static Parameters

Variable	Default	Min	Max	Comments
lpfc_scsi_req_tmo	30	0	255	Time out value (in seconds) for SCSI request sent through lpfcdfc module. (Not available using the HBAnyware GUI. HBACMD Command line only.)

Using udev for Persistent Naming

The udev tool is included in RHEL 4 and SLES 9 SP1 and can be configured to provide persistent names for SCSI drives.

SLES 9

On SLES 9 SP1, udev is configured by default to create persistent device names for each disk and partition in the `/dev/disk/by-id` directory. These names are symbolic links to the current `/dev/sd` block device. The names are derived from information retrieved from the disk itself and will therefore follow the disk even if it's `/dev/sd` name changes. For example:

```
sles9:/ # ls -l /dev/disk/by-id
total 8
drwxr-xr-x 2 root root 4096 Mar 3 21:33 .
drwxr-xr-x 4 root root 4096 Feb 10 08:49 .
lrwxrwxrwx 1 root root 9 Mar 3 21:11 32000000c5005d6e4 -> ../../sdb
lrwxrwxrwx 1 root root 9 Mar 3 21:11 32000000c5005df9d -> ../../sdc
lrwxrwxrwx 1 root root 9 Mar 3 21:11 32000000c5005dfae -> ../../sdd
lrwxrwxrwx 1 root root 10 Mar 3 21:33 32000000c5005dfae1 -> ../../sdd1
lrwxrwxrwx 1 root root 10 Mar 3 21:33 32000000c5005dfae2 -> ../../sdd2
```

In this example, only the third disk (sdd) has partitions. As partitions are added and removed, udev creates and deletes the corresponding soft links.

RHEL 4

udev can be configured to create persistent names on RHEL 4. To do this, first create a file called `20-local.rules` in the `/etc/udev/rules.d` directory containing just the following line:

```
KERNEL="sd*", BUS="scsi", PROGRAM="/sbin/scsi_id", SYMLINK="disk-%c%n"
```

The exact name of the file is not important, but it must start with a number lower than 50 to override the default rules file.

Enable scsi_id

(For RHEL only. SLES does not require this step.) The `scsi_id` utility generates unique identifiers for SCSI devices. udev uses these identifiers to create a persistent name for devices under `/dev`. By default `scsi_id` is disabled.

Method 1: enable `scsi_id` for all devices

You can enable `scsi_id` by making the following changes to `/etc/scsi_id.conf`:

Change:

```
options=-b
```

To:

```
## options=-b
```

And change:

```
## options=-g
```

To:

```
options=-g
```

Method 2: enable `scsi_id` for particular devices, such as all disks made by Seagate, by adding this line to `/etc/scsi_id`:

```
vendor=SEAGATE, options=-g
```

Then load or reload the `lpfc` driver. `udev` creates symbolic links for each SCSI disk and its partitions. For example:

```
rhel4:/ # ls -l /dev/disk*
lrwxrwxrwx 1 root root 3 Mar 7 00:06 /dev/disk-32000000c507985c4 -> sdb
lrwxrwxrwx 1 root root 3 Mar 7 00:06 /dev/disk-32000000c50797d92 -> sdc
lrwxrwxrwx 1 root root 4 Mar 7 00:06 /dev/disk-32000000c50797d921 -> sdc1
lrwxrwxrwx 1 root root 3 Mar 7 00:06 /dev/disk-32000000c507985bb -> sdd
lrwxrwxrwx 1 root root 4 Mar 7 00:06 /dev/disk-32000000c507985bb1 -> sdd1
lrwxrwxrwx 1 root root 4 Mar 7 00:06 /dev/disk-32000000c507985bb2 -> sdd2
```

For further information about `udev`, consult the following resources:

`udev` Web Page: <http://www.kernel.org/pub/linux/utils/kernel/hotplug/udev.html>

"Kernel Korner - `udev`-Persistent Device Naming in User Space" Linux Journal article by Greg Kroah-Hartman

<http://www.linuxjournal.com/article.php?sid=7316>

"Writing `udev` rules" by Daniel Drake

http://www.reactivated.net/writing_udev_rules.html

Troubleshooting

Introduction

This section describes log messages which can be useful when troubleshooting the Emulx driver for Linux. 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.

The groups and the associated number ranges are defined in the Message Log table below. The preamble string shown in the Message Log table is displayed as part of the log message. The lower case 'x' of the preamble string defines the severity of the log message. The 'x' will be replaced by one of five lower case letters. Those letters are defined in the Severity Code table.

Severity Codes

Information and warning messages can be turned ON or OFF by setting/resetting the appropriate mask bit(s) in the variable 'lpfc_log_verbose' located in the driver configuration module, lpfc.conf.c. By default, both information and warning messages are disabled. Configuration error (c), error (e), and panic (p) messages can not be disabled.

Table 6: Severity Code Table

Code	Severity
i	Information
w	Warning
c	Configuration Error
e	Error
p	Panic

Message Group Masks

Table 7 defines the log message groups and the associated number ranges.

- The preamble string shown in this table is displayed as part of the log message.
- The lower case 'x' of the preamble string defines the severity of the log message and represents one of five lower case letters defined in the severity codes table.

Table 7: Message Log Table

LOG Message Verbose Mask Definition	Preamble String	From	To	Verbose Bit	Verbose Description
LOG_ELS	ELx	0100	0199	0x1	ELS events
LOG_DISCOVERY	Dlx	0200	0299	0x2	Link discovery events

Table 7: Message Log Table (Continued)

LOG Message Verbose Mask Definition	Preamble String	From	To	Verbose Bit	Verbose Description
LOG_MBOX	MBx	0300	0399	0x4	Mailbox events
LOG_INIT	INx	0400	0499	0x8	Initialization events
Future		0500	0599		
LOG_FCP	FPx	0700	0799	0x40	FCP traffic history
Future		0800	0899		
LOG_NODE	NDx	0900	0999	0x80	Node table events
Reserved		1000	1099	0x100	
LOG_MISC	Mlx	1200	1299	0x400	Miscellaneous events
LOG_LINK_EVENT	LKx	1300	1399	0x10	Link events
IOCTL_ERROR	IOx	1600	1699	0x2000	IOCTL events
LOG_ALL_MSG_				0x1fff	Log all messages

Message Log Example

The following is an example of a LOG message:

```
Jul 12 16:30:26 <node> kernel: !lpfc0:0234:DIi:Device Discovery
completes
```

In the above LOG message:

- lpfc0 identifies the LOG message as coming from EMULEX HBA0.
- 0234 identifies the LOG message number.
- DIi identifies the LOG message as a DISCOVERY (DI) INFORMATION (i) message.

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]

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) disc (4) 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) 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) disc (4) 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) 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]

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 (2) nlp_flag

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]

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_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_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_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.

elx_mes0133 - FARP-RSP received from DID <did>

DESCRIPTION: A FARP RSP has been received from the specified node.

DATA: none

SEVERITY: Information

LOG: LOG_ELS verbose

ACTION: No action needed, informational.

elx_mes0134 - FARP-REQ received from DID <did>

DESCRIPTION: A FARP REQ has been received from the specified node.

DATA: none

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_mes0201: Abort outstanding I/O on NPort <Fabric_DID>

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

DATA: None

SEVERITY: Information

LOG: LOG_DISCOVERY verbose

ACTION: No action needed, informational.

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: Nodet timeout on NPort <nlp_DID>

DESCRIPTION: A remote NPort that was discovered by the driver disappeared for more than ELX_NODEV_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: Create SCSI Target <tgt>

DESCRIPTION: A mapped FCP target was discovered and the driver has allocated resources for it.

DATA: None

SEVERITY: Information

LOG: LOG_DISCOVERY | LOG_FCP verbose

ACTION: No action needed, informational.

elx_mes0205: Abort Outstanding I/O on Nport <nlp_DID>

DESCRIPTION: An outstanding I/O on a remote Nport was aborted.

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

SEVERITY: Information

LOG: LOG_DISCOVERY | LOG_FCP verbose

ACTION: No action needed, informational.

elx_mes0206 - Nodet timeout on NPort <nlp_DID>

DESCRIPTION: Mapped target has disappeared for longer than the timeout period.

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

SEVERITY: Information

LOG: LOG_DISCOVERY verbose

ACTION: Check entries in /proc/scsi/lpfc/ to see if WWPNs exist for all targets. If all targets are seen by the adapter but one or more targets are inaccessible by the system, run the lun_scan script (see the "Linux tools" link on the Linux section of the Emulex Web site) to remap LUNs to scsi devices in the midlayer. If a device has not been rediscovered, but other targets are seen by that adapter, check the target device. If no targets are visible to the adapter, check for link on the adapter and that the fabric has not failed.

elx_mes0207: target id %d out-of-range

DESCRIPTION: The target id is beyond the supported driver range.

DATA: (1) target id

SEVERITY: Error

LOG: Always

ACTION: Check the SAN configuration.

elx_mes0208: Failmask change on NPort <nlp_DID>

DESCRIPTION: An event was processed that indicates the driver may not be able to communicate with the remote NPort.

DATA: (1) nlp_failMask (2) bitmask (3) flag

SEVERITY: Information

LOG: LOG_DISCOVERY verbose

ACTION: No action needed, informational.

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

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

DATA: None

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_mes0213: Reassign scsi id <nlp_sid> to NPort <nlp_DID>

DESCRIPTION: A previously bound FCP Target has been rediscovered and reassigned a scsi id.

DATA: (1) nlp_bind_type (2) nlp_flag (3) nlp_state (4) nlp_rpi

SEVERITY: Information

LOG: LOG_DISCOVERY | LOG_FCP 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_mes0216: Assign scsi id <nlp_sid> to NPort <nlp_DID>

DESCRIPTION: A scsi id is assigned due to BIND_ALPA.

DATA: (1) nlp_bind_type (2) nlp_flag (3) nlp_state (4) nlp_rpi

SEVERITY: Information

LOG: LOG_DISCOVERY | LOG_FCP 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 FLOGI timeout

DESCRIPTION: The driver sent the initial FLOGI to 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 RATO_V.

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_mes0229: Cannot assign scsi ID <nlp_sid> to NPort <nlp_DID>

DESCRIPTION: The driver cannot assign a scsi id to a discovered mapped FCP target.

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

SEVERITY: Information

LOG: LOG_DISCOVERY | LOG_FCP verbose

ACTION: No action needed, informational.

elx_mes0230: Cannot assign scsi ID on NPort <nlp_DID>

DESCRIPTION: The driver cannot assign a scsi id to a discovered mapped FCP target.

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

SEVERITY: Information

LOG: LOG_DISCOVERY | LOG_FCP verbose

ACTION: Check persistent binding information.

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_mes0239: 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_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_mes0245: ALPA based bind method used on an HBA which is in a nonloop topology

DESCRIPTION: ALPA based bind method used on an HBA which is not in a loop topology.

DATA: (1) fc_topology

SEVERITY: Warning

LOG: LOG_DISCOVERY verbose

ACTION: Change the bind method configuration parameter of the HBA to 1(WWNN) or 2(WWPN) or 3(DID)

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_mes0249: All %d target ids in use. Bind creation failed.

DESCRIPTION: The driver has used all available target ids. Target to node binding has failed.

DATA: (1) Maximum number of supported targets.

SEVERITY: Error

LOG: Always

ACTION: Check the SAN configuration.

elx_mes0252 - Rescanning scsi host

DESCRIPTION: Rescanning a SCSI host because a new target has been found.

DATA: none

SEVERITY: Error

LOG: Always

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.

elx_mes0258 - Unblocking IO to Target scsi id <scsi_id> NPort pointer <pnode>

DESCRIPTION: The driver has unblocked IO to the specified SCSI ID on the specified NPort.

DATA: none

SEVERITY: Information

LOG: LOG_DISCOVERY | LOG_FCP verbose

ACTION: No action needed, informational.

elx_mes0259 - Blocking IO to Target scsi id <scsi_id> NPort pointer <pnode>

DESCRIPTION: The driver has blocked IO to the specified SCSI ID on the specified NPort.

DATA: none

SEVERITY: Information

LOG: LOG_DISCOVERY | LOG_FCP verbose

ACTION: No action needed, informational.

elx_mes0260 - Remove Target scsi id <scsi_id>

DESCRIPTION: The specified SCSI ID has been removed.

DATA: Error

SEVERITY: Information

LOG: Always

ACTION: No action needed, informational.

elx_mes0261 - Adding Target scsi id <scsi_id>

DESCRIPTION: The specified SCSI ID has been added.

DATA: Error

SEVERITY: Information

LOG: Always

ACTION: No action needed, informational.

elx_mes0262 - Cannot unblock scsi target

DESCRIPTION: A SCSI target could not be unblocked.

DATA: none

SEVERITY: Error

LOG: Always

ACTION: Please report this issue to Technical Support.

elx_mes0263 - Cannot block scsi target. target ptr <targetp>

DESCRIPTION: The SCSI target with the specified target pointer could not be blocked.

DATA: none

SEVERITY: Error

LOG: Always

ACTION: Please report this issue to Technical Support.

elx_mes0264 - HotPlug support enabled

DESCRIPTION: HotPlug support has been enabled.

DATA: Error

SEVERITY: Information

LOG: Always

ACTION: No action needed, informational.

Mailbox Events (0300 - 0399)

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_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_mes0312: 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_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_mes0316: Cmd ring <ringno> put: iotag <iotag> greater then configured max <fast_iotag> wd0 <icmd>

DESCRIPTION: The assigned I/O iotag is greater than the allowed maximum.

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: Rsp ring <ringno> get: iotag <iotag> greater then configured max <fast_iotag> wd0 <irsp>

DESCRIPTION: The assigned I/O iotag is greater than the maximum allowed.

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: Outstanding I/O count for ring <ringno> is at max <fast_iotag>

DESCRIPTION: An I/O tag cannot be assigned because none are available. The maximum number of allowed I/Os are currently outstanding.

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) 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_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_NVPARM, 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_mes0326 - 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_mes0327: Waited <msecs> mSecs for high priority IOCB <iocb> - giving up

DESCRIPTION: A high priority IOCB such as a target reset or lun reset was issued and did not complete in the required amount of time.

DATA: None

SEVERITY: Error

LOG: Always

ACTION: This message indicates a reset could not complete in the expected amount of time. If problems persist report these errors to Technical Support.

elx_mes0328: Restart HBA Data: x%x x%x

DESCRIPTION: A board reset is getting issued to the HBA

DATA: (1) Current HBA state (2) Current SLI state

SEVERITY: Information

LOG: LOG_SLI verbose

ACTION: None. General information.

elx_mes0329: Kill HBA Data: x%x x%x

DESCRIPTION: A kill-board command is getting sent to the HBA

DATA: (1) Current HBA state (2) Current SLI state

SEVERITY: Information

LOG: LOG_SLI verbose

ACTION: None. General information

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 problems persist 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: Adapter failed to init, mbxCmd <mbxCommand> READ_REV, detected outdated firmware

DESCRIPTION: Outdated firmware was detected during initialization.

DATA: (1) read_rev_reset

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_mes0452: Waiting for discovery to stop Data x%x x%x x%x x%x

DESCRIPTION: The driver has configured the HBA successfully and is waiting for FC discovery to complete. Message repeats every 30 seconds.

DATA: (1) Current HBA state (2) Current HBA flags (3) Current SLI flags (4) Number of outstanding PRLIs.

SEVERITY: Error

LOG: Always

ACTION: May be a storage device issue or switch issue. Check your SAN configuration.

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 indicting 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.

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.

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.

FCP Traffic History (0700 - 0799)

elx_mes701: Issue Abort Task Set to TGT <num> LUN <num>

DESCRIPTION: The SCSI layer detected that it needs to abort all I/O to a specific device. This causes the 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_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_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_mes0712: Bus Reset on Target <tgt> Failed

DESCRIPTION: A bus reset on the specified target failed.

DATA: None

SEVERITY: Information

LOG: LOG_FCP verbose

ACTION: Check the state of the device in question.

elx_mes0713: 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_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, please check the targets for errors.

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

DESCRIPTION: The specied 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_mes0748: Abort handler timed out waiting for abort to complete

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

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

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 mapped

DESCRIPTION: The driver is searching for a node table entry, on the mapped node list, based on the 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 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_mes0903: Add scsiid <sid> to BIND list

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

DATA: (1) bind_cnt (2) nlp_DID (3) bind_type (4) blp

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 (2) blp

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_mes0910: FIND node DID unmapped

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

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

SEVERITY: Information

LOG: LOG_NODE verbose

ACTION: None required.

elx_mes0911: 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_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.

elx_mes0933 - FIND node DID reglogin

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

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

SEVERITY: Information

LOG: LOG_NODE verbose

ACTION: No action needed, informational.

elx_mes0934 - FIND node DID prli

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

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

SEVERITY: Information

LOG: LOG_NODE verbose

ACTION: No action needed, informational.

elx_mes0935 - FIND node DID npr

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

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

SEVERITY: Information

LOG: LOG_NODE verbose

ACTION: No action needed, informational.

elx_mes0936 - FIND node DID unused

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

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

SEVERITY: Information

LOG: LOG_NODE verbose

ACTION: No action needed, informational.

Miscellaneous 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.

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_mes1600: libdfc debug entry

DESCRIPTION: The entry point for processing diagnostic ioctl.

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

SEVERITY: Information

LOG: LOG_LIBDFC verbose

ACTION: None required.

elx_mes1601: libdfc debug exit

DESCRIPTION: The exit point for processing diagnostic ioctl.

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

SEVERITY: Information

LOG: LOG_LIBDFC verbose

ACTION: None required.

elx_mes1602: libdfc hbaapi entry

DESCRIPTION: The entry point for processing HBAAPI ioctl.

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

SEVERITY: Information

LOG: LOG_LIBDFC verbose

ACTION: None required.

elx_mes1603: libdfc hbaapi exit

DESCRIPTION: The exit point for processing HBAAPI 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.

elx_mes1606: 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.

elx_mes1607: libdfc util exit

DESCRIPTION: The exit point for processing util ioctl.

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

SEVERITY: Information

LOG: LOG_LIBDFC verbose

ACTION: None required.

elx_mes1608 - libdfc get rev

DESCRIPTION: An application has requested the version of the ioctl module.

DATA: (1) dfc_major_rev (2) dfc_minor_rev

SEVERITY: Warning

LOG: Always

ACTION: Only if applications report version mismatch failures: verify lpfc, lpfcdfc, and libdfc are all compatible versions.